**Sun Server X3-2
(formerly Sun Fire X4170 M3)**

Service Manual

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Contents

Using This Documentation

This service manual explains how to remove and replace parts in the Sun Server X3-2, and how to troubleshoot and maintain the system.

Note – The Sun Server X3-2 was formerly named the Sun Fire X4170 M3 server. This former name might still appear in the software. The new product name does not indicate any change in system features or functionality.

This document is intended for system administrators, network administrators, and service technicians who have an understanding of server systems.

This section describes how to get the latest software and firmware, documentation and feedback, and support and accessibility information.

Getting the Latest Software and Firmware

Firmware, drivers and other hardware-related software for each Oracle x86 server, server module (blade), and blade chassis are updated periodically.

You can obtain the latest version in one of three ways:

- Oracle System Assistant – This is a new factory-installed option for Oracle x86 servers. It has all the tools and drivers you need and is built into the server.
- My Oracle Support: http://support.oracle.com
- Physical media request

For more information, see "Getting Server Firmware and Software" on page 159.

About This Documentation

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

A PDF version that includes all information on a particular topic subject (such as hardware installation or product notes) can be generated by clicking the PDF button in the upper left corner of the HTML page.

Related Documentation

Documentation	Link
All Oracle documentation	http://www.oracle.com/documentation
Sun Server X3-2	http://www.oracle.com/pls/topic/lookup?ctx=SunServerX3-2
Oracle Integrated Lights Out Manager (ILOM) 3.1	http://www.oracle.com/pls/topic/lookup?ctx=ilom31
Oracle Hardware Management Pack 2.2	http://www.oracle.com/pls/topic/lookup?ctx=ohmp

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Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

About the Sun Server X3-2

Note – The Sun Server X3-2 was formerly named the Sun Fire X4170 M3 server. This former name might still appear in the software. The new product name does not indicate any change in system features or functionality.

These topics describe the controls, connectors, status indicators, system components, and replaceable components of the server.

Description	Links
Product Description	"Product Description" on page 1
Learn about server controls and connectors.	"About Controls and Connectors" on page 2
Learn about the server and component status indicators	"About Server and Component Status Indicators" on page 8
Learn about system components.	"About System Components" on page 16

Product Description

The Sun Server X3-2 is an enterprise-class, one rack unit (1U) server. It supports the following components:

- Up to two Intel processors. Processors with the following capabilities are supported:
    - 2.4 GHz, 4-core, 80W
    - 2.5 GHz, 6-Core, 95W
    - 2.2 GHz, 8-Core, 95W
    - 2.9 GHz, 8-Core, 135W

- Up to 8 DIMMs per processor for a maximum of 16 DDR3 DIMMs and a maximum of 512 GB of memory on dual-processor systems. DIMM sizes of 8 GB, 16 GB, and 32 GB are supported.

Note – A maximum of eight DIMMs for a maximum of 256 GB are supported in single-processor systems.

- Four PCIe Gen3 slots in dual-processor systems, three external slots and one internal. PCIe slot 1, which is an external slot, is nonfunctional in single-processor systems.
- Storage drive configurations can include both hard disk drives (HDDs) or solid state disk (SSD) drives. Supported storage drive configurations include:
  - Up to four 3.5-inch hot-pluggable SAS HDDs
  - Up to four 2.5-inch hot-pluggable SAS/SATA HDDs/SSDs with DVD
  - Up to eight 2.5-inch hot-pluggable SAS/SATA HDDs/SSDs
- Two hot-plug, redundant power supplies.
- An on-board Oracle Integrated Lights Out Manager (Oracle ILOM) service processor (SP) based on the AST2300 chip.
- The Oracle System Assistant server setup tool, which is embedded on a preinstalled USB flash drive.

About Controls and Connectors

The following topics describe the controls and connectors located on the front and rear panels.

Related Information

- "Illustrated Parts Breakdown" on page 16

Front Panel Controls and Indicators on a System With Four 3.5-inch Drives

The following figure shows the status indicators (LEDs), connectors, and drives on the front panel of a Sun Server X3-2 configured with four 3.5-inch storage drives.

FIGURE: Front Panel View of a Server With Four 3.5-inch Drives

Figure Legend

1	Product Serial Number (PSN) label and Radio Frequency Identification (RFID) tag	8	Power Supply (PS) Fault LED: amber
2	Locator LED/Locator button: white	9	System Over Temperature LED: amber
3	Service Required LED: amber	10	USB 2.0 connectors (2)
4	Power/OK LED: green	11	Storage drive 0 (optional)
5	Power button	12	Storage drive 1 (optional)
6	SP OK LED: green	13	Storage drive 2 (optional)
7	Fan Fault LED: amber	14	Storage drive 3 (optional)

Related Information

- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 4

Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives

The following figure shows the status indicators (LEDs), connectors, and drives on the front panel of a Sun Server X3-2 configured with eight 2.5-inch storage drives.

FIGURE: Front Panel View of a Server With Eight 2.5-inch Drives

Figure Legend

1	Product Serial Number (PSN) label and Radio Frequency Identification (RFID) tag	**10**	System Over Temperature LED: amber
2	Locator LED/Locator button: white	**11**	Storage drive 0 (optional)
3	USB 2.0 connectors (2)	**12**	Storage drive 1 (optional)

4	Service Required LED: amber	**13**	Storage drive 2 (optional)
5	Power/OK LED: green	**14**	Storage drive 3 (optional)
6	Power button	**15**	Storage drive 4 (optional)
7	SP OK LED: green	**16**	Storage drive 5 (optional)
8	Fan Fault LED: amber	**17**	Storage drive 6 (optional)
9	Power Supply (PS) Fault LED: amber	**18**	Storage drive 7 (optional) (In Oracle Engineered Systems, storage drive 7 might be populated with a remote battery module for the host bus adapter (HBA) card.)

Related Information

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Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive

The following figure shows the status indicators (LEDs), connectors, and drives on the front panel of a Sun Server X3-2 configured with four 2.5-inch storage drives and a SATA DVD drive.

FIGURE: Front Panel View of a Server With Four 2.5-inch Drives and SATA DVD Drive
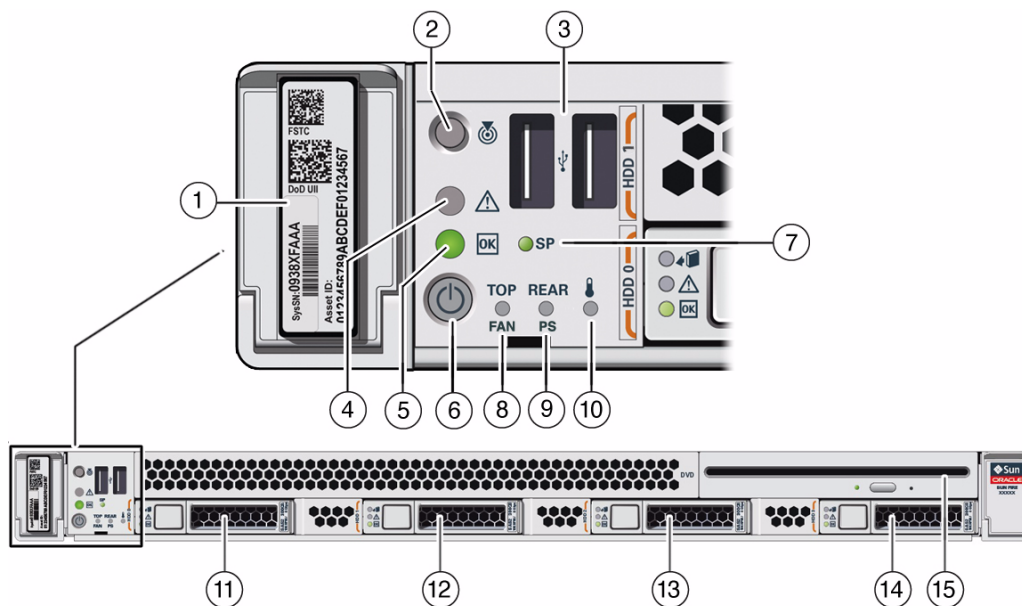
Figure Legend

1	Product Serial Number (PSN) label and Radio Frequency Identification (RFID) tag	**9**	Rear Power Supply Fault LED: amber
2	Locator LED/Locator button: white	**10**	System Over Temperature LED: amber
3	USB 2.0 connectors (2)	**11**	Storage drive 0 (optional)
4	Service Required LED: amber	**12**	Storage drive 1 (optional)
5	Power/OK LED: green	**13**	Storage drive 2 (optional)
6	Power button	**14**	Storage drive 3 (optional)
7	SP OK LED: green	**15**	SATA DVD drive
8	Fan Fault LED: amber	**16**	Not applicable

Related Information

- "Front Panel Controls and Indicators on a System With Four 3.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 4
- "Server Back Panel View" on page 7

Server Back Panel View

The following figure shows the Sun Server X3-2 back panel and the location of power supplies, status indicators (LEDs), connectors, and PCIe slots.

FIGURE: Server Back Panel View
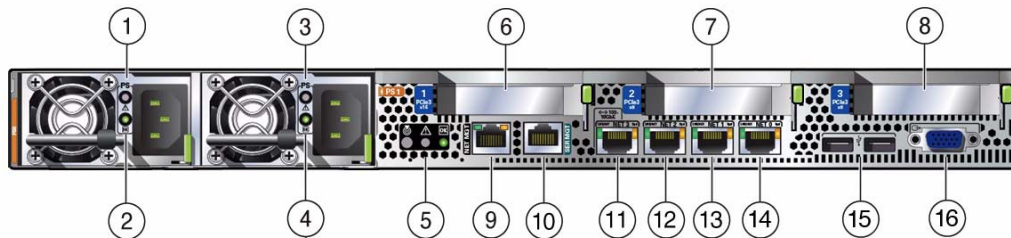
Figure Legend

1	Power Supply (PS) 0	**9**	Integrated Lights Out Manager (ILOM) service processor (SP) network management 10/100BASE-T port (NET MGT)
2	Power Supply (PS) 0 status indicators: Service Required LED: amber AC OK LED: green	**10**	Serial management (SER MGT)/RJ-45 serial port
3	Power Supply (PS) 1	**11**	Network (NET) 100/1000/10000 port: NET 3 (Nonfunctional in single-processor systems.)
4	Power Supply (PS) 1 status indicators: Service Required LED: amber, AC OK LED: green	**12**	Network (NET) 100/1000/10000 port: NET 2 (Nonfunctional in single-processor systems.)
5	System status indicators: Locator LED: white, Service Required LED: amber, Power/OK LED: green	**13**	Network (NET) 100/1000/10000 port: NET 1

6	PCIe card slot 1 (Nonfunctional in single-processor systems.)	14	Network (NET) 100/1000/10000 port: NET 0
7	PCIe card slot 2	15	USB 2.0 connectors (2)
8	PCIe card slots 3 and 4 (Slot 4 in the primary host bus adapter (HBA) card slot. This slot is internal and is not visible from the rear of the server. The server supports a maximum of one HBA card for controlling and managing the server storage drives.)	16	DB-15 video connector

Note – All of the PCIe slots comply with the PCI Express 3.0 specification and can accommodate 25 watt PCIe3 cards.

Related Information

- "Front Panel Controls and Indicators on a System With Four 3.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 4
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 5
- "About System Components" on page 16

About Server and Component Status Indicators

These topics describe the status indicators (LEDs) located on the front and rear of the server, including those found on components and ports.

- "Server General Status Indicators" on page 9
- "Server Fan Status Indicators" on page 10
- "Storage Drive Status Indicators" on page 11
- "Power Supply Status Indicators" on page 12
- "Network Management Port Status Indicators" on page 12
- "Ethernet Ports Status Indicators" on page 13

Related Information

Server General Status Indicators

There are six, system-level status indicators (LEDs), some of which are located on both the server front panel and the server back panel.

TABLE: Server General Status Indicators

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

LED Name	Icon	Color	State Meaning
Top Fan, Processor, Memory Failure	TOP	Amber	Indicates that one or more of the internal fan modules, processors, or memory DIMMs have failed. • OFF – Indicates steady state; no service is required. • STEADY ON – Indicates service required; service the fan modules, processor(s), or memory DIMMs.
Rear Power Supply Failure	REAR	Amber	Indicates that one of the server power supplies has failed. • OFF – Indicates steady state; no service is required. • STEADY ON – Indicates service required; service the power supply.
Over Temperature Warning		Amber	• OFF – Normal operation; no service is required. • STEADY ON – The system is experiencing an overtemperature warning condition. **Note -** This is a warning indication, not a fatal overtemperature. Failure to correct this might result in the system overheating and shutting down unexpectedly.

Related Information

- "Front Panel Controls and Indicators on a System With Four 3.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 4
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 5
- "Server Back Panel View" on page 7

Server Fan Status Indicators

Each fan module has one bicolored status indicator (LED). These indicators are located on the server side wall adjacent to the fan modules and are visible when the top cover fan door is open.

TABLE: Server Fan Status Indicators

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

Storage Drive Status Indicators

There are three status indicators (LEDs) on each drive.

TABLE: Server Front Storage Drive Indicators

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

Power Supply Status Indicators

There are two status indicators (LEDs) on each power supply. These indicators are visible from the rear of the server.

TABLE: Server Power Supply Indicators

Indicator Name	Icon	Color	State Meaning
AC OK/DC OK	OK	Green	• OFF – No AC power is present. • SLOW BLINK – Normal operation. Input power is within specification. DC output voltage is not enabled. • STEADY ON – Normal operation. Input AC power and DC output voltage are within specification.
Service Required	⚠	Amber	• OFF – Normal operation; no service required. • STEADY ON – The power supply (PS) has detected a PS fan failure, PS overtemperature, PS over current, or PS over/under voltage.

Related Information

- "Front Panel Controls and Indicators on a System With Four 3.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 4
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 5
- "Server Back Panel View" on page 7
- "Servicing Power Supplies (CRU)" on page 53

Network Management Port Status Indicators

The server has one 10/100BASE-T Ethernet management domain interface, labeled NET MGT. There are two status indicators (LEDs) on this port. These indicators are visible from the rear of the server.

TABLE: Network Management Port Status Indicators

Indicator Name	Location	Color	State and Meaning
Link speed	Top left	Amber or Green	• Amber on - 10BASE-T link. • Green on - 100BASE-T link. • Off - No link or link down. • Flashing - No function.
Activity	Top right	Green	• On - No function. • Off - No activity. • Flashing - Packet activity.

Related Information

- "Network Management Port" on page 152
- "Front Panel Controls and Indicators on a System With Four 3.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 4
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 5
- "Server Back Panel View" on page 7
- "Servicing Power Supplies (CRU)" on page 53

Ethernet Ports Status Indicators

The server has four Ethernet ports (NET 3, NET 2, NET 1, NET 0). There are two status indicators on each port. These indicators are visible from the rear of the server.

Note – Ethernet ports NET 2 and NET 3 are nonfunctional in single-processor systems.

TABLE: Gigabit Ethernet Port Status Indicators

Indicator Name	Location	Color	State and Meaning
Activity	Top left	Green	• On - No function. • Off - No activity. • Flashing - Packet activity.
Link speed	Top right	Amber or Green	• Amber on - 100BASE-T link. • Green on - 1000/10GBBASE-T link. • Off - No link or link down. • Flashing - No function.

Related Information

- "Gigabit Ethernet Ports" on page 151
- "Front Panel Controls and Indicators on a System With Four 3.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 4
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 5
- "Server Back Panel View" on page 7
- "Servicing Power Supplies (CRU)" on page 53

Motherboard Status Indicators

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

- "DDR3 DIMM Fault Status Indicators" on page 15
- "Processor Fault Status Indicators" on page 15
- "Fault Remind Power Status Indicators" on page 15
- "Standby Power Good Status Indicators" on page 15

DDR3 DIMM Fault Status Indicators

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

Processor Fault Status Indicators

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

Fault Remind Power Status Indicators

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

Standby Power Good Status Indicators

The service instructions for all internal components require that all AC power be removed from the power supplies prior to the server's top cover being removed. This green status indicator (LED) is labeled STBY PWRGD and is located on the rear of the server near PCIe slot 2.

Note – If a PCIe card is installed in PCIe slot 2, this LED might not be visible.

This LED lights to inform a service technician that the motherboard is receiving standby power from at least one of the power supplies. This indicator is provided to help prevent service actions on the server's internal components while the AC power cords are installed and power is being supplied to the server.

Related Information

- "Front Panel Controls and Indicators on a System With Four 3.5-inch Drives" on page 3
- "Front Panel Controls and Indicators on a System With Eight 2.5-inch Drives" on page 4
- "Front Panel Controls and Indicators on a System With Four 2.5-inch Drives and DVD Drive" on page 5
- "Server Back Panel View" on page 7
- "Illustrated Parts Breakdown" on page 16

About System Components

These topics describe the components of the server:

- "Illustrated Parts Breakdown" on page 16
- "Customer-Replaceable Units" on page 18
- "Field-Replaceable Units" on page 19
- "Battery Module" on page 20

Related Information

- "Servicing CRUs That Do Not Require Server Power Off" on page 43
- "Servicing CRUs That Require Server Power Off" on page 57
- "Servicing FRUs" on page 97

Illustrated Parts Breakdown

The following figure identifies the major components of the server.

FIGURE: Server Illustrated Parts Breakdown

Figure Legend

1	Server chassis for eight 2.5-inch storage drives	**12**	Processors **Note:** There is only one processor in single-processor systems and that processor is located in processor socket 0 (P0).
2	Server chassis for four 2.5-inch storage drives and DVD drive	**13**	DIMMs **Note:** A maximum of eight DIMMs are supported in single-processor systems and the DIMMs must be installed in sockets associated with processor 0 (P0). No DIMM filler panels are required in vacant DIMM sockets associated with processors 0 (P0) or 1 (P1).
3	Server chassis for four 3.5-inch storage drives	**14**	Battery
4	SATA DVD drive	**15**	PCIe cards and the internal HBA card **Note:** PCIe slot 1 is nonfunctional in single-processor systems.

5	Front indicator module for server with four 3.5-inch storage drives	16	Top cover
6	Four 3.5-inch storage drive configuration	17	PCIe riser
7	Four and eight 2.5-inch storage drive configurations (In Oracle Engineered Systems, storage drive 7 in eight-drive systems might be populated with a remote battery module for the HBA card.)	18	USB flash drives
8	Front indicator module for server with four or eight 2.5-inch storage drives	19	Processor heatsinks **Note:** In single-processor systems, neither a heatsink nor a processor socket filler are installed in the processor socket 1 (P1). To protect the delicate processor socket pins, the cover that comes on the motherboard from manufacturing is left in place.
9	Disk backplanes	20	Motherboard
10	Fan modules	21	Power supplies
11	Chassis mid-wall	22	Not applicable

Customer-Replaceable Units

The table below lists the customer-replaceable units (CRUs) in the server and directs you to the replacement instructions.

CRU	Description	Replacement Instructions
Battery	Lithium coin-cell battery that powers the CMOS BIOS and real-time clock.	"Servicing the Battery (CRU)" on page 92
DIMMs	Add or replace memory to the system.	"Servicing the DIMMs (CRU)" on page 58
Storage drives	Supports SAS solid-state or hard-disk drives and a DVD drive. • Four-drive configuration contains four 3.5-inch storage drives • Four-drive configuration contains four 2.5-inch storage drives and a DVD drive • Eight-drive configuration contains eight 2.5-inch storage drives **Note -** In Oracle Engineered Systems, storage drive 7 in eight-drive systems might be populated with a remote battery module for the HBA card. The battery module is not a customer-replaceable unit.	"Servicing Storage Drives (CRU)" on page 43

CRU	Description	Replacement Instructions
DVD drive	DVD drive on configurations with four 2.5-inch storage drives.	"Servicing the DVD Drive (CRU)" on page 87
Fan Modules	Contains four fan modules for cooling the motherboard assembly and installed components.	"Servicing Fan Modules (CRU)" on page 49
PCIe cards	Optional add-on cards that can expand the functionality of the server.	"Servicing PCIe Cards (CRU)" on page 80
PCIe risers	Houses and connects the PCIe cards.	"Servicing PCIe Risers (CRU)" on page 70
Power supplies	Two fully redundant AC power supplies.	"Servicing Power Supplies (CRU)" on page 53

Related Information

- "Field-Replaceable Units" on page 19
- "Illustrated Parts Breakdown" on page 16
- "Servicing CRUs That Do Not Require Server Power Off" on page 43
- "Servicing CRUs That Require Server Power Off" on page 57

Field-Replaceable Units

The table below lists the field-replaceable units (FRUs) in the server and directs you to the replacement instructions.

FRU	Description	Replacement Instructions
Processor	Carries out the instructions of the system.	"Servicing Processors (FRU)" on page 98
Disk backplane	Serves as the interface between storage drives and the host bus adapter (HBA) card.	"Servicing the Disk Backplane (FRU)" on page 113
Front indicator module (FIM)	Contains the front panel controls, indicators, and USB ports.	"Servicing the Front Indicator Module (FRU)" on page 120
Motherboard assembly	Provides connectors for the fans, DIMMs, processor(s), PCIe risers, and internal USB ports, and power supplies.	"Servicing the Motherboard (FRU)" on page 126
Internal HBA SAS controller cables	Serve to connect the disk backplane to the the internal host bus adapter (HBA) card.	"Servicing the SAS Cables (FRUs)" on page 136

Related Information

- "Customer-Replaceable Units" on page 18
- "Illustrated Parts Breakdown" on page 16
- "Servicing FRUs" on page 97

Battery Module

In Oracle Engineered Systems, storage drive 7 might be populated with a remote battery module for the host bus adapter (HBA) card.

⚠ **Caution –** The battery module is not a customer-replaceable unit (CRU) and should not be removed or replaced by customers. The battery module should be removed or replaced only by Oracle field service personnel.

The battery module is hot-pluggable and provides the backup power subsystem for the Sun Storage 6 Gb SAS PCIe RAID internal host bus adapter (HBA): SG-SAS6-R-INT-Z. It enables Oracle field service personnel to replace the battery at the end of its service life without requiring the server to be powered off.

Related Information

- "Servicing Storage Drives (CRU)" on page 43

Troubleshooting the Server

These topics introduce the diagnostic tools and strategies available to help you diagnose problems with the system.

Description	Links
Review the tasks used to locate the specific problem with the system.	"Service Troubleshooting Task List" on page 21
Understand the diagnostic system indicators, utilities, and commands available.	"Diagnostic Tools" on page 22
Gather information about the system to help a service engineer or technician work on your system.	"Gather Service Information" on page 24
Locate the server's serial number.	"Locate the Server Serial Number" on page 24
Inspect the system methodically to locate the faulty component or components.	"Inspecting the System" on page 25

Related Information

- "About the Sun Server X3-2" on page 1
- "Preparing for Service" on page 29
- "Returning the Server to Operation" on page 141

Service Troubleshooting Task List

Use the following table as a sequence for troubleshooting the server.

TABLE: Troubleshooting Task List

No.	Description	Section or Document
1	Gather initial service information.	"Gather Service Information" on page 24
2	Investigate any power-on problems.	"Troubleshoot Power Problems" on page 25
3	Perform external visual inspection and internal visual inspection.	"Inspect the Server Externally" on page 26 "Inspect Internal Server Components" on page 26
4	View service processor logs and sensor information.	Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at: `http://www.oracle.com/pls/topic/look up?ctx=ilom31`
5	Run Pc-Check diagnostics.	*Oracle x86 Servers Diagnostics, Applications, and Utilities Guide for Servers With Oracle ILOM 3.1* at: `http://www.oracle.com/pls/topic/look up?ctx=x86diag`

Related Information

- "About the Sun Server X3-2" on page 1
- "Diagnostic Tools" on page 22

Diagnostic Tools

There are a variety of diagnostic tools, commands, and indicators you can use to monitor and troubleshoot the server:

- **LEDs** – These indicators provide a quick visual notification of the status of the server and of some of the CRUs and FRUs.
- **Oracle ILOM firmware** – This firmware is located on the service processor and provides a comprehensive service portal using a command-line interface (CLI) and browser user interface (BUI) for lights-out management capabilities (such as remote power-on, power-off, etc.), monitoring the health of the environmental subsystem (such as power, fans, temperature, cover interlock, etc.), and provides fault management and automated diagnosis capabilities during server initialization (such as QuickPath Interconnect code and Memory Reference code) and server runtime.

- **Pc-Check** – Accessed through Oracle ILOM, the DOS-based Pc-Check utility tests all motherboard components (processor, memory, and I/O), ports, and slots. If enabled through Oracle ILOM, this utility will run each time the system powers on. For information about Pc-Check, refer to the *Oracle X86 Servers Diagnostics Guide for Servers With Oracle ILOM 3.1*.

- **SNMP**– Simple Network Management Protocol (SNMP) Traps are generated by the SNMP agents that are installed on the SNMP devices being managed by Oracle ILOM. Oracle ILOM receives the SNMP Traps and converts them into SNMP event messages that appear in the event log. For information about SNMP event messages that appear in the event log, refer to the *Sun Server X3-2 Administration Guide,* "Identifying SNMP Trap Messages" on page 186.

- **Oracle Solaris OS Only**

  - **Oracle Solaris OS Predictive Self-Healing (PSH)** – The PSH technology provides automated diagnosis capabilities of error events encountered with the processor, memory subsystem, and Integrated I/O subsystem during runtime. The ability of PSH to off-line faulty processors and retire memory pages during runtime enhances system availability and prevents future interruptions. The Oracle Solaris OS PSH technology in conjunction with ILOM and BIOS provide extensive fault management architecture for placing processors offline and disabling DIMMs.

  - **Log files and console messages** – These items provide the standard Oracle Solaris OS log files and investigative commands that can be accessed and displayed on the device of your choice.

  - **Oracle VTS software** – An application that exercises the system, provides hardware validation, and discloses possible faulty components with recommendations for repair.

The LEDs, Oracle ILOM, Oracle Solaris OS PSH, and many of the log files and console messages are integrated. For example, a fault detected by the Oracle Solaris software will display a detected fault, log it, pass information to Oracle ILOM where it will be logged, and, depending on the fault, will cause one one or more LEDs to light.

Related Information

- "About the Sun Server X3-2" on page 1
- Oracle Solaris OS documentation set at:
  - For Solaris 10 8/11:
    http://docs.oracle.com/cd/E23823_01/index.html
  - For Solaris 11:
    http://docs.oracle.com/cd/E23824_01/index.html
- Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:
  http://www.oracle.com/pls/topic/lookup?ctx=ilom31

- *Oracle x86 Servers Diagnostics, Applications, and Utilities Guide for Servers With Oracle ILOM 3.1* at: http://www.oracle.com/pls/topic/lookup?ctx=x86diag
- Oracle VTS documentation set at: http://docs.oracle.com/cd/E19719-01/index.html

▼ Gather Service Information

The first step in determining the cause of a problem with the server is to gather information from the service call paperwork or the onsite personnel. Follow these general guidelines when you begin troubleshooting.

1. **Collect information about the following items:**
   - Events that occurred prior to the failure
   - Whether any hardware or software was modified or installed
   - Whether the server was recently installed or moved
   - How long the server exhibited symptoms
   - The duration or frequency of the problem

2. **Document the server settings before you make any changes.**

   If possible, make one change at a time in order to isolate potential problems. In this way, you can maintain a controlled environment and reduce the scope of troubleshooting.

3. **Note the results of any change that you make. Include any errors or informational messages.**

4. **Check for potential device conflicts before you add a new device.**

5. **Check for version dependencies, especially with third-party software.**

Related Information
- "Diagnostic Tools" on page 22
- "Locate the Server Serial Number" on page 24

▼ Locate the Server Serial Number

- **To locate the server's serial number, do one of the following:**

- From the front of the server, look at the left side of the front panel to locate the server's serial number. The serial number is located on the Radio-Frequency Identification (RFID) label on the front panel, next to the general status indicators. For illustrations of the server front panel, see "About Controls and Connectors" on page 2.

- Refer to the service label that is attached to the top cover of the server. This label includes the serial number.

- Locate the yellow Customer Information Sheet (CIS) attached to your server packaging. This sheet includes the serial number.

- From the Oracle ILOM command-line interface (CLI), enter the `show /System` command or go to the System Information Summary page in the Oracle ILOM web browser interface.

Related Information

Inspecting the System

Controls that have been improperly set and cables that are loose or improperly connected are common causes of problems with hardware components. Follow these tasks to locate common problems with the system.

Related Information

▼ Troubleshoot Power Problems

1. **If the system is powered off, power on the server.**

   See "Power On the Server" on page 149.

   - If the server powers on, go to "Inspect the Server Externally" on page 26.

- If the server does not power on, go to Step 2.

2. **Check that power cords are attached firmly to the server's power supplies and to the power source.**

Related Information

- "Power On the Server" on page 149
- "Inspect the Server Externally" on page 26
- "Servicing Power Supplies (CRU)" on page 53

▼ Inspect the Server Externally

1. **Inspect the external status LED indicators, which can indicate component malfunction.**

   For the LED locations and descriptions of their behavior, see "About Controls and Connectors" on page 2.

2. **Verify that nothing in the server environment is blocking airflow or making a contact that could short out power.**

3. **If the problem is not evident, continue with the next section,** "Inspect Internal Server Components" on page 26**.**

Related Information

- "About the Sun Server X3-2" on page 1
- "Inspect the Server Externally" on page 26
- "Inspect Internal Server Components" on page 26

▼ Inspect Internal Server Components

1. **Shut down the server from main power mode to standby power mode.**

   Determine how you want to shut down the server:

   - Graceful power down – Notify users and gracefully power down the system.
   - Immediate power down – Power down the system quickly.

   See "Powering Down the Server" on page 32 for instructions.

2. **Disconnect the AC power cables from the server, extend the server to the maintenance position, and remove the server top cover**

   See "Preparing the Server for Component Replacement" on page 32.

3. **Inspect the internal status LED indicators, which can indicate component malfunction.**

   For the LED locations and descriptions of their behavior, see the service procedures for the motherboard components.

   To light these LEDs, press and hold down the Fault Remind button, which is located on the motherboard. For more information on the Fault Remind button, see "Using the Fault Remind Button" on page 66.

4. **Verify that there are no loose or improperly seated components.**

5. **Verify that all cable connectors inside the system are firmly and correctly attached to their appropriate connectors.**

6. **Verify that any components that you ordered separately and were not installed at the factory are qualified and supported.**

   Check with your customer representative for information about which PCIe cards and DIMMs are supported.

7. **Check that the installed DIMMs comply with the supported DIMM population rules and configurations.**

   For more information, see "DIMM Population Rules" on page 63.

8. **Return the server to operation.**

   See "Returning the Server to Operation" on page 141.

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

   When the main power is applied to the server, the Power/OK indicator next to the Power button blinks slowly until the OS is ready. When the OS is ready, the Power/OK indicator remains lit. For more information about the LED, see "Server General Status Indicators" on page 9.

