

Sun Server X3-2L
(formerly Sun Fire X4270 M3)
Service Manual



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Using This Documentation

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

Note – The Sun Server X3-2L was formerly named the Sun Fire X4270 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 written for technicians, system administrators, authorized service providers, and users who have advanced experience troubleshooting and replacing hardware.

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

- [“Getting the Latest Software and Firmware” on page ix](#)
- [“About This Documentation” on page x](#)
- [“Related Documentation” on page x](#)
- [“Feedback” on page x](#)
- [“Access to Oracle Support” on page xi](#)

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 Sun 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 167.

About This Documentation

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

A PDF 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 page.

Related Documentation

Documentation	Link
All Oracle documentation	http://www.oracle.com/documentation
Sun Server X3-2L	http://www.oracle.com/pls/topic/lookup?ctx=SunServerX3-2L
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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About the Sun Server X3-2L

Note – The Sun Server X3-2L was formerly named the Sun Fire X4270 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 sections describe the controls, connectors, LEDs, system components, and replaceable components of the server.

Description	Links
Product description.	“Product Description” on page 1
Review the controls and connectors on the server.	“About Controls and Connectors” on page 2
Review the LEDs on the server.	“About Server and Component LEDs” on page 7
Review system components.	“About System Components” on page 14

Product Description

The Sun Server X3-2L is an enterprise-class, two rack unit (2U) 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, 32-GB 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.
- Six PCIe Gen3 slots in the dual-processor systems. PCIe slots 1, 2, and 3 are nonfunctional in single-processor systems.
- Either eight, twelve, or twenty-four SAS/SATA storage drives, and a DVD drive, which is supported in the eight-drive configuration only.
- 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 sections describe the controls and connectors located on the front and rear panels.

- [“Front Panel Components on Eight Drive Systems” on page 2](#)
- [“Front Panel Components on Twelve Drive Systems” on page 4](#)
- [“Front Panel Components on Twenty-Four Drive Systems” on page 5](#)
- [“Rear Panel Components and Cable Connections” on page 6](#)

Related Information

- [“About Server and Component LEDs” on page 7](#)
- [“About System Components” on page 14](#)
- [“Illustrated Parts Breakdown” on page 15](#)

Front Panel Components on Eight Drive Systems

Note – Systems with eight drives contain a DVD drive. Systems with twelve drives and twenty-four drives do not contain a DVD drive.

FIGURE: Front Panel With Eight 2.5-Inch Drives and DVD Configuration

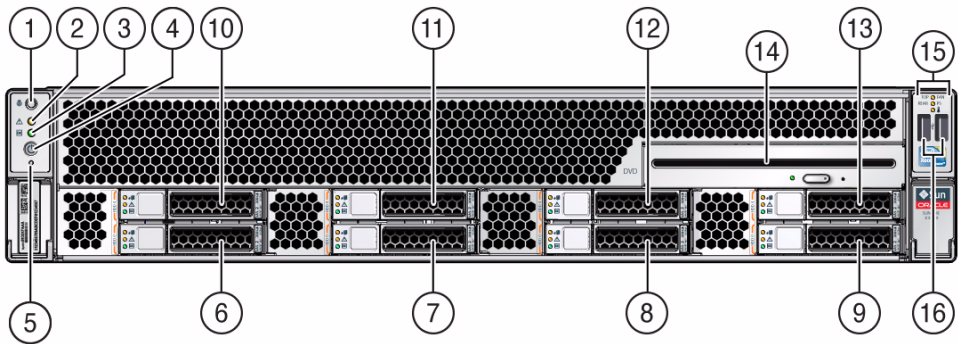


Figure Legend

1	Locator LED/Locator button: white	9	Storage drive 3
2	Service Action Required LED: amber	10	Storage drive 4
3	Power/OK LED: green	11	Storage drive 5
4	Power button	12	Storage drive 6
5	SP OK LED: green	13	Storage drive 7
6	Storage drive 0	14	SATA DVD drive
7	Storage drive 1	15	Service Required LEDs (3): Top: Fan Module (amber), Rear: Power Supply (amber), Overtemp Icon: System Over Temperature Warning (amber)
8	Storage drive 2	16	USB 2.0 connectors (2)

Related Information

- [“Front Panel Components on Twelve Drive Systems” on page 4](#)
- [“Front Panel Components on Twenty-Four Drive Systems” on page 5](#)
- [“Server General Status Indicators” on page 8](#)
- [“Storage and Boot Drive LEDs” on page 10](#)

Front Panel Components on Twelve Drive Systems

FIGURE: Front Panel With Twelve 3.5-Inch Drives Configuration

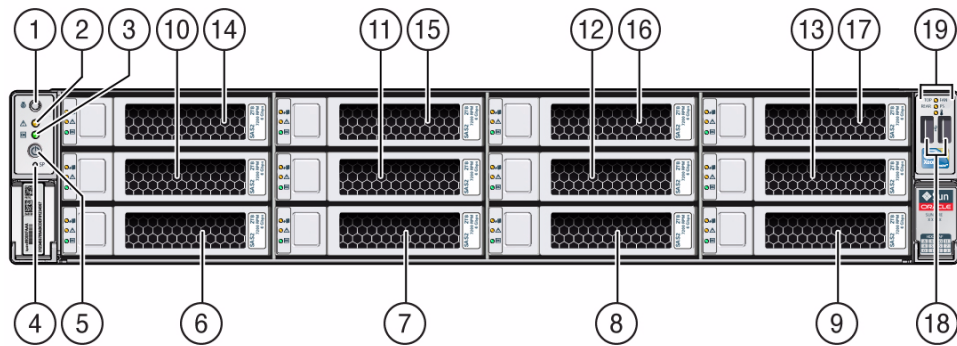


Figure Legend

1 Locator LED/Locator button: white	11 Storage drive 5
2 Service Action Required LED: amber	12 Storage drive 6
3 Power/OK LED: green	13 Storage drive 7
4 SP OK LED: green	14 Storage drive 8
5 Power button	15 Storage drive 9
6 Storage drive 0	16 Storage drive 10
7 Storage drive 1	17 Storage drive 11
8 Storage drive 2	18 USB 2.0 connectors (2)
9 Storage drive 3	19 Service Required LEDs (3): Top: Fan Module (amber), Rear: Power Supply (amber), Overtemp Icon: System Over Temperature Warning (amber)
10 Storage drive 4	

Related Information

- [“Front Panel Components on Eight Drive Systems” on page 2](#)
- [“Front Panel Components on Twenty-Four Drive Systems” on page 5](#)
- [“Server General Status Indicators” on page 8](#)
- [“Storage and Boot Drive LEDs” on page 10](#)

Front Panel Components on Twenty-Four Drive Systems

FIGURE: Front Panel With Twenty-Four 2.5-Inch Drives Configuration

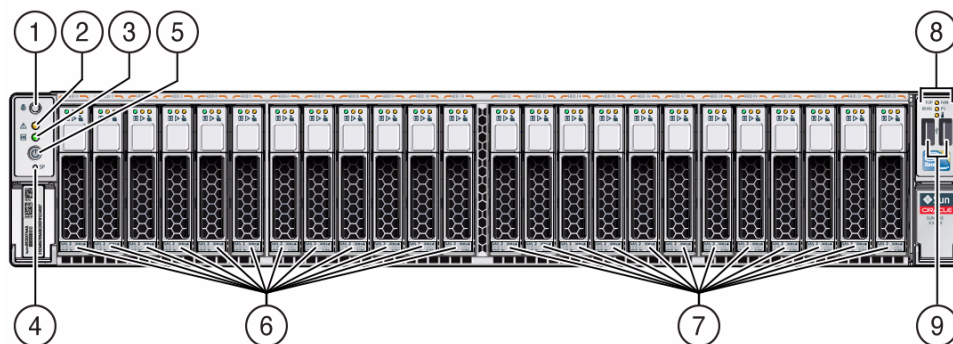


Figure Legend

- | | |
|--------------------------------------|--|
| 1 Locator LED/Locator button: white | 6 Storage drives 0 through 11 |
| 2 Service Action Required LED: amber | 7 Storage drives 12 through 23 |
| 3 Power/OK LED: green | 8 Service Required LEDs (3):
Top: Fan Module (amber),
Rear: Power Supply (amber),
Overtemp Icon: System Over Temperature
Warning (amber) |
| 4 SP OK LED: green | 9 USB 2.0 connectors (2) |
| 5 Power button | |

Related Information

- [“Front Panel Components on Eight Drive Systems” on page 2](#)
- [“Front Panel Components on Twelve Drive Systems” on page 4](#)
- [“Server General Status Indicators” on page 8](#)
- [“Storage and Boot Drive LEDs” on page 10](#)

Rear Panel Components and Cable Connections

Note – Systems that are configured with twelve and twenty-four front panel storage drives also contain two rear-mounted storage drives. Systems that are configured with eight front panel storage drives do not contain rear-mounted storage drives.

Note – Rear hard drive backplanes, the OK LED powers down, the LED

FIGURE: Back Panel With Storage Drives Configuration

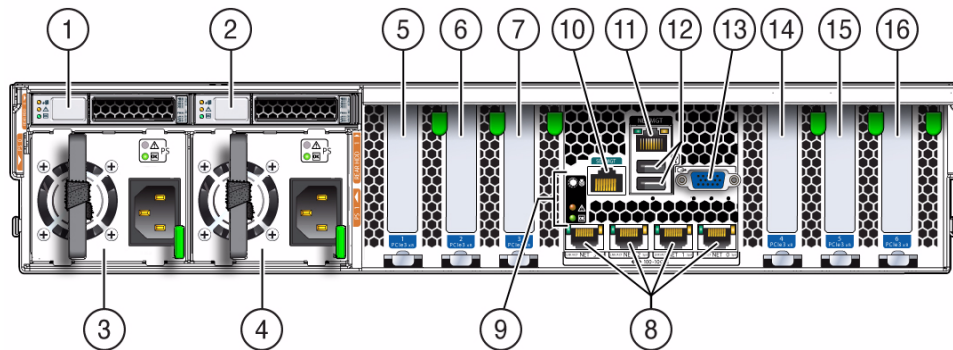


Figure Legend

- | | |
|---|--|
| 1 Rear storage drive 0 | 9 System status LEDs:
Locator/Button: white,
Service Required: amber,
Power/OK: green |
| 2 Rear storage drive 1 (In Oracle Engineered Systems, rear storage drive 1 might be populated with a remote battery module for the HBA card.) | 10 Serial management (SER MGT)/RJ-45 serial port |
| 3 Power supply unit 0 (PSU0) | 11 Oracle Integrated Lights Out Manager (ILOM) service processor (SP) network management 10/100BASE-T port (NET MGT) |
| 4 Power supply unit 1 (PSU1) | 12 USB 2.0 ports (2) |
| 5 PCIe slot 1 (Nonfunctional in single-processor systems.) | 13 DB-15 video connector |

Figure Legend *(Continued)*

6	PCIe slot 2 (Nonfunctional in single-processor systems.)	14	PCIe slot 4
7	PCIe slot 3 (Nonfunctional in single-processor systems.)	15	PCIe slot 5
8	Network (NET) 100/1000/10000 ports (NET3–NET0) (NET2 and NET3 are nonfunctional in single-processor systems.)	16	PCIe slot 6

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

Related Information

- [“Power Supply LEDs” on page 10](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Reconnect Power and Data Cables” on page 165](#)
- [“Identifying the Server Ports” on page 151](#)

About Server and Component LEDs

These sections describe the LEDs located on the front and rear of the server, including those found on components and ports.

- [“Server General Status Indicators” on page 8](#)
- [“Server Fan LED” on page 9](#)
- [“Storage and Boot Drive LEDs” on page 10](#)
- [“Power Supply LEDs” on page 10](#)
- [“Network Management Port LEDs” on page 11](#)
- [“Ethernet Port LEDs” on page 12](#)
- [“Motherboard LEDs” on page 13](#)

Related Information

- [“About Controls and Connectors” on page 2](#)
- [“Service Troubleshooting Task List” on page 21](#)

Server General Status Indicators

There are seven system-level indicators, which are located on both the server front panel and the server back panel.

TABLE: Server General Status LEDs





Indicator/LED Name	Icon	Color	State Meaning
Locator LED and button		White	<ul style="list-style-type: none">• Off – Server is operating normally.• Fast blink – Use Oracle ILOM to activate this indicator to enable you to locate a particular system quickly and easily.• Pressing the Locator button will toggle LED fast blink on or off.
Service Required		Amber	<ul style="list-style-type: none">• Off – Normal operation; no service action is required.• Steady on – Fault present on server. This indicator lights whenever a fault LED lights for a server replaceable component. <p>Note - The lighting of this indicator is always accompanied by the system console message that includes a recommended service action.</p>
Power/OK		Green	<p>This LED indicates the operational state of the chassis. This LED can be in the following states:</p> <ul style="list-style-type: none">• 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 diagnostics 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 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	None	Green	<ul style="list-style-type: none">• Off – The Oracle ILOM service processor is not running.• Slow blink – The service processor is booting.• Steady on – The Oracle ILOM SP is fully operational.

TABLE: Server General Status LEDs (*Continued*)

Indicator/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. <ul style="list-style-type: none">Off – Indicates steady state; no service action is required.Steady on – Indicates service action required; service the fan modules, processors, or memory DIMMs.
Rear Power Supply Failure	Rear	Amber	Indicates that one of the server power supplies has failed. <ul style="list-style-type: none">Off – Indicates steady state; no service action is required.Steady on – Indicates service action required; service the power supply.
Overtemp		Amber	<ul style="list-style-type: none">Off – Normal operation; no service action is required.Steady on – The system is experiencing an overtemperature warning condition. <p>Note - This is a warning indication, not a fatal overtemperature. Failure to correct this might result in the system overheating and shutting down unexpectedly.</p>

Related Information

- [“Front Panel Components on Eight Drive Systems” on page 2](#)
- [“Front Panel Components on Twelve Drive Systems” on page 4](#)
- [“Front Panel Components on Twenty-Four Drive Systems” on page 5](#)
- [“Rear Panel Components and Cable Connections” on page 6](#)

Server Fan LED

Each fan module has one bicolored, status LED. This LED is located on the server side wall adjacent to the fan modules and is visible when the top cover fan door is open.

TABLE: Server Fan Status LEDs

LED Name	Icon	Color	State Meaning
Fan Status	None	Bicolored: Amber/Green	<ul style="list-style-type: none">Amber – There is a fan fault.Green – Fan is properly installed and functioning correctly. No fan errors detected.




Related Information

- [“Servicing Fan Modules \(CRU\)” on page 54](#)
- [“Servicing Fan Modules \(CRU\)” on page 54](#)
- [“Server General Status Indicators” on page 8](#)

Storage and Boot Drive LEDs

There are three LEDs on each drive.

TABLE: Server Front Storage and Boot Disk Drive LEDs

LED Names	Icon	Color	State Meaning
Activity		Green	<ul style="list-style-type: none">• 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. LED blinks on and off to indicate activity.
Service Required		Amber	<ul style="list-style-type: none">• Off – Normal operation; no service action is required.• Steady on – The system has detected a fault with the storage drive.
Ready to Remove		Blue	The storage drive can be removed safely during a hot-plug operation.

* If a rear backplane hard disk's OK LED shuts off, it may also indicate that a rear hard disk has spun down into a temporary “suspend” mode, in which case the disk would again spin up when coming out of suspend mode.



Related Information

- [“Front Panel Components on Eight Drive Systems” on page 2](#)
- [“Front Panel Components on Twelve Drive Systems” on page 4](#)
- [“Front Panel Components on Twenty-Four Drive Systems” on page 5](#)
- [“Servicing Storage Drives and Rear Drives \(CRU\)” on page 45](#)

Power Supply LEDs

There are three LEDs on each power supply. These LEDs are visible from the rear of the server.

TABLE: Server Power Supply LEDs

LED Name	Icon	Color	State Meaning
AC OK/ DC OK		Green	<ul style="list-style-type: none">• Steady on – Normal operation. Input AC power and DC output voltages are both within specification.• Slow blink– Normal operation. Input power is within specification. DC output voltage is not enabled.• Off – No input AC power is present.
Service Required		Amber	<ul style="list-style-type: none">• Off – Normal operation; no service action is required.• Steady on – The power supply (PS) has detected a PS fan failure, PS overtemperature, PS over current, or PS over or under voltage.
AC OK	~AC	Green	<ul style="list-style-type: none">• Off – No AC power is present.• Steady on – Normal operation. Input power is within specification range.

Related Information

- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Servicing Power Supplies \(CRU\)” on page 58](#)

Network Management Port LEDs

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

TABLE: Network Management Port LEDs

Indicator Name	Location	Color	State and Meaning
Link speed	Top left	Amber or Green	<ul style="list-style-type: none">• Amber on - 10BASE-T link.• Green on - 100BASE-T link.• Off - No link or link down.• Flashing - No function.
Activity	Top right	Green	<ul style="list-style-type: none">• On - No function.• Off - No activity.• Flashing - Packet activity.

Related Information

- [“Network Management Port” on page 153](#)
- [“Front Panel Components on Eight Drive Systems” on page 2](#)
- [“Front Panel Components on Twelve Drive Systems” on page 4](#)
- [“Front Panel Components on Twenty-Four Drive Systems” on page 5](#)
- [“Rear Panel Components and Cable Connections” on page 6](#)

Ethernet Port LEDs

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 NET2 and NET3 are nonfunctional in single-processor systems.

TABLE: Gigabit Ethernet Port LEDs

Indicator Name	Location	Color	State and Meaning
Activity	Top left	Green	<ul style="list-style-type: none">• On - No function.• Off - No activity.• Flashing - Packet activity.
Link speed	Top right	Amber or Green	<ul style="list-style-type: none">• 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 Components on Eight Drive Systems” on page 2](#)
- [“Front Panel Components on Twelve Drive Systems” on page 4](#)
- [“Front Panel Components on Twenty-Four Drive Systems” on page 5](#)
- [“Rear Panel Components and Cable Connections” on page 6](#)

Motherboard LEDs

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

- [“DDR3 DIMM Fault LEDs” on page 13](#)
- [“Processor Fault LEDs” on page 14](#)
- [“Fault Remind Super Capacitor Power LED” on page 14](#)
- [“3.3V_STANDBY OK LED” on page 14](#)

DDR3 DIMM Fault LEDs

Each of the 16 DDR3 DIMM sockets on the motherboard has an amber fault 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 LEDs

The motherboard includes a fault LED adjacent to each of the two processor sockets. These LEDs indicate when a processor is faulty. Pressing the Fault Remind button on the motherboard signals the service processor to light the fault LEDs associated with the faulty processors.

Fault Remind Super Capacitor Power LED

This LED is located next to the Fault Remind button and is powered from the super capacitor that powers the fault LEDs on the motherboard. This LED lights to indicate 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.

3.3V_STANDBY OK LED

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

Related Information

- [“Front Panel Components on Eight Drive Systems” on page 2](#)
- [“Front Panel Components on Twelve Drive Systems” on page 4](#)
- [“Front Panel Components on Twenty-Four Drive Systems” on page 5](#)
- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Illustrated Parts Breakdown” on page 15](#)

About System Components

These sections describe the components of the server:

- [“Illustrated Parts Breakdown” on page 15](#)
- [“Customer-Replaceable Units” on page 17](#)

- [“Field-Replaceable Units” on page 18](#)
- [“Battery Module” on page 19](#)

Related Information

- [“Servicing CRUs That Do Not Require Server Power-Off” on page 45](#)
- [“Servicing CRUs That Require Server Power-Off” on page 63](#)
- [“Servicing FRUs” on page 97](#)

Illustrated Parts Breakdown

The following figure identifies the major components of the server.

FIGURE: System Components

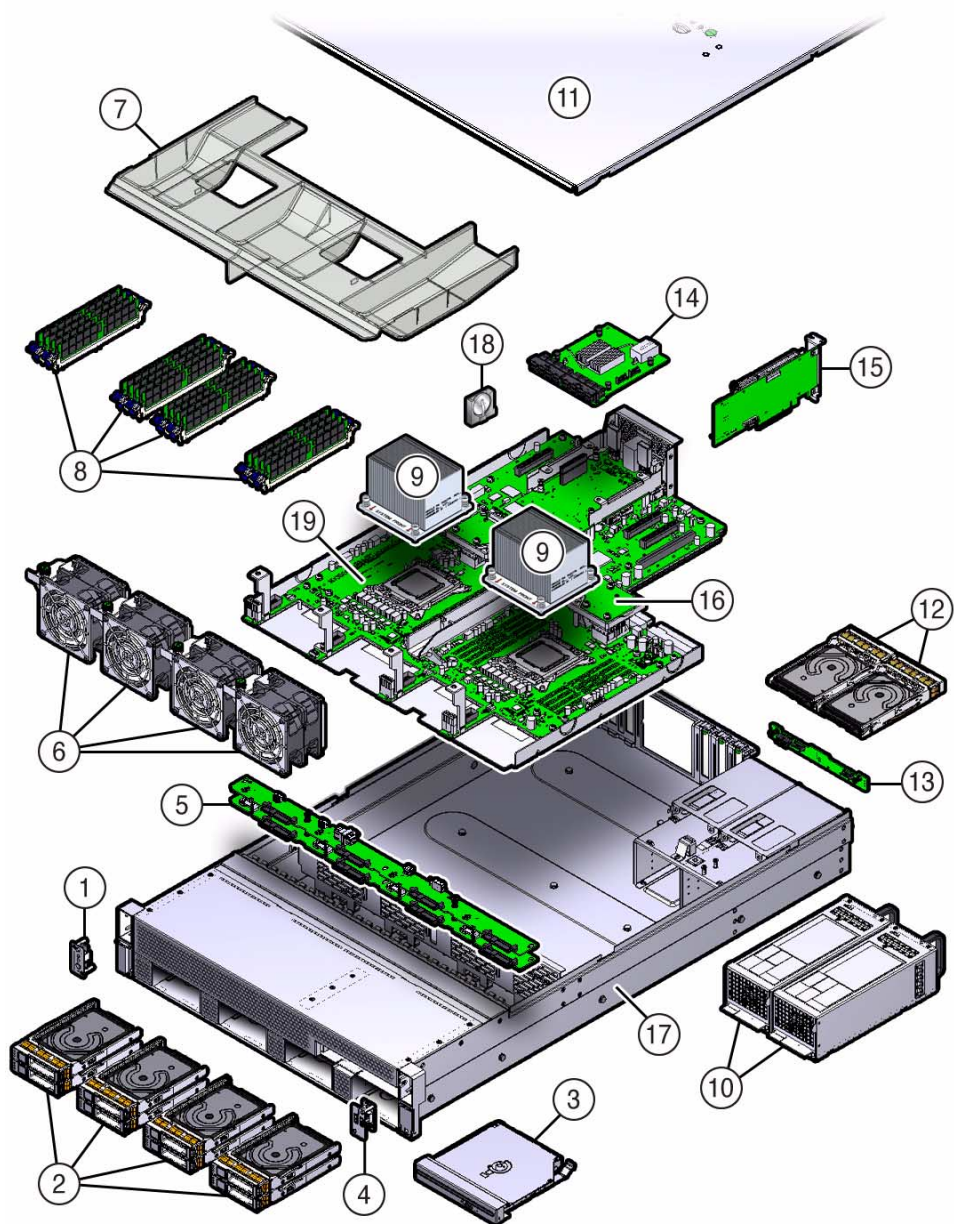


Figure Legend

1 Left LED indicator module

11 Top cover

Figure Legend *(Continued)*

2	Storage drives	12	Rear-mounted storage drives (In Oracle Engineered Systems, rear storage drive 1 might be populated with a remote battery module for the HBA card.)
3	DVD drive	13	Rear storage drive backplane
4	Right LED indicator module	14	SAS expander module
5	Front disk drive backplanes	15	PCIe cards (PCIe slots 1, 2, and 3 are nonfunctional in single-processor systems.)
6	Fan modules	16	Mezzanine board (non-removable)
7	Air baffle	17	System chassis
8	DIMMs (Only eight DIMMs are supported in single-processor systems and the DIMMs must be installed in P0 DIMM sockets. Additionally, a DIMM filler panel must always be installed in P1 DIMM socket D7.)	18	System battery
9	Processors and heatsinks (Single-processor systems contain only a single processor in socket P0.)	19	Motherboard assembly
10	Power supplies		

Customer-Replaceable Units

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

CRU	Description	Replacement Instructions
Air baffle	Aids in the cooling of the DIMMs and processors.	“Servicing the Air Baffle (CRU)” on page 85
Battery	Lithium coin-cell battery that powers the CMOS BIOS and real-time clock.	“Servicing the Battery (CRU)” on page 93
DIMMs	Add or replace memory to the system.	“Servicing the DIMMs (CRU)” on page 63
DVD drive	DVD drive on configurations with eight 2.5-inch drives.	“Servicing the DVD Drive (CRU)” on page 88

CRU	Description	Replacement Instructions
Storage drives	<p>Hard disk drive (HDD) configurations can comprise both spinning media or solid state disk (SSD) drives, including:</p> <ul style="list-style-type: none"> • Up to twelve 3.5-inch hot-pluggable SAS/SATA HDDs • Up to twenty-four 2.5-inch hot-pluggable SAS/SATA HDDs • Up to eight 2.5-inch hot-pluggable SAS/SATA HDDs <p>Note - In Oracle Engineered Systems, rear storage drive 1 might be populated with a remote battery module for the HBA card. The battery module is not a customer-replaceable unit.</p>	“Servicing Storage Drives and Rear Drives (CRU)” on page 45
Fan modules	Contains four fan modules for cooling the server components.	“Servicing Fan Modules (CRU)” on page 54
PCIe cards	Optional add-on cards that can expand the functionality of the server.	“Servicing PCIe Cards (CRU)” on page 76
Power supply unit (PSU)	Two fully redundant AC-powered power supplies.	“Servicing Power Supplies (CRU)” on page 58
SAS expander module	SAS expander that serves as an interface between the disk backplane and the storage drive cables that connect to the HBA PCIe card.	“Servicing the SAS Expander Module (CRU)” on page 81

Related Information

- [“Field-Replaceable Units” on page 18](#)
- [“Illustrated Parts Breakdown” on page 15](#)
- [“Servicing CRUs That Do Not Require Server Power-Off” on page 45](#)
- [“Servicing CRUs That Require Server Power-Off” on page 63](#)

Field-Replaceable Units

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

FRU	Description	Replacement Instructions
Processor and heatsink	The processor that carries out the instructions of the system.	“Servicing Processors (FRU)” on page 97
Disk drive backplanes	Provide power and communications connectors for disk drives.	“Servicing the Front and Rear Storage Drive Backplanes (FRU)” on page 114
Front LED/USB indicator modules	Contain the push-button circuitry and LEDs that are displayed on the bezel of the chassis.	“Servicing the Front LED/USB Indicator Modules (FRU)” on page 126
Motherboard assembly	Provides connectors for the DIMMs, processors, PCIe risers, and other components.	“Servicing the Motherboard Assembly (FRU)” on page 139
SAS and SATA cables	Provide signals between the SAS expander and the disk drive backplanes.	“Servicing Cables (FRU)” on page 132

Related Information

- [“Customer-Replaceable Units” on page 17](#)
- [“Illustrated Parts Breakdown” on page 15](#)
- [“Servicing FRUs” on page 97](#)

Battery Module

In Oracle Engineered Systems, rear storage drive 1 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 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 and Rear Drives \(CRU\)” on page 45](#)

Troubleshooting the Server

These sections 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 25
Inspect the system methodically to locate the faulty component or components.	“Inspecting the System” on page 25

Related Information

- [“About the Sun Server X3-2L” on page 1](#)
- [“Preparing for Service” on page 29](#)
- [“Returning the Server to Operation” on page 159](#)

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 26
3	Perform external visual inspection and internal visual inspection.	“Inspect the Server Externally” on page 26
4	View service processor logs and sensor information.	Oracle ILOM 3.1 Documentation Library at: http://www.oracle.com/pls/topic/lookup?ctx=ilom31
5	Run Pc-Check diagnostics.	<i>Oracle x86 Servers Diagnostics, Applications, and Utilities Guide for Servers With Oracle ILOM 3.1</i> at http://www.oracle.com/pls/topic/lookup?ctx=x86diag

Related Information

- [“About the Sun Server X3-2L” 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** – Firmware is located on the service processor and provides a comprehensive service portal via a command-line interface (CLI) and browser user interface (BUI) for lights-out management capabilities (remote power-on, power-off), monitoring of the health of environmental subsystems (power, fans, temperature, interlock), and fault management and automated diagnosis capabilities during server initialization (QuickPath Interconnect code and Memory Reference code), and runtime of the server.

- **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 runs each time the system powers on. For information about Pc-Check, refer to the *Oracle x86 Servers Diagnostics, Applications, and Utilities Guide for Servers With Oracle ILOM 3.1*.
- **POST** – POST performs diagnostics on system components upon system power-on and resets to ensure the integrity of those components. POST messages are displayed and logged in the BIOS event logs. POST works with Oracle ILOM to take faulty components offline, if needed.
- **SNMP** – Simple Network Management Protocol 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 X3-2L Administration Guide*, “Monitoring Components and Identifying SNMP Messages” on page 175.
- **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 Solaris PSH technology, ILOM, and BIOS provide extensive fault management architecture for placing processors offline and disabling of DIMMs.
 - **Log files and console messages** – These items provide the standard 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, 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, might cause one or more LEDs to light.

Related Information

- “About the Sun Server X3-2L” on page 1
- Oracle Solaris OS Documentation Set
 - Oracle Solaris 10 documentation:
http://docs.oracle.com/cd/E23823_01/index.html

- Oracle Solaris 11 documentation:
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 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 25

▼ Locate the Server Serial Number

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

- From the front panel of the server, look at the top left side of the bezel to locate the server's serial number.

The serial number is located on the RFID label on the bottom left side of the front panel, below the general status LEDs. The serial number is also recorded on the service label that is attached to the top cover of the system. For illustrations of the server front panel, see [“About the Sun Server X3-2L” on page 1](#).

- Locate the yellow Customer Information Sheet (CIS) attached to your server packaging. This sheet includes the serial number.
- From Oracle ILOM, type the `show /System` command, or go to the System Information > Summary page in the Oracle ILOM web interface.

Related Information

- [“Diagnostic Tools” on page 22](#)
- [“Gather Service Information” on page 24](#)

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 the procedures in these sections to locate common problems with the system.

- [“Troubleshoot Power Problems” on page 26](#)
- [“Inspect the Server Externally” on page 26](#)
- [“Inspect Internal Server Components” on page 26](#)

Related Information

- [“About the Sun Server X3-2L” on page 1](#)
- [“Preparing for Service” on page 29](#)

▼ Troubleshoot Power Problems

1. If the system is powered off, power on the server.
See [“Power On the Server” on page 165](#).
 - 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 165](#)
- [“Inspect the Server Externally” on page 26](#)
- [“Servicing Power Supplies \(CRU\)” on page 58](#)

▼ Inspect the Server Externally

1. Inspect the external status indicator LEDs, which can indicate component malfunction.
For the LED locations and descriptions of their behavior, see [“About Server and Component LEDs” on page 7](#).
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 X3-2L” on page 1](#)
- [“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 cables from the server and remove the server cover.

See [“Preparing the Server for Component Replacement”](#) on page 32.

3. Inspect the internal status indicator LEDs. These 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, hold down the Locator LED button on the server back panel or front panel for 5 seconds to initiate a “push-to-test” mode that illuminates all other LEDs both inside and outside of the chassis for 15 seconds.

Note – If the server supercapacitor is charged, you can view internal LEDs when the power cables are disconnected from the server. If the supercapacitor has been discharged, the server must be in standby power mode for you to view the internal LEDs. If necessary, reconnect the power cables to the server and wait for the SP to complete its boot process by monitoring the SP OK LED. Disconnect the power cables after inspecting these LEDs.

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 after-factory components 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 68.

8. Return the server to operation.

See [“Returning the Server to Operation”](#) on page 159.

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

When the main power is applied to the server, the Power/OK LED next to the Power button blinks slowly until the OS is ready. When the OS is ready, the Power/OK LED remains lit. For more information about the LED, see [“Server General Status Indicators”](#) on page 8.

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 `fmadm faulty` fault management command to list any faults that might be present on the server.

For instructions, refer to 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
- “DIMM Population Rules” on page 68
- “About Server and Component LEDs” on page 7
- “Returning the Server to Operation” on page 159

Preparing for Service

These sections describe safety considerations and provide prerequisite procedures and information about replacing 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 159](#)

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 *Sun Server X3-2L Safety and Compliance Guide* and *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 [“Electrostatic Discharge Safety” on page 30](#).
- 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 document. 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, and memory DIMMs, 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 printed circuit board (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
- Oracle ESD mat (orderable item)
- A disposable ESD mat (shipped with some replacement parts or optional system components)

Related Information

- [“Safety Precautions” on page 29](#)
- [“Safety Symbols” on page 30](#)
- [“Preparing the Server for Component Replacement” on page 32](#)
- [“Returning the Server to Operation” on page 159](#)

Required Tools

The server can be serviced with the following tools:

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

Related Information

- [“Preparing for Service” on page 29](#)

- [“Servicing CRUs That Do Not Require Server Power-Off” on page 45](#)
 - [“Servicing CRUs That Require Server Power-Off” on page 63](#)
 - [“Servicing FRUs” on page 97](#)
-

Preparing the Server for Component Replacement

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

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

- [“Powering Down the Server” on page 32](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Extend the Server to the Maintenance Position” on page 37](#)
- [“Remove the Server From the Rack” on page 39](#)
- [“Take Antistatic Measures” on page 40](#)
- [“Remove the Server Top Cover” on page 41](#)
- [“Remove the Fan Assembly Door From a Server With 2.5-Inch Drives” on page 42](#)

Related Information

- [“Returning the Server to Operation” on page 159](#)

Powering Down the Server

Determine how you want to power down the server.

Description	Link
Power down the server gracefully to prevent data from being corrupted.	“Power Down the Server Gracefully Using the Oracle ILOM CLI” on page 33 “Power Down the Server Gracefully Using the Oracle ILOM Web Interface” on page 34 “Power Down the Server Gracefully Using the Power Button” on page 35
If the server is not responding, or you must shut down the server quickly, perform an immediate power-down.	“Power Down the Server for Immediate Shutdown” on page 36

Related Information

- [“Power On the Server” on page 165](#)

▼ Power Down the 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. For log file information, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Collection at:

<http://www.oracle.com/pls/topic/lookup?ctx=ilom31>.

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 about these processes.

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

Refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Collection for instructions.

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.

Related Information

- “Power Down the Server Gracefully Using the Oracle ILOM Web Interface” on page 34
- “Power Down the Server Gracefully Using the Power Button” on page 35
- “Power Down the Server for Immediate Shutdown” on page 36
- “Disconnect Cables From the Server” on page 37
- “Power On the Server” on page 165

▼ Power Down the Server Gracefully Using the Oracle ILOM Web Interface

Performing a graceful shutdown 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. For log file information, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Collection at:
<http://www.oracle.com/pls/topic/lookup?ctx=ilom31>.

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

3. Save any open files, and quit all running applications.

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

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

The Oracle ILOM web interface main page appears.

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

6. **Click Save and OK.**

The host server performs an orderly power-down.

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

See [“Disconnect Cables From the Server” on page 37](#).

Related Information

- [“Power Down the Server Gracefully Using the Oracle ILOM CLI” on page 33](#)
- [“Power Down the Server Gracefully Using the Power Button” on page 35](#)
- [“Power Down the Server for Immediate Shutdown” on page 36](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Power On the Server” on page 165](#)

▼ Power Down the Server Gracefully Using the Power Button

Note – You can use the Power button on the front of the server to initiate a graceful system shutdown.

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 begins flashing, indicating that the server is in standby power mode. See [“Server General Status Indicators” on page 8](#).

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

- [“Server General Status Indicators” on page 8](#)
- [“Power Down the Server Gracefully Using the Oracle ILOM CLI” on page 33](#)

- [“Power Down the Server Gracefully Using the Oracle ILOM Web Interface” on page 34](#)
- [“Power Down the Server for Immediate Shutdown” on page 36](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Power On the Server” on page 165](#)

▼ Power Down the Server for Immediate Shutdown



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

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 begins flashing, indicating that the server is in standby power mode. See [“Server General Status Indicators” on page 8](#).

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

- [“Server General Status Indicators” on page 8](#)
- [“Power Down the Server Gracefully Using the Oracle ILOM CLI” on page 33](#)
- [“Power Down the Server Gracefully Using the Power Button” on page 35](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Power On the Server” on page 165](#)

▼ Disconnect Cables From the Server



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

1. Label all cables connected to the server.
2. Disconnect the power cables from the rear of the server.
3. Disconnect all data cables from the rear of the server.
4. If your rackmount kit includes a cable management device, remove the cables from it.
5. Depending on the components that you are servicing, either extend the server to the maintenance position, or remove the server from the rack.

Related Information

- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Powering Down the Server” on page 32](#)
- [“Extend the Server to the Maintenance Position” on page 37](#)
- [“Remove the Server From the Rack” on page 39](#)
- [“Reconnect Power and Data Cables” on page 165](#)

▼ 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 drive
- DDR3 DIMMs
- PCIe cards
- SAS expander module
- Internal USB drives
- Motherboard battery

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

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

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

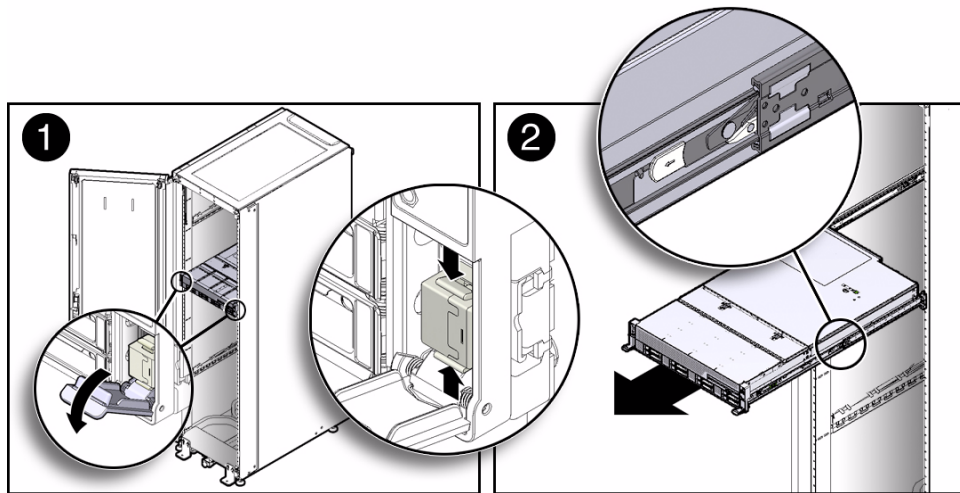
2. From the front of the server, open and hold the left and right release latch covers in the open position.