10. **If the problem with the server is not evident, then log in to either the Oracle ILOM service portal or Oracle Solaris service portal and use the fault management command** `fmadm faulty` **to list any faults that might be present on the server.**

    For instructions, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:
    http://www.oracle.com/pls/topic/lookup?ctx=ilom31.

Related Information

- "Preparing for Service" on page 29
- "About Server and Component Status Indicators" on page 8
- "Returning the Server to Operation" on page 141

Preparing for Service

These topics describe safety considerations and provide prerequisite procedures and information to replace components within the server.

Description	Links
Understand the safety precautions, understand the safety symbols, and take ESD precautions prior to removing or installing parts in the server.	"Safety Precautions" on page 29 "Safety Symbols" on page 30 "Electrostatic Discharge Safety" on page 30
Assemble the required tools.	"Required Tools" on page 31
Before working with components within the server, power down the server and prepare for servicing.	"Preparing the Server for Component Replacement" on page 32

Related Information

- "Returning the Server to Operation" on page 141

Safety Precautions

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

- Follow all standard cautions, warnings, and instructions marked on the equipment and described in the online *Sun Server X3-2 Safety and Compliance Guide* and in the printed *Important Safety Information for Oracle Hardware Systems*.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Follow the electrostatic discharge safety practices as described in this section.
- Disconnect both power supply cords before servicing components.

Related Information

- "Safety Symbols" on page 30
- "Electrostatic Discharge Safety" on page 30

Safety Symbols

The following symbols might appear in this book. Note their meanings.

Caution – There is a risk of personal injury or equipment damage. To avoid personal injury or equipment damage, follow the instructions.

Caution – Hot surface. Avoid contact. Surfaces are hot and might cause personal injury if touched.

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

Related Information

- "Safety Precautions" on page 29
- "Electrostatic Discharge Safety" on page 30

Electrostatic Discharge Safety

Devices that are sensitive to electrostatic discharge (ESD), such as the motherboard, PCIe cards, drives, processors, and memory cards require special handling.

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

- Use an antistatic wrist strap

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

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

- Use an antistatic mat

  Place ESD-sensitive components such as the motherboard, memory, and other PCB cards on an antistatic mat. The following items can be used as an antistatic mat:

  - Antistatic bag used to wrap an Oracle replacement part
  - An ESD mat (orderable from Oracle)
  - A disposable ESD mat (shipped with some replacement parts or optional system components)

Related Information

Required Tools

The server can be serviced with the following tools:

- Antistatic wrist strap
- Antistatic mat
- No. 2 Phillips screwdriver

Related Information

- "Servicing CRUs That Require Server Power Off" on page 57
- "Servicing FRUs" on page 97

Preparing the Server for Component Replacement

Before you can remove and install components that are inside the server, you must perform the following tasks:

Note – When replacing the storage drives or power supplies, not all of these tasks are necessary. See the replacement tasks for those components for more information.

- "Powering Down the Server" on page 32
- "Disconnect Cables From the Server" on page 37
- "Extend the Server to the Maintenance Position" on page 38
- "Remove the Server From the Rack" on page 39
- "Take Antistatic Measures" on page 40
- "Remove the Server Top Cover" on page 42

Related Information

- "Returning the Server to Operation" on page 141

Powering Down the Server

Determine how you want to power off the server.

Description	Link
Power down the server gracefully to save all data and to prevent data from being corrupted.	• "Power Down Server Gracefully Using the Oracle ILOM CLI" on page 33 • "Power Down Server Gracefully Using the Oracle ILOM Web Interface" on page 34 • "Power Down Server Gracefully Using the Power Button" on page 35

Description	Link
If the server is not responding, or you must shut down the server quickly, perform an immediate power down.	• "Use the Power Button for Immediate Shutdown" on page 35 • "Use the Oracle ILOM CLI for Immediate Shutdown" on page 36 • "Use the Oracle ILOM Web Interface for Immediate Shutdown" on page 37

Related Information

■ "Power On the Server" on page 149

▼ Power Down Server Gracefully Using the Oracle ILOM CLI

Performing a graceful shut down ensures that all of your data is saved and the system is ready for restart.

1. **Log in to the server as superuser or equivalent.**

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

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

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

   Refer to your application documentation for specific information on these processes.

4. **Log in to the Oracle ILOM command-line interface (CLI) using an Administrator account.**

   For instructions, see the *Sun Server X3-2 Installation Guide,* "Log In to Oracle ILOM Remotely Using the Command-Line Interface" on page 71.

5. **At the Oracle ILOM prompt, shut down the operating system:**

```
-> stop /System
```

   If the system is running the Oracle Solaris OS, refer to the Oracle Solaris system administration documentation for additional information.

6. **Disconnect the power and cables from the server.**

   See "Disconnect Cables From the Server" on page 37.

7. **Disconnect the power and data cables from the server.**

Related Information

- "Power Down Server Gracefully Using the Oracle ILOM Web Interface" on page 34
- "Power Down Server Gracefully Using the Power Button" on page 35
- "Use the Power Button for Immediate Shutdown" on page 35
- "Disconnect Cables From the Server" on page 37
- "Power On the Server" on page 149

▼ Power Down Server Gracefully Using the Oracle ILOM Web Interface

1. **Log in to the server as superuser or equivalent.**

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

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

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

   Refer to your application documentation for specific information on these processes.

4. **Log in to the Oracle ILOM web interface using an Administrator account.**

   For instructions, see the *Sun Server X3-2 Installation Guide,* "Log In to Oracle ILOM Remotely Using the Web Interface" on page 69.

   The Oracle ILOM web interface Summary page appears.

5. **In the left pane, click Host Management > Power Control, and select Graceful Shutdown and Power Off from the Actions list.**

6. **Click Save and OK.**

   The host server performs an orderly power shutdown.

Related Information

- "Power Down Server Gracefully Using the Oracle ILOM CLI" on page 33
- "Power Down Server Gracefully Using the Power Button" on page 35
- "Use the Power Button for Immediate Shutdown" on page 35
- "Disconnect Cables From the Server" on page 37
- "Power On the Server" on page 149

▼ Power Down Server Gracefully Using the Power Button

Note – You can use the Power button on the front of the server to power down the server gracefully.

1. **Press and quickly release the Power button on the front panel.**

   This action causes ACPI-enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems shut down to standby power mode immediately.

   When main power is off, the Power/OK LED on the front panel will begin flashing, indicating that the server is in standby power mode. See "About Controls and Connectors" on page 2.

2. **Disconnect the power and data cables from the server.**

   See "Disconnect Cables From the Server" on page 37.

Caution – When you press the Power button to enter standby power mode, power is still directed to the service processor remote management subsystem and power supply fans. To completely power off the server, you must disconnect the power cords from the back of the power supplies.

Related Information

- "About Controls and Connectors" on page 2
- "Power Down Server Gracefully Using the Oracle ILOM CLI" on page 33
- "Power Down Server Gracefully Using the Oracle ILOM Web Interface" on page 34
- "Use the Power Button for Immediate Shutdown" on page 35
- "Disconnect Cables From the Server" on page 37
- "Power On the Server" on page 149

▼ Use the Power Button for Immediate Shutdown

Caution – This task quickly forces the server's main power off. You might corrupt your system data during an immediate power down, so only use this task to power down the server after attempting the graceful power down tasks.

1. **Press and hold the Power button for four seconds to force the main power off and to enter standby power mode.**

   When main power is off, the Power/OK LED on the front panel will begin flashing, indicating that the server is in standby power mode. See "About Controls and Connectors" on page 2.

2. **Disconnect the power and data cables from the server.**

   See "Disconnect Cables From the Server" on page 37.

Caution – When you press the Power button to enter standby power mode, power is still directed to the service processor remote management subsystem and power supply fans. To completely power off the server, you must disconnect the power cords from the back of the power supplies.

Related Information

- "About Controls and Connectors" on page 2
- "Power Down Server Gracefully Using the Oracle ILOM CLI" on page 33
- "Power Down Server Gracefully Using the Oracle ILOM Web Interface" on page 34
- "Power Down Server Gracefully Using the Power Button" on page 35
- "Disconnect Cables From the Server" on page 37
- "Power On the Server" on page 149
- "Use the Oracle ILOM CLI for Immediate Shutdown" on page 36
- "Use the Oracle ILOM Web Interface for Immediate Shutdown" on page 37

▼ Use the Oracle ILOM CLI for Immediate Shutdown

1. **Log in to the Oracle ILOM command-line interface (CLI) using an Administrator account.**

   Oracle ILOM displays the default command prompt (->), indicating that you have successfully logged in to Oracle ILOM.

2. **From the CLI prompt, type the following command:**

   `-> stop -f /System`

   The server powers down immediately.

Related Information

- "Use the Power Button for Immediate Shutdown" on page 35

▼ Use the Oracle ILOM Web Interface for Immediate Shutdown

1. **Log in to the Oracle ILOM web interface using an Administrator account.**

   The Oracle ILOM web interface System Information page appears.

2. **In the left pane, click Host Management > Power Control, and in the Actions list, click Immediate Power Off.**

3. **Click Save, and then click OK.**

   The server powers down immediately.

Related Information

▼ Disconnect Cables From the Server

Caution – The system supplies standby power to the circuit boards when the power cords are connected even when the system is powered off.

1. **Label all cables connected to the server.**

2. **Disconnect the power cords from the rear of the server.**

3. **Disconnect all data cables from the rear of the server.**

Related Information

▼ Extend the Server to the Maintenance Position

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

- Storage drives
- Fan modules
- Power supplies
- DVD module
- PCIe risers
- PCIe cards
- DDR3 DIMMs
- Internal USB flash drives
- Motherboard Battery
- Processors
- Disk backplane
- FIM (front indicator module)
- Motherboard

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

1. **To prevent the rack from tipping forward when the server is extended, extend all rack anti-tilt devices.**

Caution – To reduce the risk of personal injury, stabilize the expansion rack cabinet and extend all anti-tilt devices before extending the server from the rack.

For instructions for stabilizing the rack, see *Sun Server X3-2 Installation Guide,* "Stabilize the Rack for Installation" on page 26.

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

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

3. **To release the rack rails, pull down on the flip-down handles, which are located on the sides of the server front panel, to release the slide-rail locks and slowly pull the server out of the rack until the slide-rails latch (see** FIGURE: Slide-Rail Release Latches on page 39 **[callout 1]).**

Note – The slide-rail locks are located behind the flip-down handles on the front of the server. The slide-rail locks are released when the flip-down handles are pulled down.

The server is now in the extended maintenance position.

FIGURE: Slide-Rail Release Latches
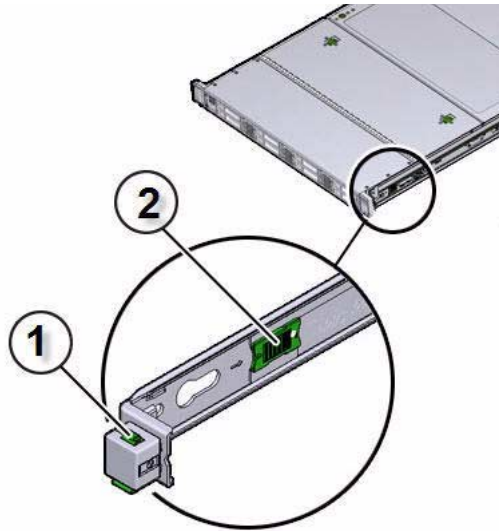
Figure Legend

1	Slide-rail lock
2	Slide-rail release tab

Related Information

- "Disconnect Cables From the Server" on page 37
- "Remove the Server From the Rack" on page 39
- "Reinstall the Server Chassis Into the Rack" on page 144

▼ Remove the Server From the Rack

Caution – The server weighs approximately 18.0 kg (40.0 lb). Two people are required to dismount and carry the chassis.

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

2. **Remove the cable management arm (CMA).**

   ■ For instructions for removing the second-generation CMA, see *Sun Server X3-2 Installation Guide,* "Remove the Second-Generation Cable Management Arm" on page 47.

   ■ For instructions for removing the first-generation CMA, see the installation procedure at *Sun Server X3-2 Installation Guide,* "Install the First-Generation Cable Management Arm" on page 52and perform the installation steps in reverse order.

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

   For instructions, see "Extend the Server to the Maintenance Position" on page 38.

4. **From the front of the server, pull the green slide-rail release tabs toward the front of the server and pull the server out of the rack until it is free of the rack rails.**

   A slide-rail release tab is located on each slide-rail (see FIGURE: Slide-Rail Release Latches on page 39 [callout 2]).

Note – To pull the green slide-rail release tab, place your finger in the center of the tab, not on the end, and apply pressure as you pull the tab toward the front of the server.

---

5. **Set the server on a sturdy work surface.**

Related Information

■ "Disconnect Cables From the Server" on page 37

■ "Take Antistatic Measures" on page 40

■ "Extend the Server to the Maintenance Position" on page 38

■ "Reinstall the Server Chassis Into the Rack" on page 144

▼ Take Antistatic Measures

1. **Prepare an antistatic surface on which to set parts during removal and installation.**

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

   ■ Antistatic bag used to wrap a replacement part

   ■ An ESD mat, orderable from Oracle

■ Disposable ESD mat (shipped with some replacement parts or optional system components)

2. Attach an antistatic wrist strap.

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

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

Related Information

■ "Remove Antistatic Measures" on page 144

▼ Open the Server Fan Door

Servicing the server fan modules and other components located in the front of the server, such as the front indication module, the DVD drive, and disk backplanes, requires that the fan door be opened. It is also easier to remove the server's top cover if you open the fan door first.

● **To open the server fan door, slide the fan door latches forward and swing the door up to the open position.**

FIGURE: Opening the Server Fan Door
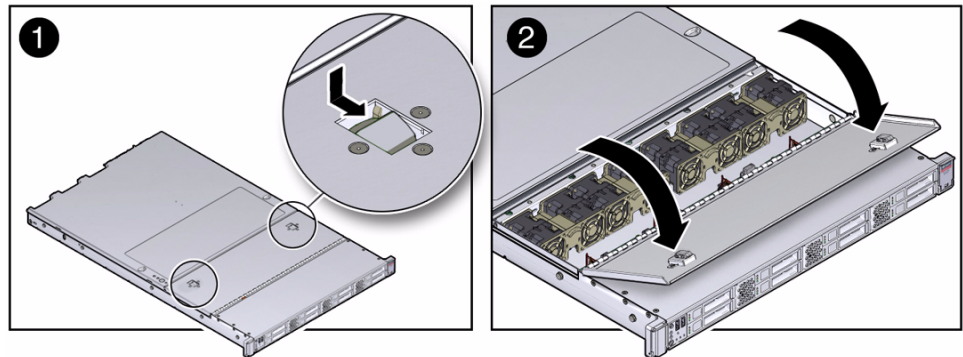
Related Information

■ "Take Antistatic Measures" on page 40
■ "Remove the Server Top Cover" on page 42

▼ Remove the Server Top Cover

Servicing most of the server components requires that the top cover be removed.

⚠ **Caution –** If the top cover is removed without first removing the AC power cords, the server host shuts down immediately and an event is logged to indicate that the chassis top cover has been removed.

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

2. **To open the server fan door, slide the latches toward the front of the server and swing up to the open position.**

3. **To open the top cover, press the top cover release buttons and use the recessed areas to slide the top cover toward the rear of the server about 0.5 inches (12.7 mm) [1].**

FIGURE: Removing the Server Top Cover
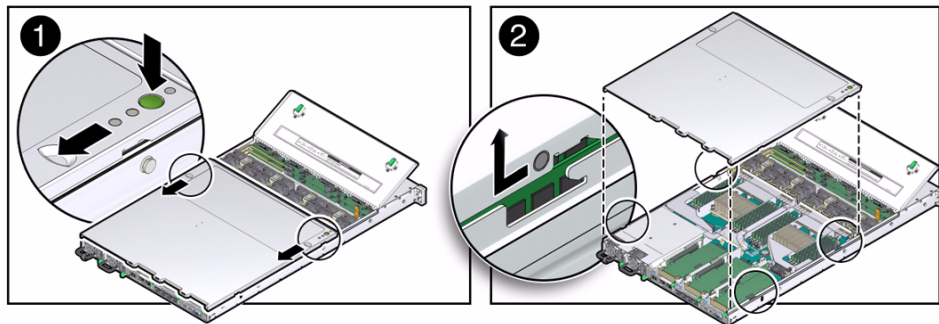
4. **Lift the cover off the chassis and set it aside [2].**

Related Information
- "Take Antistatic Measures" on page 40
- "Install the Top Cover" on page 142

Servicing CRUs That Do Not Require Server Power Off

The following topics describe how to service customer-replaceable units (CRUs) that do not require you to power off the server.

Description	Links
Servicing the storage drives.	"Servicing Storage Drives (CRU)" on page 43
Servicing the fan modules.	"Servicing Fan Modules (CRU)" on page 49
Servicing the power supplies.	"Servicing Power Supplies (CRU)" on page 53

Related Information

- "Servicing CRUs That Require Server Power Off" on page 57
- "Servicing FRUs" on page 97

Servicing Storage Drives (CRU)

This section describes how to remove and install the storage drives.

In addition to the service procedures provided in this document, Oracle provides animated service procedures that describe how to remove and install the storage drives. To play the Sun Server X3-2 Service Animations go to: http://docs.oracle.com/cd/E22368_01/html/E38015/index.html

- "Storage Drives Hot-Plug Conditions" on page 44

Related Information

Storage Drives Hot-Plug Conditions

The solid-state drives (SSDs) or hard-disk drives (HHDs) in the server are hot-pluggable, but this capability depends on how the drives are configured. To hot-plug a drive you must be able to take the drive offline before you can remove it. When you take the drive offline, you prevent any application from accessing the drive and remove the logical software links to the drive.

The following situations inhibit the ability to perform hot-plugging of a drive:

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

If your drive falls into one of these conditions, you must shut down the system before you replace the drive. See "Powering Down the Server" on page 32.

Note – Replacing a drive does not require removing the server from a rack.

Related Information

HDD or SSD Failure and RAID

A single storage drive failure does not cause a data failure if the storage drives are configured as a mirrored RAID 1 volume (optional). The storage drive can be removed, and when a new storage drive is inserted, the contents are automatically

rebuilt from the rest of the array with no need to reconfigure the RAID parameters. If the replaced storage drive was configured as a hot-spare, the new storage drive is automatically configured as a new hot-spare.

For information about the implementation of RAID on this server and references to RAID controller documentation, refer to http://docs.oracle.com/cd/E23383_01/index.html.

Storage Drive Status Indicators

The following figure and table describe the storage drive status indicators (LEDs).

FIGURE: Storage Drive Status Indicators
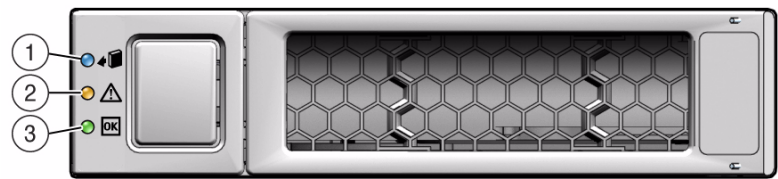
TABLE: Storage Drive LED Indicators

Legend	LED	Color	Lights When...
1	OK to Remove	Blue	The storage drive can be removed safely during a hot-plug operation.
2	Service Required	Amber	The system is running and the storage drive is faulty. The front and rear panel Service Required LEDs are also lit if the system detects a storage drive fault.
3	OK/Activity	Green	• OFF – Power is off or installed drive is not recognized by the system. • STEADY ON – The drive is engaged and is receiving power. • STEADY BLINK – There is disk activity. Indicator blinks on and off to indicate activity.

▼ Remove a Storage Drive

1. **Prepare the system for the drive removal.**

   ■ See "Take Antistatic Measures" on page 40.

2. **Identify the location of the drive that you want to remove.**

   The following illustrations show the location of the drives and the internal system software designations for the drives.

FIGURE: Drive Location and Numbering on a Server With Four 3.5-inch Drives

HDD0	HDD1	HDD2	HDD3
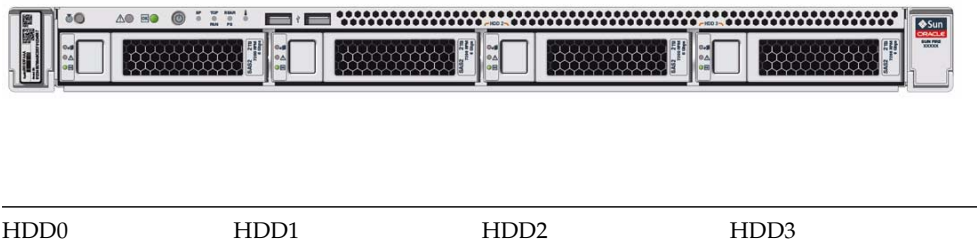
FIGURE: Drive Location and Numbering on a Server With Four 2.5-inch Drives and a DVD Drive
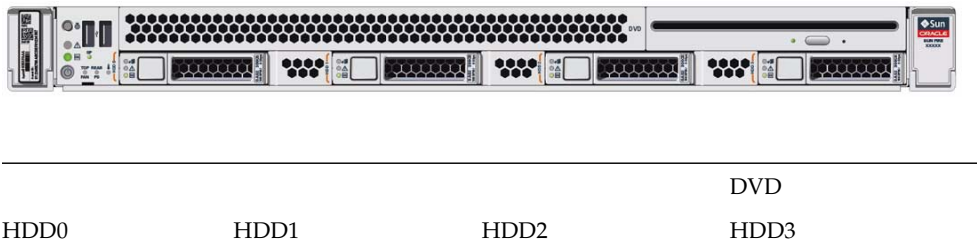
			DVD
HDD0	HDD1	HDD2	HDD3

FIGURE: Drive Location and Numbering on a Server With Eight 2.5-inch Drives

HDD4	HDD5	HDD6	HDD7 (See Caution below.)
HDD0	HDD1	HDD2	HDD3
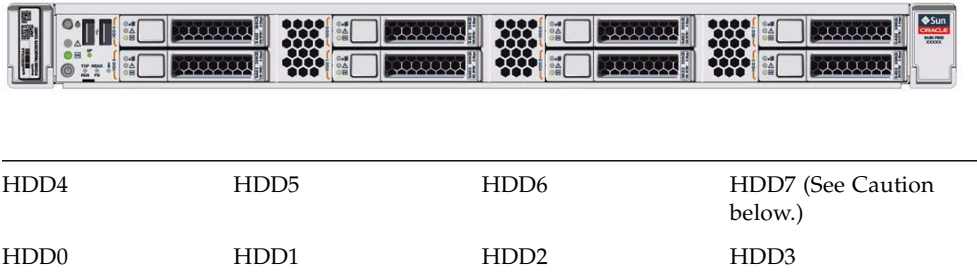
⚠ **Caution –** In Oracle Engineered Systems, storage drive 7 (HDD7) on eight-drive systems might be populated with a remote battery module for the host bus adapter (HBA). The battery module is not a customer-replaceable unit (CRU) and should not be removed or replaced by customers. The battery module should be removed or replaced only by Oracle field service personnel. For more information, refer to "Battery Module" on page 20.

3. **Type the operating system commands required to stop the server from using the drive.**

Note – The blue OK to Remove LED on the storage drive might not light, as support for this varies depending on the operating system in use.

Exact commands required depend on the configuration of your drives. Unmount file systems or perform RAID commands as needed.

4. **On the drive you plan to remove, push the latch release button to open the latch.**

FIGURE: Locating the Hard Drive Release Button and Latch
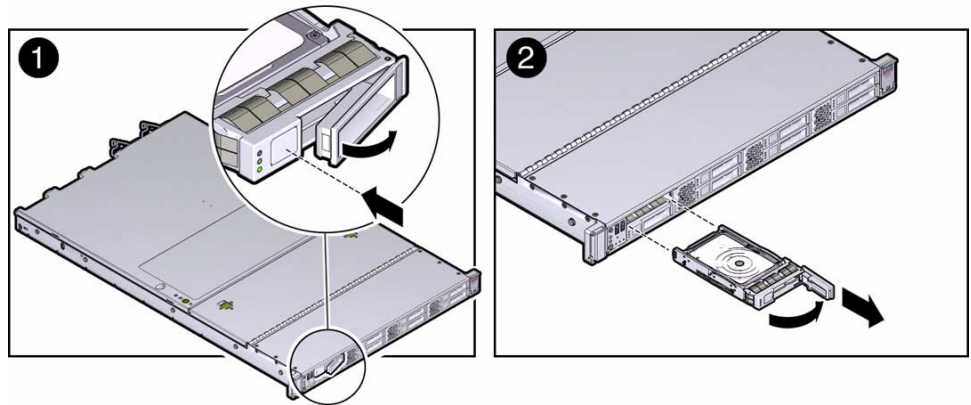
Caution – The latch is not an ejector. Do not bend the latch too far to the right. Doing so can damage the latch.

---

5. **Grasp the latch and pull the drive out of the drive slot.**

6. **Consider your next steps:**
   - If you are replacing the drive, continue to "Install a Storage Drive" on page 48.
   - If you are not replacing the drive, install a filler panel in the empty drive slot to maintain proper air flow and perform administrative tasks to configure the server to operate without the drive.

Related Information
- "Storage Drive Status Indicators" on page 45
- "Storage Drives Hot-Plug Conditions" on page 44

▼ Install a Storage Drive

1. **Remove the replacement drive from its packaging and place the drive on an antistatic mat.**

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

3. **Align the replacement drive to the drive slot.**

   The drive is physically addressed according to the slot in which it is installed. It is important to install a replacement drive in the same slot as the drive that was removed.

4. **Slide the drive into the bay until the drive is fully seated [1].**
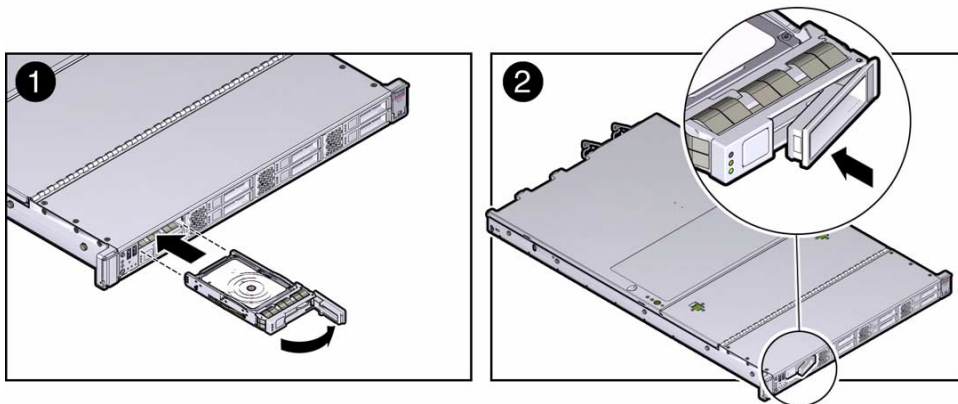
5. **Close the drive latch to lock the drive in place [2].**

6. **Perform administrative tasks to reconfigure the drive.**

   The procedures that you perform at this point depend on how your data is configured. You might need to partition the drive, create file systems, load data from backups, or have the drive updated from a RAID configuration.

Related Information

- "Storage Drive Status Indicators" on page 45
- "Storage Drives Hot-Plug Conditions" on page 44
- "HDD or SSD Failure and RAID" on page 44
- "Remove a Storage Drive" on page 45

Servicing Fan Modules (CRU)

This section describes how to remove and install the fan modules.

In addition to the service procedures provided in this document, Oracle provides animated service procedures that describe how to remove and install the fan modules. To play the Sun Server X3-2 Service Animations go to:
http://docs.oracle.com/cd/E22368_01/html/E38015/index.html

- "Remove a Fan Module" on page 49
- "Install a Fan Module" on page 52

Related Information

- "Open the Server Fan Door" on page 41

▼ Remove a Fan Module

You do not have to power off the server to service the fan modules.

You should not begin this procedure unless you have a replacement fan and you are ready to install it right away.

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

   See "Extend the Server to the Maintenance Position" on page 38.

2. **To access the fan modules, open the server fan door.**

   "Open the Server Fan Door" on page 41

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

---

3. **Identify the faulty fan module.**

   Each fan module has a status indicator (LED). If the LED is lit amber, the fan has failed. The status LEDs are located on the chassis mid-wall adjacent to and aligned with the fan module, as shown in the following figure.

FIGURE: Fan Module LEDs

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

4. **Remove the faulty fan module.**

   a. **Using your thumb and forefinger, grasp the fan module in the finger recesses located in the plastic between the fans.**

b. Lift the fan module straight up and out of the chassis.

FIGURE: Removing a Fan Module
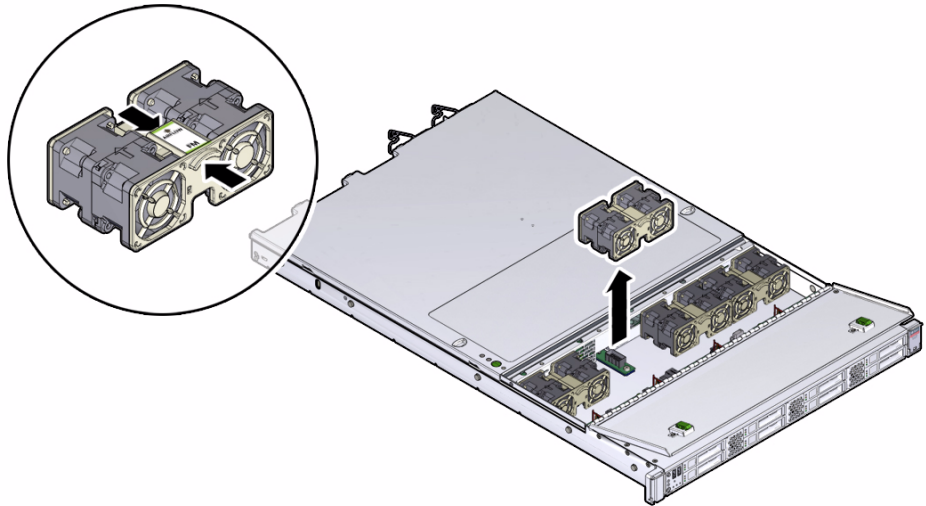
5. Set fan module aside.

⚠️ **Caution –** When removing a fan module, do not rock it back and forth. Rocking the fans module can cause damage to the motherboard connectors.

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

6. Consider your next step:
- If you removed the fan assembly as part of another procedure, return to that procedure.
- Otherwise, continue to "Install a Fan Module" on page 52.

Related Information
- "Install a Fan Module" on page 52

▼ Install a Fan Module

1. **Remove the replacement fan module from its packaging and place it on an antistatic mat.**

2. **With the fan door open, install the replacement fan module into the server.**

   The fan modules are keyed to ensure that they are installed in the correct orientation.

FIGURE: Installing a Fan Module
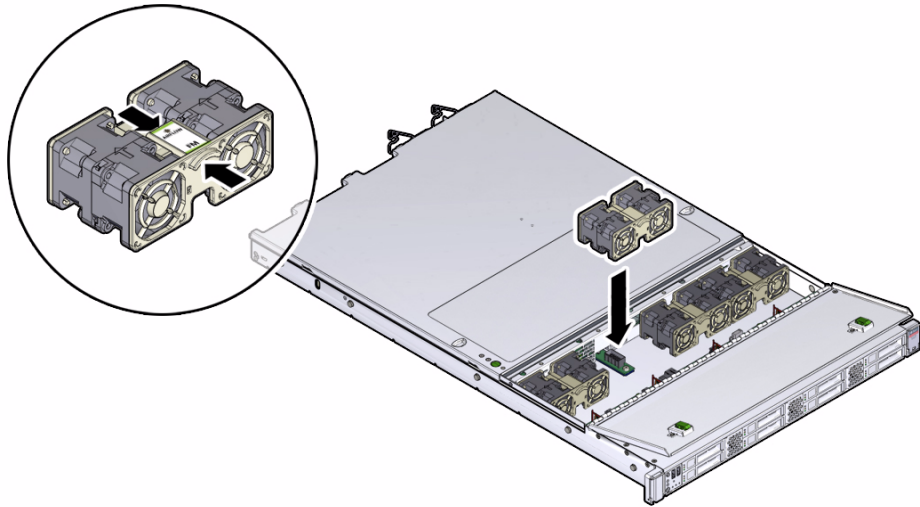
3. **Press down on the fan module and apply firm pressure to fully seat the fan module.**

4. **Verify that the Fan status LED that aligns with the replaced fan module is lit green.**

5. **Close the fan door.**

6. **Verify that the Top Fan LED on the front of the server and the Service Required LEDs on the front and rear of the server are extinguished.**

   See "About Controls and Connectors" on page 2 for more information about identifying and interpreting system LEDs.

7. **Consider your next step:**

   ■ If you installed the fan module as part of another procedure, return to that procedure.

- Otherwise, return the server to operation.

  See "Returning the Server to Operation" on page 141.

Related Information

- "Remove a Fan Module" on page 49

Servicing Power Supplies (CRU)

This section describes how to remove and install the power supplies.

In addition to the service procedures provided in this document, Oracle provides animated service procedures that describe how to remove and install the power supplies. To play the Sun Server X3-2 Service Animations go to: http://docs.oracle.com/cd/E22368_01/html/E38015/index.html

The server's redundant power supplies support concurrent maintenance, which enables you to remove and replace a power supply without shutting down the server, provided that the other power supply is online and working.

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

- Front and rear Service Required LEDs
- Amber Fault LED on the faulty power supply
- Rear LED located on the server front panel (see FIGURE: Front Panel View of a Server With Four 3.5-inch Drives on page 3).

If a power supply fails and you do not have a replacement available, leave the failed power supply installed to ensure proper airflow in the server.

See the following topics for more information.

- "Power Supply Status Indicators" on page 54
- "Remove a Power Supply" on page 54
- "Install a Power Supply" on page 55

Related Information

- "Powering Down the Server" on page 32

Power Supply Status Indicators

Each power supply contains three status indicators (LEDs) on the back panel. The following figure and table provide a description of the power supply status indicators.

FIGURE: Power Supply Status Indicators
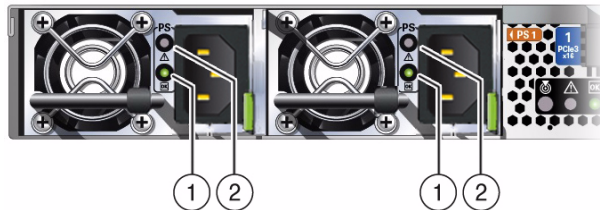
TABLE: Server Power Supply Indicators

Legend	LED Name	Icon	Color	State Meaning
1	AC OK/DC OK	OK	Green	• OFF – No AC power is present. • SLOW BLINK – Normal operating. Input power is within specification. DC output voltage is not enabled. • STEADY ON – Normal operation. Input AC power and DC output voltage are within specification.
2	Service Required	⚠	Amber	• OFF – Normal operation; no service required. • STEADY ON – The power supply (PS) has detected a PS fan failure, PS overtemperature, PS over current, or PS over/under voltage.

▼ Remove a Power Supply

1. Identify which power supply requires replacement.

A lit amber LED on a power supply indicates that a failure was detected. You can also use the Oracle ILOM `show Systems/Open_Problems` command at the Oracle ILOM prompt (->) to identify a power supply failure.

Note – The fans of a failed power supply may still be spinning when the system is powered on. You can remove a power supply while the fans are still spinning.

---

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

3. **If the cable management arm (CMA) is in the way, extend the server approximately 20 cm (8 inches) out of the front of the rack.**

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

5. **Grasp the power supply handle and push the power supply latch to the left.**

FIGURE: Removing a Power Supply
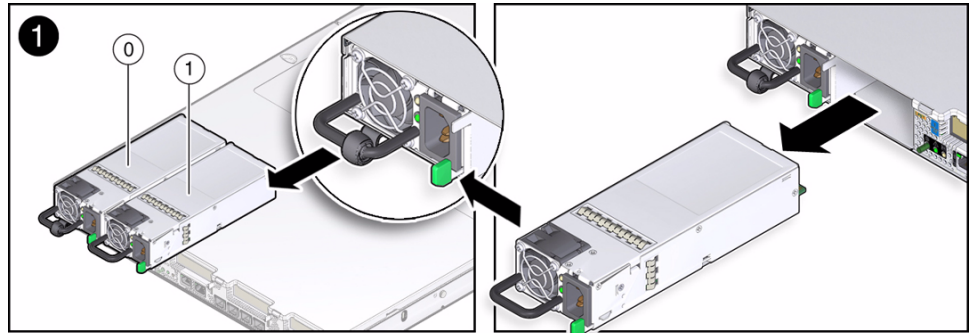
Figure Legend

1	Power Supply 0 (PS0)
2	Power Supply 1 (PS1)

6. **Pull the power supply out of the chassis.**

Caution – Whenever you remove a power supply, you should replace it with another power supply; otherwise, the server might overheat due to improper airflow.

7. **Continue to** "Install a Power Supply" on page 55**.**

Related Information

- "Server Back Panel View" on page 7
- "Power Supply Status Indicators" on page 54
- "Install a Power Supply" on page 55

▼ Install a Power Supply

1. **Remove the replacement power supply from its packaging and place it on an antistatic mat.**

2. Align the replacement power supply with the empty power supply bay.

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

Listen for the audible click when the power supply fully seats.
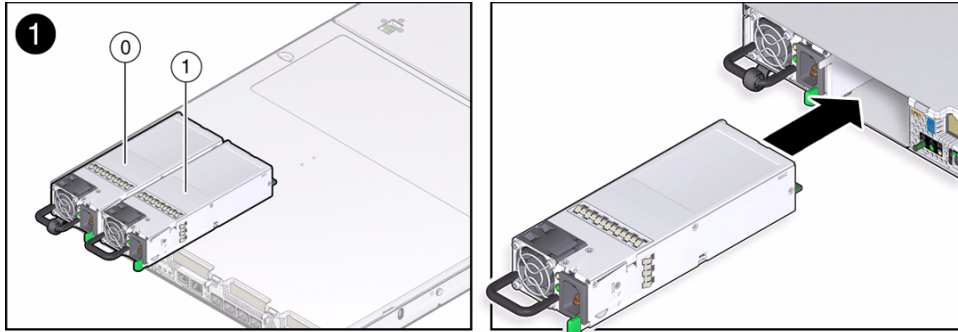
4. Reconnect the power cord to the power supply.

5. Verify that the amber LED on the replaced power supply and the Service Required LEDs on the chassis are not lit.

6. If you pulled the server out of the rack to make it easier to remove the power supply, push the server into the rack until the slide-rail locks (on the front of the server) engage the slide-rail assemblies.

You will hear an audible click when the server is in the normal rack position.

Note – After you have replaced Power Supply 0, you must reset the ILOM service processor (SP) to propagate the FRU top-level indicator (TLI) data to the new power supply. For instructions on resetting the SP, see the *Oracle Integrated Lights Out Manager (ILOM) 3.1 Configuration and Maintenance Guide* at http://www.oracle.com/goto/ILOM/docs. Power Supply 1 does not contain FRU TLI data, and therefore does not require an SP reset after replacement.

Related Information

- "Server Back Panel View" on page 7
- "Power Supply Status Indicators" on page 54
- "Remove a Power Supply" on page 54

Servicing CRUs That Require Server Power Off

These sections describe how to service customer-replaceable units (CRUs) that require you to power off the server.

Tasks	Description
Learn about the locations of the CRUs.	"CRU Locations" on page 57
Service the DIMMs.	"Servicing the DIMMs (CRU)" on page 58
Service the PCIe Risers.	"Servicing PCIe Risers (CRU)" on page 70
Service the PCIe cards.	"Servicing PCIe Cards (CRU)" on page 80
Service the DVD drive.	"Servicing the DVD Drive (CRU)" on page 87
Service the internal USB flash drives.	"Servicing the Internal USB Flash Drives (CRU)" on page 90
Service the battery.	"Servicing the Battery (CRU)" on page 92

Related Information

- "Servicing CRUs That Do Not Require Server Power Off" on page 43
- "Servicing FRUs" on page 97

CRU Locations

The CRU locations are shown in the following figure.

FIGURE: CRU Locations
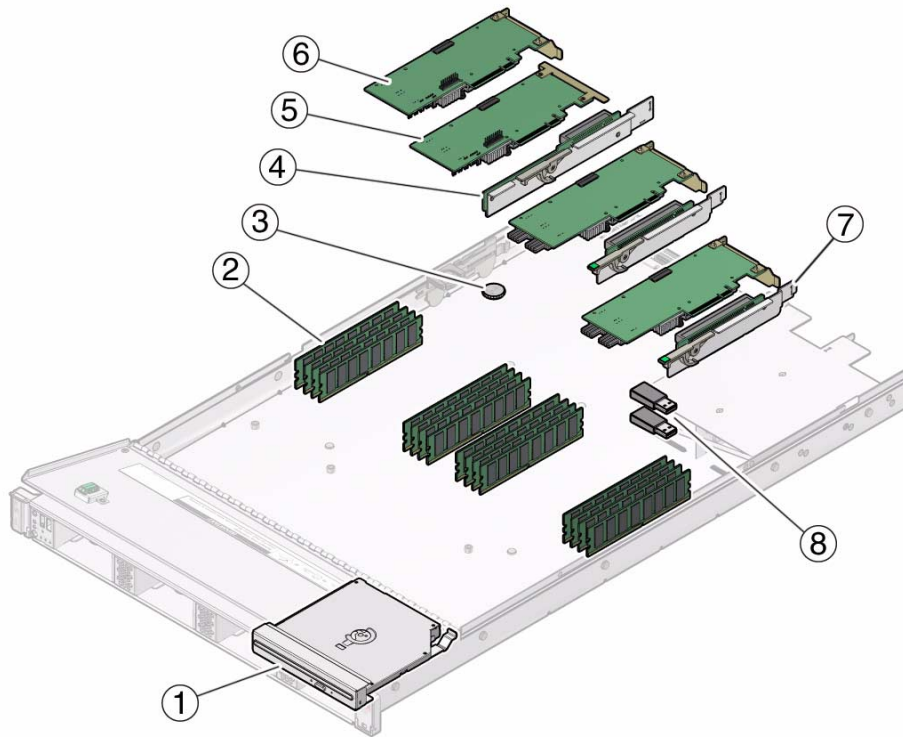
Figure Legend

1	DVD drive (CRU)	**5**	Internal HBA card (installs in slot 4 on PCIe riser for slots 3 and 4)
2	DIMMS (CRUs) **Note:** A maximum of eight DIMMs are supported in single-processor systems and the DIMMs must be installed in DIMM sockets associated with the P0 processor socket.	**6**	PCIe card (installs in slot 3 on PCIe riser for slots 3 and 4)
3	Battery (CRU)	**7**	PCIe riser for slot 1 (Nonfunctional in single-processor systems.)
4	PCIe riser for slots 3 and 4	**8**	USB flash drives

Servicing the DIMMs (CRU)

This section describes how to remove and install the DIMMs.

In addition to the service procedures provided in this document, Oracle provides animated service procedures that describe how to remove and install DIMMs. To play the Sun Server X3-2 Service Animations go to:
http://docs.oracle.com/cd/E22368_01/html/E38015/index.html

The Sun Server X3-2 supports a variety of DDR3 DIMM configurations that can include quad-rank (QR), dual-rank (DR), or single-rank (SR) DDR3 DIMMs.

Note – While Sun Server X3-2 does support single-rank DIMMs, that is, single-rank DIMMs can be installed in the server, Oracle does not offer any single-rank DIMMs for purchase, either as factory-installed options or as separately orderable options.

Caution – These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 40.

Caution – Ensure that all power is removed from the server before removing or installing DDR3 DIMMs, or damage to the DDR3 DIMMs might occur. You must disconnect all power cables from the system before performing these procedures.

The following topics provide information to assist you when replacing or upgrading a DIMM:

Related Information

- "Servicing CRUs That Require Server Power Off" on page 57
- "Servicing FRUs" on page 97

DIMM and Processor Physical Layout

The physical layout of the DIMMs and processor(s) is shown in the following figure. When viewing the server from the front, processor 0 (P0) is on the left.

FIGURE: DIMM and Processor Physical Layout
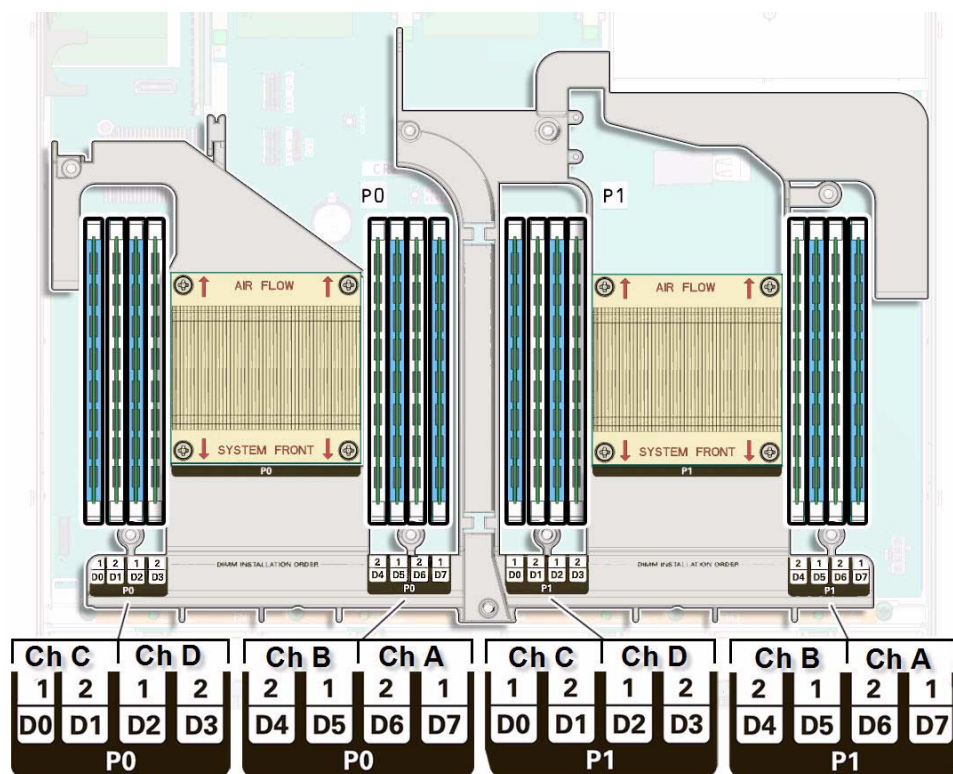
Note – In single-processor systems, the DIMM sockets associated with the processor in socket P1 are nonfunctional and should not be populated with DIMMs or DIMM fillers.

Related Information

- "DIMM Population Example for Optimal System Performance" on page 61
- "DIMM Population Rules" on page 63
- "DIMM Rank Classification Labels" on page 65
- "Inconsistencies Between DIMM Fault LEDs and the BIOS Isolation of Faulty DIMMs" on page 66

DIMM Population Example for Optimal System Performance

This section provides an example of how to populate the DIMMs to achieve optimal system performance.

Note – Not all possible configurations are shown here.

The following figure shows the order in which the DIMMs should be populated in dual-processor systems. In single-processor systems, you should follow the same order except that you should not install DIMMs in the DIMM sockets for processor 1 (P1), because the P1 DIMM sockets are nonfunctional.

FIGURE: DIMM Population Order
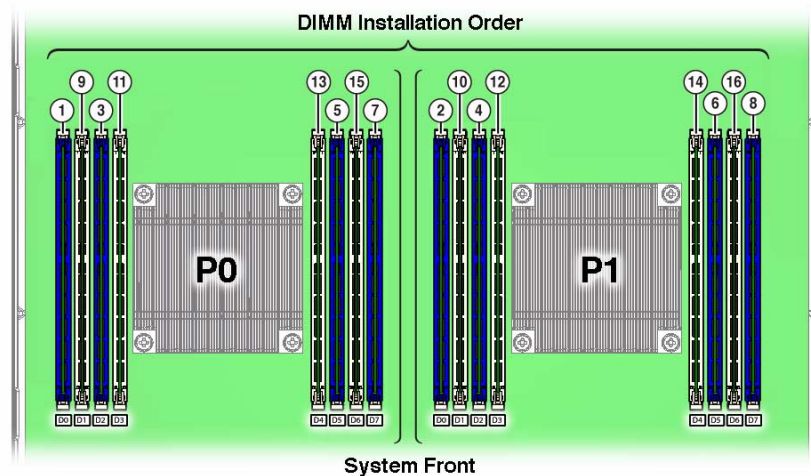
For more information on populating the DIMMs, see the following topics:

- "DIMM Population Order for Single-processor Systems" on page 62

DIMM Population Order for Single-processor Systems

In single-processor systems, DIMMs should only be installed into DIMM sockets associated with processor 0 (P0) starting with P0 D0, first filling the blue sockets and then the white. This DIMM population order is illustrated in FIGURE: DIMM Population Order on page 61.

The following table describes the order in which the DIMMs should be populated in single-processor systems. The figure callouts in column two of the table refer to the callouts in FIGURE: DIMM Population Order on page 61.

TABLE: DIMM Population Order for Single-processor Systems

Population Order	Figure Callouts	DIMMs Sockets for Processor 0 (P0)
Fill the blue sockets first		
First	1	D0
Second	3	D2
Third	5	D5
Fourth	7	D7
Then fill the white sockets		
Fifth	9	D1
Sixth	11	D3
Seventh	13	D4
Eighth	15	D6

DIMM Population Order for Dual-processor Systems

In dual-processor systems, DIMMs should be installed into DIMM sockets starting with P0 D0 and alternating back and forth between P0 and the matching socket on P1, first filling the blue sockets and then the white. This DIMM population order is illustrated in FIGURE: DIMM Population Order on page 61.

The following table describes the order in which the DIMMs should be populated in dual-processor systems. The figure callouts in columns two and four of the table refer to callouts in FIGURE: DIMM Population Order on page 61.

Population Order	Figure Callouts	DIMMs Sockets for Processor 0 (P0)	Figure Callouts	DIMMs Sockets for Processor 1 (P1)
Fill the blue sockets first				
First	1	Fill D0 first	2	Then D0
Second	3	Fill D2 first	4	Then D2
Third	5	Fill D5 first	6	Then D5
Fourth	7	Fill D7 first	8	Then D7
Then fill the white sockets				
Fifth	9	Fill D1 first	10	Then D1
Sixth	11	Fill D3 first	12	Then D3
Seventh	13	Fill D4 first	14	Then D4
Eighth	15	Fill D6 first	16	Then D6

DIMM Population Rules

The DIMM population rules for the server are as follows:

- In dual-processor systems, all DIMM sockets can have either a DIMM or DIMM filler.

Note – In dual-processor systems, DIMM filler panels are not required in sockets that do not have DIMMs installed.

- In single-processor systems, all DIMM sockets associated with processor socket P0 can have either a DIMM or DIMM filler and all DIMM sockets associated with processor socket P1 must remain empty, that is, neither DIMMs nor DIMM fillers should be installed.

Note – In single-processor systems, DIMM filler panels are not required in sockets that do not have DIMMs installed.

- A single DIMM configuration is supported.
- Do not populate any DIMM sockets next to an empty processor socket. Each processor contains a separate memory controller.
- Each processor has four channels and can support two DIMMs per channel for a maximum of eight quad-rank (QR), dual-rank (DR), or single-rank (SR) DIMMs.

- If a mix of DIMM sizes (for example, 8 GB, 16 GB, 32 GB) is being installed, then install all of the largest DIMMs first, followed next by all of the next largest, and so on until all DIMMs are installed.

Note – Each processor (P0, P1) has eight associated DIMM sockets, numbered D0, D1, D2, D3, D4, D5, D6, and D7.

- When mixing DIMMs with differing number of ranks within a channel, populate the DIMMs with the higher number of ranks first.
- When QR DIMMs are installed within a channel they must always be populated in the blue sockets prior to populating the white sockets.

Note – While the processor used in the server supports four modes of operation – Independent Channel Mode, Lockstep Channel Mode, Mirrored Channel Mode, and, Device Tagging Mode – the server supports the Independent Channel mode only.

- DIMMs should be installed into DIMM sockets starting with P0 D0 and alternating back and forth between P0 and the matching socket on P1, first filling the blue sockets, and then the white. For an example of a configuration that follows this rule, see "DIMM Population Example for Optimal System Performance" on page 61.
- For maximum performance, apply the following rules:
    - The best performance is ensured by preserving symmetry. For example: adding four of the same kind of DIMMs, one per memory channel; and, if the server has two processors, ensuring that both processors have the same size of DIMMs populated in the same manner.
    - For optimal performance, the memory population should be identical across both sockets. Within each socket populate QR, DR, or SR DIMMs in sets of four, one per memory channel.

Further, DIMM operational frequency, or speed, is a function of the processor speed, the maximum speed of the installed DIMMs, and the DIMM configuration. All memory installed in the system will operate at the same speed. This speed will be limited to the lowest speed determined by each one of the following factors:

- Maximum memory frequency supported by processor
- Maximum memory frequency supported by the installed DIMMs
- Memory configuration within a channel

The table below covers the memory speed limitations associated with all the possible combinations of DIMMs within an individual memory channel.

Blue Socket	White Socket	Speed
Quad-rank LRDIMM	Empty	1600 MT/s
Quad-rank DIMM	Empty	1066 MT/s
Dual-rank DIMM	Empty	1600 MT/s
Single-rank DIMM	Empty	1600 MT/s
Quad-rank LRDIMM	Quad-rank LRDIMM	1333 MT/s
Quad-rank DIMM	Quad-rank DIMM	1066 MT/s
Quad-rank DIMM	Dual-rank DIMM	1066 MT/s
Quad-rank DIMM	Single-rank DIMM	1066 MT/s
Dual-rank DIMM	Dual-rank DIMM	1600 MT/s
Dual-rank DIMM	Single-rank DIMM	1600 MT/s
Single-rank DIMM	Single-rank DIMM	1600 MT/s
Single-rank DIMM	Dual-rank DIMM	1600 MT/s

DIMM Rank Classification Labels

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

TABLE: DIMM Rank Classifications Labels

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

Note – While Sun Server X3-2 does support single-rank DIMMs, that is, single-rank DIMMs can be installed in the server, Oracle does not offer any single-rank DIMMs for purchase, either as factory-installed options or as separately orderable options.

Inconsistencies Between DIMM Fault LEDs and the BIOS Isolation of Faulty DIMMs

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

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

When the faulty DIMM is replaced, the memory available to the operating system returns to normal. If the DIMM fault message in Oracle ILOM is not cleared under Open Problems, you should use Oracle ILOM to clear the fault. For instructions for manually clearing a DIMM fault, see the procedure "Undetected Replaced or Repaired Hardware Components" in the *Oracle Integrated Lights Out Manager (ILOM) 3.1 User's Guide* in the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at: http://www.oracle.com/pls/topic/lookup?ctx=ilom31.

Using the Fault Remind Button

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

The following figure shows the location of the Fault Remind button.

FIGURE: Fault Remind Button Location
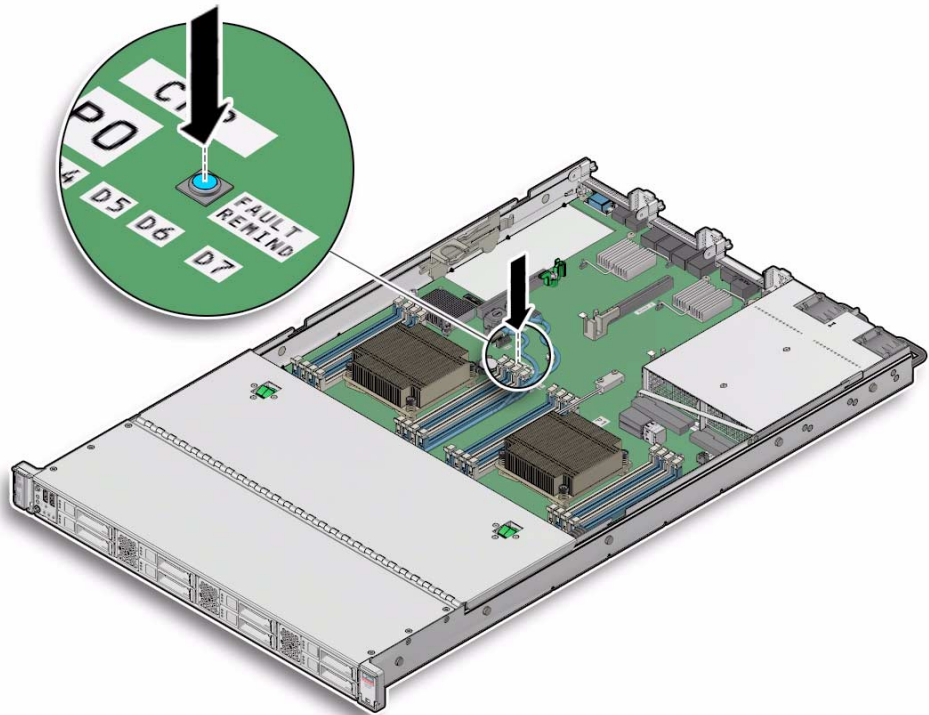
▼ Identify and Remove Faulty DIMMs

1. Prepare the server for service.

a. Power off the server and disconnect the power cords from the power supplies.

See "Powering Down the Server" on page 32

b. Extend the server to the maintenance position.

See "Extend the Server to the Maintenance Position" on page 38.

c. Attach an antistatic wrist strap.

See "Take Antistatic Measures" on page 40.

d. Remove the top cover.

See "Remove the Server Top Cover" on page 42.

2. **Replace the faulty DIMM.**

   a. **To identify the location of the faulty DDR3 DIMM, press the Fault Remind button on the motherboard (see** "Using the Fault Remind Button" on page 66**).**

   b. **Note the location of faulty DDR3 DIMM.**

      Faulty DDR3 DIMMs are identified with a corresponding amber LED on the motherboard.
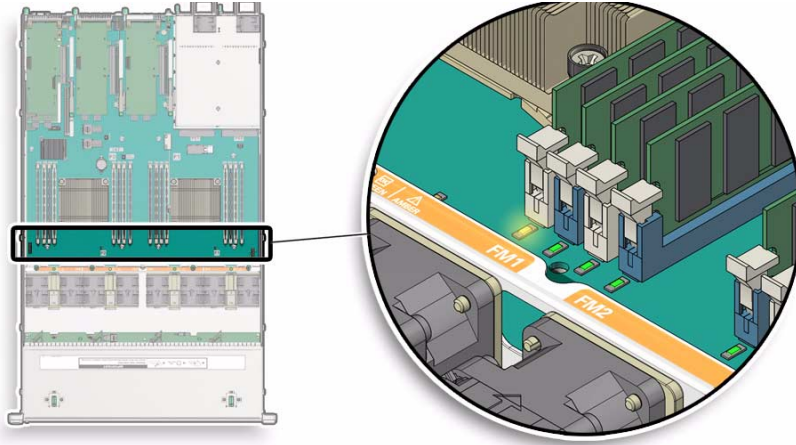
   - If DIMM fault LED is off: DIMM is operating properly.
   - If DIMM fault LED is on (amber): DIMM is faulty and should be replaced.

   c. **To remove the faulty DIMM do the following:**

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

         The DIMM is partially ejected from the socket (See FIGURE: DIMM Socket Release and Alignment on page 69).

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

   d. **Replace each faulty DIMM with either another DIMM of the same rank size (quad rank, dual rank, or single rank) or leave the socket empty.**

Note – DIMM filler panels are optional and not required.

For DIMM replacement instructions, see "Install a DIMM" on page 69.

FIGURE: DIMM Socket Release and Alignment
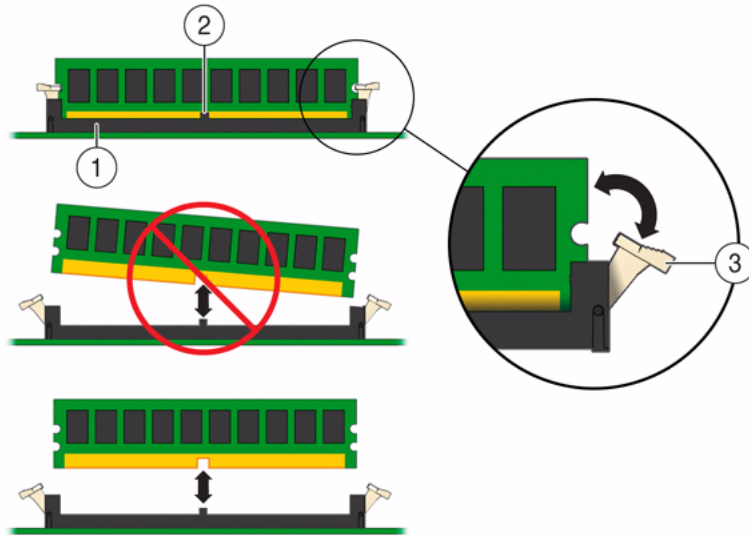
Figure Legend

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

▼ Install a DIMM

1. **Unpack the replacement DDR3 DIMM and place it on an antistatic mat.**

2. **Ensure that the replacement DDR3 DIMM matches the size it is replacing.**

    You must not replace a dual-rank DIMM with a quad-rank DIMM and vice versa. If you violate this rule, the performance of the server might be adversely affected. For DIMM population rules, see "DIMM Population Rules" on page 63.

3. **Install the DIMM.**

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

    b. **Align the notch in the replacement DIMM with the key in the connector.**

       The notch ensures that the DIMM is oriented correctly.

c. **Push the DDR3 DIMM into the connector until the ejector tabs lock the DIMM in place.**

   If the DIMM does not easily seat into the connector, verify that the notch in the DIMM is aligned with the key in the connector. If the notch is not aligned, damage to the DIMM might occur.