When in an open position, the release latch covers squeeze the slide-rail release latches [1].



Caution – Deploy any rack anti-tilt mechanism before releasing the slide release latches.

FIGURE: Extending the Server to the Maintenance Position



3. While the release latch covers are in the open position, slowly pull the server forward until the slide-rails latch into a locked position [2].

The server is now in the extended maintenance position.

Related Information

- [“Disconnect Cables From the Server” on page 37](#)
- [“Remove the Server From the Rack” on page 39](#)
- [“Reinstall the Server Chassis in the Rack” on page 164](#)

▼ Remove the Server From the Rack

You must remove the server from the rack to service the following components:

- Motherboard
- Processors
- Left FIM (front indicator module)
- Right FIM
- Disk backplane
- Rear-mounted storage drive assembly



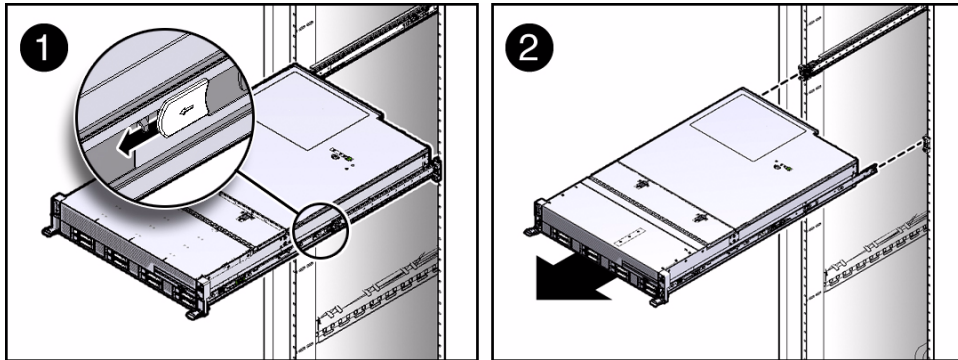
Caution – The server weighs approximately 63 pounds (28.5 kg). Two people are required to unmount and carry the chassis.

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 X3-2L Installation Guide*, “Remove the Second-Generation Cable Management Arm” on page 49.
 - For instructions for removing the first-generation CMA, see the installation procedure at *Sun Server X3-2L Installation Guide*, “Install the First-Generation Cable Management Arm” on page 54 and perform the installation steps in reverse order.
3. **Extend the server to the maintenance position.**

See “Extend the Server to the Maintenance Position” on page 37.
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 is free of the rack rails [1 and 2].**

A slide-rail release tab is located on each slide-rail.

FIGURE: Removing the Server From the Chassis



5. Set the server on a sturdy work surface.

Related Information

- [“Disconnect Cables From the Server” on page 37](#)
- [“Extend the Server to the Maintenance Position” on page 37](#)
- [“Reinstall the Server Chassis in the Rack” on page 164](#)

▼ Take Antistatic Measures

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

Place ESD-sensitive components 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.

Related Information

- [“Extend the Server to the Maintenance Position” on page 37](#)
- [“Remove the Server From the Rack” on page 39](#)
- [“Remove the Server Top Cover” on page 41](#)

- “Remove the Fan Assembly Door From a Server With 2.5-Inch Drives” on page 42
- “Remove Antistatic Measures” on page 163

▼ Remove the Server Top Cover

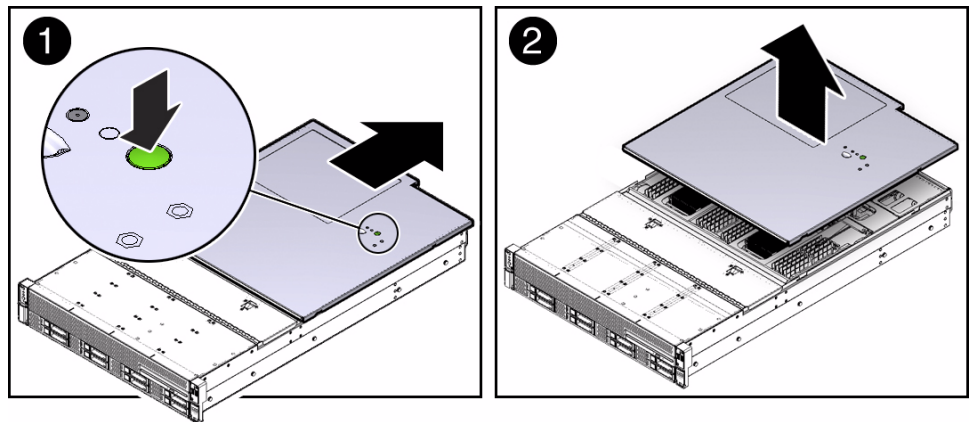


Caution – If you remove the top cover without first removing the AC power cords, then not only will the server host shut down, but also this condition will be flagged as a system fault (that is, the fault LEDs will light).

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

1. Ensure that the AC power cords are disconnected from the server power supplies.
2. Unlatch the top cover [1].
Press the green release button on the top of the server cover.

FIGURE: Removing the Server Top Cover



3. While pressing the top cover release button, slide the cover toward the rear of the server [2].
4. If necessary, open the fan assembly door.
5. Lift up and remove the top cover [2].

Related Information

- [“Take Antistatic Measures” on page 40](#)
- [“Remove the Fan Assembly Door From a Server With 2.5-Inch Drives” on page 42](#)
- [“Install the Top Cover” on page 161](#)

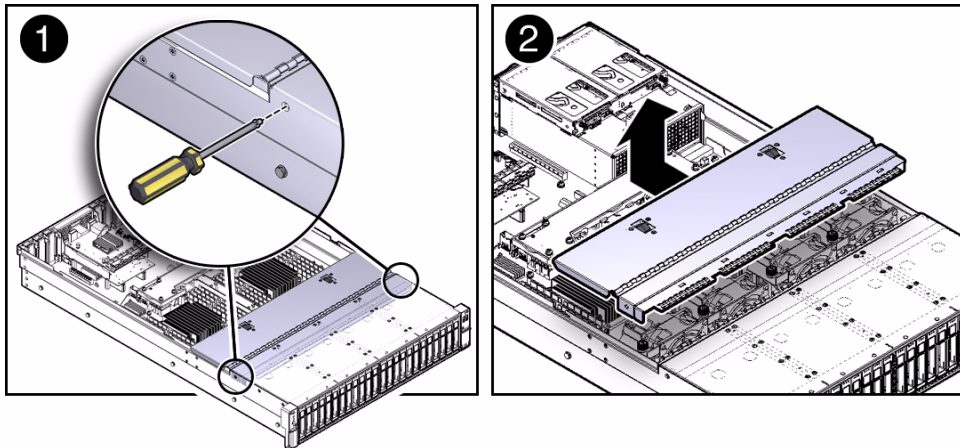
▼ Remove the Fan Assembly Door From a Server With 2.5-Inch Drives

Before you service the server’s storage drive backplane, you should first remove the server’s front fan assembly door.

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

1. Ensure that the AC power cords are disconnected from the server power supplies.
2. Using a No. 1 Phillips screwdriver, remove the two screws (one on each side of the chassis) that secure the fan assembly door [1].

FIGURE: Removing the Fan Assembly Door



3. Slide the fan assembly door toward the rear of the server, and lift and remove the door from the chassis [2].

Related Information

- [“Take Antistatic Measures” on page 40](#)

- “Remove the Server Top Cover” on page 41
- “Install the Top Cover” on page 161

Servicing CRUs That Do Not Require Server Power-Off

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

Description	Links
Service storage and boot drives.	“Servicing Storage Drives and Rear Drives (CRU)” on page 45
Service fan modules.	“Servicing Fan Modules (CRU)” on page 54
Service power supplies.	“Servicing Power Supplies (CRU)” on page 58

Related Information

- [“Servicing CRUs That Require Server Power-Off” on page 63](#)
- [“Servicing FRUs” on page 97](#)

Servicing Storage Drives and Rear Drives (CRU)

These sections describe how to remove and install storage drives.

- [“Storage Drives Hot-Plug Conditions” on page 46](#)
- [“Remove a Storage Drive” on page 47](#)
- [“Install a Storage Drive” on page 50](#)
- [“Remove a Rear Storage Drive” on page 52](#)
- [“Install a Rear Storage Drive” on page 53](#)

Related Information

- [“Servicing Cables \(FRU\)” on page 132](#)

Storage Drives Hot-Plug Conditions

The solid state drives (SSDs) or hard disk drives (HDDs) 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

- [“Storage and Boot Drive LEDs” on page 10](#)
- [“Remove a Storage Drive” on page 47](#)
- [“Install a Storage Drive” on page 50](#)
- [“Remove a Rear Storage Drive” on page 52](#)
- [“Install a Rear Storage Drive” on page 53](#)

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 HDD 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 the RAID Management Software Documentation Library at:
http://docs.oracle.com/cd/E23383_01/index.html.

▼ Remove a Storage Drive

1. Prepare the system for the drive removal.

Refer to “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 Eight 2.5-Inch Drives

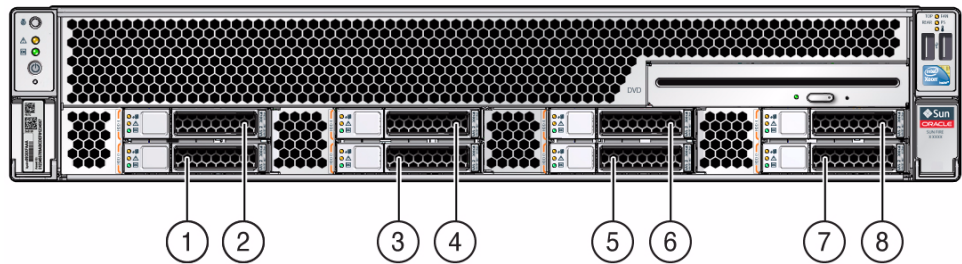


Figure Legend

-
- | | |
|---|-----------------|
| 1 | Storage drive 0 |
| 2 | Storage drive 4 |
| 3 | Storage drive 1 |
| 4 | Storage drive 5 |
| 5 | Storage drive 2 |
| 6 | Storage drive 6 |
| 7 | Storage drive 3 |
| 8 | Storage drive 7 |
-

FIGURE: Drive Location and Numbering on a Server With Twelve 3.5-Inch Drives

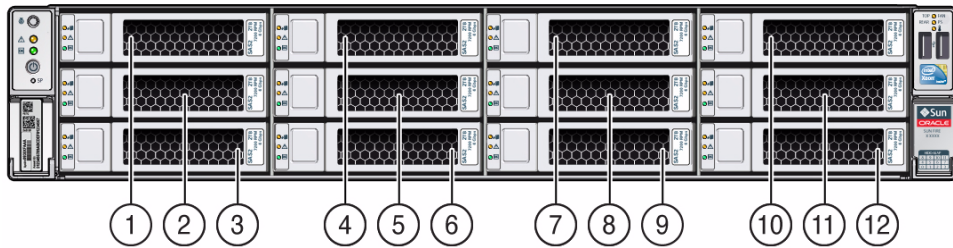


Figure Legend

-
- | | |
|----|------------------|
| 1 | Storage drive 8 |
| 2 | Storage drive 4 |
| 3 | Storage drive 0 |
| 4 | Storage drive 9 |
| 5 | Storage drive 5 |
| 6 | Storage drive 1 |
| 7 | Storage drive 10 |
| 8 | Storage drive 6 |
| 9 | Storage drive 2 |
| 10 | Storage drive 11 |
| 11 | Storage drive 7 |
| 12 | Storage drive 3 |
-

FIGURE: Drive Location and Numbering on a Server With Twenty-Four 2.5-Inch Drives

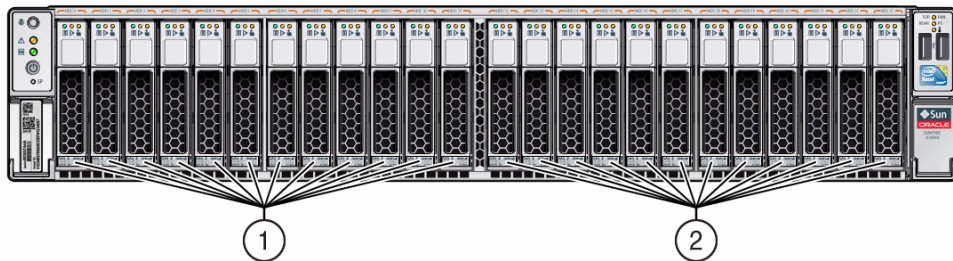


Figure Legend

-
- | | |
|---|------------------------------|
| 1 | Storage drives 0 through 11 |
| 2 | Storage drives 12 through 23 |
-

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

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

Note – The blue OK to Remove LED on the drive may or may not light, depending on operating system support.

4. On the drive you plan to remove, push the latch release button to open the latch [1, 2].

FIGURE: Opening the Drive Latch

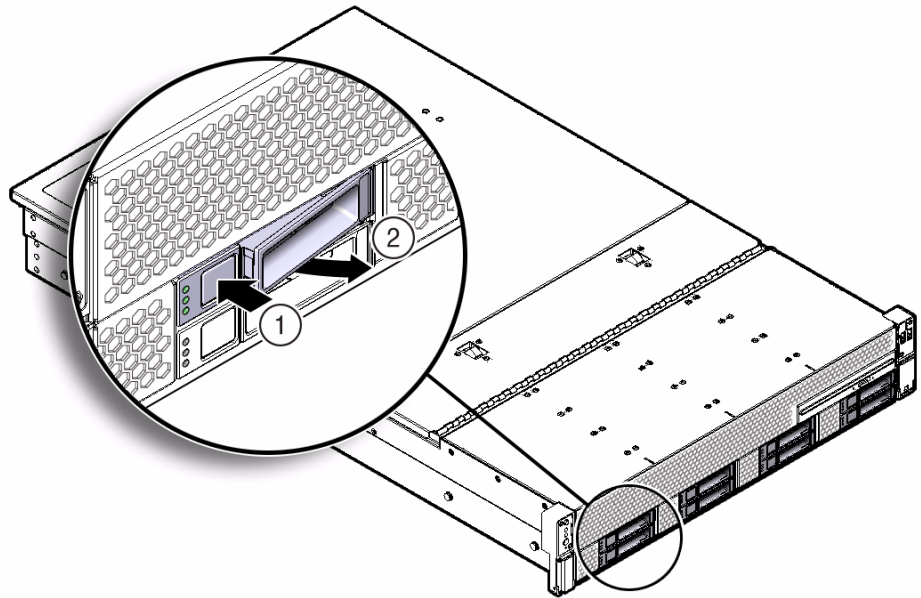


Figure Legend

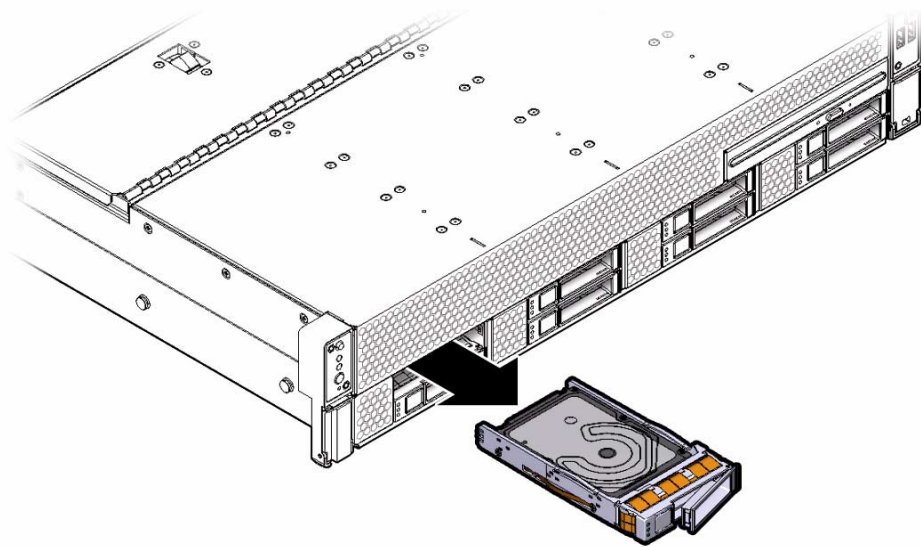
- 1 Pressing the latch release button.
- 2 Opening the latch.



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.

FIGURE: Removing a Storage Drive



6. Consider your next steps:

- If you are replacing the drive, continue to [“Install a Storage Drive” on page 50](#).
- If you are not replacing the drive, perform administrative procedures to configure the server to operate without the drive, and install a filler panel for the unoccupied drive slot. See [“Remove and Install Filler Panels” on page 160](#).



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

Related Information

- [“Storage and Boot Drive LEDs” on page 10](#)
- [“Storage Drives Hot-Plug Conditions” on page 46](#)
- [“Install a Storage Drive” on page 50](#)
- [“Install a Rear Storage Drive” on page 53](#)

▼ 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.

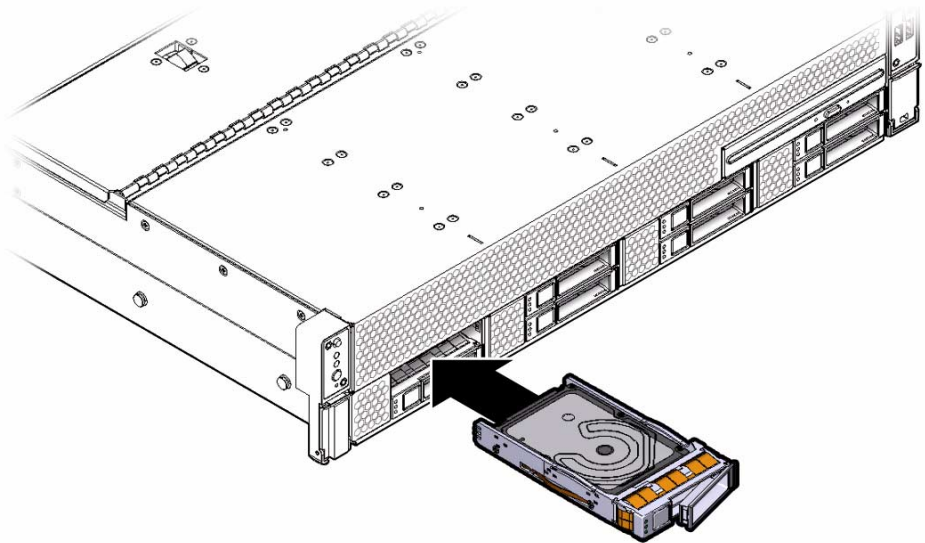
The system might have blank filler panels covering unoccupied drive slots.

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.

FIGURE: Installing a Storage Drive



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

6. Perform administrative procedures 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 and Boot Drive LEDs” on page 10](#)
- [“Storage Drives Hot-Plug Conditions” on page 46](#)
- [“Remove a Storage Drive” on page 47](#)
- [“Remove a Rear Storage Drive” on page 52](#)

▼ Remove a Rear Storage Drive

Note – Rear storage drives are supported only in the twelve 3.5-inch storage drive and twenty-four 2.5-inch storage drive configurations. Rear storage drives are not supported in the eight 2.5-inch storage drive configuration.

1. Identify the rear storage drive you want to remove.

The amber Service Required LED might be lit. For specific storage drive locations, see [“Rear Panel Components and Cable Connections” on page 6](#).



Caution – In Oracle Engineered Systems, rear storage drive 1 might be populated with a remote battery module for the host bus adapter (HBA) card. 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 19](#).

2. Remove the rear storage drive.

- a. On the storage drive that you want to remove, push the drive release button to open the latch [1].
 - b. Grasp the drive latch, and pull the drive out of the drive slot [2].
-

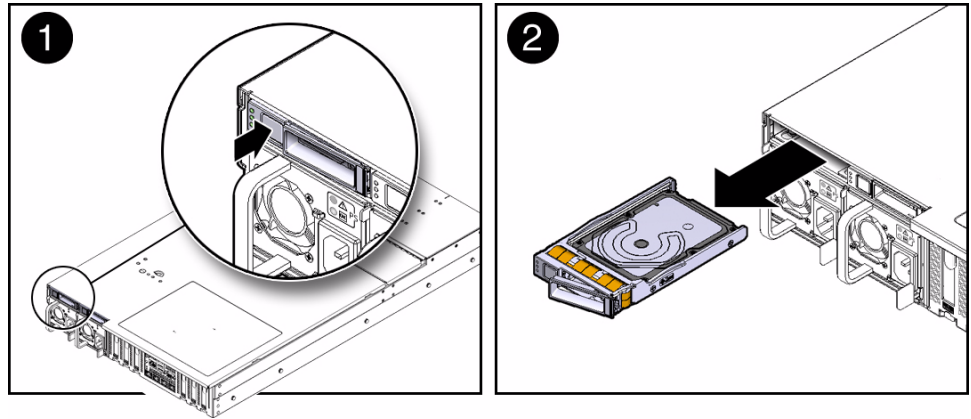


Caution – The drive latch is not an ejector. Do not bend the latch too far to the right. Doing so can damage the latch.



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

FIGURE: Removing a Rear-Mounted Storage Drive



Related Information

- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Storage and Boot Drive LEDs” on page 10](#)
- [“Battery Module” on page 19](#)
- [“Remove a Storage Drive” on page 47](#)

▼ Install a Rear Storage Drive

Note – Rear storage drives are supported only in the twelve 3.5-inch storage drive and twenty-four 2.5-inch storage drive configurations. Rear storage drives are not supported in the eight 2.5-inch storage drive configuration.

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

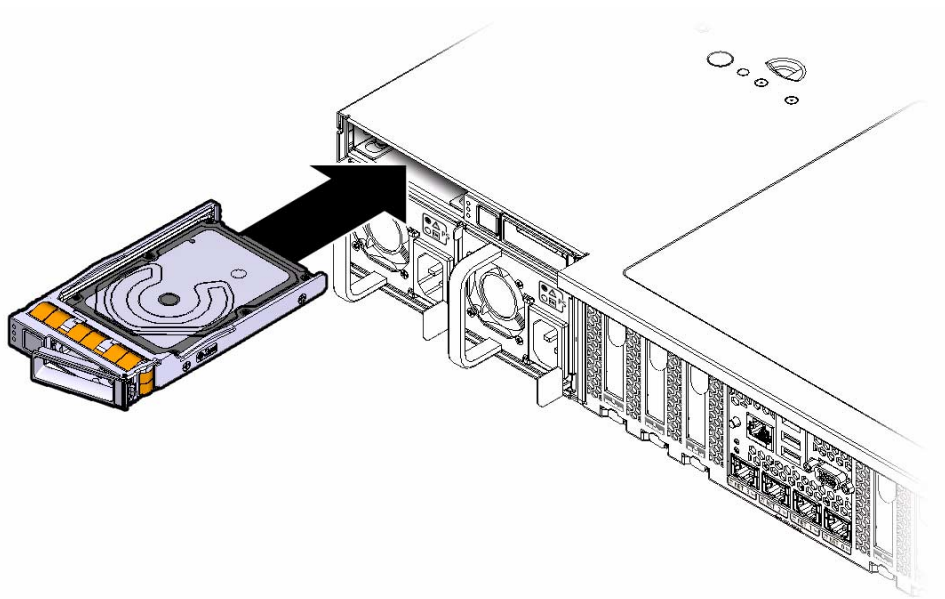
The system might have blank filler panels covering unoccupied drive slots.

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

If you removed an existing drive from a slot in the system, you must install the replacement drive in the same slot as the drive that was removed. Drives are physically addressed according to the slot in which they are installed. See [“Rear Panel Components and Cable Connections” on page 6](#) for boot drive locations.

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

FIGURE: Installing a Rear-Mounted Storage Drive



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

Related Information

- [“Install a Storage Drive” on page 50](#)
- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Storage and Boot Drive LEDs” on page 10](#)
- [“Battery Module” on page 19](#)

Servicing Fan Modules (CRU)

The fan modules are located in the front of the server.

- [“Remove a Fan Module” on page 55](#)
- [“Install a Fan Module” on page 57](#)

Related Information

- [“Remove the Server Top Cover” on page 41](#)

▼ Remove a Fan Module

1. Extend the server to the maintenance position.

See [“Extend the Server to the Maintenance Position” on page 37.](#)

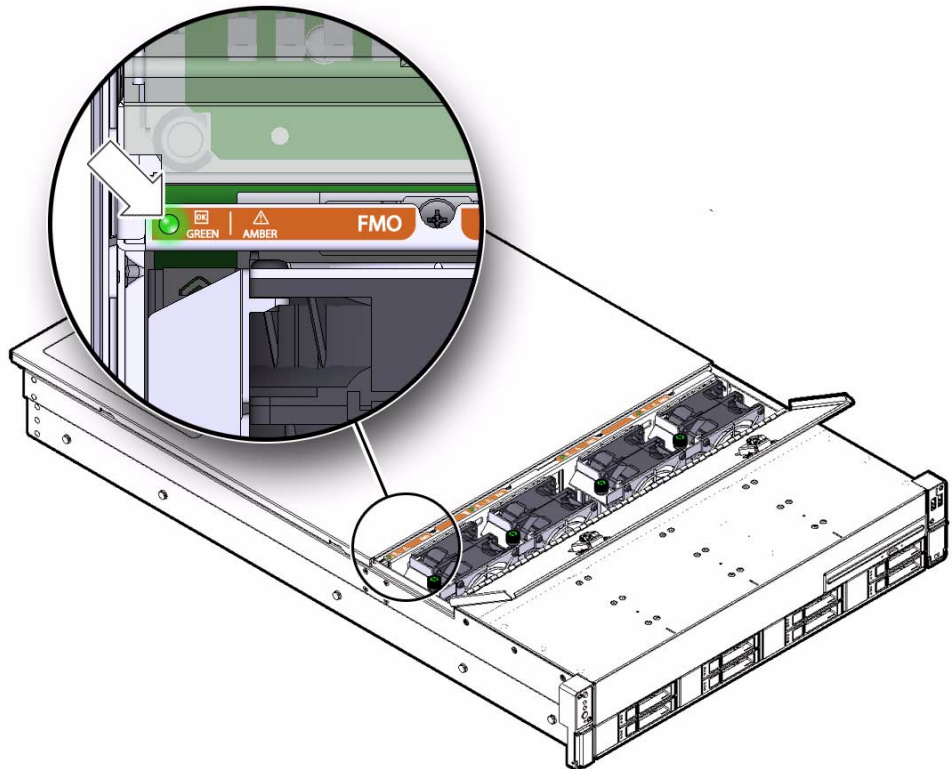
2. To access the fan modules, open the top cover fan assembly door.

Note – Close the top cover fan assembly 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, will cause the server to automatically shut down.

3. Identify the faulty fan module.

Each fan module has a fan status LED that is located next to the module. If the LED is amber, the fan has failed. The location of the fan status LED is shown in the following figure.

FIGURE: Fan Module Locations and LED Indicators



LED Color and State Meaning

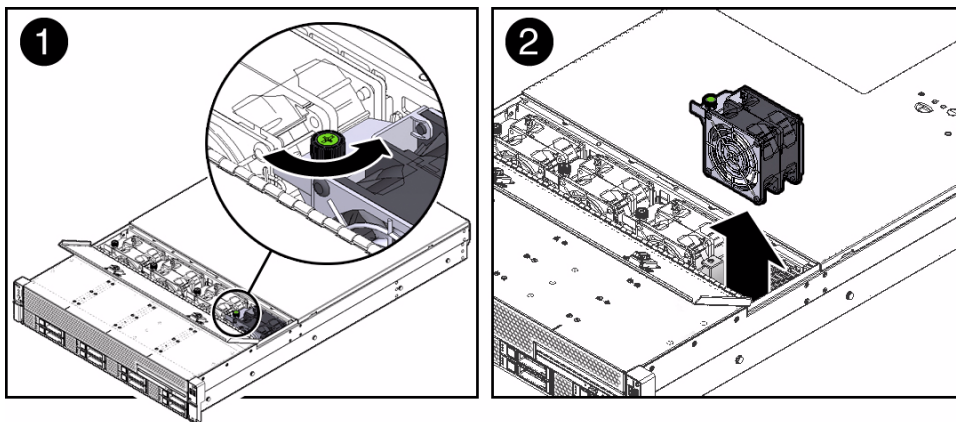
Amber - The fan module is faulty.

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. Using a No. 2 Phillips screwdriver, loosen the captive screw that secures the faulty fan module in the chassis [1].

FIGURE: Removing a Fan Module



5. Grasp both the captive screw and the opposite end of the module and lift the fan module straight up and out of the chassis, and set it aside on an antistatic mat [2].



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



Caution – When changing fan modules, note that fan modules can only 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 57](#).

Related Information

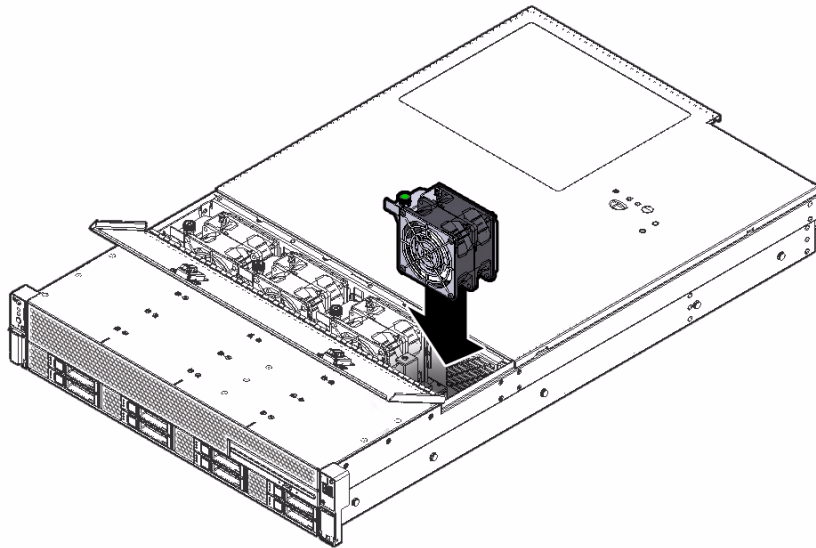
- [“Install a Fan Module” on page 57](#)

▼ Install a Fan Module

1. Remove the replacement fan module from its packaging, and place it on an antistatic mat.
2. With the top cover fan assembly 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 module status LED on the replacement fan module is lit green.
5. Using your thumb and forefinger, tighten the captive screw until finger tight. Then using a No. 2 Phillips screwdriver, tighten the captive screw an additional 1/4 turn to secure the fan module to the chassis.

6. Close the top cover fan assembly door.

7. 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 “[Server General Status Indicators](#)” on page 8 for more information about identifying and interpreting system LEDs.

8. 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 159.

Related Information

- “[Remove a Fan Module](#)” on page 55

Servicing Power Supplies (CRU)

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 server supports model A258 (1000 watt) power supplies. The A258 power supply unit (PSU) provides conversion from the AC lines to the system, accepting ranges from 100-240 volts AC (VAC). These PSUs are designed to be hot-swappable, and in most cases will provide fully redundant “1+1” power, allowing the system to suffer the loss of a PSU or an AC feed with no loss to system availability.

In maximally configured systems, it is possible that the worst-case power consumption of the system could exceed the capacity of a single PSU. The PSUs provide an over-subscription mode, which allows the system to operate with fault-tolerance even with modest excursions beyond the rated capacity of a single PSU. This over-subscription support is accomplished using hardware signaling between the PSU and motherboard circuitry, which can force the system to throttle CPU and memory power in the event that a PSU is lost. The resulting power savings will be enough to allow the system to continue to run (in a lower-performance state) until the power problem is resolved.

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

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.

- [“Remove a Power Supply” on page 60](#)
- [“Install a Power Supply” on page 61](#)

Related Information

- [“About Server and Component LEDs” on page 7](#)

▼ Remove a Power Supply

1. Identify which power supply requires replacement.

FIGURE: Power Supplies and Latches Locations

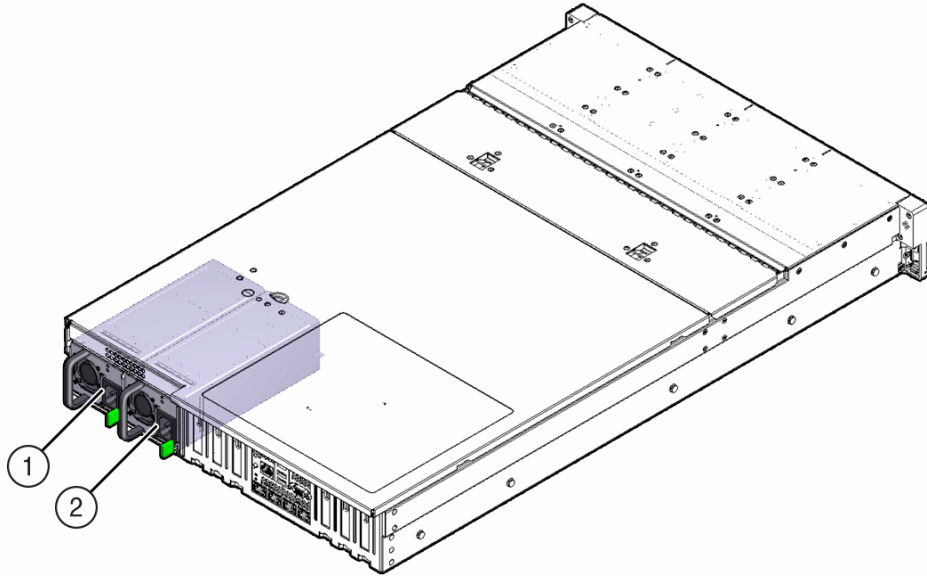


Figure Legend

-
- | | |
|---|----------------|
| 1 | Power supply 0 |
| 2 | Power supply 1 |
-

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

Alternatively, to list all known faults in the server, log into the Oracle Solaris OS and issue the `fmadm faulty` command, or log into the Oracle ILOM service processor from the FM captive shell and issue the `fmadm faulty` command.

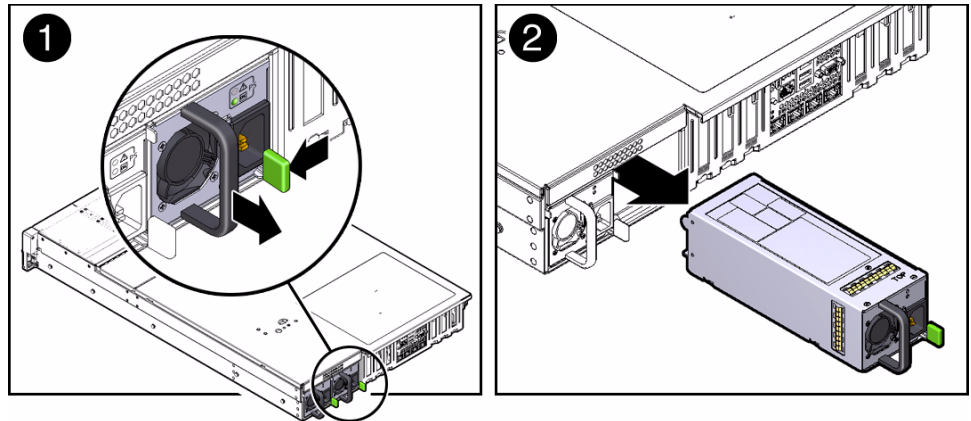
Note – The fans of a failed power supply might still be spinning when the system is powered on. The fans will stop spinning when you disconnect the power cords.

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

3. If necessary, release the cable management arm (CMA).

- a. Press and hold the metal CMA release tab.
- b. Rotate the CMA out of the way so that you can access the power supply.
4. Disconnect the power cord from the faulty power supply.
5. Grasp the power supply handle and push the power supply latch to the left [1].

FIGURE: Removing a Power Supply



6. Pull the power supply out of the chassis [2].
7. Continue to [“Install a Power Supply”](#) on page 61.

Related Information

- [“Rear Panel Components and Cable Connections”](#) on page 6
- [“Power Supply LEDs”](#) on page 10
- [“Install a Power Supply”](#) on page 61

▼ Install a Power Supply

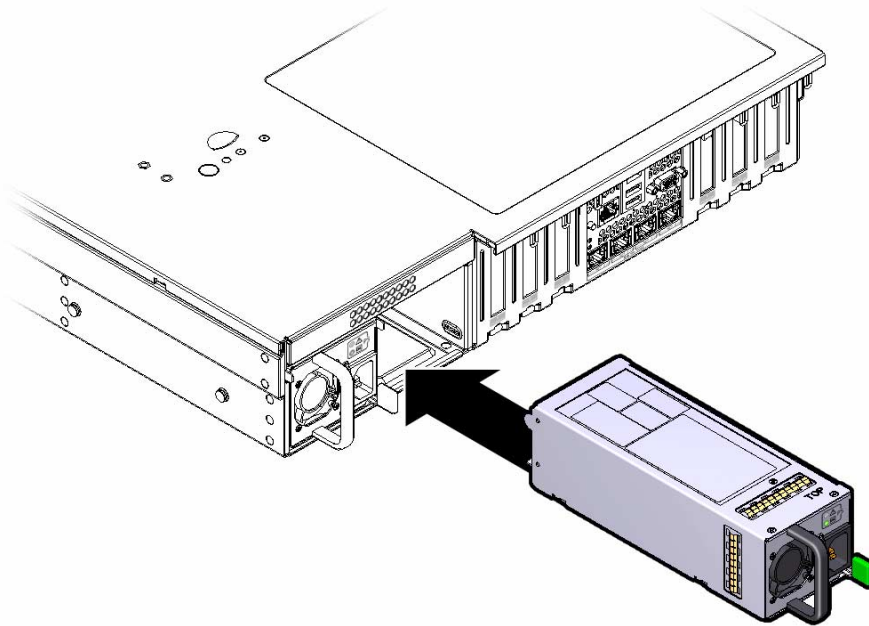


Caution – Always replace the failed power supply with the same type of power supply.

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.

FIGURE: Installing a Power Supply



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 are not lit on the front and rear panels.