4. **Repeat** Step 3 **until all replacement DDR3 DIMMs are installed.**

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

   a. **Install the top cover.**

   See "Install the Top Cover" on page 142.

   b. **Close the fan door.**

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

   See "Return the Server to the Normal Rack Position" on page 145.

   d. **Reconnect the power cord to the server power supply and the data cables.**

   See "Reconnect Data Cables and Power Cords" on page 147.

   e. **Power on the server.**

   See "Power On the Server" on page 149.

   Verify that the Power/OK indicator is steady on.

Servicing PCIe Risers (CRU)

This section describes how to remove and install the PCIe risers.

In addition to the service procedures provided in this document, Oracle provides animated service procedures that describe how to remove and install PCIe risers and cards. To play the Sun Server X3-2 Service Animations go to: http://docs.oracle.com/cd/E22368_01/html/E38015/index.html

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

Caution – These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 40.

Caution – Ensure that all power is removed from the server before removing or installing PCIe risers, or damage to the PCIe cards installed in the risers might occur. You must disconnect all power cables from the system before performing these procedures.

The following topics are covered:

Related Information

PCIe Riser Location and Differences

The PCIe riser that installs in PCIe slots 3 and 4 is different than the risers in PCIe slots 1 and 2. The riser for slots 3 and 4 supports two cards, a standard PCIe card and an internal HBA card. Do not attempt to install the riser for PCIe slots 3 and 4 in slots 1 or 2, and vice versa.

FIGURE: PCIe Riser Locations
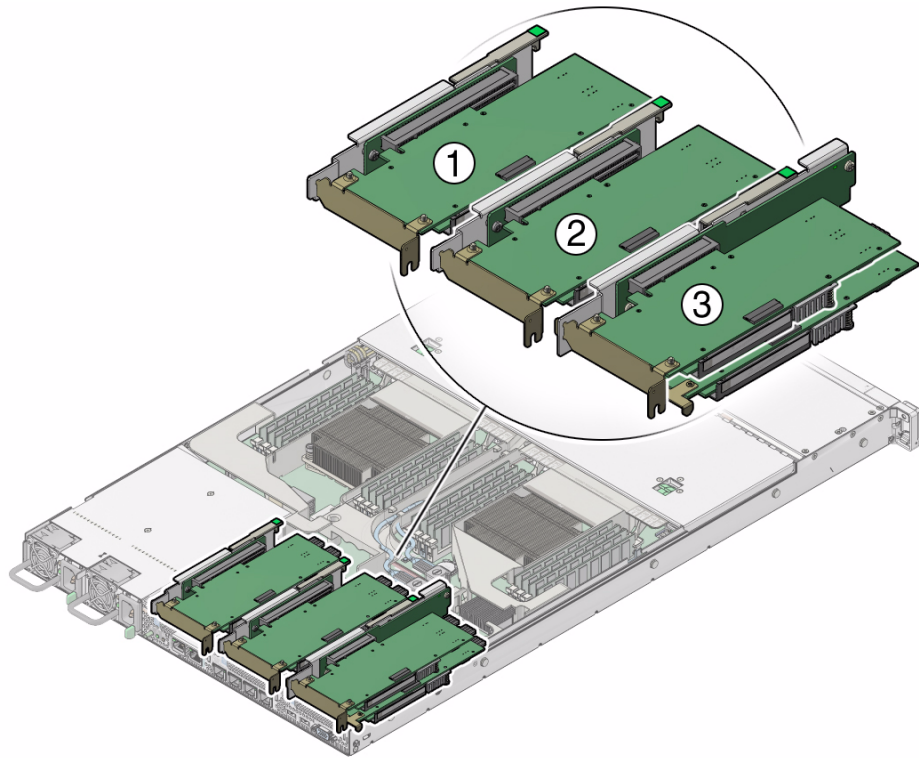
Related Information

■ "PCIe Slot Characteristics" on page 81

▼ Remove a PCIe Riser From PCIe Slot 1 or 2

**Note –** PCIe slot 1 is nonfunctional in single-processor systems.

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See

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

      See .

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

      See .

   d. **Remove the top cover.**

      See .

2. **Select the PCIe riser that you want to remove.**

   See .

3. **If a PCIe card is installed in the riser, disconnect any external or internal cables from the card.**

4. **Lift the green-tabbed latch on the rear of the server's chassis next to the applicable PCIe slot to release the PCIe card's rear bracket [1].**
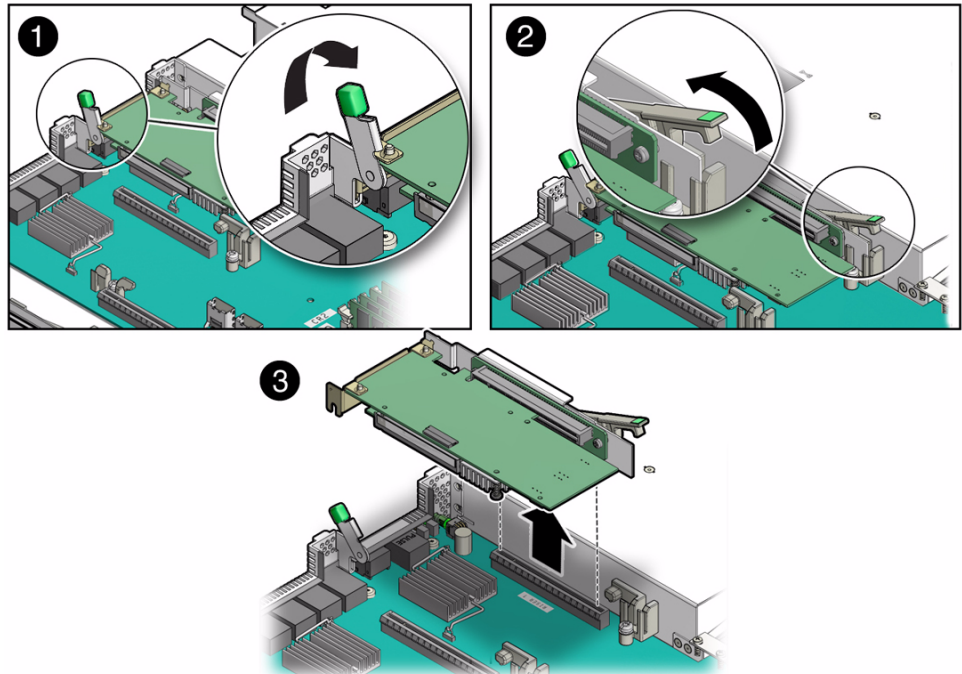
Note – If the riser does not have a PCIe card installed, then lift the latch to release the PCIe slot filler panel.

5. **Lift the riser release lever with one hand and use your other hand to remove the riser from the motherboard [2, 3].**

   The release lever is marked with a green tab.

6. **If there is a PCIe card installed in the riser, place the riser on an antistatic mat and make a note of the slot in which the PCIe riser was originally installed; otherwise, set the PCIe riser aside.**

   Related Information
   - "Install a PCIe Riser Into PCIe Slot 1 or 2" on page 74

▼ Install a PCIe Riser Into PCIe Slot 1 or 2

Note – PCIe slot 1 is nonfunctional in single-processor systems.

Note – The PCIe riser in slots 3 and 4 is different than the PCIe risers in slots 1 and 2. Do not attempt to install a PCIe riser from slots 1 or 2 into PCIe slots 3 and 4 and vice versa.

1. **Determine into which slot you will install the PCIe riser.**

2. **Retrieve the PCIe riser and any PCIe cards attached to it.**

3. **Raise the PCIe riser release lever (marked with a green tab) to the open (up) position [1].**

4. **Gently press the riser into the motherboard connector until it seats and press the green-tabbed, riser release lever to the close (down) position [2].**
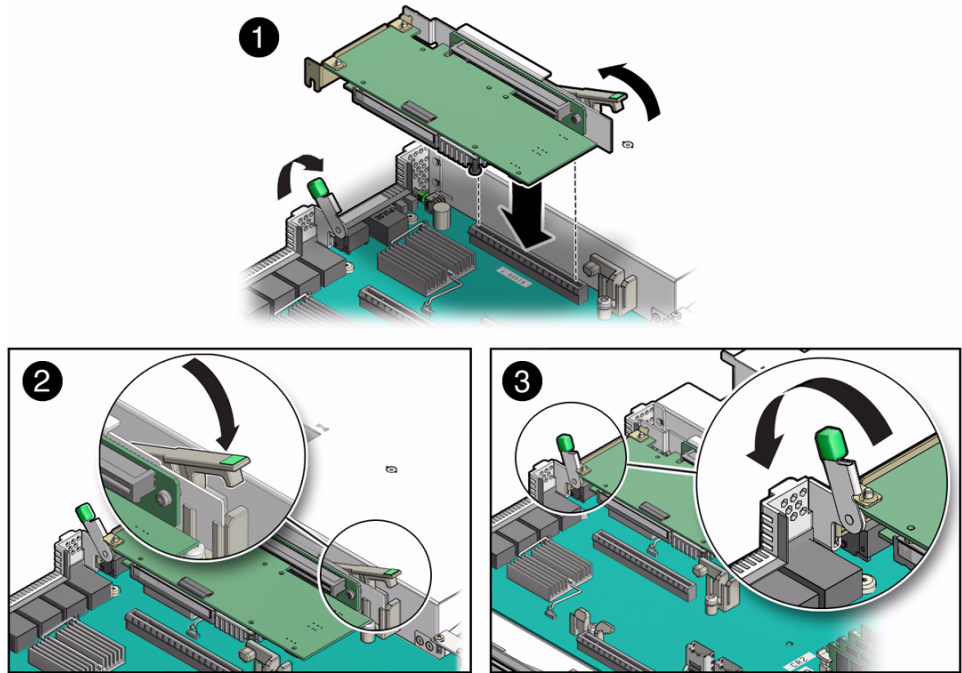
5. **If there is a PCIe card installed in the riser, reconnect any external or internal cables to the card.**

6. **Close the green-tabbed latch on the rear of the server's chassis next to the applicable PCIe slot to secure the PCIe card's rear bracket to the server's chassis [3].**

Note – If the riser does not have a PCIe card installed, install a PCIe slot filler panel and close the green-tabbed latch to secure filler panel.

---

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

   a. **Install the top cover.**

      See "Install the Top Cover" on page 142.

   b. **Close the fan door.**

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

      See "Return the Server to the Normal Rack Position" on page 145.

   d. **Reconnect the power cord to the server power supply and the data cables.**

      See "Reconnect Data Cables and Power Cords" on page 147.

e. **Power on the server.**

See "Power On the Server" on page 149.

Verify that the Power/OK indicator is steady on.

8. **Use Oracle ILOM to clear the server PCIe riser fault.**

If the PCIe riser fault message in Oracle ILOM is not cleared under Open Problems, you should use Oracle ILOM to clear the fault. For instructions for manually clearing a PCIe riser fault, see the procedure "Undetected Replaced or Repaired Hardware Components" in the *Oracle Integrated Lights Out Manager (ILOM) 3.1 User's Guide* in the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:
`http://www.oracle.com/pls/topic/lookup?ctx=ilom31`.

Related Information

- "Remove a PCIe Riser From PCIe Slot 1 or 2" on page 72

▼ Remove a PCIe Riser From PCIe Slots 3 and 4

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

   See "Powering Down the Server" on page 32

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

   See "Extend the Server to the Maintenance Position" on page 38.

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

   See "Take Antistatic Measures" on page 40.

   d. **Remove the top cover.**

   See "Remove the Server Top Cover" on page 42.

2. **If there is a PCIe card installed in the riser, disconnect any external or internal cables.**

   Note – Do not disconnect the SAS cable from the internal HBA card until after you have removed the riser from the server.

   ---

3. **Open the green-tabbed latch located on the rear of the server's chassis next to the PCIe slot 3 to release the PCIe card holding bracket [1].**
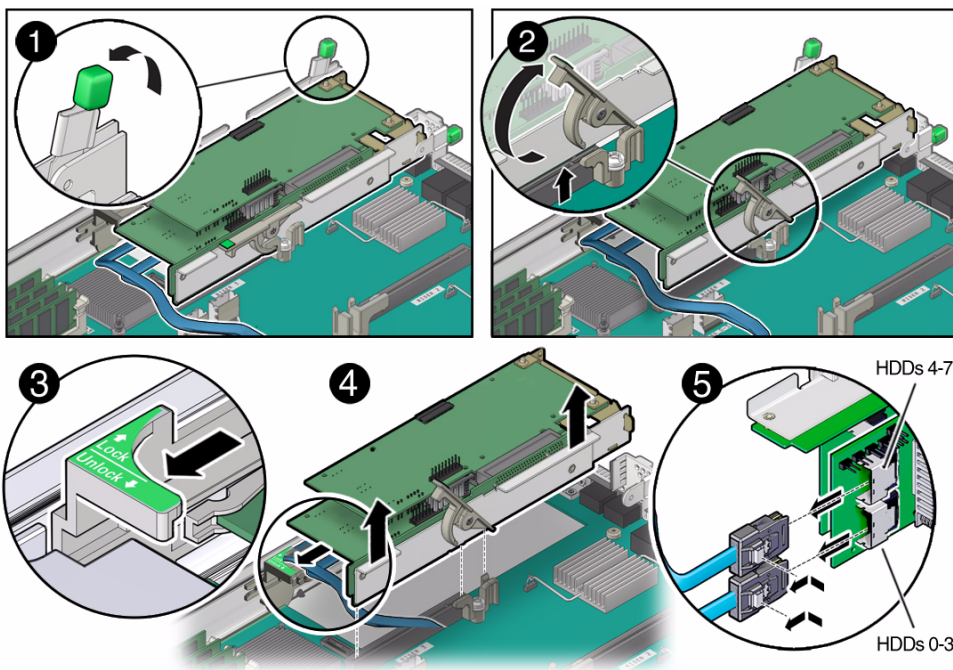
Note – If the riser does not have a PCIe card installed in slot 3, then lift the latch to release PCIe slot 3 filler panel.

4. **To release the riser from the motherboard connector, lift the riser's green-tabbed lease lever to the open position [2].**

5. **Slide the plastic PCIe card retainer, which is mounted on the side of the chassis, forward to release the card(s) installed in the riser [3].**

6. **Grasp the riser with both hands and remove it from the server [4].**

7. **Disconnect the SAS storage drive (HDD) cables from the internal HBA card installed in PCIe slot 4 [5].**

Note – If the server has four or fewer storage drives, the SAS cable for HDDs 0-3 will be the only one installed.

8. **Place the riser an antistatic mat.**

Related Information

■ "Install a PCIe Riser Into PCIe Slots 3 and 4" on page 78

▼ Install a PCIe Riser Into PCIe Slots 3 and 4

Note – The PCIe riser in slots 3 and 4 is different than the PCIe risers in slots 1 and 2. Do not attempt to install a PCIe riser from slots 1 or 2 into PCIe slots 3 and 4 and vice versa.

1. **Retrieve the PCIe riser and any PCIe cards attached to it.**

2. **Reconnect the SAS cable(s) to the internal HBA card [1].**

   Be sure to connect the SAS cable for storage drives 0 through 3 (HDDs 0-3) to the connector that is farther from the riser in which the HBA card is installed; otherwise, the server will incorrectly identify the storage drives when it is powered on.
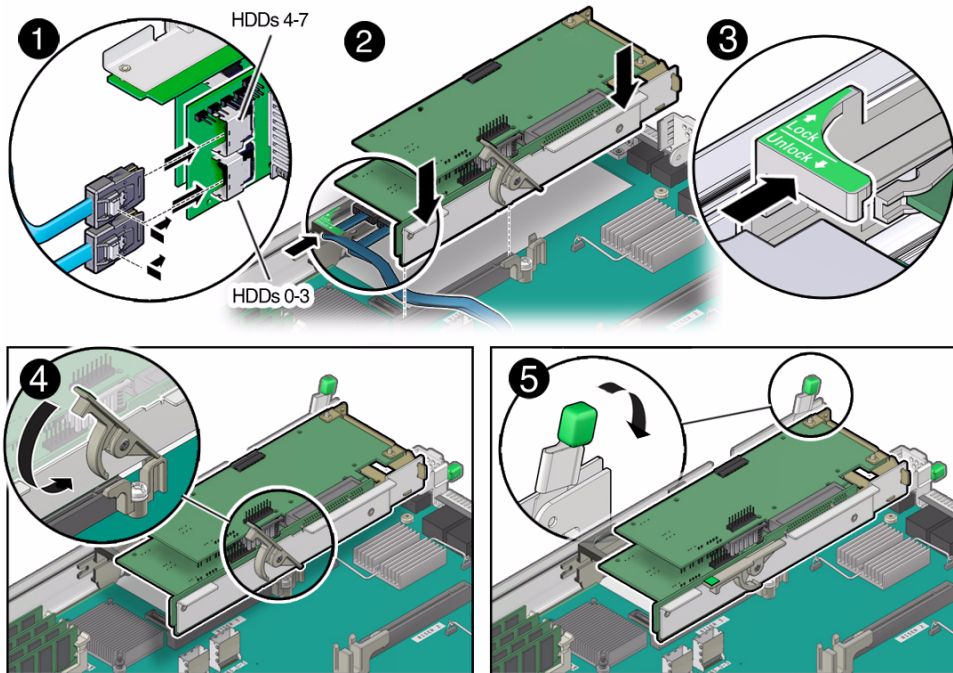
3. **Raise the PCIe riser green-tabbed release lever to the open (up) position and gently press the riser into the motherboard connector until it seats [2].**

4. **Ensure that the rear bracket on the internal HBA card in PCIe slot 4 is connected to the slot in the server's chassis side wall. If the bracket is not connected, remove the riser and reposition it so that the rear bracket connects to the side wall, then gently press the riser into the motherboard connector.**

5. **Slide the plastic PCIe card retainer that is mounted on the side of the chassis toward the back of the server to secure the card(s) installed in the riser [3].**

6. **Press the green-tabbed release lever on the PCIe riser to the close (down) position [4].**

7. **To secure the PCIe card's rear bracket to the server, close the green-tabbed latch on the rear of the server's chassis [5].**

Note – If the riser does not have a PCIe card installed in slot 3, install a PcIe filler panel and close the green-tabbed latch to secure the PCIe slot filler panel.

---

8. **If there is a PCIe card installed in slot 3 of the riser, reconnect any external or internal cables to the card.**

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

   a. **Install the top cover.**

      See "Install the Top Cover" on page 142.

   b. **Close the fan door.**

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

      See "Return the Server to the Normal Rack Position" on page 145.

   d. **Reconnect the power cord to the server power supply and the data cables.**

      See "Reconnect Data Cables and Power Cords" on page 147.

   e. **Power on the server.**

      See "Power On the Server" on page 149.

      Verify that the Power/OK indicator is steady on.

10. **Use Oracle ILOM to clear the server PCIe riser fault.**

    If the PCIe riser fault message in Oracle ILOM is not cleared under Open Problems, you should use Oracle ILOM to clear the fault. For instructions for manually clearing a PCIe riser fault, see the procedure "Undetected Replaced or Repaired Hardware Components" in the *Oracle Integrated Lights Out Manager (ILOM) 3.1 User's Guide* in the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:
    http://www.oracle.com/pls/topic/lookup?ctx=ilom31.

Related Information

■ "Remove a PCIe Riser From PCIe Slot 1 or 2" on page 72

Servicing PCIe Cards (CRU)

This section describes how to remove and install the PCIe cards.

In addition to the service procedures provided in this document, Oracle provides animated service procedures that describe how to remove and install PCIe risers and cards. To play the Sun Server X3-2 Service Animations go to:
http://docs.oracle.com/cd/E22368_01/html/E38015/index.html

These topics describe how to service PCIe cards. Refer to your PCIe card documentation for complete software and cabling information about your card.

> **Caution –** These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 40.

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

> **Note –** For a complete list of supported PCIe cards, see the *Sun Server X3-2 Product Notes* at http://www.oracle.com/pls/topic/lookup?ctx=SunServerX3-2.

The following topics are covered:

- "PCIe Slot Characteristics" on page 81
- "Remove a PCIe Card From PCIe Slot 1 or 2" on page 81
- "Install a PCIe Card in PCIe Slot 1 or 2" on page 82
- "Remove a PCIe Card From PCIe Slot 3" on page 83
- "Install a PCIe Card in the PCIe Riser in Slot 3" on page 84
- "Remove the Internal HBA Card" on page 85
- "Install the Internal HBA Card in the PCIe Riser" on page 86

PCIe Slot Characteristics

There are three external and one internal PCIe slots available. The external slots support optional, standard PCIe cards and are numbered 1, 2, and 3 from left to right when you view the server from the rear. The internal slot, which installs on the riser in PCIe slot 3 and 4, supports a required internal SAS controller HBA card. For a view of the rear panel that shows PCIe slot numbering, see "Server Back Panel View" on page 7.

Note – PCIe slot 1 is nonfunctional in single-processor systems.

Note – All of the PCIe slots comply with the PCI Express 3.0 specification and can accommodate 25 watt PCIe cards.

The following table lists the characteristics and requirements of the PCIe slots.

Slot Number	Supported PCIe Card Types	Supported PCIe Specifications	Slot Connector Width/PCI Express Lanes
1	Low-profile cards only	PCIe 1.0, PCIe 2.0, PCIe 3.0	x16 mechanical/x16 electrical
2	Low-profile cards only	PCIe 1.0, PCIe 2.0, PCIe 3.0	x16 mechanical/x8 electrical
3 and 4	Low-profile cards only	PCIe 1.0, PCIe 2.0, PCIe 3.0	x8 mechanical/x8 electrical

▼ Remove a PCIe Card From PCIe Slot 1 or 2

Note – PCIe slot 1 is nonfunctional in single-processor systems.

---

1. **Remove the PCIe riser from the server.**

   For instructions, see

2. **Remove the PCIe card from the PCIe riser.**

   a. **Hold the riser in one hand and use your other hand to carefully pull the PCIe card connector out of the riser.**

   b. **Disconnect the rear bracket that is attached to the PCIe card from the rear of the PCIe riser.**

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

⚠
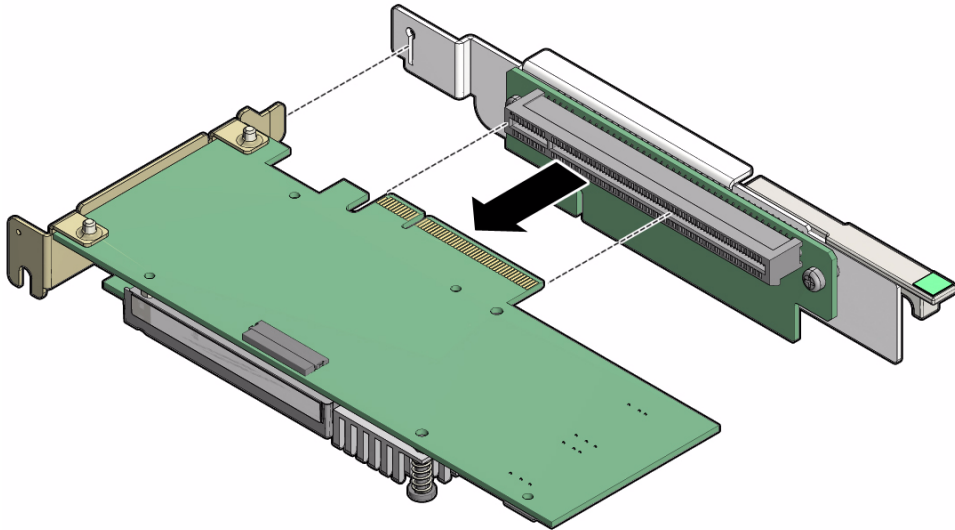
Caution – Whenever you remove a PCIe card, you should replace it with another PCIe card or a filler panel. Installing filler panels in vacant PCIe slots helps reduce the level of electromagnetic interference (EMI) emitted by the server. For instructions for installing a filler panel, see "Removing and Installing Server Filler Panels" on page 141.

▼ Install a PCIe Card in PCIe Slot 1 or 2

Note – PCIe slot 1 is nonfunctional in single-processor systems.

1. **Install the PCIe card.**

   a. **Insert the rear bracket that is attached to the PCIe card into the PCIe riser.**

   b. **Hold the riser in one hand and use your other hand to carefully insert the PCIe card connector into the Riser.**
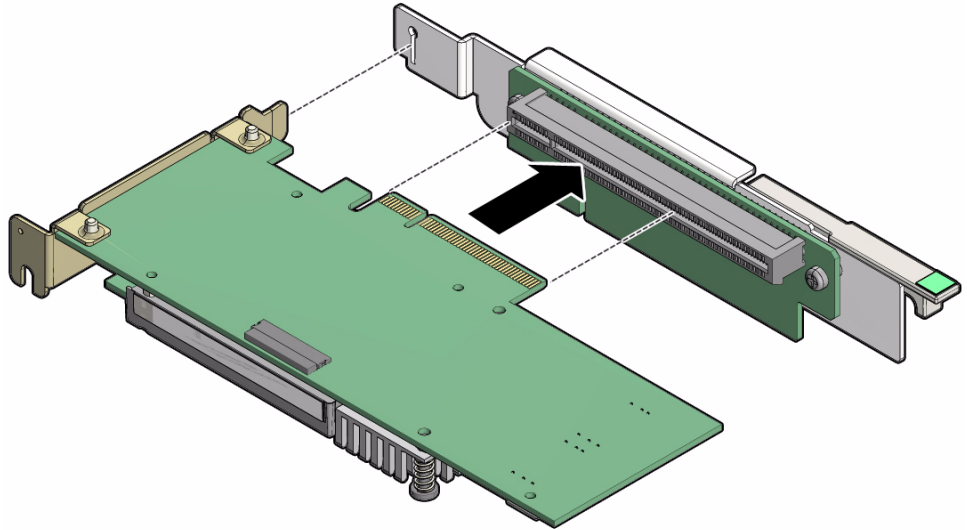
2. **Install the PCIe riser into the server.**

   For instructions, see "Install a PCIe Riser Into PCIe Slot 1 or 2" on page 74.

▼ Remove a PCIe Card From PCIe Slot 3

1. **Remove the PCIe riser from the server.**

   For instructions, see "Remove a PCIe Riser From PCIe Slots 3 and 4" on page 76

2. **Remove the PCIe card from the riser.**

   a. **Hold the riser in one hand and use your other hand to carefully remove the PCIe card connector from the riser.**

   b. **Disconnect the rear bracket attached to the PCIe card from the rear of the PCIe riser.**
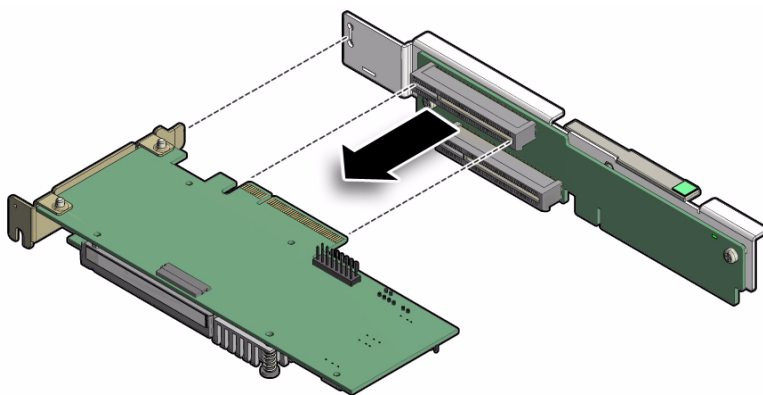
3. Place the PCIe card on an antistatic mat.

⚠ **Caution –** Whenever you remove a PCIe card, you should replace it with another PCIe card or a filler panel. Installing filler panels in vacant PCIe slots helps reduce the level of electromagnetic interference (EMI) emitted by the server.

▼ Install a PCIe Card in the PCIe Riser in Slot 3

1. Install the PCIe card in the riser.

   a. Insert the rear bracket that is attached to the PCIe card into the PCIe riser.

   b. Insert the PCIe card connector into the riser.
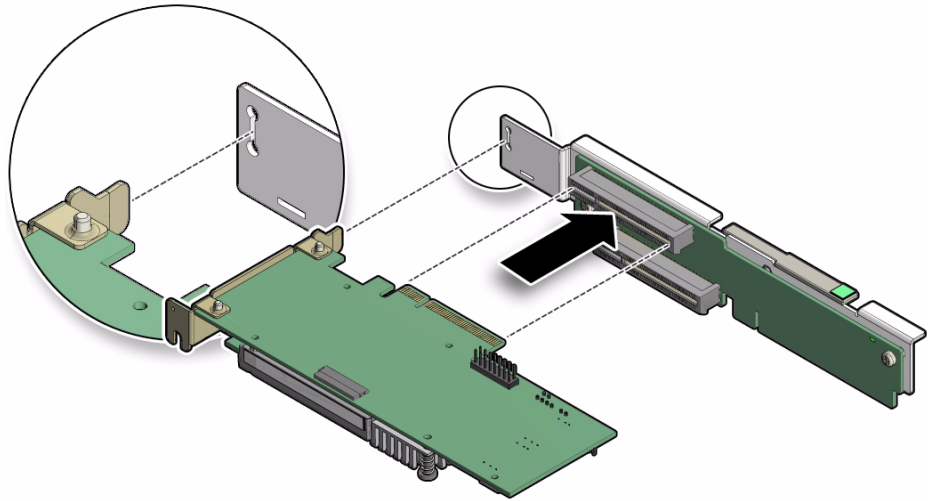
2. **Install the PCIe riser.**

   For instructions, see "Install a PCIe Riser Into PCIe Slots 3 and 4" on page 78.

▼ Remove the Internal HBA Card

1. **Remove the PCIe riser from slot 3.**

   For instructions, see "Remove a PCIe Riser From PCIe Slots 3 and 4" on page 76.

2. **Remove the internal HBA card from the riser.**

   a. **Hold the riser in one hand and use your other hand to carefully remove the card from slot 4 of the riser.**

   b. **Disconnect the rear bracket attached to the PCIe card from the rear of the PCIe riser.**
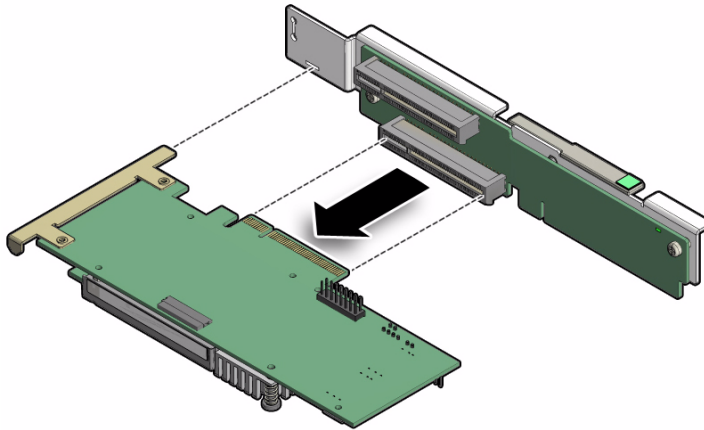
3. **Place the PCIe card on an antistatic mat.**

> ⚠️ **Caution –** Whenever you remove a PCIe card, you should replace it with another PCIe card or a filler panel. Installing filler panels in vacant PCIe slots helps reduce the level of electromagnetic interference (EMI) emitted by the server.