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

- “Rear Panel Components and Cable Connections” on page 6
- “Power Supply LEDs” on page 10
- “Remove a Power Supply” on page 60

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.

Description	Links
Service the DIMMs.	“Servicing the DIMMs (CRU)” on page 63
Service the PCIe cards.	“Servicing PCIe Cards (CRU)” on page 76
Service the SAS expander module.	“Servicing the SAS Expander Module (CRU)” on page 81
Service the air baffle.	“Servicing the Air Baffle (CRU)” on page 85
Service the DVD drive.	“Servicing the DVD Drive (CRU)” on page 88
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 93

Related Information

- [“Servicing CRUs That Do Not Require Server Power-Off” on page 45](#)
- [“Servicing FRUs” on page 97](#)

Servicing the DIMMs (CRU)

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

Note – While the Sun Server X3-2L does support single-rank DIMMs, that is, single-rank DIMMs can be installed in the server, Oracle does not offer any single-ranks 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 [“Electrostatic Discharge Safety”](#) on page 30.



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.

When replacing or upgrading a DIMM on the server, consider the following:

Description	Links
Learn the location of the DIMM sockets in relation to the processors.	“DIMM and Processor Physical Layout” on page 65
Learn the rules to follow when installing DIMMs in slots.	“DIMM Population Rules” on page 68
Understand the classification rank labels on DIMMs.	“DIMM Rank Classification Labels” on page 70
Review how Oracle ILOM and BIOS identify DIMM fault locations, and review inconsistencies between DIMM fault LEDs and BIOS mapping.	“Inconsistencies Between DIMM Fault LEDs and the BIOS Isolation of Faulty DIMMs” on page 71
Identify the faulty DIMM using the Fault Remind button.	“Using the Fault Remind Button” on page 71
Remove the faulty DIMMs from the server.	“Remove Faulty DIMMs” on page 72
Install replacement or new DIMMs.	“Install DDR3 DIMMs” on page 75

Related Information

- [“Servicing the Air Baffle \(CRU\)”](#) on page 85
- [“Servicing Processors \(FRU\)”](#) on page 97

DIMM and Processor Physical Layout

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

FIGURE: DIMM and Processor Physical Layout

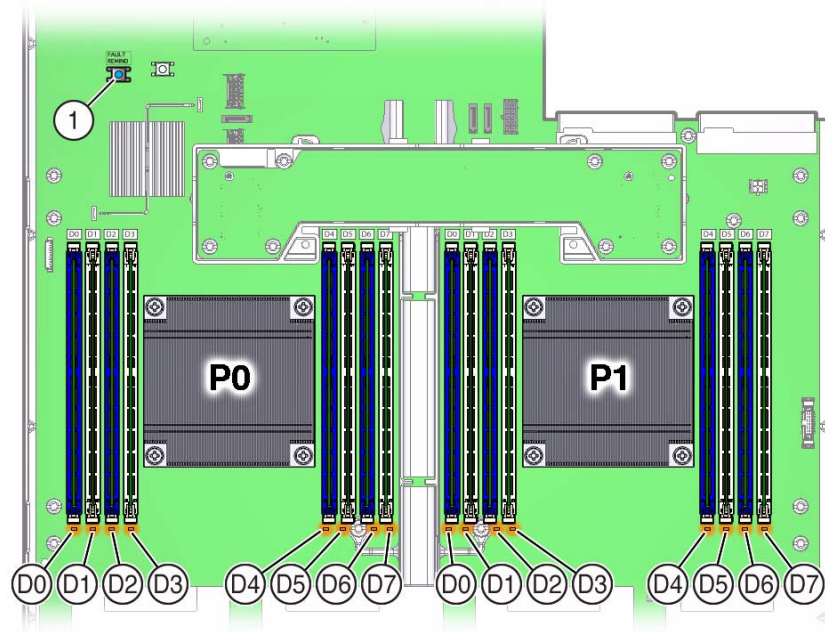


Figure Legend

1 Fault Remind button

Note – Only DIMM sockets associated with processor P0 are supported in single-processor systems.

Related Information

- [“DIMM Rank Classification Labels” on page 70](#)
- [“Inconsistencies Between DIMM Fault LEDs and the BIOS Isolation of Faulty DIMMs” on page 71](#)
- [“Remove Faulty DIMMs” on page 72](#)
- [“Install DDR3 DIMMs” on page 75](#)

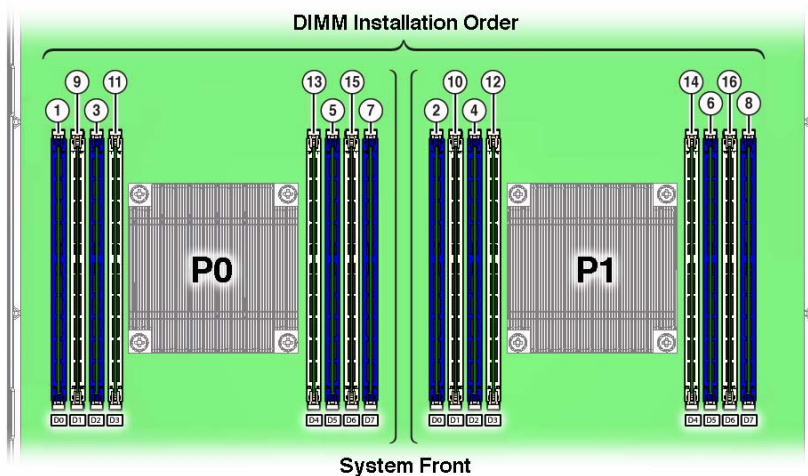
DIMM Population Example for Optimal System Performance

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 on a dual-processor system. On a single-processor system, you should follow the same order except that you should only install DIMMs in the DIMM sockets for processor 0 (P0). On a single-processor system, a DIMM filler panel must always be installed in processor 1 (P1) DIMM socket D7.

FIGURE: DIMM Population Example



For more information on populating the DIMMs, see the following topics:

- “DIMM Population Order for Single-processor Systems” on page 66
- “DIMM Population Order for Dual-processor Systems” on page 67

DIMM Population Order for Single-processor Systems

For single-processor systems, DIMMs should only be installed into DIMM sockets associated 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 Example on page 66](#).

The following table describes the order in which the DIMMs should be populated on a single-processor system. The figure callouts in column two of the table refer to the callouts in [FIGURE: DIMM Population Example on page 66](#).

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

For 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 Example on page 66](#).

The following table describes the order in which the DIMMs should be populated on a dual-processor system. The figure callouts in columns two and four of the table refer to callouts in [FIGURE: DIMM Population Example on page 66](#).

TABLE: DIMM Population Order for Dual-processor Systems

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

TABLE: DIMM Population Order for Dual-processor Systems (*Continued*)

Population Order	Figure Callouts	DIMMs Sockets for Processor 0 (P0)	Figure Callouts	DIMMs Sockets for Processor 1 (P1)
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:

- On dual-processor systems, all DIMM sockets must have either a DIMM or DIMM filler.
- On single-processor systems, all DIMM sockets associated with processor socket P0 can have either a DIMM or DIMM filler panel.

Note – A DIMM filler panel must always be installed in processor 1 (P1) DIMM socket D7 to support proper air flow for cooling; however, DIMM filler panels are not required in any of the other DIMM sockets for P0 or P1.

- 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 Sun Server X3-2L supports four modes of operation—Independent Channel mode, Lockstep Channel mode, Mirrored Channel mode, and Device Tagging mode—the Sun Server X3-2L 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 sockets. For an example of a configuration that follows this rule, see [“DIMM Population Example for Optimal System Performance” on page 66](#).
- 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 or DR 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 the specific processor installed in your system
- 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

Blue Socket	White Socket	Speed
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

Related Information

- [“DIMM and Processor Physical Layout” on page 65](#)
- [“DIMM Rank Classification Labels” on page 70](#)
- [“Inconsistencies Between DIMM Fault LEDs and the BIOS Isolation of Faulty DIMMs” on page 71](#)
- [“Remove Faulty DIMMs” on page 72](#)
- [“Install DDR3 DIMMs” on page 75](#)

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 Classification Labels

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

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

Related Information

- “DIMM and Processor Physical Layout” on page 65
- “Remove Faulty DIMMs” on page 72
- “Install DDR3 DIMMs” on page 75

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.dimmi.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 and the DIMM fault is cleared using Oracle ILOM, the memory available to the operating system returns to normal. You can use the Oracle ILOM web interface or the command-line interface (CLI) to manually clear faults. For information on how to use the Oracle ILOM web interface or the CLI to clear server faults, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:

<http://www.oracle.com/pls/topic/lookup?ctx=ilom31>.

Related Information

- “DIMM and Processor Physical Layout” on page 65
- “Remove Faulty DIMMs” on page 72
- “Install DDR3 DIMMs” on page 75

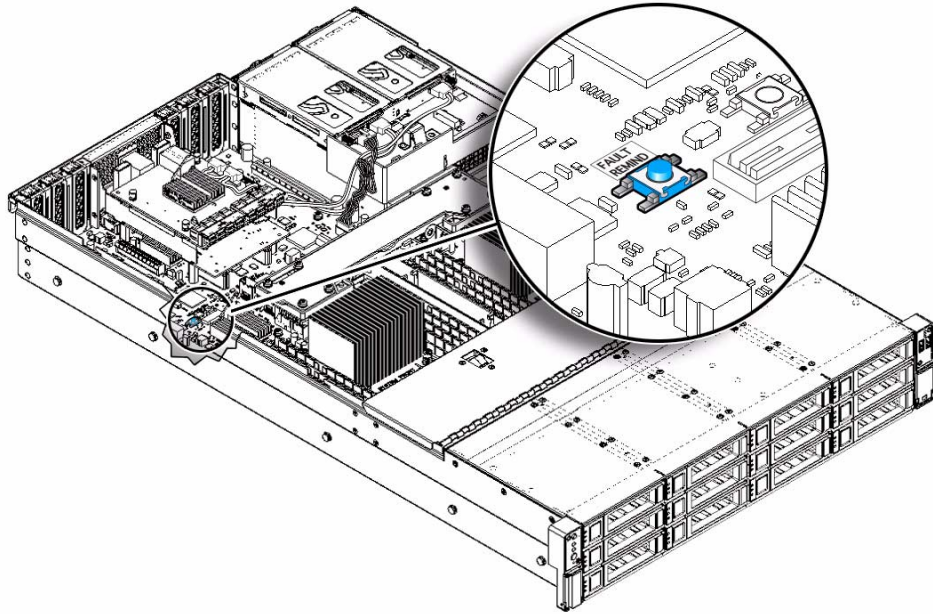
Using the Fault Remind Button

When the Fault Remind button is pressed, an 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: DIMM Fault Remind Button Location



▼ Remove Faulty DIMMs

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

1. Prepare the server for service.

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

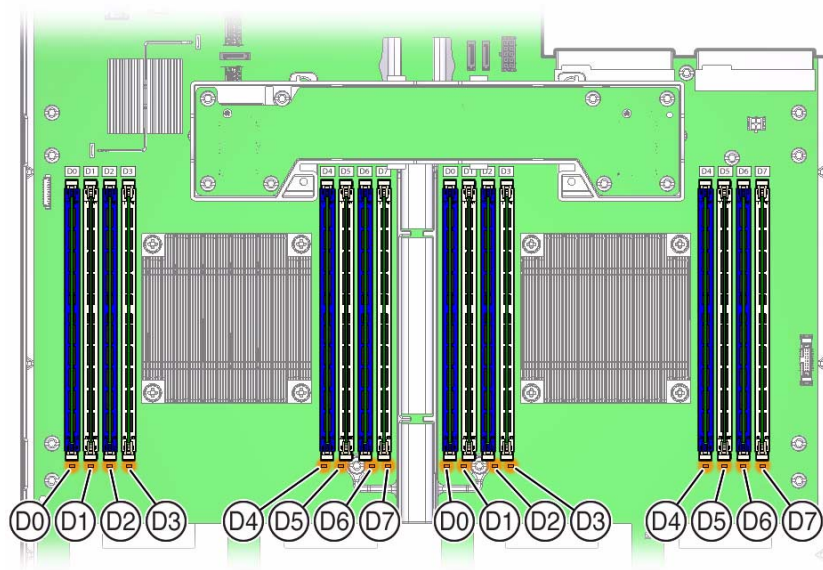
See [“Powering Down the Server”](#) on page 32.

- b. Extend the server into the maintenance position.

See [“Extend the Server to the Maintenance Position”](#) on page 37.

- c. **Attach an antistatic wrist strap.**
See [“Electrostatic Discharge Safety”](#) on page 30.
 - d. **Remove the top cover.**
See [“Remove the Server Top Cover”](#) on page 41.
 - e. **Remove the air baffle.**
See [“Servicing the Air Baffle \(CRU\)”](#) on page 85.
2. **Replace the faulty DIMMs.**
 - a. **To identify the location of the faulty DDR3 DIMMs, press the Fault Remind button on the motherboard**
See [“Using the Fault Remind Button”](#) on page 71.
 - b. **Note the location of faulty DDR3 DIMMs.**
Faulty DIMMs are identified with a corresponding amber LED on the motherboard.
 - If the DIMM fault LED is off, the DIMM is operating properly.
 - If the DIMM fault LED is on (amber), the DIMM is faulty and should be replaced.

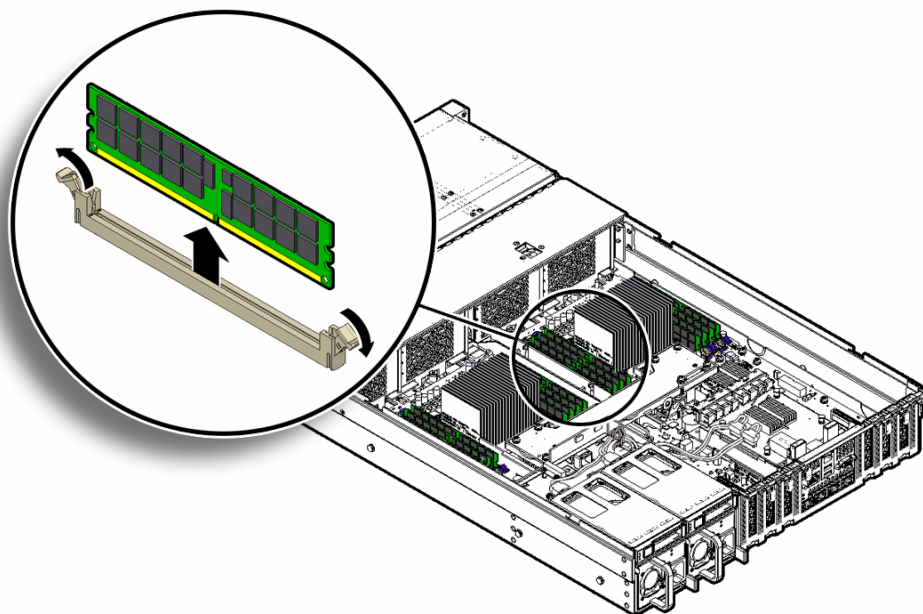
FIGURE: Identifying Faulty DIMMs



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

- Rotate both DIMM socket ejectors outward as far as they will go.
The DIMM is partially ejected from the socket.
- Carefully lift the DIMM straight up to remove it from the socket.

FIGURE: Removing a DIMM



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

For DIMM replacement instructions, see [“Install DDR3 DIMMs” on page 75](#).

Note – With one exception, DIMM filler panels are optional and not required. The exception is processor 1 (P1) DIMM socket D7 in single-processor systems, which is required to support proper air flow for cooling.

Related Information

- [“DIMM and Processor Physical Layout” on page 65](#)
- [“DIMM Population Rules” on page 68](#)
- [“DIMM Rank Classification Labels” on page 70](#)
- [“Install DDR3 DIMMs” on page 75](#)

▼ Install DDR3 DIMMs

1. **Unpack the new or replacement DDR3 DIMMs, and place them on an antistatic mat.**
2. **Ensure that the DDR3 DIMMs match the sizes of the DDR3 DIMMs they are replacing.**

If you violate the DIMM population rules, the performance of the server might be adversely affected. For DIMM population rules, see [“DIMM Population Rules” on page 68](#).

3. **Install the DIMMs.**

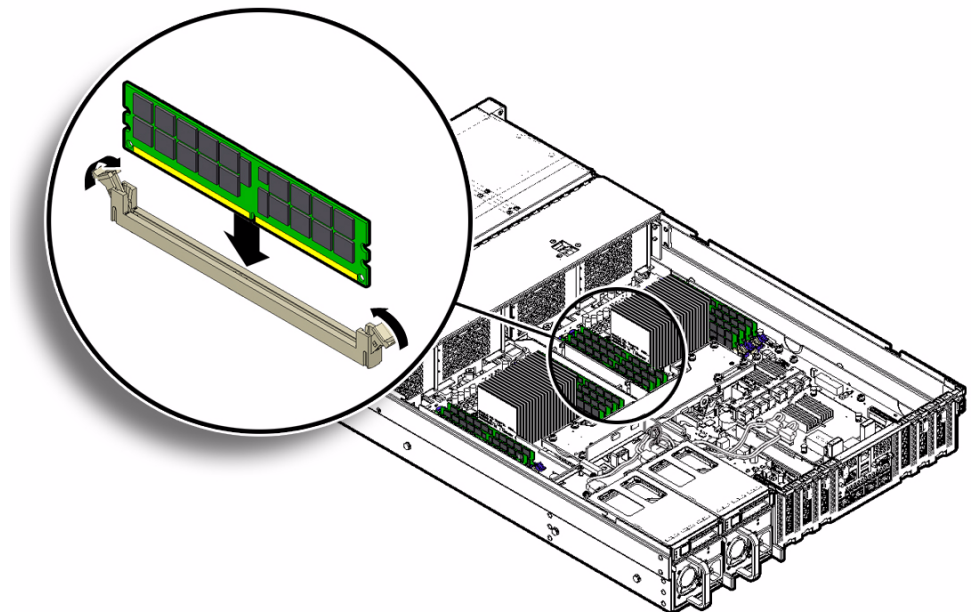
- a. **Ensure that the ejector tabs are in the open position.**
- b. **Align the notch in the replacement DIMM with the key in the connector.**

The aligned notch ensures that the DIMM is oriented correctly.

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

FIGURE: Installing a DIMM



4. Repeat [Step 3](#) until all replacement DIMMs are installed.
5. Return the server to operation:
 - a. Install the air baffle.
See [“Install the Air Baffle”](#) on page 86.
 - b. Install the top cover.
See [“Install the Top Cover”](#) on page 161.
 - c. Return the server to the normal rack position.
See [“Reinstall the Server Chassis in the Rack”](#) on page 164.
 - d. Reconnect the power cords to the server power supplies, and power on the server.
See [“Reconnect Power and Data Cables”](#) on page 165 and [“Power On the Server”](#) on page 165. Verify that the AC OK LED is lit.
6. (Optional) Use Oracle ILOM to clear server DDR3 DIMM faults.
DDR3 DIMM faults are automatically cleared after a new memory DIMM has been installed. If you need to manually clear DDR3 DIMM faults, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:
<http://www.oracle.com/pls/topic/lookup?ctx=ilom31>.

Related Information

- [“DIMM and Processor Physical Layout”](#) on page 65
- [“DIMM Population Rules”](#) on page 68
- [“DIMM Rank Classification Labels”](#) on page 70
- [“Remove Faulty DIMMs”](#) on page 72

Servicing PCIe Cards (CRU)

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

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

- [“PCIe Slot Locations”](#) on page 77

- “Remove a PCIe Card” on page 78
- “Install a PCIe Card” on page 79

Related Information

- “Servicing the Air Baffle (CRU)” on page 85
- “Servicing the SAS Expander Module (CRU)” on page 81

PCIe Slot Locations

There are six PCIe slots available for optional PCIe cards. The following figure shows the PCIe slot numbering.

FIGURE: PCIe Slot Locations

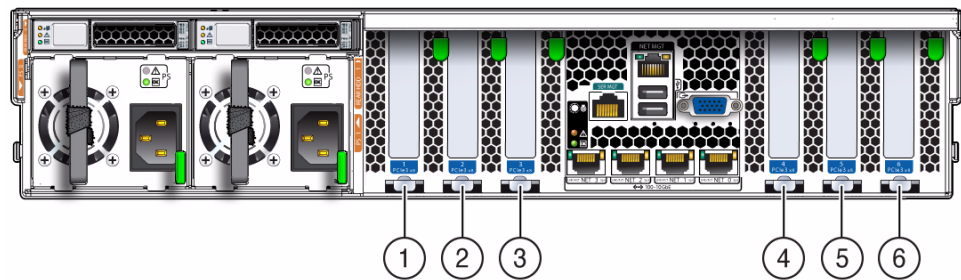


Figure Legend

- | | |
|---|---|
| 1 | PCIe slot 1 (PCIe slot 1 is nonfunctional in single-processor systems.) |
| 2 | PCIe slot 2 (PCIe slot 2 is nonfunctional in single-processor systems.) |
| 3 | PCIe slot 3 (PCIe slot 3 is nonfunctional in single-processor systems.) |
| 4 | PCIe slot 4 |
| 5 | PCIe slot 5 |
| 6 | PCIe slot 6 (Primary internal HBA card slot) |

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

Related Information

- “Remove a PCIe Card” on page 78
- “Install a PCIe Card” on page 79

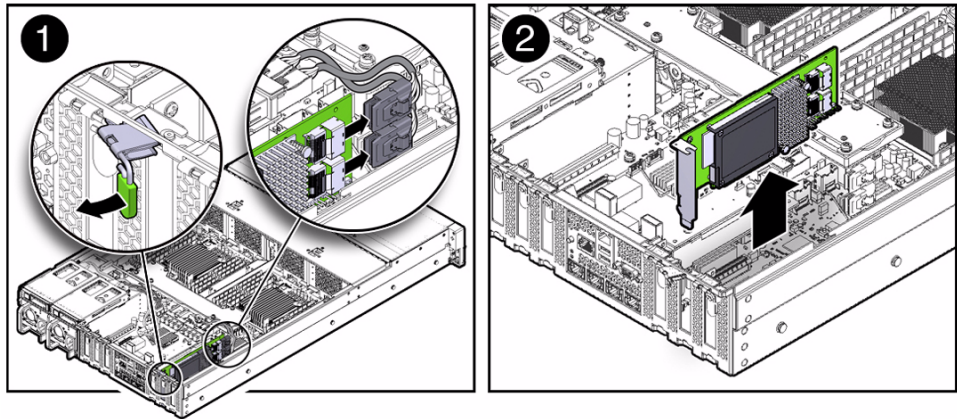
▼ Remove a PCIe Card

Note – PCIe slots 1, 2, and 3 are nonfunctional in single-processor systems.

Note – Prior to replacing or installing a PCIe card, refer to the card documentation for specific installation and cabling instructions.

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 37.
 - c. **Attach an antistatic wrist strap.**
See [“Electrostatic Discharge Safety”](#) on page 30.
 - d. **Remove the top cover.**
See [“Remove the Server Top Cover”](#) on page 41.
2. **Locate the PCIe card that you want to remove.**
See [“PCIe Slot Locations”](#) on page 77.
3. **If necessary, make a note of where the PCIe cards are installed.**
4. **Unplug all data cables from the PCIe card [1].**
5. **Rotate the PCIe card locking mechanism [1], and then lift up on the PCIe card to disengage it from the motherboard connectors [2].**

FIGURE: Removing a PCIe Card



6. Place the PCIe card on an antistatic mat.



Caution – If you are not immediately inserting a replacement PCIe card into the empty slot, insert a PCIe filler panel in the slot to reduce the possibility of radiated electromagnetic interference (EMI). For instructions for installing a PCIe filler panel, see [“Remove and Install Filler Panels” on page 160](#).

Related Information

- [“PCIe Slot Locations” on page 77](#)
- [“Install a PCIe Card” on page 79](#)

▼ Install a PCIe Card

Note – PCIe slots 1, 2, and 3 are nonfunctional in single-processor systems.

1. Unpack the replacement PCIe card, and place it on an antistatic mat.
2. Locate the proper PCIe slot for the card you are replacing.

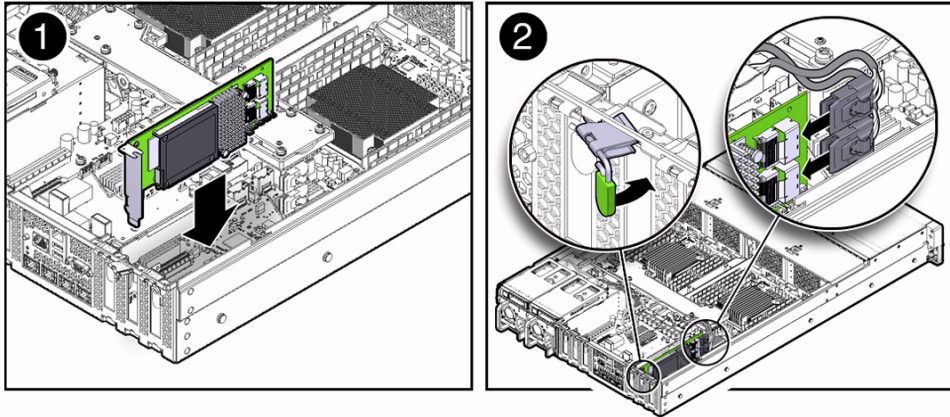
Note – PCIe slot 6 is the primary slot for the internal HBA for controlling and managing the storage drives.

3. If necessary, remove the PCIe filler panel from the slot.

Note – Save this filler panel in case you ever need to remove the PCIe card from the system.

4. Insert the PCIe card into the correct slot [1], and rotate the PCIe locking mechanism to secure the PCIe card in place [2].

FIGURE: Installing a PCIe Card



5. Reconnect the cables to the PCIe card that you unplugged during the removal procedure [2].
6. Return the server to operation.
 - a. Install the top cover.
See [“Install the Top Cover”](#) on page 161.
 - b. Return the server to the normal rack position.
See [“Reinstall the Server Chassis in the Rack”](#) on page 164.
 - c. Connect any required data cables to the PCIe card.
Route data cables through the cable management arm.
 - d. Reconnect the power cords to the power supplies and power on the server.
See [“Reconnect Power and Data Cables”](#) on page 165 and [“Power On the Server”](#) on page 165. Verify that the AC OK LED is lit.

7. Use Oracle ILOM to clear the server PCIe card fault.

You can use the Oracle ILOM web interface or the command-line interface (CLI) to manually clear faults. For information on how to use the Oracle ILOM web interface or the CLI to clear server faults, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at:

<http://www.oracle.com/pls/topic/lookup?ctx=ilom31>.

8. To determine if additional steps are required to complete the installation of the PCIe card, see the server product notes for the type of PCIe card you installed.

For a complete listing of the PCIe host bus adapter (HBA) cards supported by the server, refer to the *Sun Server X3-2L Product Notes* at:

<http://www.oracle.com/pls/topic/lookup?ctx=SunServerX3-2L>.

Related Information

- “PCIe Slot Locations” on page 77
- “Remove a PCIe Card” on page 78

Servicing the SAS Expander Module (CRU)

The SAS expander module serves as an interface between the storage drive backplane and the storage drive cables that connect to the HBA PCIe card.



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

- “Remove the SAS Expander Module” on page 82
- “Install the SAS Expander Module” on page 83

Related Information

- “Servicing Storage Drives and Rear Drives (CRU)” on page 45
- “Servicing PCIe Cards (CRU)” on page 76
- “Servicing Cables (FRU)” on page 132

▼ Remove the SAS Expander Module

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 37.

- c. Attach an antistatic wrist strap.

See [“Electrostatic Discharge Safety”](#) on page 30.

- d. Remove the top cover.

See [“Remove the Server Top Cover”](#) on page 41.

2. Remove the SAS expander module.

- a. Locate the SAS expander module [1].

- b. Disconnect the HBA cable and SAS cables from the SAS expander module [1 and 2].

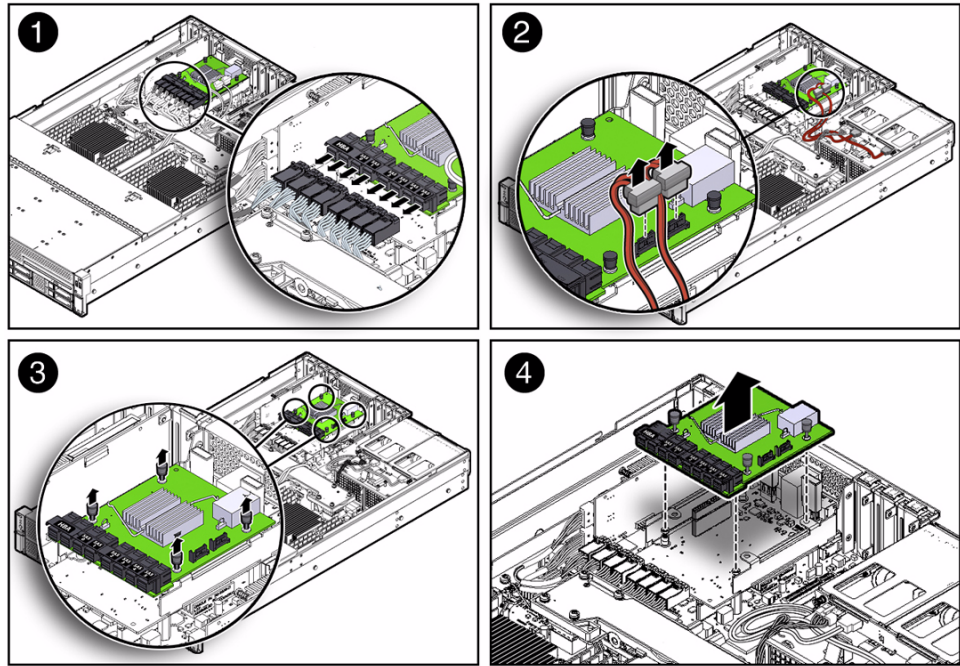
See [“Remove Storage Drive Cables From a SAS/SATA Configuration”](#) on page 132.

- c. Locate and loosen the four black push pins that secure the SAS expander module to the server’s chassis. Loosen each push pin by pulling up on the pin until it clicks into the open position [3].

- d. Grasp the sides of the SAS expander module, and gently lift the module to disengage the module from the chassis connector [4].

- e. Place the SAS expander module on an antistatic mat.

FIGURE: Removing the SAS Expander Module



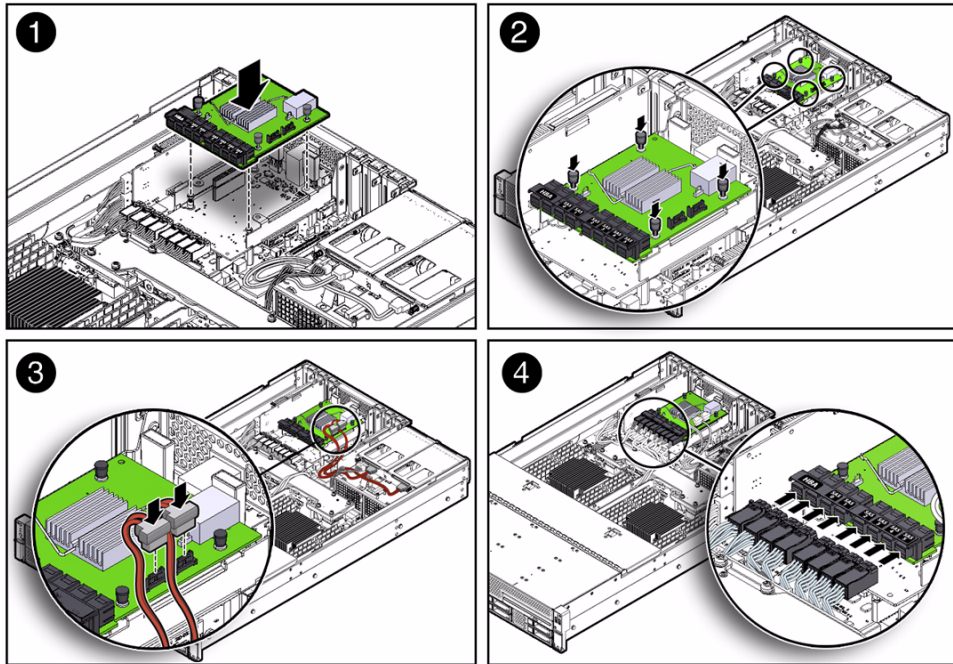
Related Information

- [“Install the SAS Expander Module” on page 83](#)
- [“Remove Storage Drive Cables From a SAS/SATA Configuration” on page 132](#)

▼ Install the SAS Expander Module

1. Install the SAS expander module.
 - a. Lower the SAS expander module into the server chassis, and gently push down on the module to engage the chassis connector [1].
 - b. Push down on the four black push pins to secure the SAS expander module to the server's chassis [2].

FIGURE: Installing the SAS Expander Module



- c. Connect the HBA cable and SAS cables to the SAS expander module [3 and 4].

See [“Install Storage Drive Cables in a SAS/SATA Configuration” on page 135](#).

2. Return the server to operation.

- a. Install the top cover.

See [“Install the Top Cover” on page 161](#).

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

See [“Reinstall the Server Chassis in the Rack” on page 164](#).

- c. Reconnect the power cords to the power supplies and power on the server.

See [“Reconnect Power and Data Cables” on page 165](#) and [“Power On the Server” on page 165](#). Verify that the AC OK LED is lit.

Related Information

- [“Remove the SAS Expander Module” on page 82](#)
- [“Install Storage Drive Cables in a SAS/SATA Configuration” on page 135](#)

Servicing the Air Baffle (CRU)

You must remove the air baffle to access certain motherboard components, such as DIMMs and processors.



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



Caution – You must disconnect all power cables from the system before performing this procedure.

- [“Remove the Air Baffle” on page 85](#)
- [“Install the Air Baffle” on page 86](#)

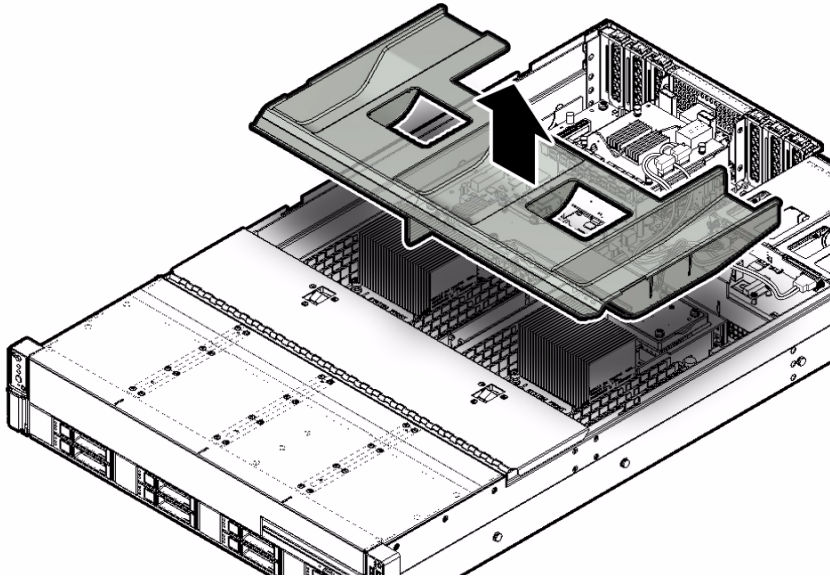
Related Information

- [“Servicing the DIMMs \(CRU\)” on page 63](#)
- [“Servicing Processors \(FRU\)” on page 97](#)

▼ Remove the Air Baffle

1. **Prepare the server for service.**
 - a. **Power off the server and disconnect the power cords from the server power supplies.**
See [“Powering Down the Server” on page 32](#).
 - b. **Extend the server into the maintenance position.**
See [“Extend the Server to the Maintenance Position” on page 37](#).
 - c. **Attach an antistatic wrist strap.**
See [“Electrostatic Discharge Safety” on page 30](#).
 - d. **Remove the top cover.**
See [“Remove the Server Top Cover” on page 41](#).
2. **Remove the air baffle by lifting the baffle up and out of the server.**

FIGURE: Removing the Air Baffle



3. Set the air baffle aside.

4. Consider your next step:

- If you removed the air baffle as part of another procedure, return to that procedure.
- Otherwise, continue to [“Install the Air Baffle” on page 86](#).

Related Information

- [“Install the Air Baffle” on page 86](#)
- [“Servicing the DIMMs \(CRU\)” on page 63](#)
- [“Servicing Processors \(FRU\)” on page 97](#)

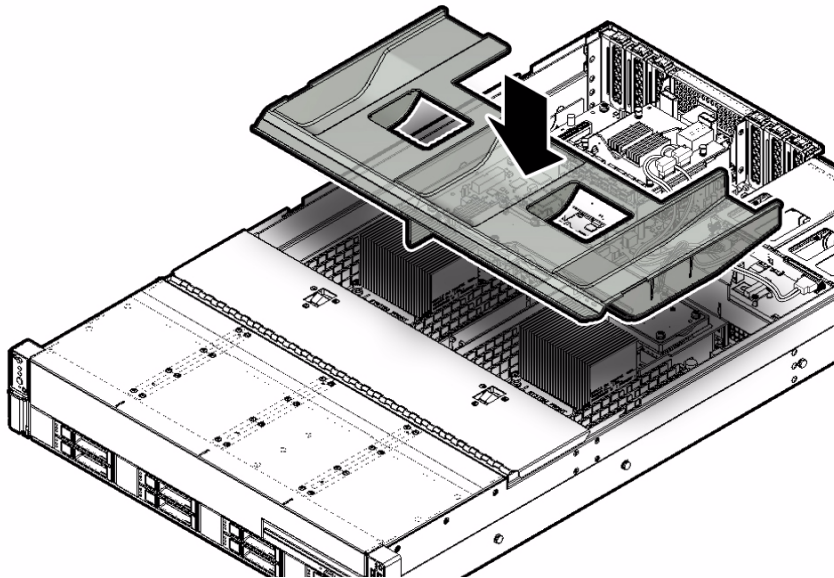
▼ Install the Air Baffle



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

1. Remove the replacement air baffle from its packaging.
2. Install the air baffle by placing it into the server and lowering it to its down position.

FIGURE: Installing the Air Baffle



3. Consider your next step:

- If you installed the air baffle as part of another procedure, return to that procedure.
- Otherwise, continue with this procedure.

4. Return the server to operation.

a. Install the top cover.

See [“Install the Top Cover” on page 161.](#)

b. Return the server to the normal rack position.