▼ Install the Internal HBA Card in the PCIe Riser

1. **Install the internal HBA card into the riser in slot 3.**

    a. **Insert the rear bracket that is attached to the internal HBA card into the rear connector on the PCIe riser.**

    b. **Insert the internal HBA card connector into the riser's bottom connector.**
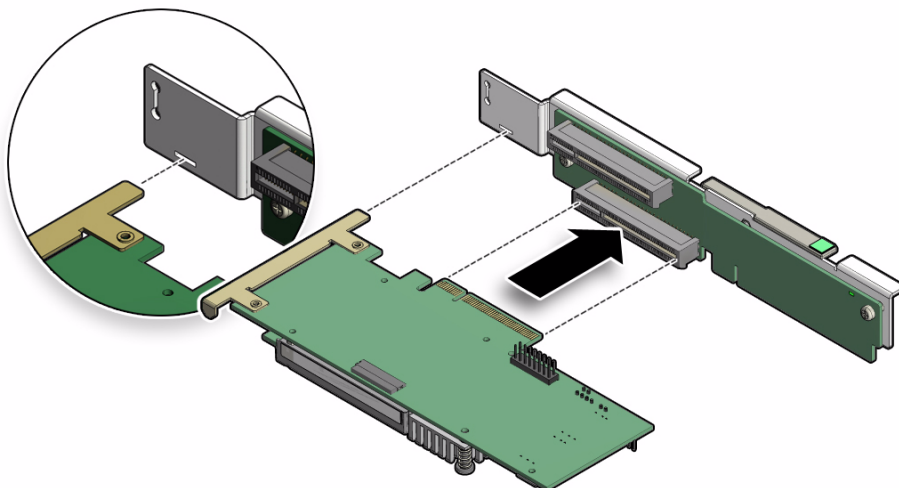
2. **Install the PCIe riser.**

   For instructions, see "Install a PCIe Riser Into PCIe Slots 3 and 4" on page 78.

Servicing the DVD Drive (CRU)

The DVD drive is accessible from the front panel of the system.

Caution – These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 40.

Caution – Ensure that all power is removed from the server before removing or installing the DVD drive or damage to the drive might occur. You must disconnect all power cables from the system before performing these procedures.

The following topics are covered:

- "Remove the DVD Drive" on page 88.
- "Install the DVD Drive" on page 89.

Related Information

- "Disconnect Cables From the Server" on page 37
- "Extend the Server to the Maintenance Position" on page 38
- "Open the Server Fan Door" on page 41

▼ Remove the DVD Drive

1. Remove any media from the DVD drive.

2. Prepare the server for service.

    a. Power off the server and disconnect the power cords from the power supplies.

    See "Powering Down the Server" on page 32

    b. Extend the server to the maintenance position.

    See "Extend the Server to the Maintenance Position" on page 38.

    c. Attach an antistatic wrist strap.

    See "Take Antistatic Measures" on page 40.

    d. Remove the top cover.

    See "Remove the Server Top Cover" on page 42.

3. Locate the DVD drive [1].

4. Disconnect the cable from the rear of the DVD [2]).

FIGURE: Removing the DVD Drive
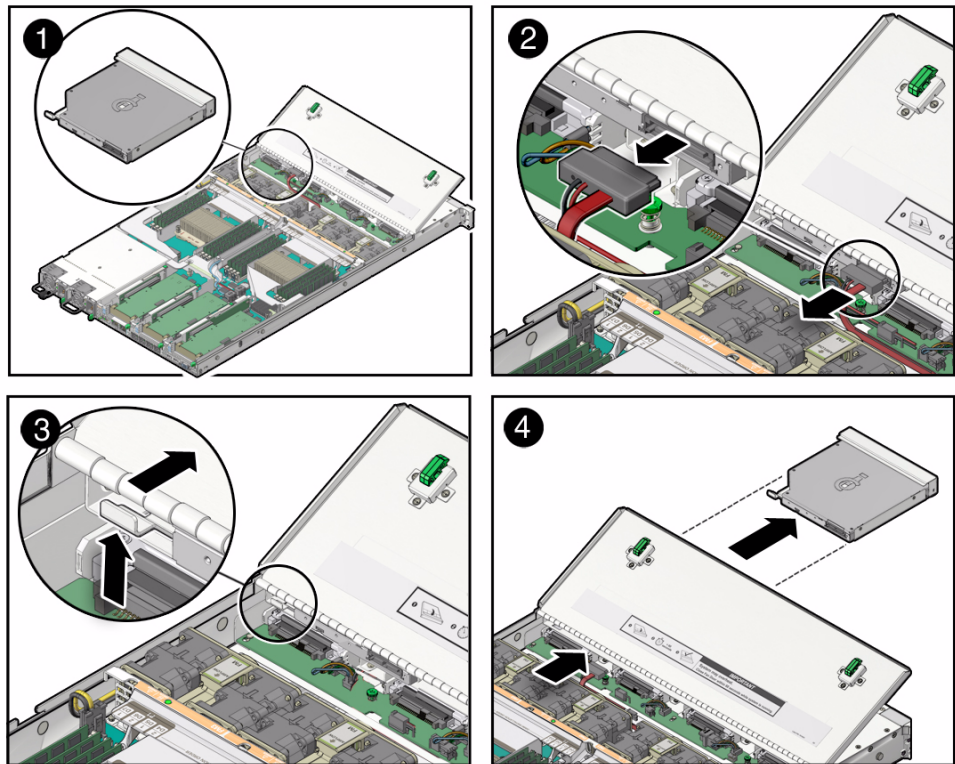
5. **To disengage the DVD drive from the chassis, press and hold the release tab on the rear of the DVD drive up slightly [3].**

6. **Gently push the DVD drive forward, slide it out of the server, and place it on an antistatic mat [4].**

Related Information

■ "Install the DVD Drive" on page 89

▼ Install the DVD Drive

1. **Push the replacement DVD drive into the chassis until the release tab on the rear of the drive engages the chassis with an audible click (see FIGURE: Removing the DVD Drive on page 89 [4]).**

2. **Reconnect the DVD drive cable [2].**

3. **Return the server to operation.**

a. **Install the top cover.**

See "Install the Top Cover" on page 142.

b. **Close the fan door.**

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

See "Return the Server to the Normal Rack Position" on page 145.

d. **Reconnect the power cord to the server power supply and the data cables.**

See "Reconnect Data Cables and Power Cords" on page 147.

e. **Power on the server.**

See "Power On the Server" on page 149.

Verify that the Power/OK indicator is steady on.

Related Information

- "Remove the DVD Drive" on page 88

Servicing the Internal USB Flash Drives (CRU)

Caution – These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 40.

Caution – Ensure that all power is removed from the server before removing or installing a flash drive or damage to the drive might occur. You must disconnect all power cables from the system before performing these procedures.

The following topics are covered:

- "Remove an Internal USB Flash Drive" on page 91
- "Install an Internal USB Flash Drive" on page 91

Related Information

- "Extend the Server to the Maintenance Position" on page 38

- "Remove the Server Top Cover" on page 42

▼ Remove an Internal USB Flash Drive

The server can be equipped with up to two internal USB flash drives.

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 32

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

      See "Extend the Server to the Maintenance Position" on page 38.

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

      See "Take Antistatic Measures" on page 40.

   d. **Remove the top cover.**

      See "Remove the Server Top Cover" on page 42.

2. **To access the USB flash drives, remove the cover [1].**

FIGURE: Removing an Internal USB Flash Drive
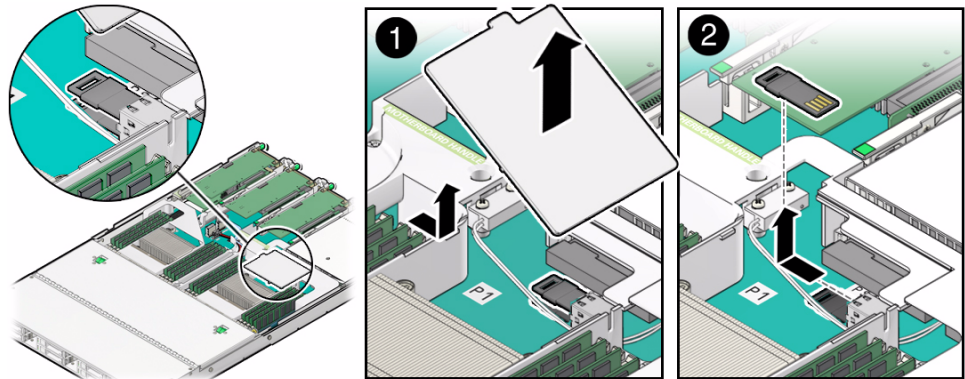
3. **To remove a USB flash drive, grasp it and pull it out of the internal USB port [2].**

▼ Install an Internal USB Flash Drive

1. **Unpack the replacement USB flash drive.**

2. **Insert the USB flash drive into the internal USB port (see** FIGURE: Removing an Internal USB Flash Drive on page 91 **[2].**

3. **Install the USB flash drive cover [1].**

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

   a. **Install the top cover.**

      See "Install the Top Cover" on page 142.

   b. **Close the fan door.**

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

      See "Return the Server to the Normal Rack Position" on page 145.

   d. **Reconnect the power cord to the server power supply and the data cables.**

      See "Reconnect Data Cables and Power Cords" on page 147.

   e. **Power on the server.**

      See "Power On the Server" on page 149.

      Verify that the Power/OK indicator is steady on.

   f. **If you have replaced the Oracle System Assistant USB flash drive, you can restore the Oracle System Assistant image onto the new USB device. For instructions, refer to the** *Sun Server X3-2 Administration Guide,* "Restore Oracle System Assistant" on page 83**.**

Servicing the Battery (CRU)

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

The BIOS power-on self-test (POST) code checkpoint tests check the battery when the server is powered on. If the battery is low, the BIOS POST code checkpoint tests generates a Low battery error and logs it to the Oracle ILOM service processor (SP) event log.

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

The following topics are covered:

- "Remove the Battery" on page 93
- "Install the Battery" on page 94

Related Information

- "Extend the Server to the Maintenance Position" on page 38
- "Remove the Server Top Cover" on page 42

▼ Remove the Battery

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 32

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

      See "Extend the Server to the Maintenance Position" on page 38.

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

      See "Take Antistatic Measures" on page 40.

   d. **Remove the top cover.**

      See "Remove the Server Top Cover" on page 42.

2. **To dislodge the battery from its retainer, place your finger under the rear of the battery (the side nearest the rear of the server) [1] and gently lift it up and out of its retainer [2].**

FIGURE: Removing the Battery
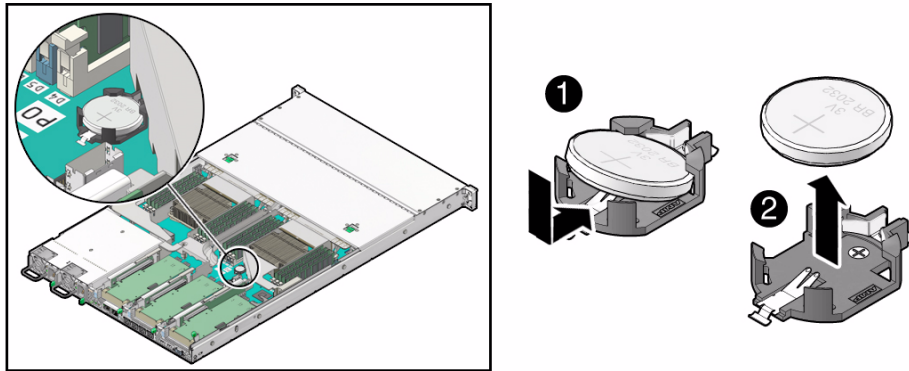
▼ Install the Battery

1. **Unpack the replacement battery.**

2. **Press the new battery into the battery retainer with the positive side (+) facing up (see** FIGURE: Removing the Battery on page 94**[1].**

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

4. **If the service processor is not configured to use NTP, you must do the following:**

    a. **Reset the Oracle ILOM clock using the Oracle ILOM CLI or the web interface.**

    For instructions, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:
    http://www.oracle.com/pls/topic/lookup?ctx=ilom31.

    b. **Use the BIOS Setup Utility to reprogram the host clock.**

    For the BIOS Main menu screen that supports this task, see the *Sun Server X3-2 Administration Guide,* "Setting Up BIOS Configuration Parameters" on page 107.

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

    a. **Install the top cover.**

    See "Install the Top Cover" on page 142.

    b. **Close the fan door.**

c. Return the server to the normal rack position.

See "Return the Server to the Normal Rack Position" on page 145.

d. Reconnect the power cord to the server power supply and the data cables.

See "Reconnect Data Cables and Power Cords" on page 147.

e. Power on the server.

See "Power On the Server" on page 149.

Verify that the Power/OK indicator is steady on.

Note – On first boot, use the BIOS Setup utility to reset the server host time.

Servicing FRUs

The following topics describe how to service field-replaceable units (FRUs). You must power down the system and disconnect the AC power cords from the server before servicing any of these components.

Note – Only Oracle authorized service personnel should service FRU components.

Description	Link
Identifying FRU locations.	"FRU Locations" on page 97
Servicing the processor(s).	"Servicing Processors (FRU)" on page 98
Servicing the disk backplane.	"Servicing the Disk Backplane (FRU)" on page 113
Servicing the front indicator module.	"Servicing the Front Indicator Module (FRU)" on page 120
Servicing the motherboard.	"Servicing the Motherboard (FRU)" on page 126
Servicing the server SAS cables.	"Servicing the SAS Cables (FRUs)" on page 136

Related Information

- "Servicing CRUs That Do Not Require Server Power Off" on page 43
- "Servicing CRUs That Require Server Power Off" on page 57

FRU Locations

The locations of the FRUs are shown in the following figure.

Figure Legend

1	Heatsink(s) **Note:** In single-processor systems, neither a heatsink nor a processor socket filler are installed in the socket for processor 1 (P1). To protect the delicate processor socket pins, the cover that comes on the motherboard from manufacturing is left in place.	**4**	FIM (front indicator module) on server with 3.5-inch storage drives (FRU)
2	Processor(s) (FRU) **Note:** In single-processor systems, the processor is installed in socket 0 (P0).	**5**	FIM on server with 2.5-inch storage drives (FRU)
3	Motherboard (FRU)	**6**	Disk backplane (FRU)

Servicing Processors (FRU)

This section describes how to remove and install the processors.

In addition to the service procedures provided in this document, Oracle provides animated service procedures that describe how to remove and install processors. To play the Sun Server X3-2 Service Animations go to:
http://docs.oracle.com/cd/E22368_01/html/E38015/index.html

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

Caution – These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 40.

Note – On single-processor systems, neither a heatsink nor a processor filler cover are installed in the processor socket 1 (P1). To protect the delicate processor socket pins, the cover that comes on the motherboard from manufacturing is left in place.

These following sections provide information to assist you when replacing a processor:

- "Selecting the Correct Processor Removal/Replacement Tool" on page 100
- "Remove a Processor" on page 104
- "Install a Processor" on page 109

Related Information

- "Disconnect Cables From the Server" on page 37
- "Take Antistatic Measures" on page 40
- "Remove the Server From the Rack" on page 39
- "Remove the Server Top Cover" on page 42

Selecting the Correct Processor Removal/Replacement Tool

⚠️ **Caution –** The correct processor removal/replacement tool must be used to remove and replace a processor; otherwise, the processor or the processor socket might be damaged.

Selecting the correct processor removal/replacement tool is a two-step process. First you determine the size of the processor that is being replaced, then you select the removal/replacement tool that fits that size.

The processors supported by the Sun Server X3-2 come in two sizes. The processors with 10 or fewer cores are smaller than the processors with 12 cores. You can determined the size of the processor that you are going to remove and replace in either of two ways:

- Use Oracle Integrated Lights Out Manager (ILOM) to display processor information.

  For instructions for using Oracle ILOM to display processor information, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library.

  Or

- Visually check the size of the processor installed in the server.

  This requires that you remove the processor heatsink and open the processor independent loading mechanism (ILM) assembly that holds the processor in the socket. For instructions, see "Remove a Processor" on page 104. This is the same procedure that you will use when you remove the processor.

If you choose to visually check the size of the processor, refer to the next two figures to see how to distinguish the smaller processors from the larger processors. FIGURE: Smaller Processor Installed in a Motherboard Processor Socket on page 101 shows a smaller processor installed. Notice that the right and left edges of the processor are within the boundaries of the processor alignment brackets.

FIGURE: Smaller Processor Installed in a Motherboard Processor Socket
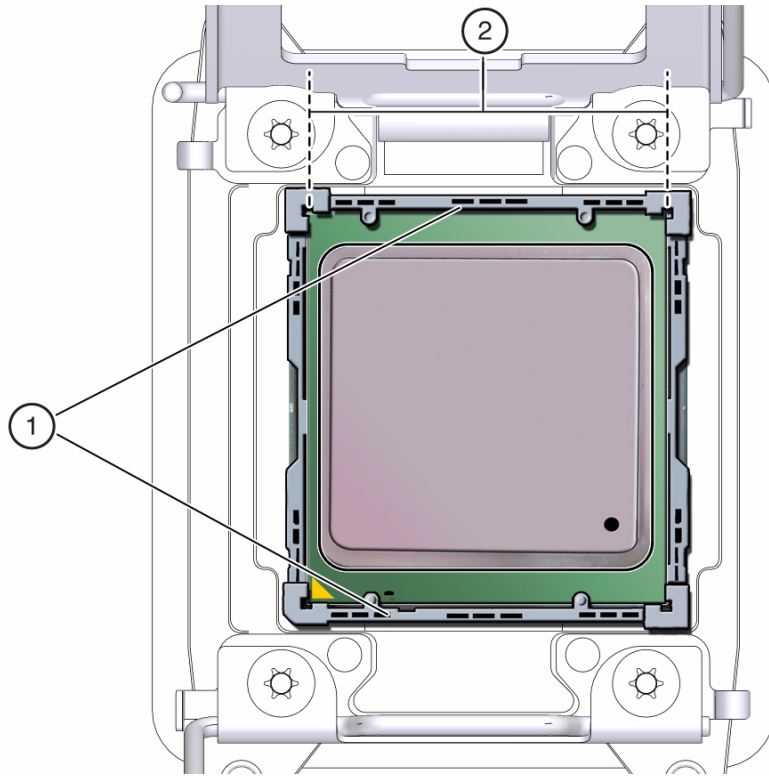
Figure Legend

1	Processor alignment brackets
2	Processor left and right edges are within alignment bracket boundaries

FIGURE: Larger Processor Installed in a Motherboard Processor Socket on page 102 shows a larger processor installed. Notice that the right and left edges of the processor extend beyond the boundaries of the processor alignment brackets.

FIGURE: Larger Processor Installed in a Motherboard Processor Socket
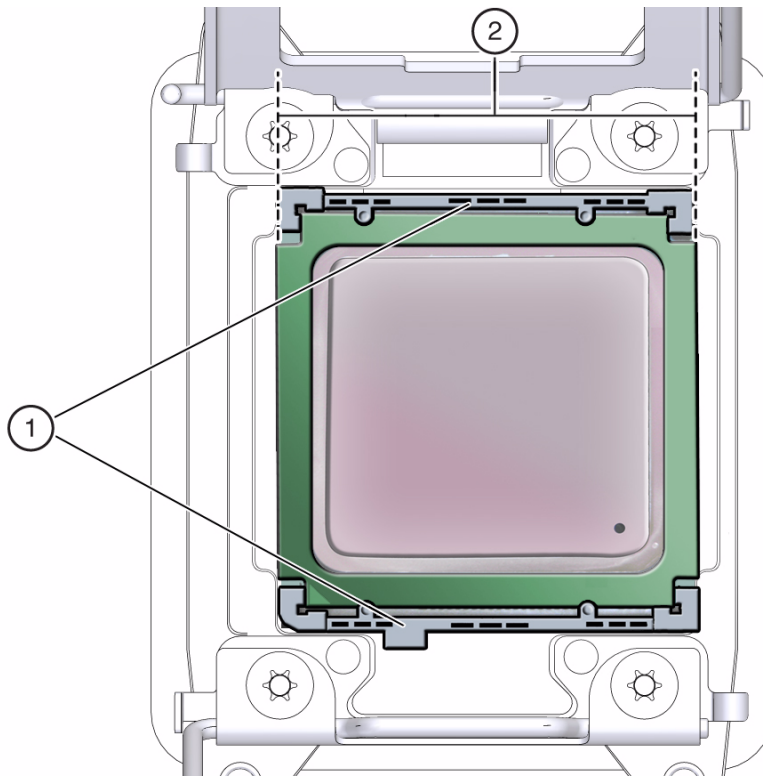
Figure Legend

1	Processor alignment brackets
2	Processor left and right edges extend beyond alignment bracket boundaries

After you have determined the size of the processor installed in your server, select the correct processor removal/replacement tool. Like the processors, the processor removal/replacement tool also comes in two sizes. The tool for the smaller processors (processors with 10 or fewer cores) is color-coded green. The tool for the larger processors (12-core processors) is color-coded pink. See FIGURE: Color-Coded Processor Removal/Replacement Tools on page 103.

FIGURE: Color-Coded Processor Removal/Replacement Tools
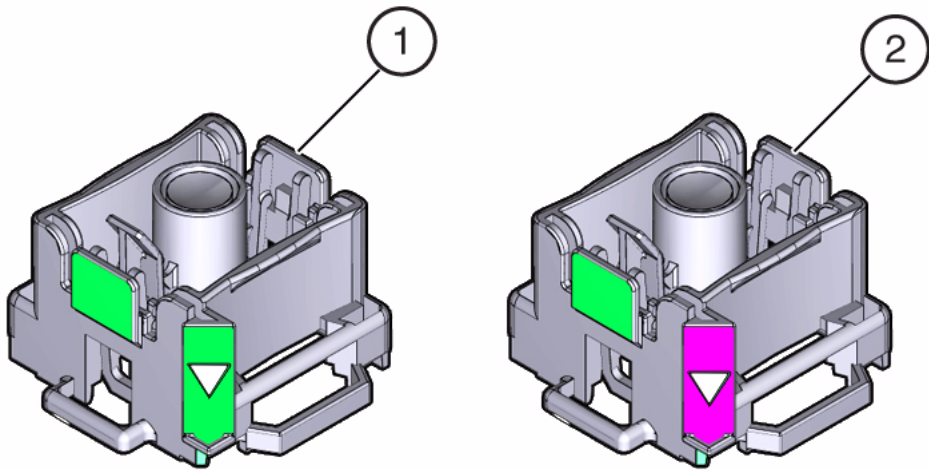
Figure Legend

1	Green, color-coded removal/replacement tool for the smaller processors—models E5-2609 V2 (4-core), E5-2630 V2 (6-core), E5-2650 V2 (8-core), and E5-2690 V2 (10-core)
2	Pink, color-coded removal/replacement tool for the larger processor—model E5-2697 V2 (12-core)

Caution – The pink color-coded processor removal/replacement tool must be used only with the larger processor (the 12-core processor). Likewise, the green color-coded removal/replacement tool must be used only with smaller processors (the 4-, 6-, 8-, and 10-core processors); otherwise, the processor or the processor socket might be damaged.

The following table provides an easy reference for matching a processor (by number of cores or model number) to the correct processor removal/replacement tool.

TABLE: Processor Model Numbers by Number of Cores

Processor Cores	Processor Model Number	Processor Removal/Replacement Tool Color Code
4-core	E5-2609 V2	Green
6-core	E5-2630 V2	
8-core	E5-2650 V2	
10-core	E5-2690 V2	
12-core	E5-2697 V2	Pink

Note – The correct processor removal/replacement tool is included in the box with the replacement processor. Additionally, both removal/replacement tools ship with replacement motherboards.

▼ Remove a Processor

Caution – Processor(s) should be removed only by an Oracle qualified service technician.

Caution – The processor socket used in the Sun Server X3-2 is the Intel LGA2011. Processor removal and replacement must be done using the green color-coded tool (see FIGURE: Removing a Processor on page 108). Using a tool with a different color code might result in damage to the processor and the socket. The supported replacement processor for the server includes the correct tool.

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 32

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

      See "Extend the Server to the Maintenance Position" on page 38.

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

      See "Take Antistatic Measures" on page 40.

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

"Remove the Server Top Cover" on page 42.

2. **To identify the location of the faulty processor, press the Fault Remind button on the motherboard.**

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

---

3. **Identify the faulty processor using the fault LED.**

The processor fault LEDs are located next to the processor(s).

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

Note – Processor 0 (P0) is on the left side when viewing the server from the front.

---
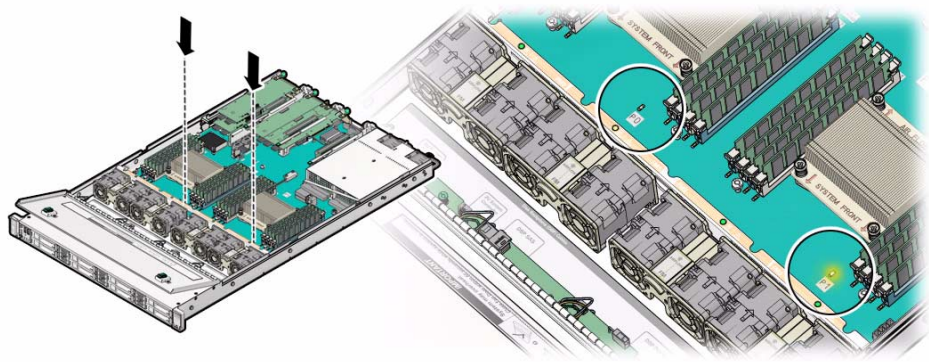
4. **Gently press down on the top of the heat sink to counteract the pressure of the captive spring-loaded screws that secure the heat sink to the motherboard and loosen the four Phillips captive screws in the heatsink for the faulty processor [1].**

Turn the screws counterclockwise alternately one and one half turns until they are fully removed.
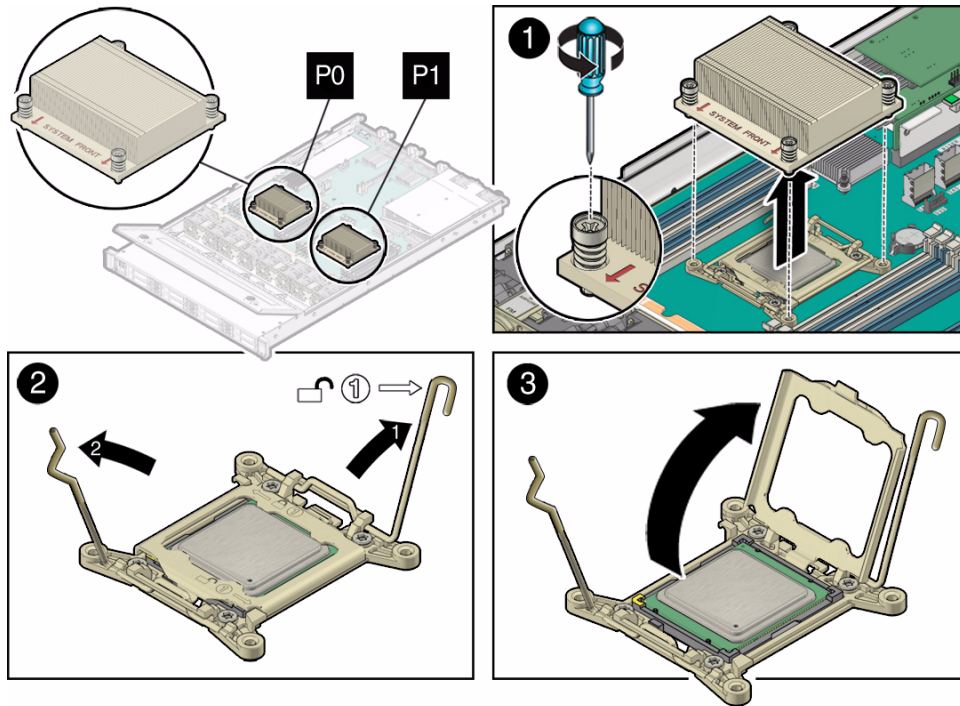
5. **To separate the heat sink from the top of the processor, gently twist the heat sink left and right, while pulling upward, then lift off the heatsink and place it upside down on a flat surface [1].**

   A thin layer of thermal grease separates the heat sink and the processor. This grease also acts as an adhesive.

Note – Do not allow the thermal grease to contaminate the work space or other components.

---

6. **Use an alcohol pad to clean the thermal grease from the underside of the heatsink.**

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

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

---

7. **Disengage the processor release lever on the right side of the processor socket (viewing the server from the front) by pushing down and moving it to the side away from the processor, and then rotating the lever upward [2].**

8. **Disengage the processor release lever on the left side of the processor socket (viewing the server from the front) by pushing down and moving it to the side away from the processor, and then rotating the lever upward [2].**

9. **To lift the pressure frame off of the socket, rotate the processor release lever on the right side of the processor toward the closed position (the pressure frame is lifted up as the release lever is lowered toward the closed position) and carefully swing the pressure frame to the fully open position [3].**

⚠️

Caution – Whenever you remove a processor, you should replace it with another processor and reinstall the processor heatsink; otherwise, the server might overheat due to improper airflow. For instructions for installing a processor, see "Install a Processor" on page 109.