See [“Reinstall the Server Chassis in the Rack” on page 164.](#)

c. Reconnect the power cords to the server power supplies, and power on the server.

See [“Reconnect Power and Data Cables” on page 165](#) and [“Power On the Server” on page 165](#). Verify that the AC OK LED is lit.

Related Information

- [“Remove the Air Baffle” on page 85](#)

Servicing the DVD Drive (CRU)

The DVD drive is available only on eight-drive systems. The DVD drive is accessible from the chassis front panel and by opening the fan door assembly.

- [“Remove the DVD Drive” on page 88](#)
- [“Install the DVD Drive” on page 89](#)

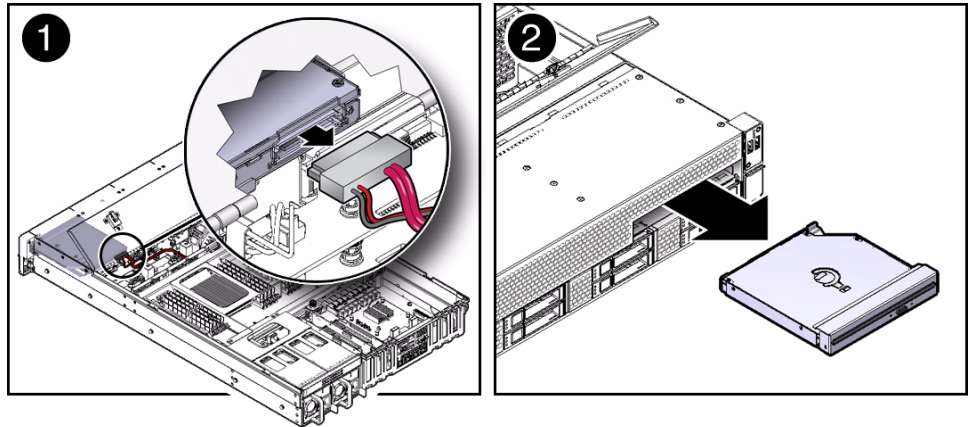
Related Information

- [“Servicing Fan Modules \(CRU\)” on page 54](#)

▼ Remove the DVD Drive

1. **Remove media from the drive.**
2. **Prepare the server for service.**
 - a. **Power off the server and disconnect the power cords from the server power supplies.**
[See “Powering Down the Server” on page 32.](#)
 - b. **Extend the server into the maintenance position.**
[See “Extend the Server to the Maintenance Position” on page 37.](#)
 - c. **Attach an antistatic wrist strap.**
[See “Electrostatic Discharge Safety” on page 30.](#)
 - d. **Open the fan assembly door.**
3. **Remove fan modules 2 and 3 from the chassis.**
[See “Remove a Fan Module” on page 55.](#)
4. **Reach into the server directly behind the DVD drive, and disconnect the power and communication connector from rear of the DVD drive [1].**

FIGURE: Removing a DVD Drive



5. Lift up on the release tab on the rear of the DVD drive to disengage the drive from chassis.
6. Gently push the DVD forward and out of the front of the chassis [2].
7. Standing in front of the chassis, grasp the DVD drive with both hands, and continue to pull the DVD drive from the chassis until it clears the front of the server.
8. Place the DVD drive on an antistatic mat.

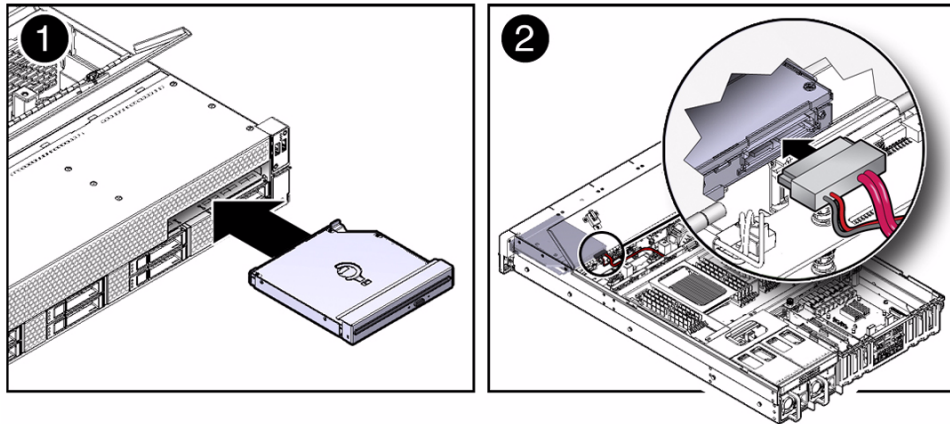
Related Information

- [“Install the DVD Drive” on page 89](#)

▼ Install the DVD Drive

1. Gently push the replacement DVD drive into the chassis [1].
2. Continue to push the DVD drive into the chassis until the release tab on the rear of the drive engages the chassis with an audible click.

FIGURE: Installing a DVD Drive



3. Reach into the server directly behind the DVD drive, and reconnect the power and communication connector to the rear of the DVD drive [2].
4. Reinstall fan modules 2 and 3 in the chassis, and close the fan assembly door.
See [“Install a Fan Module” on page 57](#).
5. Return the server to operation.
 - a. Return the server to the normal rack position.
See [“Reinstall the Server Chassis in the Rack” on page 164](#).
 - b. Reconnect the power cords to the server power supplies, and power on the server.
See [“Reconnect Power and Data Cables” on page 165](#) and [“Power On the Server” on page 165](#). Verify that the AC OK LED is lit.

Related Information

- [“Remove the DVD Drive” on page 88](#)

Servicing the Internal USB Flash Drives (CRU)

This section covers the following topics:

- [“Remove an Internal USB Flash Drive” on page 91](#)

- [“Install an Internal USB Flash Drive” on page 92](#)

Related Information

- [“Servicing the Air Baffle \(CRU\)” on page 85](#)

▼ Remove an Internal USB Flash Drive

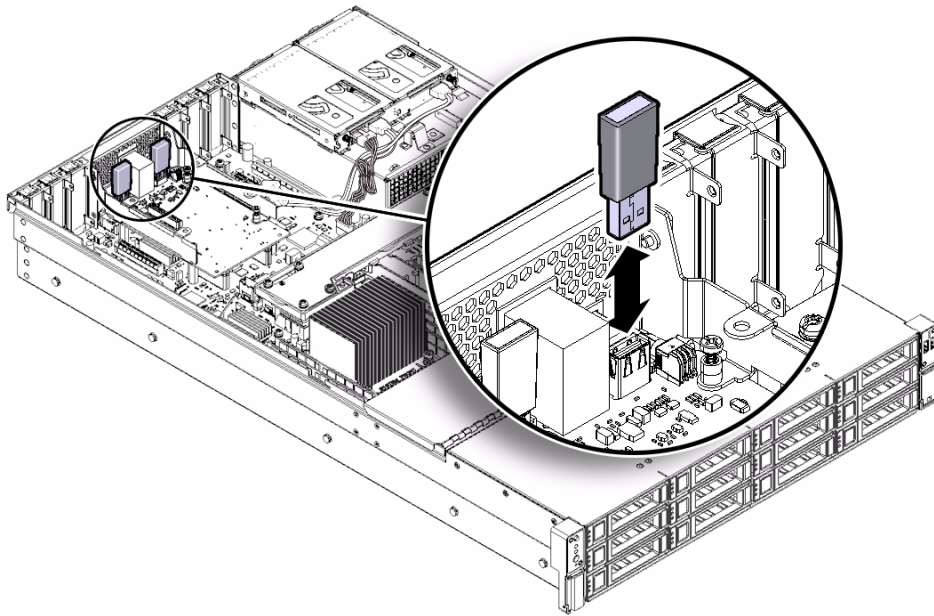
The server can be equipped with up to two internal USB Flash drives.



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

1. **Prepare the server for service.**
 - a. **Power off the server and disconnect the power cords from the server power supplies.**
See [“Powering Down the Server” on page 32](#).
 - b. **Extend the server into maintenance position.**
See [“Extend the Server to the Maintenance Position” on page 37](#).
 - c. **Attach an antistatic wrist strap.**
See [“Electrostatic Discharge Safety” on page 30](#).
 - d. **Remove the top cover.**
See [“Remove the Server Top Cover” on page 41](#).
2. **To remove a USB flash drive, grasp the flash drive and pull it from the slot.**

FIGURE: Removing the USB Flash Drive



Related Information

- [“Install an Internal USB Flash Drive” on page 92](#)

▼ Install an Internal USB Flash Drive



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

1. Unpack the replacement USB flash drive.
2. Insert the flash drive into the USB slot.
3. Return the server to operation.
 - a. Install the top cover.
[See “Install the Top Cover” on page 161.](#)
 - b. Return the server to the normal rack position.
[See “Reinstall the Server Chassis in the Rack” on page 164.](#)

- c. **Reconnect the power cords to the server power supplies and power on the server.**
See [“Reconnect Power and Data Cables” on page 165](#) and [“Power On the Server” on page 165](#). Verify that the AC OK LED is lit.
4. **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 X3-2L Administration Guide*, “Restore Oracle System Assistant” on page 83.**

Related Information

- [“Remove an Internal USB Flash Drive” on page 91](#)

Servicing the Battery (CRU)

The real-time clock (RTC) 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 system is powered off and not connected to a network, replace the battery.



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

- [“Remove the Battery” on page 93](#)
- [“Install the Battery” on page 94](#)

▼ Remove the Battery

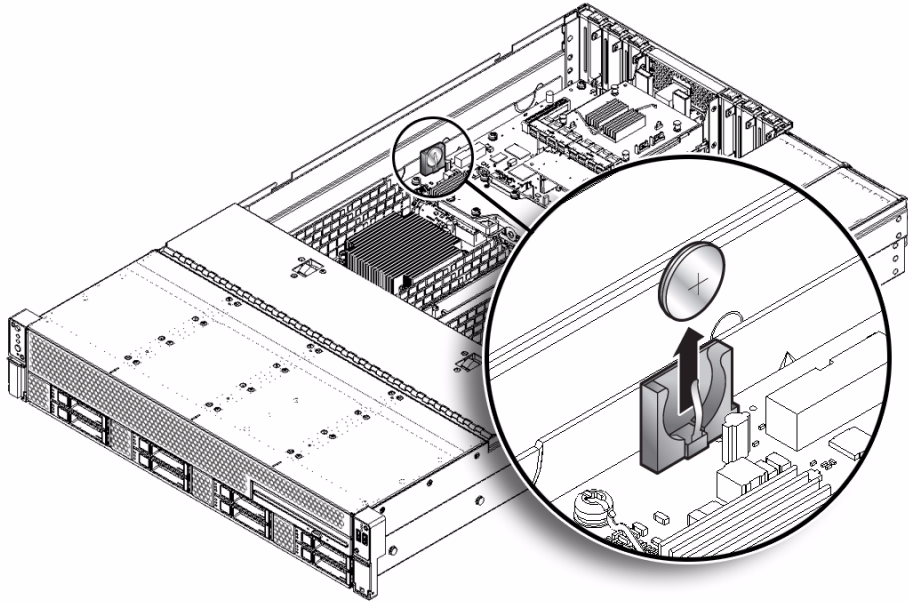
1. **Prepare the server for service.**
 - a. **Power off the server and disconnect the power cords from the server power supplies.**
See [“Powering Down the Server” on page 32](#).
 - b. **Extend the server into the maintenance position.**
See [“Extend the Server to the Maintenance Position” on page 37](#).
 - c. **Attach an antistatic wrist strap.**
See [“Electrostatic Discharge Safety” on page 30](#).

d. Remove the top cover.

See [“Remove the Server Top Cover”](#) on page 41.

2. To dislodge the battery from its retainer, gently push the top edge of the battery away from the retainer.

FIGURE: Removing the System Battery



3. Lift the battery up and out of its retainer.

Related Information

- [“Install the Battery”](#) on page 94

▼ Install the Battery

1. Unpack the replacement battery.
2. Press the new battery into the battery retainer with the positive side (+) facing the server chassis side wall.

Note – If the service processor is configured to synchronize with a network time server using the Network Time Protocol (NTP), the Oracle ILOM SP clock will be reset as soon as the server is powered on and connected to the network. If the service processor is not configured to use NTP, you must reset the Oracle ILOM SP clock using the Oracle ILOM CLI or the web interface. For instructions, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at: <http://www.oracle.com/pls/topic/lookup?ctx=ilom31>.

3. Return the server to operation.

a. Install the top cover.

See “Install the Top Cover” on page 161.

b. Return the server to the normal rack position.

See “Reinstall the Server Chassis in the Rack” on page 164.

c. Reconnect the power cords to the server power supplies, and power on the server.

See “Reconnect Power and Data Cables” on page 165 and “Power On the Server” on page 165. Verify that the AC OK LED is lit.

Related Information

- “Remove the Battery” on page 93

Servicing FRUs

The following sections describe how to service field-replaceable units (FRUs). You must power down the system and remove the AC power cords before servicing all FRU components.

Note – Only authorized service personnel should service FRU components.

Description	Links
Service the processors.	“Servicing Processors (FRU)” on page 97
Service the front and rear storage drive backplanes.	“Servicing the Front and Rear Storage Drive Backplanes (FRU)” on page 114
Service the front indicator LED/USB modules.	“Servicing the Front LED/USB Indicator Modules (FRU)” on page 126
Service SAS and SATA cables.	“Servicing Cables (FRU)” on page 132
Service the motherboard assembly.	“Servicing the Motherboard Assembly (FRU)” on page 139

Related Information

- [“Servicing CRUs That Do Not Require Server Power-Off” on page 45](#)
- [“Servicing CRUs That Require Server Power-Off” on page 63](#)

Servicing Processors (FRU)



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



Caution – This procedure requires 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 electrostatic discharge safety measures and antistatic practices. See [“Electrostatic Discharge Safety” on page 30](#).

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.

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.

The following topics are covered:

- [“Selecting the Correct Processor Removal/Replacement Tool” on page 98](#)
- [“Remove a Processor” on page 103](#)
- [“Install a Processor” on page 109](#)

Related Information

- [“Servicing the DIMMs \(CRU\)” on page 63](#)

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 X4-2L are available in two sizes. The processors with 10 or fewer cores are smaller than the processors with 12 cores. You can determine the size of the processor that you are going to remove and replace in either of these two ways:

- Use Oracle Integrated Lights Out Manager (ILOM) 3.1 to display processor information.

For instructions, see the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library at: <http://www.oracle.com/goto/ILOM/docs>.

- 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 103. 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 100](#) shows the 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

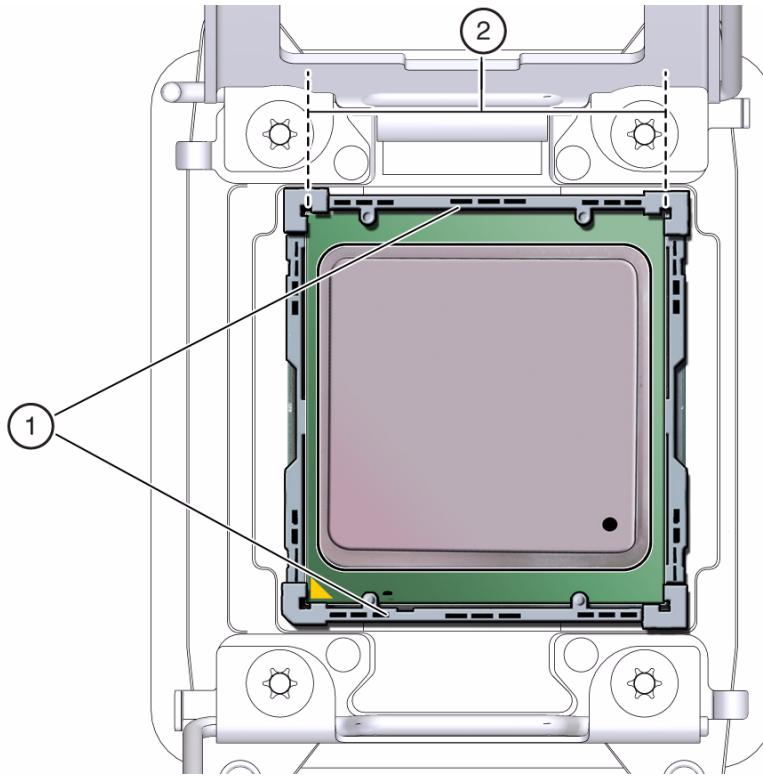


Figure Legend

-
- 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 101 shows the 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

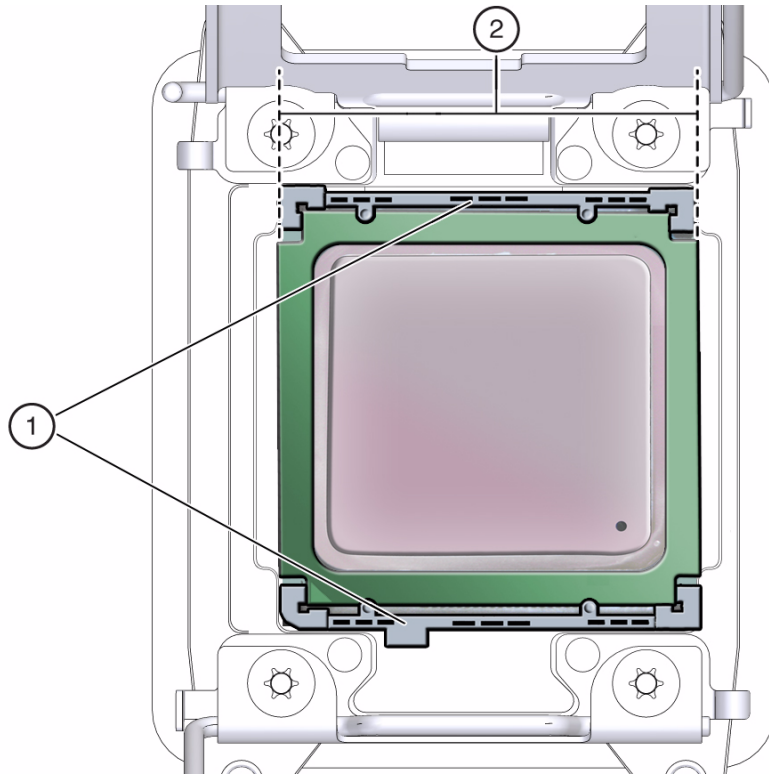


Figure Legend

-
- | | |
|---|---|
| 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 is also available 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 Tool on page 102](#)).

FIGURE: Color-Coded Processor Removal/Replacement Tool

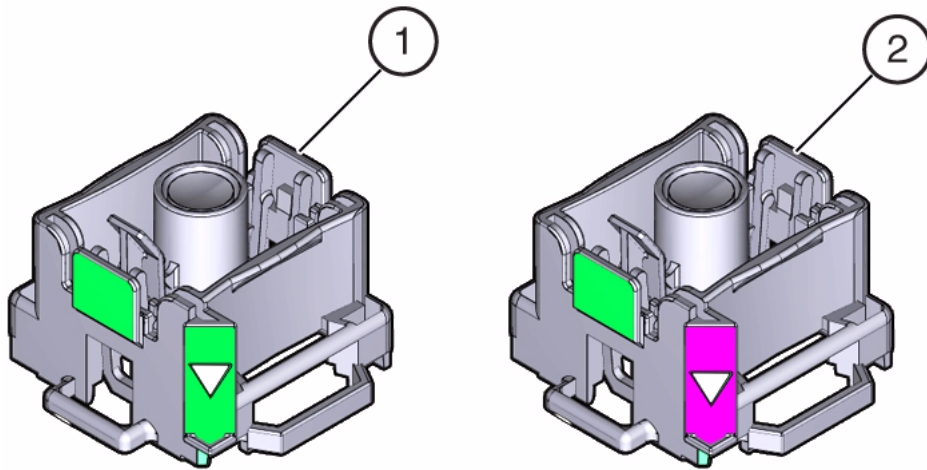


Figure Legend

-
- | | |
|---|---|
| 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 – Processors should be removed only by a qualified Oracle service technician.