10. **To remove the processor from the socket, acquire the processor removal/replacement tool and perform the following steps:**

   a. **Locate the button in the center of the top of the processor removal/replacement tool and press it to the down position [1].**

   b. **Properly position the tool over the processor socket and lower it into place over the processor socket [2].**

   To properly position the tool over the processor socket, rotate the tool until the green triangle on the side of the tool is facing the front of the server and it is over the left side of the processor socket when viewing the server from the front.

   c. **Press the release lever on the tool to release the center button and engage the processor [3].**

   An audible click indicates that the processor is engaged.

   d. **Grasp the tool by its sides and remove it from the server [4].**

   e. **Turn the tool upside down and verify that it contains the processor [5].**

   f. **While holding the processor tool up side down, press the center button on the tool to release the processor [5].**

   g. **Carefully grasp the processor on the front and back edges, lift it out of the tool and place it with its circuit side down (the installed orientation) into an antistatic container [6].**

   h. **Carefully clean the thermal grease off the top of the processor.**

FIGURE: Removing a Processor
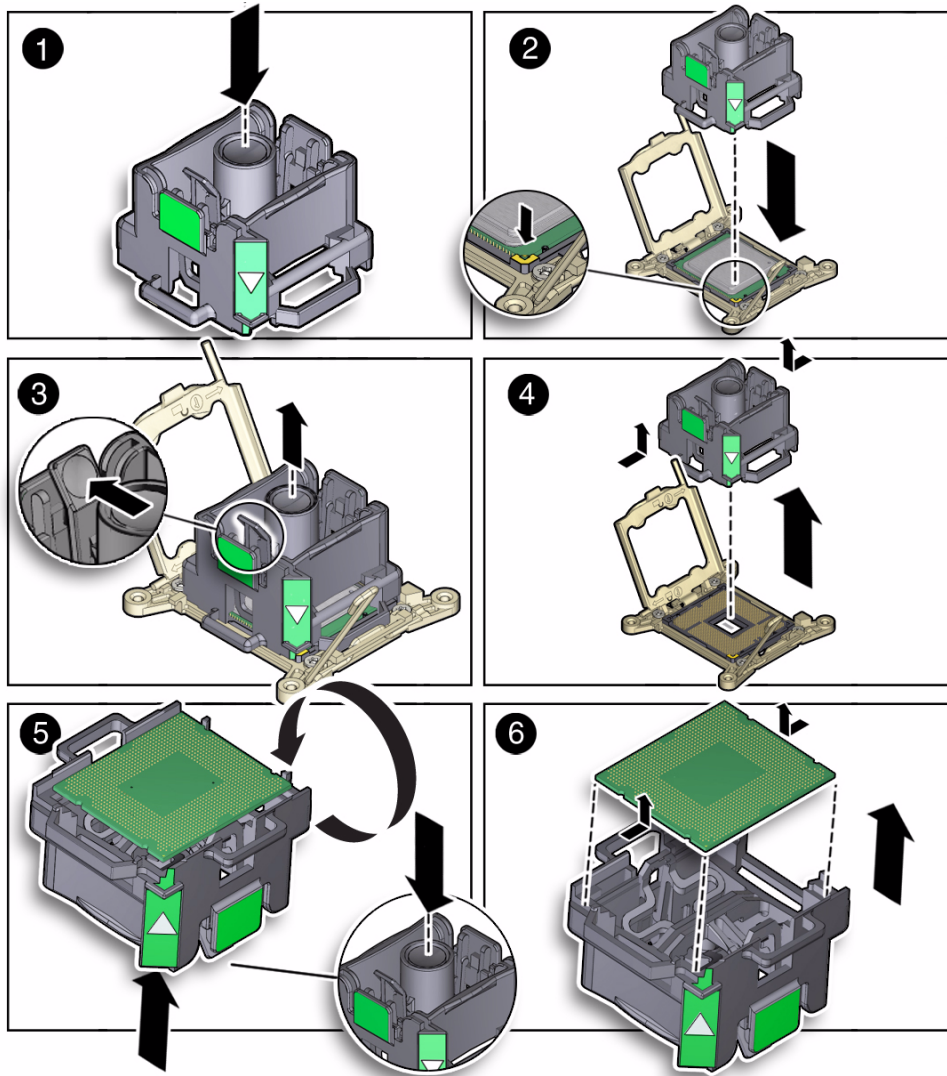
Related Information

- "Install a Processor" on page 109

▼ Install a Processor

Caution – Processors should be installed only by an Oracle qualified service technician.

Caution – The processor socket used in the Sun Server X3-2 is the Intel LGA2011. Processor removal and replacement must be done using the green color-coded tool (see FIGURE: Installing a Processor on page 111). Using a tool with a different color code might result in damage to the processor and the socket. The supported replacement processor for the server includes the correct tool.

Caution – Handle the processor socket pins with extreme care. Processor socket pins are very fragile. A light touch can bend the processor socket pins and damage the board beyond repair.

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

   See "Electrostatic Discharge Safety" on page 30.

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

3. **Ensure that the replacement processor is identical to the failed processor that was removed.**

   For a description of the processors supported by the server, see the *Sun Server X3-2 Installation Guide*, "Server Components" on page 6.

4. **Ensure that the two processor socket release levers and the processor pressure frame are in the fully open position.**

   For instructions for opening the processor release levers and the pressure frame, see Step 7 through Step 9 of "Remove a Processor" on page 104.

5. **To install the replacement processor into the processor removal/replacement tool, acquire the tool and perform the following steps:**

   a. **Press the button in the center of the tool to the down position [1].**

   b. **Turn the tool upside down, grasp the processor by its front an back edges and position the processor (circuit side up) in the tool so that the triangle on the corner of the processor aligns with the triangle on the side of the processor removal/replacement tool [2].**

   c. **Lower the processor into the tool and press the tool release lever to release the center button and engage the processor [3].**

   An audible click indicates that the processor is locked in place.

d. Properly position the tool over the processor socket and lower it into place [4].

To properly position the tool in the processor socket, rotate the tool until the green triangle on the side of the tool is facing the front of the server and it is over the left side of the processor socket (when viewing the server from the front) and lower the tool into the processor socket.

e. Press the center button in the tool down to release the processor so that it is placed in the socket [5].

f. Remove the processor removal/replacement tool [6].

FIGURE: Installing a Processor
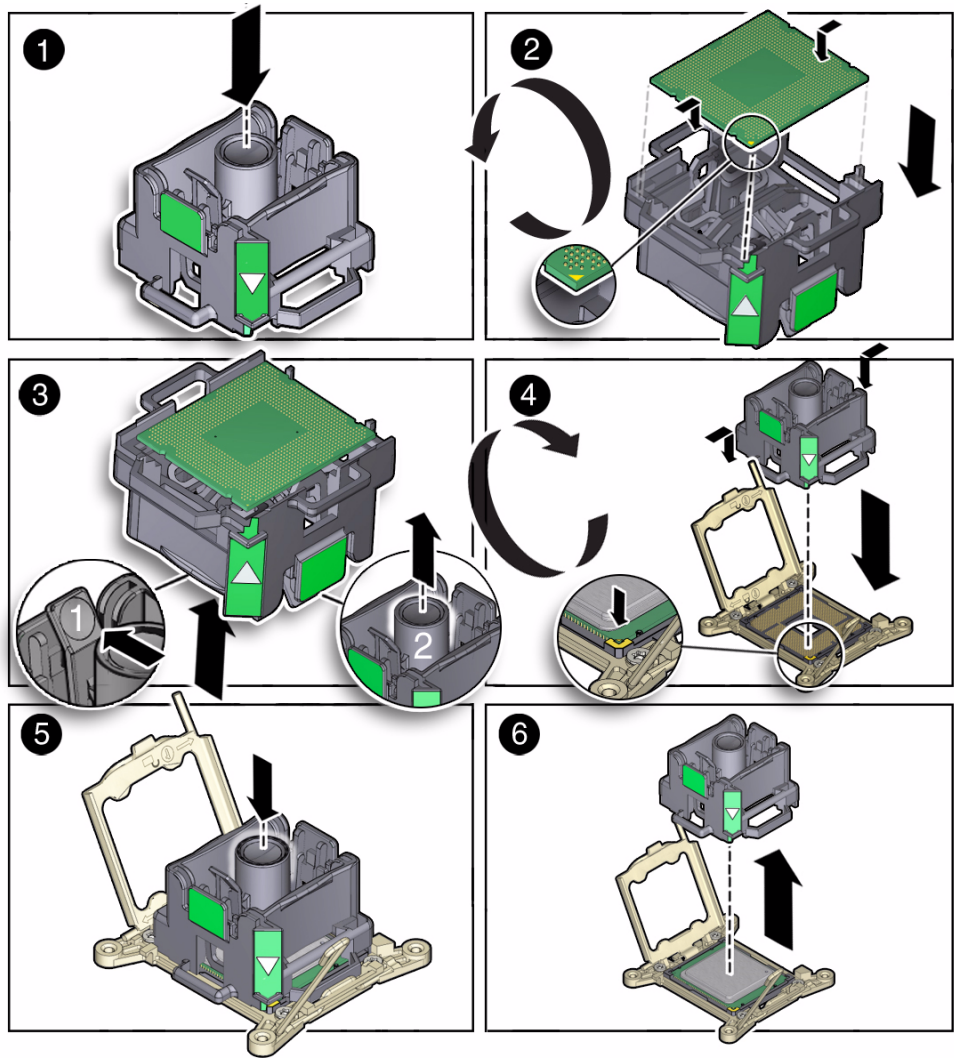
6. Visually check the alignment of the processor in the socket.

When properly aligned, the processor sits flat in the processor socket.

Caution – Do not press down on the processor. Irreparable damage to the processor or motherboard might occur from excessive downward pressure. Do not forcibly seat the processor into the socket. Excessive downward pressure might damage the socket pins.

7. **Swing the processor pressure frame into the closed position [1].**

   Ensure that the pressure frame sits flat around the periphery of the processor.
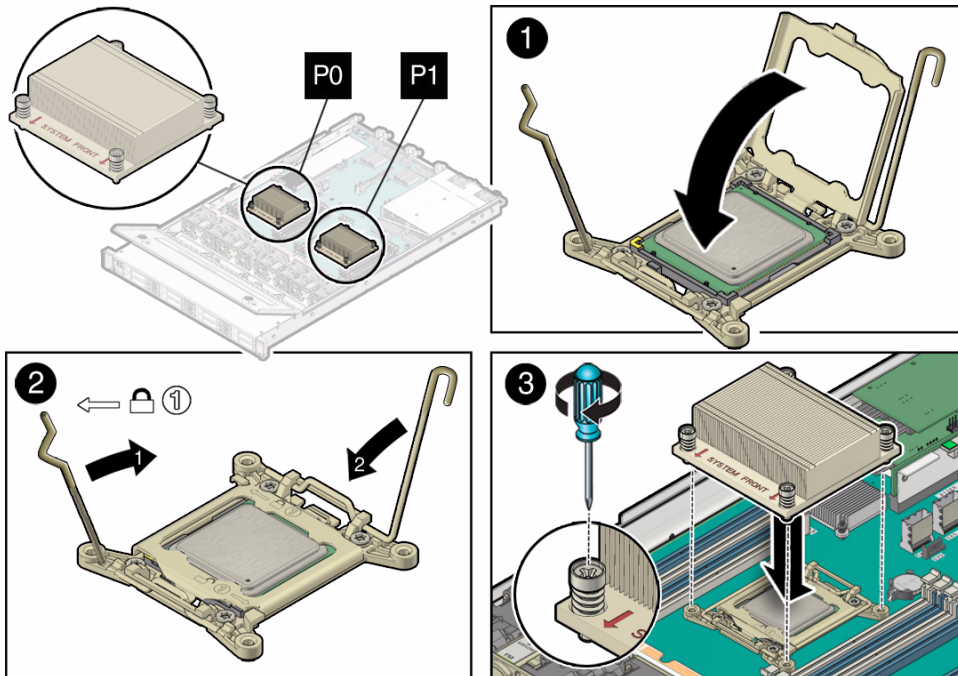
8. **Engage the socket release lever on the left side of the socket (viewing the server from the front) by rotating it downward and slipping it under the catch [2].**

9. **Engage the socket release lever on the right side of the socket (viewing the server from the front) by rotating it downward and slipping it under the catch [2].**

10. **Use the syringe (supplied with the new or replacement processor) to apply approximately 0.1 ml of thermal grease to the center of the top of the processor.**

    To measure 0.1ml of thermal grease, use the graduated scale on the thermal grease syringe.

Note – Do not distribute the grease; the pressure of the heatsink will do so for you when you install it.

---

11. **Inspect the heatsink for dust and lint.**

    Clean heatsink if necessary.

12. **Orient the heatsink so that the screws line up with the mounting studs [3].**

    The processor heatsink is not symmetrical.

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

⚠️ **Caution –** Avoid moving the heat sink after it has contacted the top of the processor. Too much movement could disturb the layer of thermal grease, causing voids, and leading to ineffective heat dissipation and component damage.

14. **Tighten the Phillips screws alternately one-half turn until fully seated.**

15. **Return the server to operation.**

    a. **Install the top cover.**

       See "Install the Top Cover" on page 142.

    b. **Close the server fan door.**

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

       See "Return the Server to the Normal Rack Position" on page 145.

    d. **Reconnect the data cables and the power cords to the server power supplies.**

       See "Reconnect Data Cables and Power Cords" on page 147.

    e. **Power on the server.**

       See "Power On the Server" on page 149.

       Verify that the Power/OK indicator is steady on.

Related Information

- "Remove a Processor" on page 104

Servicing the Disk Backplane (FRU)

This section describes how to remove and install the disk backplane.

In addition to the service procedures provided in this document, Oracle provides animated service procedures that describe how to remove and install the disk backplane. To play the Sun Server X3-2 Service Animations go to: http://docs.oracle.com/cd/E22368_01/html/E38015/index.html

PLAY the ANIMATION

This section covers the following topics:

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

-
-
-

Related Information

-
-
-
-

Disk Backplane Configurations

The server has one or two disk backplanes depending on the number of storage drives installed. On servers with four or fewer storage drives, only one disk backplane is needed. Servers with five or more storage drives require two disk backplanes. The following figure shows a configuration with two disk backplanes, DBP0 and DBP1. Storage drives 0-3 plug into DBP0. Storage drives 4-7 plug into DBP1.

FIGURE: Disk Backplane Configurations
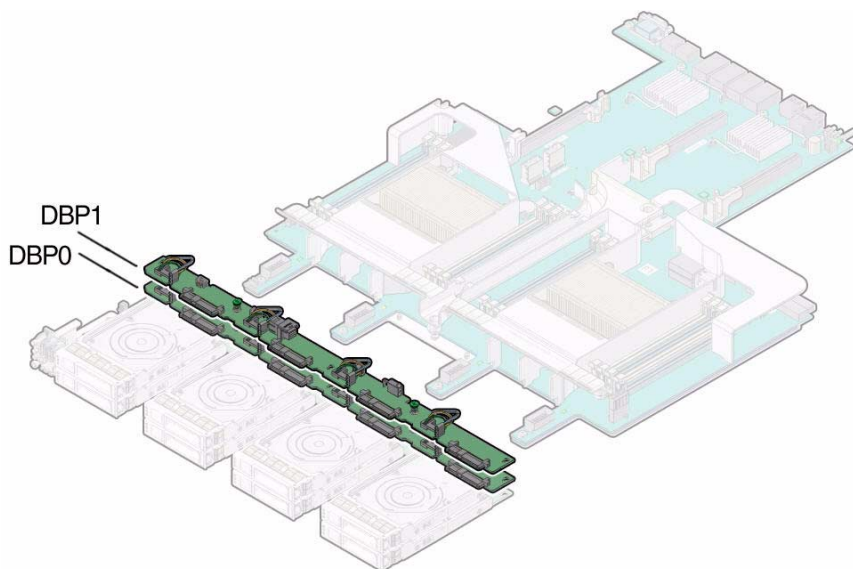
▼ Remove the Disk Backplane

> **Note –** A server with four or fewer storage drives (either 2.5-inch or 3.5-inch drives) has only one disk backplane.

> **Caution –** Ensure that all power is removed from the server before removing or installing disk backplane. You must disconnect the power cables before performing these procedures.

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 32

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

      See "Extend the Server to the Maintenance Position" on page 38.

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

      See "Take Antistatic Measures" on page 40.

d. Open the server's fan door to gain access to the disk backplanes.

2. **Pull out each storage drive out far enough to disengage it from the disk backplane.**

   See "Remove a Storage Drive" on page 45.

Note – It is not necessary to completely remove the storage drives from the server; simply pull them out far enough to disengage them from the disk backplane. If you do remove the storage drives from the server, make a note of their locations so that you can reinstalled them in the same locations.

---

3. **Remove all four fan modules.**

   See "Remove a Fan Module" on page 49.

4. **Starting with top disk backplane if servicing a server with two disk backplanes, disconnect the SAS cable from the disk backplane [1].**

   See FIGURE: Removing the Disk Backplane on page 117.

Note – If you are going to remove and replace both backplanes, before disconnecting any backplane cables, make a note of, or tag, which cables connect to the top disk backplane and which cables connect to the bottom disk backplane for reference when you install the replacement disk backplanes.

FIGURE: Removing the Disk Backplane
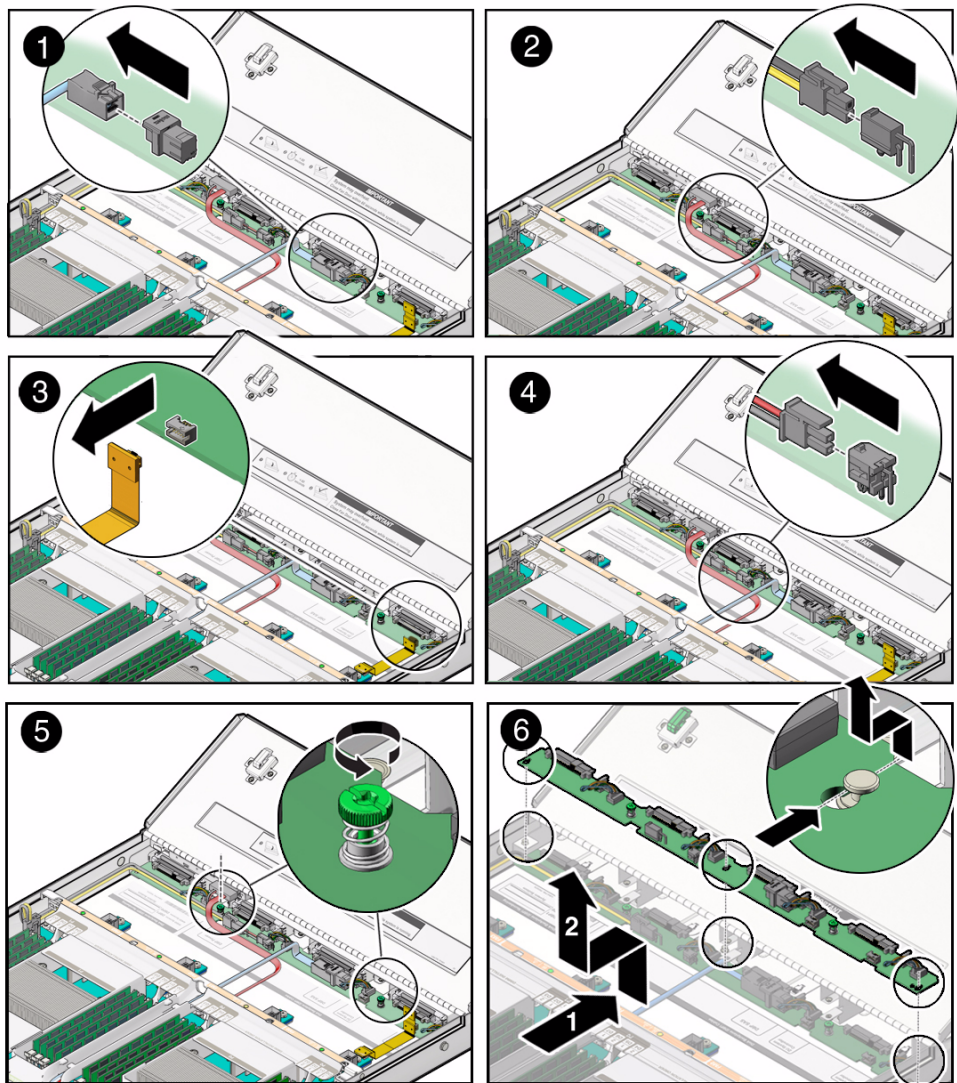
5. **Disconnect the disk backplane power cable from the disk backplane [2].**

6. **Disconnect the disk backplane LED cable from the disk backplane [3].**

7. **If the server has a DVD drive, disconnect the DVD drive power cable from the disk backplane [4].**

Note – Servers with a DVD drive have only one disk backplane.

8. **Using just your thumb and fingers, loosen the two captive thumb screws that secure the disk backplane to the chassis [5].**

9. **Slide the backplane forward toward the front of the server to release it from the three mushroom standoffs and lift it out of the chassis [6].**

10. **Place the disk backplane on an antistatic mat.**

11. **If the server has a second disk backplane, repeat Step 4 through Step 10 to remove it.**

Related Information

■ "Install the Disk Backplane" on page 118

▼ Install the Disk Backplane

1. **Starting with the bottom disk backplane location, lower the backplane into the server and position it to engage the three mushroom standoffs [1].**

FIGURE: Installing the Disk Backplane
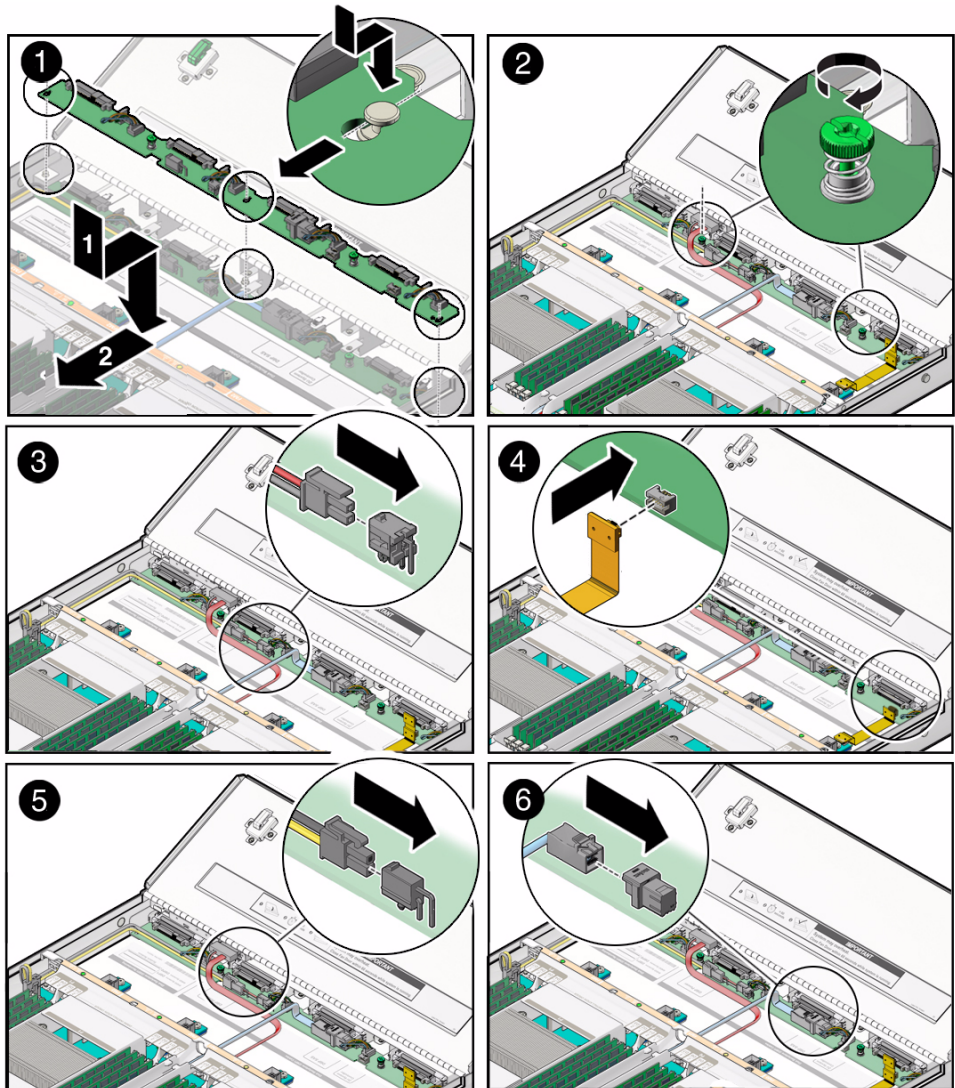
2. **Using just your thumb and fingers, tighten the two captive thumb screws to secure the disk backplane to the chassis [2].**

3. **If the server has a DVD drive, reconnect the DVD drive power cable to the disk backplane [3].**

4. **Reconnect the disk backplane LED cable to the disk backplane [4].**

5. **Reconnect the disk backplane power cable to the disk backplane [5].**

6. **Reconnect the SAS cable to the disk backplane [6].**

7. **If the server has more than four storage drives, repeat all of the preceding steps (with the exception of** Step 3**, which directs you to reconnect the DVD drive power cable) to install the second disk backplane.**

   A server that has two disk backplanes does not have a DVD drive installed.

8. **Reinstall all of the storage drives into the storage drive cage.**

   See "Install a Storage Drive" on page 48.

9. **Install all four fan modules.**

   See "Install a Fan Module" on page 52.

10. **Return the server to operation.**

    a. **Close the server fan door.**

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

       See "Return the Server to the Normal Rack Position" on page 145.

    c. **Reconnect the data cables and the power cords to the server power supplies.**

       See "Reconnect Data Cables and Power Cords" on page 147.

    d. **Power on the server.**

       See "Power On the Server" on page 149.

       Verify that the Power/OK indicator is steady on.

Note – **IMPORTANT:** After replacing the disk backplane, you must manually program the product serial number (PSN) into the new disk backplane. This is necessary because the disk backplane is the primary quorum member for maintaining the PSN for service entitlement.

Related Information

- "Remove the Disk Backplane" on page 115

Servicing the Front Indicator Module (FRU)

Follow these tasks to remove and install the front indicator module (FIM).

- "Remove the Front Indicator Module From a Server With 2.5-Inch Storage Drives" on page 121
- "Install the Front Indicator Module Into a Server With 2.5-Inch Storage Drives" on page 122
- "Remove the Front Indicator Module From a Server With 3.5-Inch Storage Drives" on page 123
- "Install the Front Indicator Module Into a Server With 3.5-Inch Storage Drives" on page 125

Related Information

- "Disconnect Cables From the Server" on page 37
- "Remove the Server From the Rack" on page 39
- "Take Antistatic Measures" on page 40
- "Open the Server Fan Door" on page 41

▼ Remove the Front Indicator Module From a Server With 2.5-Inch Storage Drives

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 32

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

      See "Extend the Server to the Maintenance Position" on page 38.

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

      See "Take Antistatic Measures" on page 40.

2. **To remove the top cover from the storage drive cage, do the following:**

   a. **Remove six Phillips screws from the top of the drive cage—three on each side [1].**

   b. **Open the server's fan door.**

      See "Open the Server Fan Door" on page 41.

   c. **To remove the storage drive cover, slide it forward (toward the front of the server) and lift it up.**

3. **Loosen the screw that secures the FIM assembly to the server chassis [2].**

4. **Carefully slide the FIM assembly toward the rear enough to lift it over the Phillips screw and lift the FIM assembly out of the server [2].**

5. **Disconnect the FIM cable from the FIM assembly and set the assembly aside [3].**

6. **Continue to** "Install the Front Indicator Module Into a Server With 2.5-Inch Storage Drives" on page 122.

Related Information

■ "Install the Front Indicator Module Into a Server With 2.5-Inch Storage Drives" on page 122

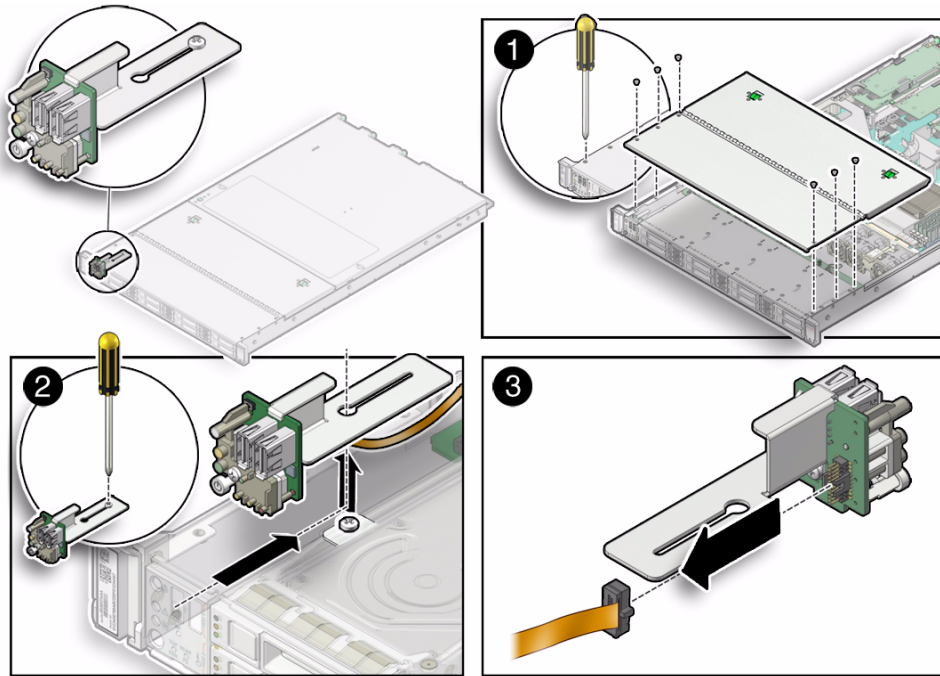# ▼ Install the Front Indicator Module Into a Server With 2.5-Inch Storage Drives

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

   See "Take Antistatic Measures" on page 40

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

3. **Connect the FIM cable to the replacement FIM assembly [3].**

   See

4. **Carefully lower the FIM assembly into the chassis, position it over the Phillips screw in the server's chassis, and slide it forward so that all the LEDs, USB connectors and Power On button fit into place on the server's front panel [2].**

5. **Tighten the Phillips screw to secure the FIM assembly to the server's chassis [2].**

6. **Place the drive cage cover over the server's drive cage and install the six Phillips (three on each side) to secure the cover to the server.**

7. **Ensure that server fan door is closed.**

8. **Return the server to operation.**

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

      See

   b. **Reconnect the data cables and the power cords to the server power supplies.**

      See

   c. **Power on the server.**

      See

      Verify that the Power/OK indicator is steady on.

Related Information

-

▼ Remove the Front Indicator Module From a Server With 3.5-Inch Storage Drives

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See

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

      See

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

   See "Take Antistatic Measures" on page 40.

2. **To remove the cover from the storage drive cage, do the following:**

   a. **Remove six Phillips screws from the top of the drive cage—three on each side [1].**

   b. **Open the server's fan door.**

      See "Open the Server Fan Door" on page 41.

   c. **Slide the storage drive cage cover forward toward the front of the server and lift it up [1].**

FIGURE: Removing the FIM From a Server With 3.5-inch Storage Drives
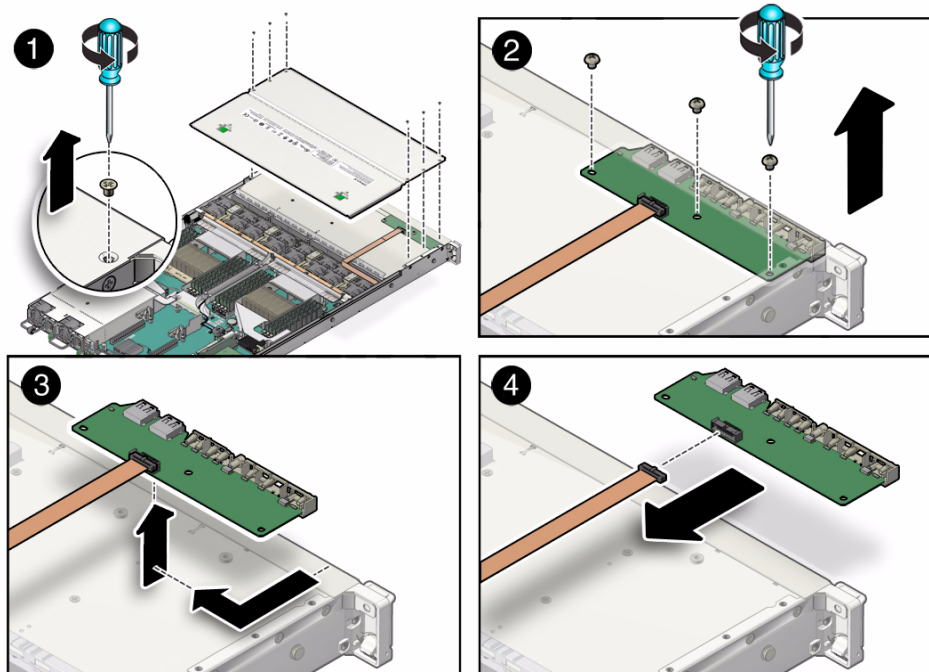
3. **Loosen and remove the three Phillips screws that hold the FIM card in place [2].**

4. **Carefully slide the FIM card toward the rear of the server and to the right (viewing the server from the front) and lift it off of the drive cage [3].**

5. **Disconnect the FIM cable from the FIM card and set it aside [4].**

6. **Continue to** "Install the Front Indicator Module Into a Server With 3.5-Inch Storage Drives" on page 125.

Related Information

- "Install the Front Indicator Module Into a Server With 3.5-Inch Storage Drives" on page 125

▼ Install the Front Indicator Module Into a Server With 3.5-Inch Storage Drives

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

   See "Take Antistatic Measures" on page 40

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

3. **Connect the FIM cable to the replacement FIM card [4].**

   See FIGURE: Removing the FIM From a Server With 3.5-inch Storage Drives on page 124

4. **Position the FIM card over the screw holes on top of the storage drive cage and slide it forward so that all the LEDs, USB connectors and Power On button fit into place on the server's front panel [3].**

5. **Insert and tighten the Phillips screw to secure the FIM assembly in place [2].**

6. **Place the drive cage cover over the server's drive cage and install the six Phillips (three on each side) to secure the cover to the server [1].**

7. **Ensure that server fan door is closed.**

8. **Return the server to operation.**

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

      See "Return the Server to the Normal Rack Position" on page 145.

   b. **Reconnect the data cables and the power cords to the server power supplies.**

      See "Reconnect Data Cables and Power Cords" on page 147.

   c. **Power on the server.**

      See "Power On the Server" on page 149.

   Verify that the Power/OK indicator is steady on.

Related Information

- "Remove the Front Indicator Module From a Server With 3.5-Inch Storage Drives" on page 123

Servicing the Motherboard (FRU)

Follow these tasks to remove and install the motherboard.

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

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

⚠ **Caution –** These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "Take Antistatic Measures" on page 40.

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

- "Remove the Motherboard" on page 126
- "Install the Motherboard" on page 133

Related Information

- "Remove the Server From the Rack" on page 39
- "Take Antistatic Measures" on page 40
- "Remove the Server Top Cover" on page 42

▼ Remove the Motherboard

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

Caution – Use of the Oracle ILOM backup utility prior to removing the motherboard. This utility backs up the Oracle ILOM configuration of the service processor.

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 32

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

      See "Extend the Server to the Maintenance Position" on page 38.

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

      See "Take Antistatic Measures" on page 40.

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

      See "Remove the Server Top Cover" on page 42.

2. **Remove the following reusable components**

Caution – During the motherboard removal procedure, it is important to label the power supplies with the slot numbers from which they were removed (PS0, PS1). This is required because the power supplies must be reinstalled into the same slots from which they were removed; otherwise, the server's FRU top-level indicator (TLI) data might be lost. When a server requires service, the FRU TLI is used by Oracle to verify that the server's warranty has not expired. For more information on the server's FRU TLI, see the *Sun Server X3-2 Administration Guide,* "FRU TLI Auto-Update" on page 97.

   a. **Fan modules.**

      For instructions, see "Remove a Fan Module" on page 49.

   b. **Power supplies.**

      For instructions, see "Remove a Power Supply" on page 54.

   c. **PCIe risers and attached PCIe cards.**

      For instructions, see "Servicing PCIe Risers (CRU)" on page 70.

3. **Disconnect the disk backplane power cable from the motherboard [1].**
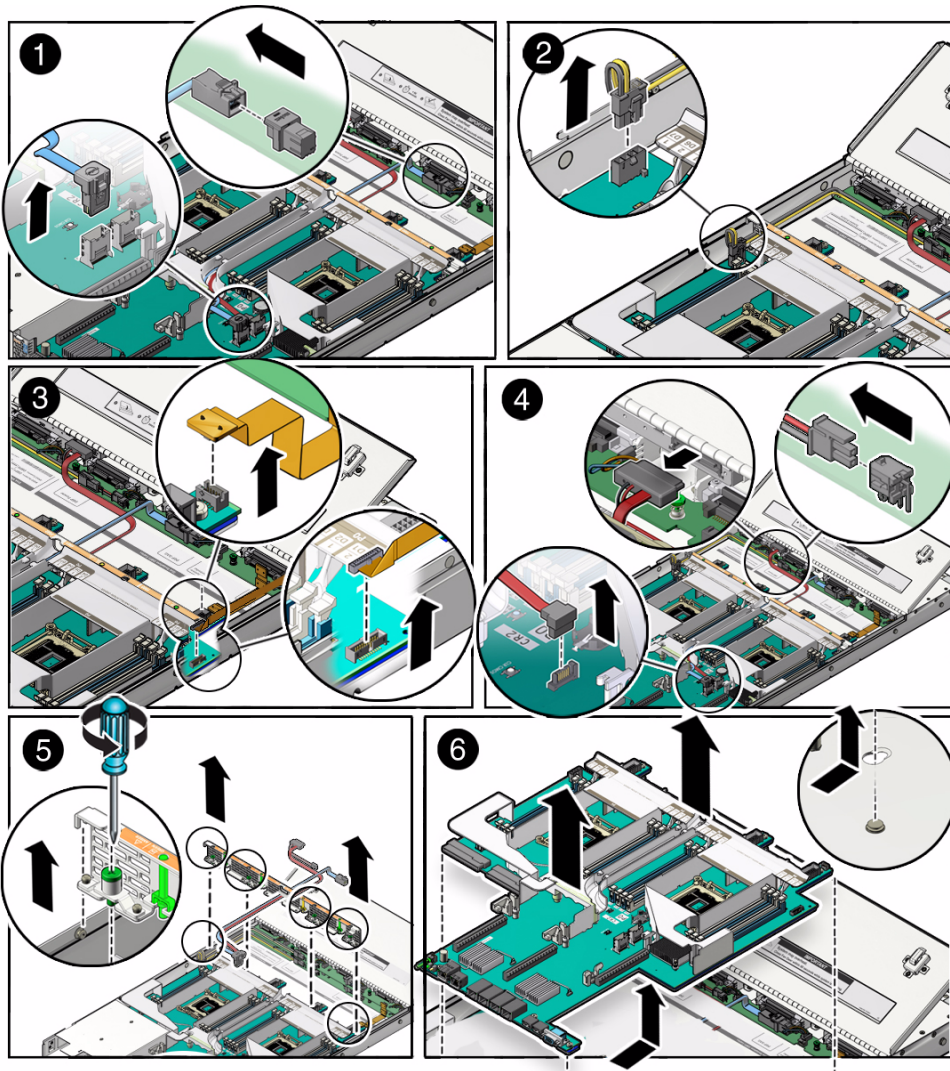
4. Disconnect disk backplane LED cable from the motherboard [2].

5. Disconnect the front indicator module (FIM) cable from the motherboard [3].

6. If the server has a DVD drive, do the following:

   a. Disconnect the DVD drive cable from the motherboard [4].

   b. Carefully lift the DVD drive cable out of the cable trough.

7. Carefully lift the SAS cables that you disconnected from the internal HBA out of the cable trough.

8. **Remove the server's mid-wall [5].**

   a. **Loosen the four green captive screws that secure the mid-wall to the server's chassis.**

   b. **Lift the mid-wall slightly up and toward the front of the server to disengage it from the mushroom standoffs that are located on the server's chassis sidewall (one on each end of the mid-wall).**

   c. **Place the mid-wall and DVD and SAS cables toward the front of the server out of the way of the motherboard.**

9. **Remove the motherboard from the server's chassis [6].**

   a. **Grasp the middle of the air duct in the front and back and slide the motherboard toward the front of the server and lift it slightly to disengage the six mushroom standoffs that are located on the server's chassis under the motherboard.**

   b. **Lift the motherboard out of the server's chassis and place it on an antistatic mat, and next to the replacement motherboard.**

10. **Remove the internal USB flash drives from the motherboard and install them on the replacement motherboard.**

    For instructions, see "Servicing the Internal USB Flash Drives (CRU)" on page 90.

11. **Remove the DDR3 DIMMs from the motherboard and install them on the replacement motherboard.**

    For instructions, see "Servicing the DIMMs (CRU)" on page 58.

Note – Install the DDR3 DIMMs only in the slots (connectors) from which they were removed, Performing a one-to-one replacement of the DIMMs significantly reduces the possibility that the DIMMs will be installed in the wrong slots. If you do not reinstall the DIMMs in the same slots, server performance might suffer and some DIMMs might not be used.

---

12. **Remove the processors from the faulty motherboard.**

    For instructions, see "Remove a Processor" on page 104.

13. **Remove the processor socket covers from the replacement motherboard and install the processors.**

    a. **Disengage the processor ILM assembly hinge lever on the right side of the processor socket (viewing the server from the front) by pushing down on the lever and moving it to the side away from the processor, and then rotating the lever upward [Frame 1].**
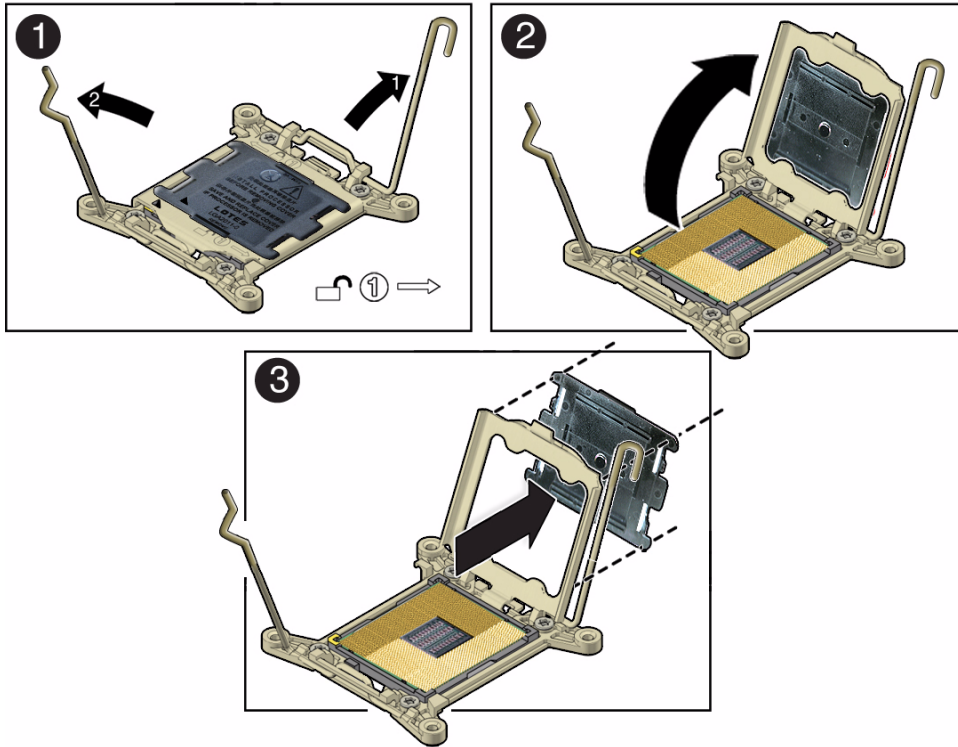
b. **Disengage the processor ILM assembly load lever on the left side of the processor socket (viewing the server from the front) by pushing down on the lever and moving it to the side away from the processor, and then rotating the lever upward [1].**

c. **To lift the processor ILM assembly load plate off of the processor socket, rotate the ILM assembly hinge lever on the right side of the processor toward the closed position (the load plate is lifted up as the hinge lever is lowered) and carefully swing the load plate to the fully open position [2].**

d. **Grasp the top and underside of the processor socket cover with one hand (place your thumb against the underside of the cover), place your other thumb against the underside of the cover, and carefully push the cover out of the processor ILM assembly load plate [3].**

Caution – Be careful not to allow the processor socket cover to fall into the processor socket as this could result in damage to the socket.

e. Install a processor into the socket from which you removed the processor socket cover.

For instructions for installing a processor, see "Install a Processor" on page 109.

f. Repeat Step a **through** Step e **above to remove the second processor socket cover from the replacement motherboard and install the second processor.**

14. **Install the processor socket covers on the faulty motherboard.**
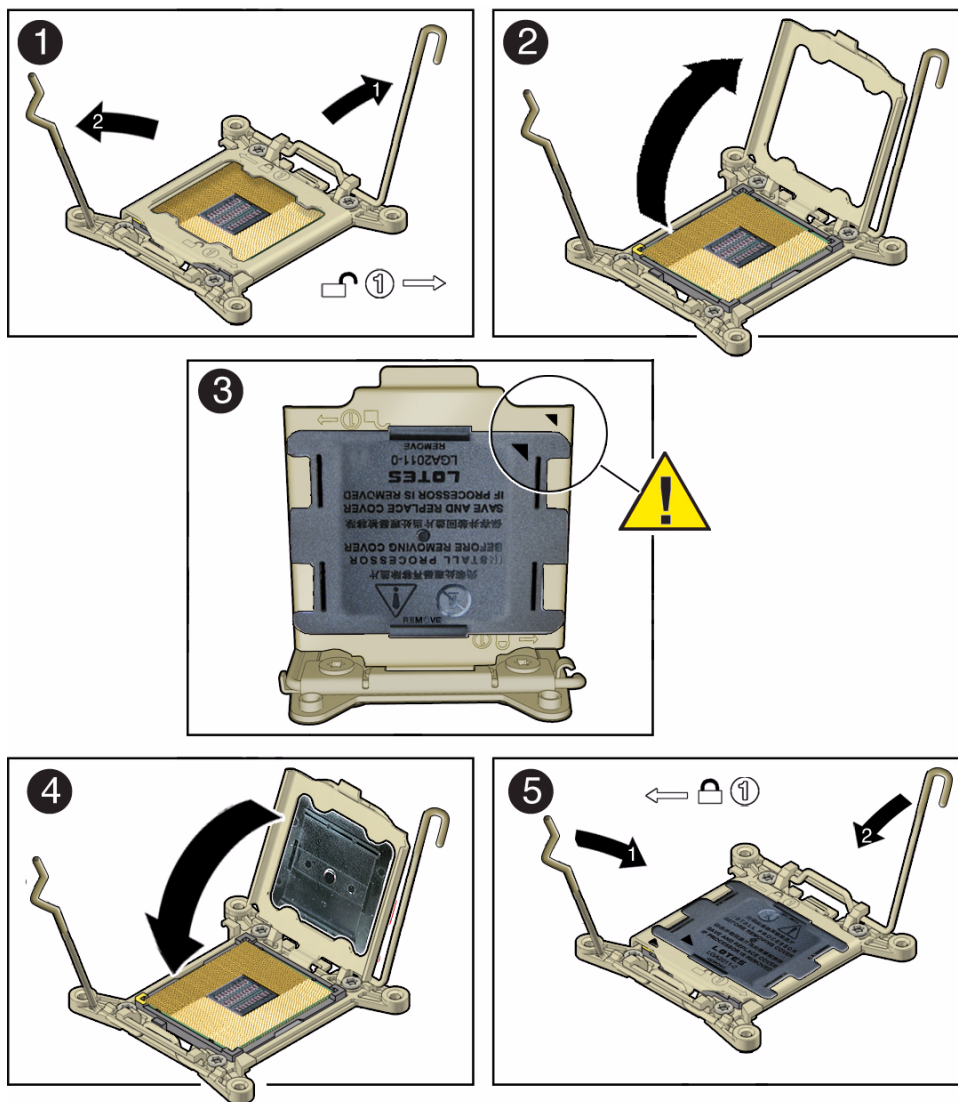
⚠️ **Caution –** The processor socket covers must be installed on the faulty motherboard; otherwise, damage might result to the processor sockets during handling and shipping.

⚠️ **Caution –** Be careful not to allow the processor socket cover to fall into the processor socket as this could result in damage to the socket.

a. Open one of the processor ILM assemblies on the faulty motherboard [Frames 1 and 2].

b. **Hold the processor ILM assembly load plate open with one hand and position the processor socket cover over the top of the pressure frame so that 1) the arrow on the processor socket cover is aligned with the arrow on the load plate and 2) the fasteners on one side of the cover (the fasteners are located on the underside of the cover) are inside the load plate (it does not matter which side), and use your thumb to press the other side of the processor socket cover into the load plate. [3].**

You will hear a clicking sound when the processor socket cover snaps into place.

   c. **Close the processor ILM assembly load plate [4 and 5].**

   d. **Repeat** Step a **through** Step c **above to install the second processor socket cover on the faulty motherboard.**

Related Information

- "Install the Motherboard" on page 133

▼ Install the Motherboard

Caution – The motherboard should be installed only by an Oracle qualified service technician.

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

   See "Take Antistatic Measures" on page 40.

2. **Install the motherboard into the server's chassis [1].**

   a. **To install the motherboard into the server, grasp the middle of the air duct in the front and back and tilt the front of the motherboard up slightly and push it into the opening in the rear of the server's chassis.**

   b. **Lower the motherboard into the server's chassis and slide it to the rear until it engages the six mushroom standoffs located on the server's chassis under the motherboard.**
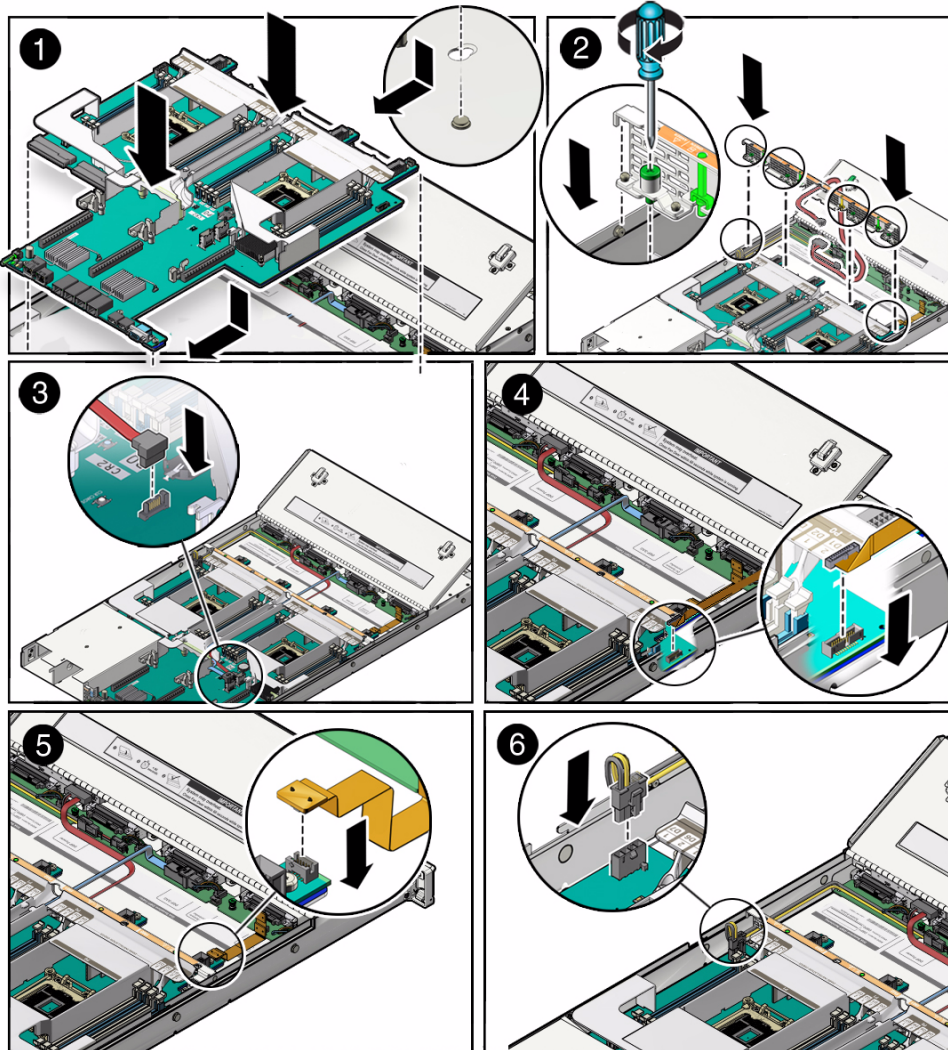
c. Ensue that the indicators, controls and connectors on the rear of the motherboard fit correctly into the rear of the server's chassis.

3. Install the server's mid-wall [2].

   a. Ensure that the cables (SAS and DVD cable, if applicable), are running through the opening in the center of the mid-wall.

   b. Position the mid-wall with cables in front of the motherboard so that it engages the mushroom standoffs that are located on the server's chassis sidewall (one for each side of the mid-wall).

c. Place the FIM cable and the disk backplane power cable along side the mid-wall next to their respective motherboard connectors.

d. Ensure that FIM cable and the disk backplane power cable are not pinched by the mid-wall and that they run beside the mid-wall and not under it; otherwise, the cables might be damaged.

e. To secure the mid-wall to the server's chassis, tighten the four green captive screws.

4. Carefully place the SAS cable(s) that you disconnected from the internal HBA into the cable trough provided by the air duct on the motherboard.

5. If the server has a DVD drive, carefully place the DVD drive cable into the cable trough provided by the air duct on the motherboard.

6. If the server has a DVD drive, reconnect the DVD drive cable to the motherboard [3].

7. Reconnect the front indicator module (FIM) cable to the motherboard [4].

8. Reconnect disk backplane LED cable to the motherboard [5].

9. Reconnect the disk backplane power cable to the motherboard [6].

10. Reinstall the following reusable components:

a. PCIe risers and attached PCIe cards.

For instructions, see "Servicing PCIe Risers (CRU)" on page 70.

b. Power supplies.

⚠ **Caution –** When reinstalling power supplies, it is important to reinstall them into the slots from which they were removed during the motherboard removal procedure; otherwise, the server's FRU top-level indicator (TLI) data might be lost. When a server requires service, the FRU TLI is used by Oracle to verify that the server's warranty has not expired. For more information on the server's FRU TLI, see the *Sun Server X3-2 Administration Guide,* "FRU TLI Auto-Update" on page 97

For instructions, see "Install a Power Supply" on page 55.

c. Fan modules.

For instructions, see "Install a Fan Module" on page 52.

11. Return the server to operation.

a. Install the top cover.

See "Install the Top Cover" on page 142.

b. **Close the server fan door.**

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

   See "Return the Server to the Normal Rack Position" on page 145.

d. **Reconnect the data cables and the power cords to the server power supplies.**

   See "Reconnect Data Cables and Power Cords" on page 147.

e. **Power on the server.**

   See "Power On the Server" on page 149.

   Verify that the Power/OK indicator is steady on.

Note – **IMPORTANT:** After replacing the motherboard, you might need to manually program the product serial number (PSN) into the new motherboard. This is necessary because the motherboard is a secondary quorum member for maintaining the PSN for service entitlement and if you replace move than one of the quorum members during any given service procedure, a secondary quorum member might need to be programmed with PSN.

Related Information

■ "Remove the Motherboard" on page 126

Servicing the SAS Cables (FRUs)

Caution – The system supplies power to the cables even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect power cords before servicing the cables.

To remove and install cables, follow the procedures in these sections:

■ "Remove Storage Drive SAS Cables" on page 137
■ "Install Storage Drive SAS Cables" on page 139

Related Information

■ "Extend the Server to the Maintenance Position" on page 38
■ "Take Antistatic Measures" on page 40
■ "Remove the Server Top Cover" on page 42

▼ Remove Storage Drive SAS Cables

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

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Powering Down the Server" on page 32

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

      See "Extend the Server to the Maintenance Position" on page 38.

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

      See "Take Antistatic Measures" on page 40.

   d. **Remove the top cover.**

      See "Remove the Server Top Cover" on page 42.

2. **Remove all of the server fan modules.**

   See "Remove a Fan Module" on page 49.

3. **Remove the PCIe riser from PCIe slot 3 and 4.**

   See "Remove a PCIe Riser From PCIe Slots 3 and 4" on page 76.

4. **If the server has two disk backplanes, do the following; otherwise, proceed to the next step:**

   a. **To disconnect the SAS cable from top disk backplane, press the latch, push in toward the connector, and then pull out to remove the cable [1].**

Note – Servers with four storage drives or fewer have only one disk backplane. Servers with more than four storage drives have two disk backplane.

---

   b. **Remove the top disk backplane.**

      See "Remove the Disk Backplane" on page 115.

   c. **To disconnect the SAS cable from bottom disk backplane, press the latch, push in toward the connector, and then pull out to remove the cable [1].**
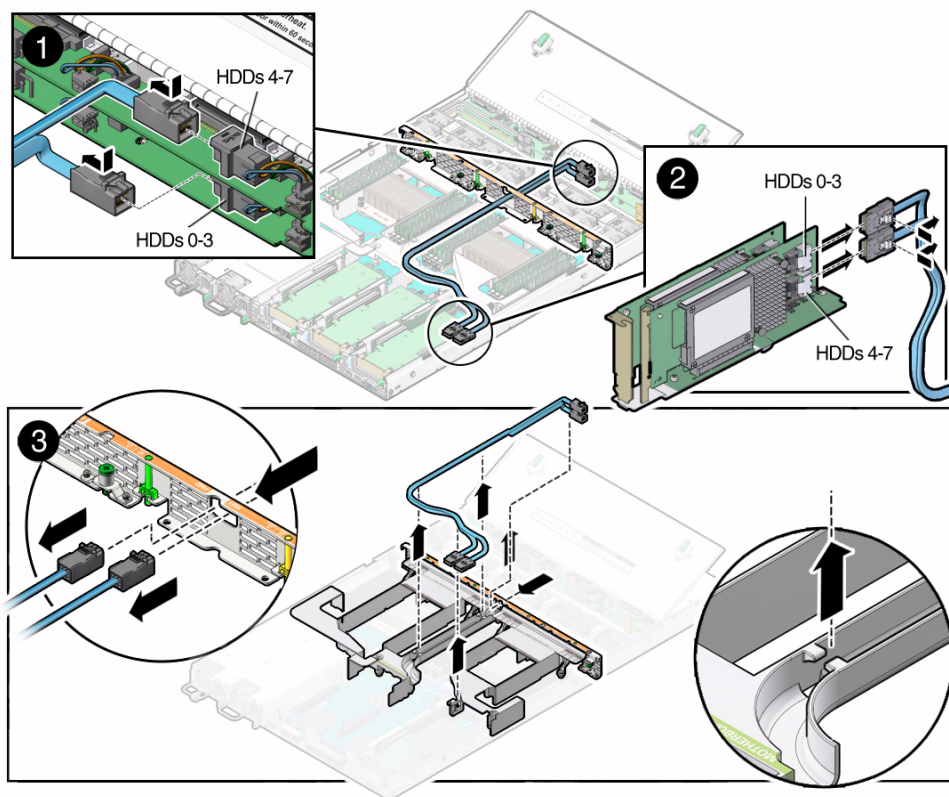
5. **If the server has only one disk backplane, to disconnect the cable from disk backplane, press the latch, push in toward the connector, and then pull out to remove the SAS cable [1].**

6. **Disconnect the SAS cable(s) from the internal host bus adapter (HBA) [2].**

   To disconnect the SAS cable(s) from the internal HBA card, press the latch and pull out to remove the cables.

7. **Carefully remove the SAS cables from the trough in the air duct [3].**

8. **Carefully pull the internal SAS cables through the mid-wall and remove them from the chassis [3].**

Related Information

■ "Install Storage Drive SAS Cables" on page 139

▼ Install Storage Drive SAS Cables

1. **Properly orient the ends of the SAS cables to connect to the disk backplane and the HBA respectively.**

2. **Carefully push the SAS cables through the mid-wall and place them into the cable trough in the middle of the air duct [1].**
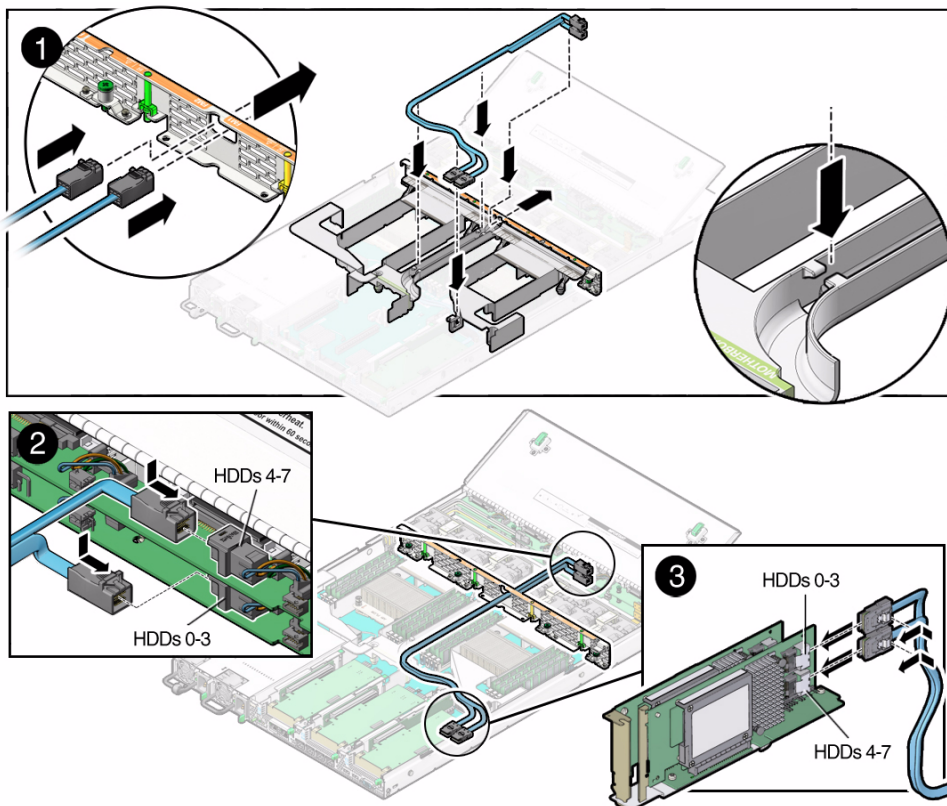
3. **Install the HDDs 0-3 cable.**

   a. **Install the HDDs 0-3 cable connector into the bottom disk backplane [2].**

   b. **Plug the HDDs 0-3 cable connector into the connector on the left side of HBA card (the connector that is farther from the power supplies) [3].**

4. **If the server has more than four storage drives, do the following:**

   a. **Install the top disk backplane.**

      See "Install the Disk Backplane" on page 118

b. **Install the HDDs 4-7 cable connector into the top disk backplane [2].**

c. **Plug the HDDs 4-7 cable connector into the connector on the right side of HBA card (the connector that is closer to the power supplies) [3].**

5. **Install the PCIe riser with the internal HBA card into PCIe slot 3.**

   See "Install a PCIe Riser Into PCIe Slots 3 and 4" on page 78

6. **Install all of the server fan modules.**

   See "Install a Fan Module" on page 52.

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

   a. **Install the top cover.**

      See "Install the Top Cover" on page 142.

   b. **Close the server fan door.**

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

      See "Return the Server to the Normal Rack Position" on page 145.

   d. **Reconnect the data cables and the power cords to the server power supplies.**

      See "Reconnect Data Cables and Power Cords" on page 147.

   e. **Power on the server.**

      See "Power On the Server" on page 149.

      Verify that the Power/OK indicator is steady on.

Related Information

■ "Remove Storage Drive SAS Cables" on page 137

Returning the Server to Operation

After replacing components inside of the server, perform the procedures in the following sections.

Description	Links
Learn about filler panels.	"Removing and Installing Server Filler Panels" on page 141
Installing the top cover.	"Install the Top Cover" on page 142
Removing antistatic measures.	"Remove Antistatic Measures" on page 144
Installing the server chassis into the rack.	"Reinstall the Server Chassis Into the Rack" on page 144
Returning the server to the normal rack position.	"Return the Server to the Normal Rack Position" on page 145
Reconnecting power and data cables.	"Reconnect Data Cables and Power Cords" on page 147
Powering on the server.	"Power On the Server" on page 149

Removing and Installing Server Filler Panels

Each server might be shipped with module-replacement filler panels for storage drives and PCIe cards. These filler panels are installed at the factory and must remain in the server until you replace them with a purchased option.

Before you can install an optional server component into the server, you must remove the filler panel from the location into which you intend to install the component. When you remove a storage drive or a PCIe card from the server, you must install either a replacement component or a filler panel.

- "Remove and Install Filler Panels" on page 142

Related Information

- "Servicing CRUs That Do Not Require Server Power Off" on page 43
- "Servicing CRUs That Require Server Power Off" on page 57

▼ Remove and Install Filler Panels

- **See the procedures in the following table to remove and install filler panels for storage drives and PCIe cards.**

Filler Panel Type	Removal Procedure	Install Procedure
Storage Drive	1. Locate the storage drive filler panel to be removed from the server. 2. Push the lever on the front of the filler panel to the right and use the lever to pull the filler out of the server.	1. Locate the vacant disk drive module slot in the server. 2. Slide the filler panel into the vacant slot by pressing the middle of the filler panel faceplate with your thumb or finger.
PCI Slot	1. Remove the server top cover. 2. Remove the PCI slot filler panel from the location into which you intend to install the PCIe card. **Note:** In single-processor systems, PCIe slot 1 is nonfunctional, therefore, there is no need to remove the filler panel for slot 1.	1. Remove the server top cover. 2. Press the PCI filler panel into the vacant PCI slot. **Note:** In single-processor systems, PCIe slot 1 is nonfunctional, therefore, the server ships with this filler panel installed.

▼ Install the Top Cover

1. **Open the server fan door.**

   See "Open the Server Fan Door" on page 41.

2. **Place the top cover on the chassis.**

   Place the cover down so that it hangs over the rear of the server by about 13 mm (0.5 inches) [1] and the side latches align with the slots in the sides of the chassis.

Note – There are three latching tabs on the sides of the cover, two on the right side and one on the left side (viewing the server from the front), There is also a latch on the underside of the cover in the front left corner near the green release button.

3. Check both sides of the chassis to ensure that the four corners of the top cover are fully down and flush with the chassis.

If the cover corners are not flush with the chassis, slide the cover towards the rear of the chassis until you can position the cover correctly.

Note – If the top cover is not correctly positioned before attempting to slide the cover forward, the internal latch that is located on the underside of the cover might be damaged.

4. Gently slide the cover forward until it locks into place (you hear an audible click) [2].

As you slide the cover toward the front of the server, watch the green release button. You will hear an audible click when the green release button pops up, indicating that the cover is locked.

FIGURE: Installing the Top Cover
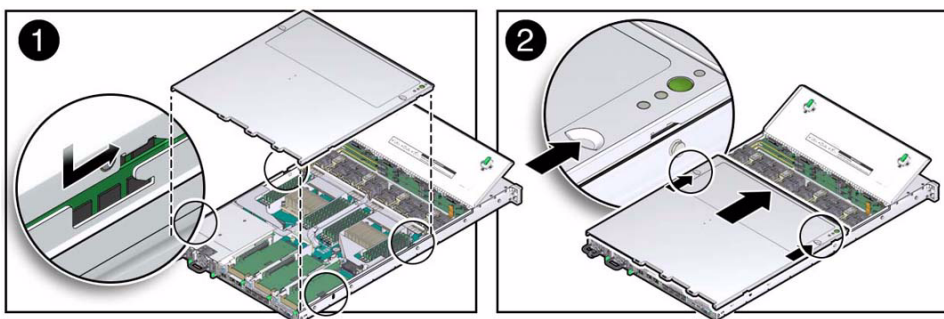
5. Close the server fan door.

6. Remove the antistatic precautions.

See "Remove Antistatic Measures" on page 144.

Related Information

- "Remove the Server Top Cover" on page 42
- "Remove Antistatic Measures" on page 144

▼ Remove Antistatic Measures

1. **Remove any antistatic straps or conductors from the server chassis.**

2. **Remove the antistatic wrist strap from yourself.**

▼ Reinstall the Server Chassis Into the Rack

If you removed the server chassis from the rack, perform these steps to reinstall it.

⚠ **Caution –** Deploy any rack anti-tilt mechanisms before installing the server into the rack.

⚠ **Caution –** The server weighs approximately 18.1 kgs (39.9 pounds). Two people are required to carry the chassis and install it into the rack.

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

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

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

   The server is now in the extended maintenance position.

FIGURE: Returning the Server to the Rack.
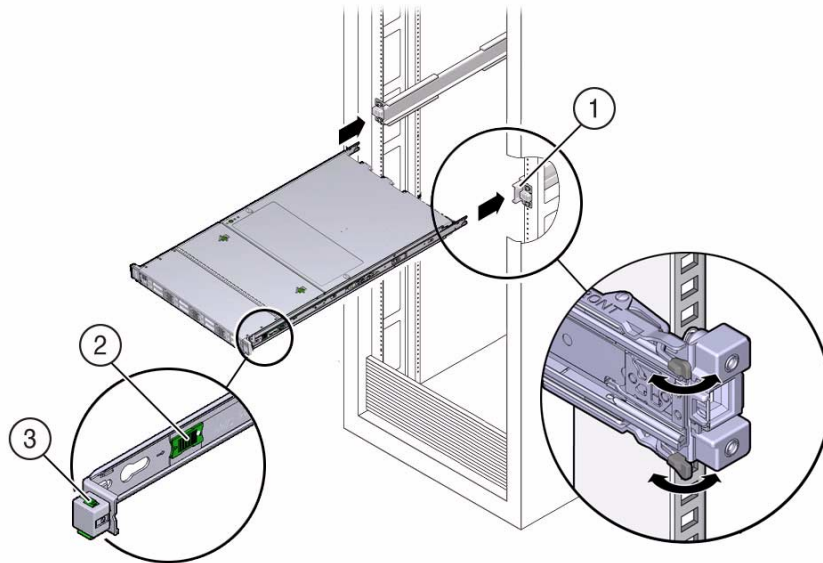
Figure Legend

1	Inserting mounting brackets into slide-rails
2	Slide-rail release button (green)
3	Slide-rail lock

Related Information

- "Remove the Server From the Rack" on page 39
- "Remove Antistatic Measures" on page 144
- "Reconnect Data Cables and Power Cords" on page 147

▼ Return the Server to the Normal Rack Position

If the server is in the extended maintenance position, use this procedure to return the server to the normal rack position.

1. Push the server back into the rack, as described in the following steps.

a. **Simultaneously pull and hold the two green release tabs (one on each side of of the server) toward the front of the server (see the following figure) while you push the server into the rack.**

As you push the server into the rack, verify that the cable management arm (CMA) retracts without binding.

Note – To pull the green release tab, place your finger in the center of the tab, not on the end, and apply pressure as you pull the tab toward the front of the server.

FIGURE: Location of the Release Tabs on the Slide-Rails
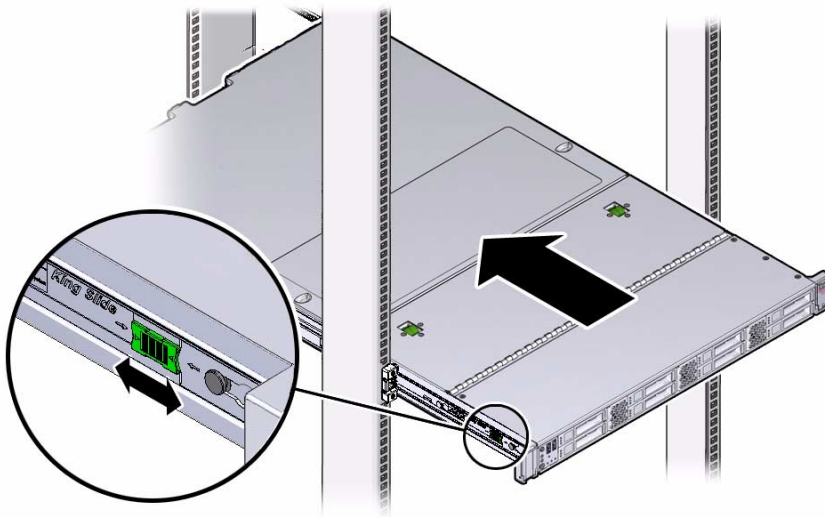
b. **Continue pushing the server into the rack until the slide-rail locks (on the front of the server) engage the slide-rail assemblies.**

You will hear an audible click when the server is in the normal rack position.

2. **If the CMA is not installed, that is, you removed it because you removed the server completely out of the rack, install the CMA.**

For installation instructions for the CMA, see one of the following procedures, depending on which version of the CMA is installed on your server.

- *Sun Server X3-2 Installation Guide,* "Install the Second-Generation Cable Management Arm" on page 35

- *Sun Server X3-2 Installation Guide,* "Install the First-Generation Cable Management Arm" on page 52

3. **If the cables are disconnected from the rear of the server, that is, you disconnected the cables because you removed the server completely out of the rack, reconnect the cables.**

   - For instructions on reconnecting cables to the rear of the server, see "Reconnect Data Cables and Power Cords" on page 147.

   - For detailed information on connecting cables to the rear of the server, see *Sun Server X3-2 Installation Guide*, "Rear Cable Connections and Ports" on page 59.

Related Information

- "Reconnect Data Cables and Power Cords" on page 147

▼ Reconnect Data Cables and Power Cords

1. **Reconnect the data cables to the rear of the server, as required.**

   If the cable management arm (CMA) is in the way, extend the server approximately 13 cm (5 inches) out of the front of the rack.

2. **Reconnect the power cables to the power supplies and secure them with the Velcro straps as shown in the following figure.**
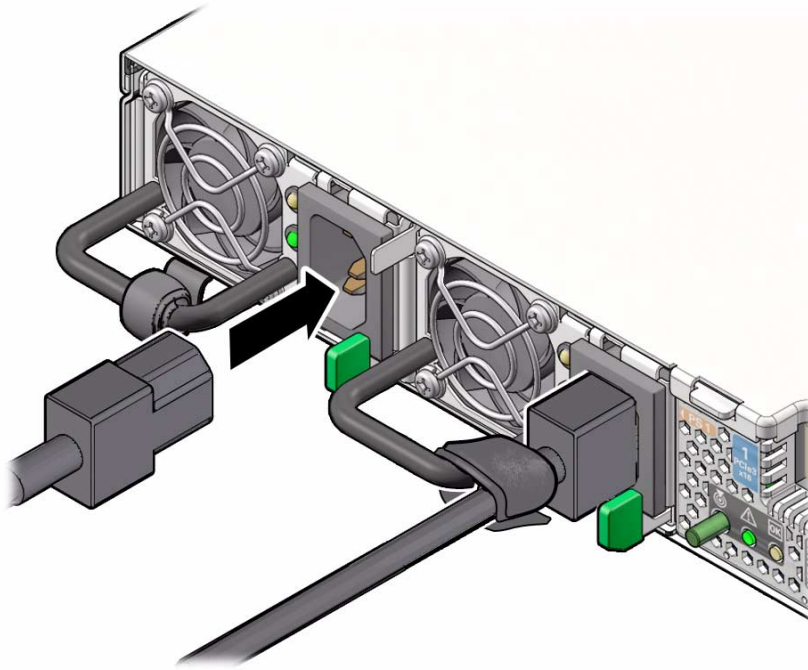
3. **If necessary, reinstall the cables into the cable management arm and secure them with the Velcro straps or cable straps, depending on which version of the CMA you are using.**

4. **If you pulled the server out of the rack to make it easier to connect the cables, push the server into the rack until the slide-rail locks (on the front of the server) engage the slide-rail assemblies.**

   You will hear an audible click when the server is in the normal rack position.

Related Information

- "Disconnect Cables From the Server" on page 37
- "Reinstall the Server Chassis Into the Rack" on page 144
- "Power On the Server" on page 149

▼ Power On the Server

As soon as the power cords are connected, standby power is applied and the green Power/OK status indicator on the server's front panel blinks. Depending on the configuration of the firmware, the system might boot. If not, complete this step:

● **Power on the server by performing one of the following:**

  ■ Press the Power button on the server's front panel.

  ■ Log in to the Oracle ILOM web interface, click Host Management > Power Control and select Power On from the Select Action list box.

  ■ Log in to the Oracle ILOM command-line interface (CLI), and type the following command at the Oracle ILOM CLI prompt.

```
-> start /System
```

When the server is powered on and the power-on self-test (POST) code checkpoint tests have completed, the green Power/OK status indicator on the front panel lights and remains lit.

Related Information

■ "Powering Down the Server" on page 32

■ "Reconnect Data Cables and Power Cords" on page 147

Identifying the Server Ports

This section describes the pinouts of the server connectors.

Description	Links
Learn about the Gigabit Ethernet ports.	"Gigabit Ethernet Ports" on page 151
Learn about the network management port.	"Network Management Port" on page 152
Learn about the serial management port.	"Serial Management Port" on page 153
Learn about video connector.	"Video Connector" on page 155
Learn about USB ports.	"USB Ports" on page 156

Gigabit Ethernet Ports

The server has four auto-negotiating 100/1000/10,000BASE-T GbE system domain ports. All four Ethernet ports use a standard RJ-45 connector.

The transfer rates are shown in the following table.

TABLE: Ethernet Port Transfer Rates

Connection Type	IEEE Terminology	Transfer Rate
Fast Ethernet	100BASE-TX	100 Mbps
Gigabit Ethernet	1000BASE-T	1,000 Mbps
10 Gigabit Ethernet	10GBASE-T	10,000 Mbps

The following figure and table describe the gigabit Ethernet port pin signals.
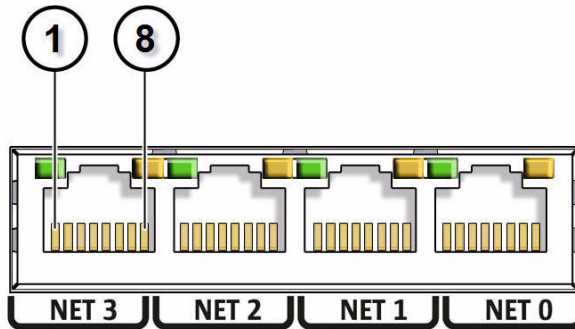
Note – Ethernet ports NET 2 and NET 3 are nonfunctional in single-processor systems.

TABLE: 10GBE Port Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit/Receive Data 0 +	5	Transmit/Receive Data 2 –
2	Transmit/Receive Data 0 –	6	Transmit/Receive Data 1 –
3	Transmit/Receive Data 1 +	7	Transmit/Receive Data 3 +
4	Transmit/Receive Data 2 +	8	Transmit/Receive Data 3 –

Related Information

- "Server Back Panel View" on page 7
- "Disconnect Cables From the Server" on page 37
- "Reconnect Data Cables and Power Cords" on page 147

Network Management Port

The server has one 10/100BASE-T Ethernet management domain interface, labeled NET MGT. For information on configuring this port for managing the server with Oracle ILOM, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at: http://www.oracle.com/pls/topic/lookup?ctx=ilom31
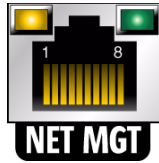
TABLE: Network Management Port Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit Data +	5	Common Mode Termination
2	Transmit Data –	6	Receive Data –
3	Receive Data +	7	Common Mode Termination
4	Common Mode Termination	8	Common Mode Termination

Related Information

- "Server Back Panel View" on page 7
- "Disconnect Cables From the Server" on page 37
- "Reconnect Data Cables and Power Cords" on page 147

Serial Management Port

The serial management connector (labeled SER MGT) is an RJ-45 connector that can be accessed from the rear panel. This port is the default connection to the server. Use this port *only* for server management.

TABLE: Default Serial Connections for Serial Port

Parameter	Setting
Connector	SER MGT
Rate	9600 baud
Parity	None
Stop bits	1
Data bits	8

The following figure and table describe the pin descriptions of the SER MGT port.

TABLE: Serial Management Port Signals

Pin	Signal Description	Pin	Signal Description
1	Request to Send	5	Ground
2	Data Terminal Ready	6	Receive Data
3	Transmit Data	7	Data Set Ready
4	Ground	8	Clear to Send

If you need to connect to the SER MGT port using a cable with either a DB-9 or a DB-25 connector, follow the pin descriptions in the tables to create a crossover adapter appropriate for your serial connection.

TABLE: RJ-45 to DB-9 Adapter Crossovers Wiring Reference

Serial Port (RJ-45 Connector)		DB-9 Adapter	
Pin	**Signal Description**	**Pin**	**Signal Description**
1	RTS	8	CTS
2	DTR	6	DSR
3	TXD	2	RXD
4	Signal Ground	5	Signal Ground
5	Signal Ground	5	Signal Ground
6	RXD	3	TXD
7	DSR	4	DTR
8	CTS	7	RTS

TABLE: RJ-45 to DB-25 Adapter Crossovers Wiring Reference

Serial Port (RJ-45 Connector)		DB-25 Adapter	
Pin	Signal Description	Pin	Signal Description
1	RTS	5	CTS
2	DTR	6	DSR
3	TXD	3	RXD
4	Signal Ground	7	Signal Ground
5	Signal Ground	7	Signal Ground
6	RXD	2	TXD
7	DSR	20	DTR
8	CTS	4	RTS

Related Information

- "Server Back Panel View" on page 7
- "Disconnect Cables From the Server" on page 37
- "Reconnect Data Cables and Power Cords" on page 147

Video Connector

The video connector is an DB-15 connector that can be accessed from the back panel.

TABLE: Video Connector Signals

Pin	Signal Description	Pin	Signal Description
1	Red Video	9	[KEY]
2	Green Video	10	Sync Ground
3	Blue Video	11	Monitor ID - Bit 1
4	Monitor ID - Bit 2	12	Monitor ID - Bit 0
5	Ground	13	Horizontal Sync
6	Red Ground	14	Vertical Sync
7	Green Ground	15	N/C (Reserved)
8	Blue Ground		

Related Information

- "Server Back Panel View" on page 7
- "Disconnect Cables From the Server" on page 37
- "Reconnect Data Cables and Power Cords" on page 147

USB Ports

The server has six USB ports for attaching supported USB 2.0 compliant devices. There are two USB ports on the server front panel, two on the rear panel, and two on the motherboard.
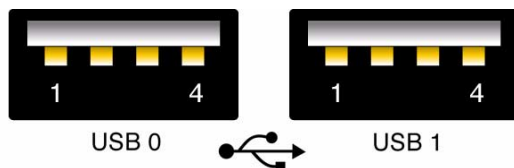
TABLE: USB Port Signals

Pin	Signal Description
1	+5 V
2	DAT-
3	DAT+
4	Ground

Related Information

Getting Server Firmware and Software

This section explains the options for accessing server firmware and software.

Description	Links
Learn about server firmware and software updates.	"Firmware and Software Updates" on page 159
Learn about options for accessing firmware and software.	"Firmware and Software Access Options" on page 160
Review available firmware and software releases.	"Software Releases" on page 161
Learn how to get firmware and software using Oracle System Assistant, My Oracle Support, or Physical Media Request.	"Getting Firmware and Software From MOS or PMR" on page 162
Install firmware and software updates using other methods.	"Installing Updates Using Other Methods" on page 166

Firmware and Software Updates

Firmware and software for your server are updated periodically. These updates are made available as software releases. The software releases are a set of downloadable files (patches) that include all available firmware, software, hardware drivers, tools, and utilities for the server. All these files have been tested together and verified to work with your server.

You should update your server firmware and software as soon as possible after a new software release becomes available. Software releases often include bug fixes, and updating your server ensures that your server has the latest firmware and software.

The ReadMe document that is included with each patch in a software release contains information about the patch, such as what has changed or not changed from the prior software release, as well as bugs that are fixed with the current release.

The product notes that are part of the server documentation identify which server software release is the latest release supported on your server.

Firmware and Software Access Options

Use one of the following options to obtain the latest set of firmware and software for your server:

■ **Oracle System Assistant** – Oracle System Assistant is a new factory-installed option for Oracle servers that allows you to easily download and install server firmware and software.

For more information about using Oracle System Assistant, refer to the *Sun Server X3-2 Administration Guide*, "Setting Up Software and Firmware" on page 29.

■ **My Oracle Support** – All system firmware and software are available from My Oracle Support at http://support.oracle.com.

For more information on what is available on the My Oracle Support web site, see "Software Releases" on page 161.

For instructions on how to download software releases from My Oracle Support, see "Download Firmware and Software Using My Oracle Support" on page 162.

■ **Physical Media Request (PMR)** – You can request a DVD that contains any of the downloads (patches) available from My Oracle Support.

For information see, "Request Physical Media (Online)" on page 164.

■ **Other Methods** – You can use Oracle Enterprise Manager Ops Center, Oracle Hardware Management Pack, or Oracle ILOM to update your server software and firmware.

For information, see "Installing Updates Using Other Methods" on page 166.

Software Releases

Software releases on My Oracle Support are grouped by product family (such as Sun Server), then the product (the specific server or blade), and finally the software release version. A software release contains all the updated software and firmware for your server or blade as a set of downloadable files (patches), including firmware, drivers, tools, or utilities, all tested together to be compatible with your server.

Each patch is a zip file that contains a ReadMe file and a set of subdirectories containing firmware or software files. The ReadMe file contains details on the components that have changed since the prior software release and the bugs that have been fixed.

My Oracle Support provides the set of software releases for your server as described in the following table. You can obtain these software releases by downloading the files from My Oracle Support or by submitting to Oracle a physical media request (PMR). Alternatively, you can download the same firmware and software to your server using Oracle System Assistant.

Package Name	Description	When to Download This Package
Sun Server X3-2 (X4170 M3) *SWversion* – Firmware Pack	All the system firmware, including Oracle ILOM, BIOS, and option card firmware.	You need the latest firmware.
Sun Server X3-2 (X4170 M3) *SWversion* – OS Pack	An OS Pack is available for each supported operating system version. Each OS Pack includes a package of all tools, drivers, and utilities for that version of the OS. Software includes Oracle Hardware Management Pack and LSI MegaRAID software. For the Windows OS, this OS Pack also includes Intel Network Teaming and Install Pack.	You need to update OS-specific drivers, tools, or utilities.
Sun Server X3-2 (X4170 M3) *SWversion* – All Packs	Includes the Firmware Pack, all OS Packs, and all documents. This pack does not include Oracle VTS or the Oracle System Assistant image.	You need to update a combination of system firmware and OS-specific software.

Package Name	Description	When to Download This Package
Sun Server X3-2 (X4170 M3) *SWversion* – Diagnostics	Oracle VTS diagnostics image.	You need the Oracle VTS diagnostics image.
Sun Server X3-2 (X4170 M3) *SWversion* – Oracle System Assistant Updater	Oracle System Assistant recovery and ISO update image.	You need to manually recover or update Oracle System Assistant.

Getting Firmware and Software From MOS or PMR

You can use Oracle System Assistant to easily download and then use the latest software release. For further information, see the *Oracle X4 Series Servers Administration Guide* at `http://www.oracle.com/goto/x86AdminDiag/docs`.

However, you can also obtain updated firmware and software by using My Oracle Support (MOS) or by submitting to Oracle a physical media request (PMR). For information, see:

- "Download Firmware and Software Using My Oracle Support" on page 162
- "Requesting Physical Media" on page 163

▼ Download Firmware and Software Using My Oracle Support

1. **Go to the following web site:** `http://support.oracle.com`.

2. **Sign in to My Oracle Support.**

3. **At the top of the page, click the Patches & Updates tab.**

   The Patch search pane appears at the right of the screen.

4. **Within the Search tab area, click Product or Family (Advanced Search).**

   The Search tab area appears with search fields.

5. **In the Product field, select the product from the drop-down list.**

   Alternatively, type a full or partial product name until a match appears. For example, Sun Server X3-2 (formerly Sun Fire X4170 M3).

6. **In the Release field, select a software release from the drop-down list.**

   Expand the list to see all available software releases.

7. **Click Search.**

   The Patch Advanced Search Results screen appears, listing the patches for the software release.

   See "Software Releases" on page 161 for a description of the available downloads.

8. **To select a patch for a software release, click the patch number next to the software release version**

   You can use the shift key to select more than one patch).

   A pop-up action panel appears. The pop-up panel contains several action options, including the ReadMe, Add to Plan, and Download options. For information about the Add to Plan option, click on the associated drop-down button and select "Why use a plan?"

9. **To review the ReadMe file for the patch, click ReadMe.**

10. **To download the patch for the software release, click Download.**

    The File Download dialog box appears.

11. **In the File Download dialog box, click the patch zip file name.**

    The patch for the software release downloads.

Requesting Physical Media

If your processes do not allow downloads from Oracle web sites, you can receive the latest software release packages by submitting to Oracle a physical media request (PMR). The preferred method for submitting a PMR is through the My Oracle Support (MOS) web site.

The high-level tasks for submitting a physical media request are described in these sections:

- "Gathering Information for the Physical Media Request" on page 164
- "Request Physical Media (Online)" on page 164
- "Request Physical Media (By Phone)" on page 166

Gathering Information for the Physical Media Request

You must have a warranty or support contract for your server in order to make a physical media request (PMR).

Before you make the PMR, do the following:

- **Obtain the product name, software release version, and patches required.** It will be easier to make the request if you know the latest software release version and the name of the patches for the software release that you are requesting.

  - *If you have access to My Oracle Support* – Follow the instructions in "Download Firmware and Software Using My Oracle Support" on page 162 to determine the latest software release version and view available software release packages (patches). After viewing the list of patches, you can navigate away from the Patch Advanced Search Results screen, if you do not want to continue with the download steps.

  - *If you do not have access to My Oracle Support* – Use the information in "Software Releases" on page 161 to determine which patches for the software release you want, and then request those patches for the latest software release version.

- **Have the shipping information ready.** You will need to provide a contact name, phone number, email address, company name, and shipping address as part of the request.

▼ Request Physical Media (Online)

Gather the information described in "Gathering Information for the Physical Media Request" on page 164 before making the request.

1. **Go to the My Oracle Support web site:** `http://support.oracle.com`.

2. **Sign in to My Oracle Support.**

3. **Click on the Contact Us link in the upper right corner of the page.**

   The Create Service Request: Problem screen appears.

4. **Describe your request as follows:**

   a. **In the Problem Summary field, type `PMR for latest software release`.**

   b. **From the Problem Type drop-down list, select Software & OS Media Requests.**

   c. **In the Support Identifier field, type the Customer Support Identifier associated with your support contract.**

5. **Skip the Create Service Request: Solutions screen by clicking the Next button in the upper right corner of the screen twice.**

   The Create Service Request: More Details screen appears.

6. **Provide more information about your request as follows:**

   a. **In the Additional Information section, answer the questions listed in the following table:**

Question	Your Answer
Is this a physical software media shipment request?	Yes
Which product line does the media request involve?	Sun Products
Are you requesting a required password for a patch download?	No
Are you requesting a patch on CD/DVD?	Yes
If requesting a patch on CD/DVD, please provide the patch number and OS/platform?	Enter the patch number for each download that you want for the software release.
List the product name and version requested for the physical media shipment?	*Product Name:* Sun Server X3-2 *Version:* Latest software release number
What is the OS/platform for the requested media?	If you are requesting OS-specific downloads, specify the OS here. If you are requesting system firmware only, enter Generic.
Are any languages required for this shipment?	No

   b. **Fill in the ship-to contact information, which includes a contact name, phone number, email address, company name, and shipping address.**

7. **Click the Next button.**

   The Create Service Request: Severity/Contact screen appears.

8. **Enter your contact phone number and preferred method of contact.**

9. **Click the Submit button.**

   This completes the physical media request. It can take up to seven business days to receive the physical media.

▼ Request Physical Media (By Phone)

Gather the information described in "Gathering Information for the Physical Media Request" on page 164 before making the request.

1. **Call Oracle support, using the appropriate number from the Oracle Global Customer Support Contacts Directory at:**

   http://www.oracle.com/us/support/contact-068555.html

2. **Tell Oracle support that you want to make a physical media request (PMR) for the Sun Server X3-2.**

   - If you are able to find the specific software release package and patch number information from My Oracle Support, provide this information to the support representative.

   - If you are unable to find the software release package information, request the latest software release package for the Sun Server X3-2.

Installing Updates Using Other Methods

In addition to using Oracle System Assistant and My Oracle Support, you can install updated firmware and software using one of the following methods:

- **Oracle Enterprise Manager Ops Center** – You can use Ops Center Enterprise Controller to automatically download the latest firmware from Oracle, or firmware can be loaded manually into the Enterprise Controller. In either case, Ops Center can install the firmware onto one or more servers, blades, or blade chassis.

  For more information, go to:
  http://www.oracle.com/technetwork/oem/ops-center/index.html.

- **Oracle Hardware Management Pack** – You can use the fwupdate CLI Tool within the Oracle Hardware Management Pack to update firmware within the system.

  For more information, refer to the Oracle Hardware Management Pack Documentation Library at: http://www.oracle.com/goto/OHMP/docs.

- **Oracle ILOM** – You can use the Oracle ILOM web interface or command-line interface to update Oracle ILOM and BIOS firmware.

  For more information, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:
  http://www.oracle.com/pls/topic/lookup?ctx=ilom31.

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