Caution – The processor socket used in the Sun Server X3-2L is the Intel LGA2011. Processor removal and replacement must be done using the green color-coded tool (see [FIGURE: Removing the 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. Attach an antistatic wrist strap.

See [“Take Antistatic Measures” on page 40](#).

- c. Remove the top cover.

See [“Remove the Server Top Cover” on page 41](#).

d. Remove the air baffle.

See [“Remove the Air Baffle”](#) on page 85.

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, an 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 processor Fault LED for the faulty processor lights. The processor Fault LEDs are located next to the processors:

- If the processor Fault LED is off, the processor is operating properly.
- If the processor Fault LED is on (amber), the processor is faulty and should be replaced.

FIGURE: Identifying Faulty Processors

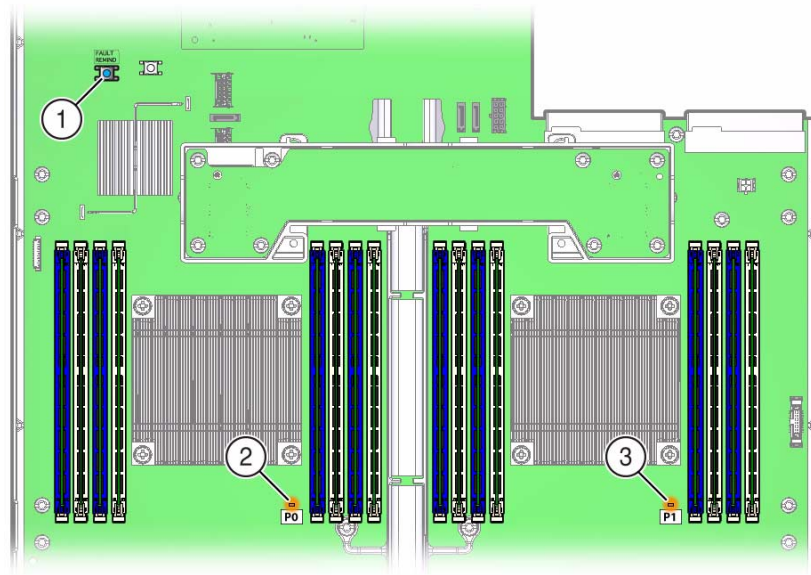


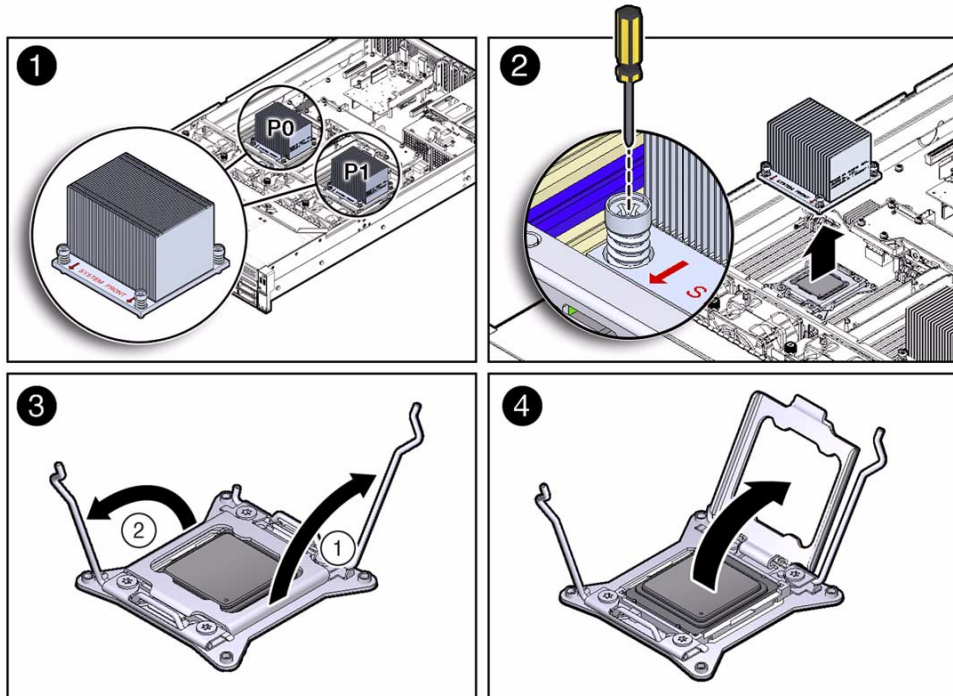
Figure Legend

-
- | | |
|---|---------------------|
| 1 | Fault Remind button |
| 2 | Processor 0 LED |
| 3 | Processor 1 LED |
-

3. Gently press down on the top of the heatsink to counteract the pressure of the captive spring-loaded screws that secure the heatsink to the motherboard and loosen the four Phillips captive screws in the heatsink using a No. 2 Phillips screwdriver [2].

Turn the screws counterclockwise alternately one and one-half turns until they are fully released.

FIGURE: Removing the Heatsink



4. To separate the heatsink from the top of the processor, gently twist the heatsink left and right, while pulling upward, and then lift off the heatsink and place it upside down on a flat surface.

A thin layer of thermal grease separates the heatsink 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.

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

Be 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.

6. 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 [3].
7. 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 [3].
8. 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 [4].



Caution – Whenever you remove a processor, you must 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](#).

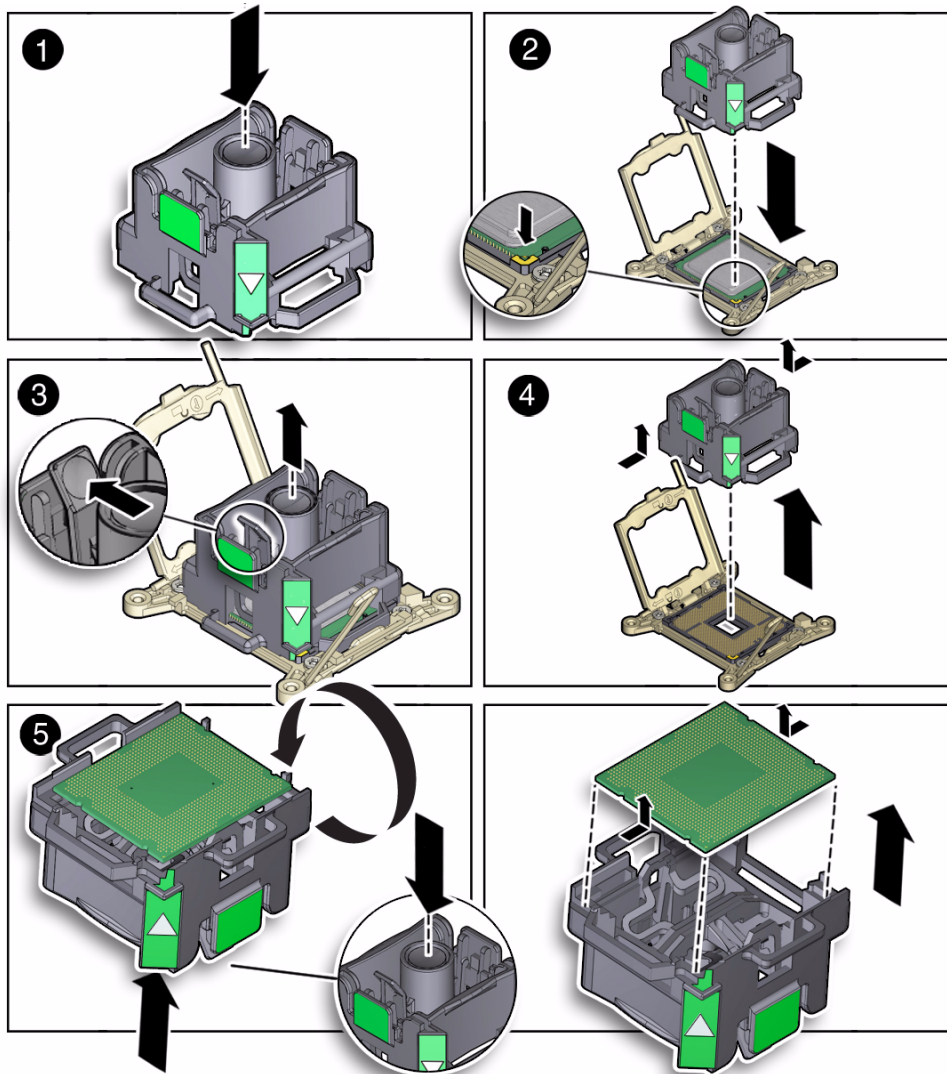
9. To remove the processor from the socket, acquire the processor removal/replacement tool and perform the following steps.
 - a. Locate the button in the center of the top of the processor removal tool and press it to the down position [1].
 - b. Properly position the tool over the processor socket 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 processor tool to release the center button and engage the processor [3].

An audible click indicates that the processor is engaged.
 - d. Grasp the processor removal tool by its sides and remove it from the server [4].
 - e. Turn the processor removal tool upside down and verify that it contains the processor [5].
 - f. While holding the processor removal tool upside down, press the center button to release the processor from the tool [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.

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

FIGURE: Removing the 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 X3-2L is the Intel LGA2011. Processor removal and replacement must be done using the green color-coded tool (see [FIGURE: Installing the 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 [“Take Antistatic Measures” on page 40](#).

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 that are supported by the server, see the [Sun Server X3-2L 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 6 through Step 8 of “Remove a Processor” on page 103](#).

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

- a. **Locate the button in the center of the top of the tool and press it to the down position [1].**
- b. **Turn the tool upside down, grasp the processor by its front and 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 into place.

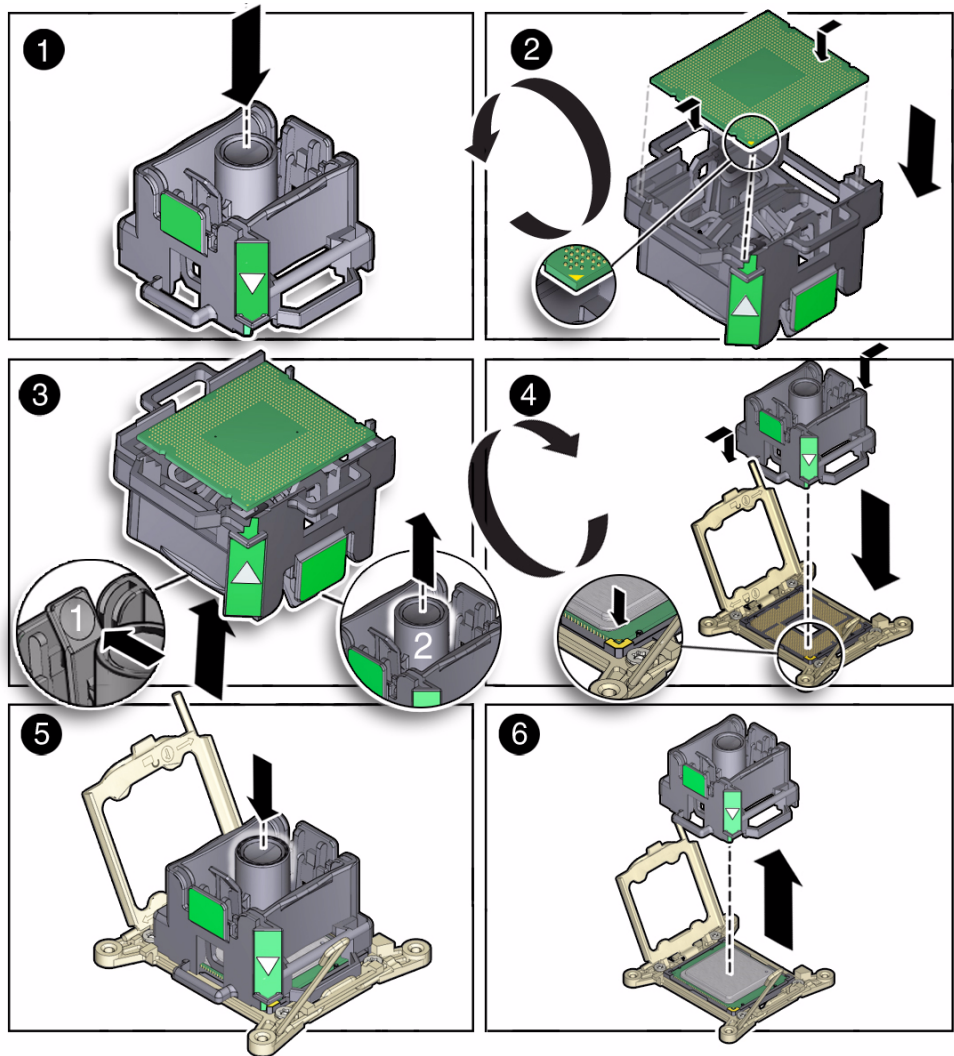
- d. Properly position the tool over the processor socket and lower it into place [4].**

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 on 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 the Processor



6. Visually check the alignment of the processor in the socket.

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

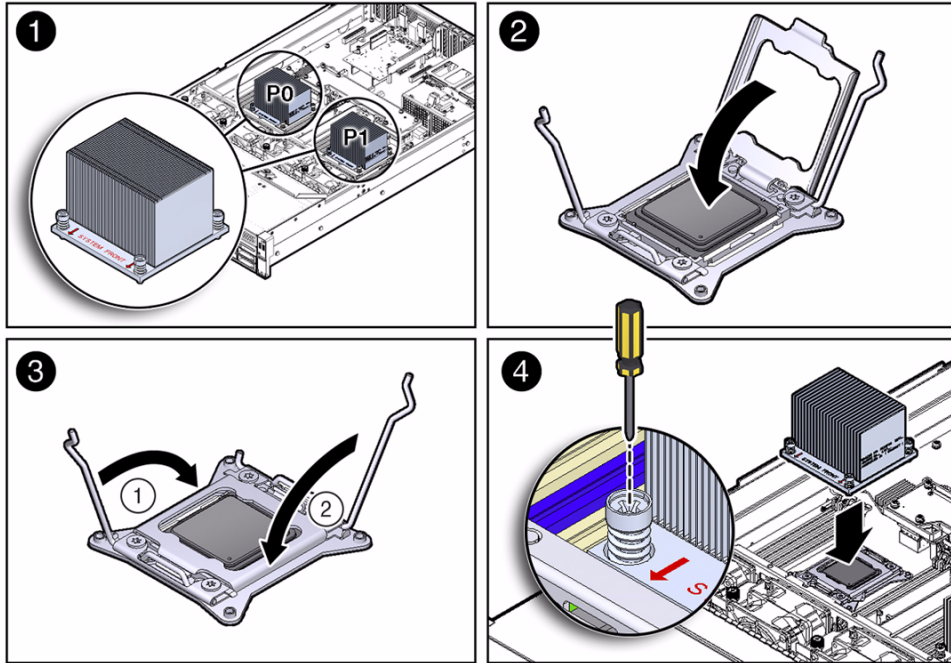


Caution – Do not press down on the processor. Irreparable damage to the processor or motherboard might occur from excessive downward pressure. Do not forcibly seat the processor into the socket. Excessive downward pressure might damage the socket pins.

7. Swing the processor pressure frame into the closed position [2].

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

FIGURE: Installing the Heatsink



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 [3].

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 [3].

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.
Do not distribute the grease, as the processor heatsink pressure will do so for you.

11. Inspect the heatsink for dust and lint.

Clean the heatsink if necessary.

12. Orient the heatsink so that the screws line up with the mounting studs [4].

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 [4].



Caution – Avoid moving the heatsink 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. Use a No. 2 Phillips screwdriver to tighten the screws alternately one-half turns until fully seated [4].
15. Return the server to operation.
 - a. Install the air baffle.
See [“Install the Air Baffle” on page 86.](#)
 - b. Install the server top cover.
See [“Install the Top Cover” on page 161.](#)
 - c. Return the server to the normal rack position.
See [“Reinstall the Server Chassis in the Rack” on page 164.](#)
 - d. Reconnect the power cords to the power supplies, and power on the server.
See [“Reconnect Power and Data Cables” on page 165](#) and [“Power On the Server” on page 165.](#) Verify that the AC OK LED is lit.
16. Use Oracle ILOM to clear server processor faults.
Refer to the Oracle Integrated Lights Out Manager (ILOM) 3.1 Documentation Library for more information about the following steps.

- a. To show server faults, log in to the server as `root` using the Oracle ILOM CLI, and type the following command to list all known faults on the system:

-> **show /SP/faultmgmt**

The server lists all known faults, for example:

```
-> show /SP/faultmgmt
Targets:
    0 (/SYS/MB/P0)
Properties:
Commands:
    cd
    show
```

Alternatively, to list all known faults in the server, log into the Oracle Solaris OS and issue the `fmadm faulty` command, or log into the Oracle ILOM service processor from the FM captive shell and issue the `fmadm faulty` command.

- b. To clear the fault, type the following command:

-> **set /System/MB/P0 clear_fault_action=true**

For example:

```
-> set /System/MB/P0 clear_fault_action=true
Are you sure you want to clear /SYS/MB/P0 9y/n)? y
Set 'clear_fault_action' to 'true'
```

Alternatively, to clear all known faults in the server, log into the Oracle Solaris OS and issue the `fmadm repair` command, or log into the Oracle ILOM service processor from the FM captive shell and issue the `fmadm repair` command.

Related Information

- [“Remove a Processor” on page 103](#)

Servicing the Front and Rear Storage Drive Backplanes (FRU)

To remove and install the front and rear storage drive backplanes, follow the procedures in these sections.



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

- “Remove the Storage Drive Backplane for Eight-Drive and Twelve-Drive Systems” on page 115
- “Install the Storage Drive Backplane for Eight-Drive and Twelve-Drive Systems” on page 118
- “Remove the Storage Drive Backplane for Twenty-Four Drive Systems” on page 119
- “Install the Storage Drive Backplane for Twenty-Four Drive Systems” on page 122
- “Remove the Storage Drive Backplane for Rear-Mounted Storage Drives” on page 123
- “Install the Storage Drive Backplane for Rear-Mounted Storage Drives” on page 125

Related Information

- “Servicing Storage Drives and Rear Drives (CRU)” on page 45
- “Servicing the SAS Expander Module (CRU)” on page 81
- “Servicing Cables (FRU)” on page 132

▼ Remove the Storage Drive Backplane for Eight-Drive and Twelve-Drive Systems

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. **Attach an antistatic wrist strap.**

See “Take Antistatic Measures” on page 40.

- c. **Extend the server into the maintenance position.**

See “Extend the Server to the Maintenance Position” on page 37.

- d. **Open the server fan assembly door, and remove the fan modules from the server.**

See “Remove a Fan Module” on page 55.

2. Remove all of the storage drives from the storage drive cage.

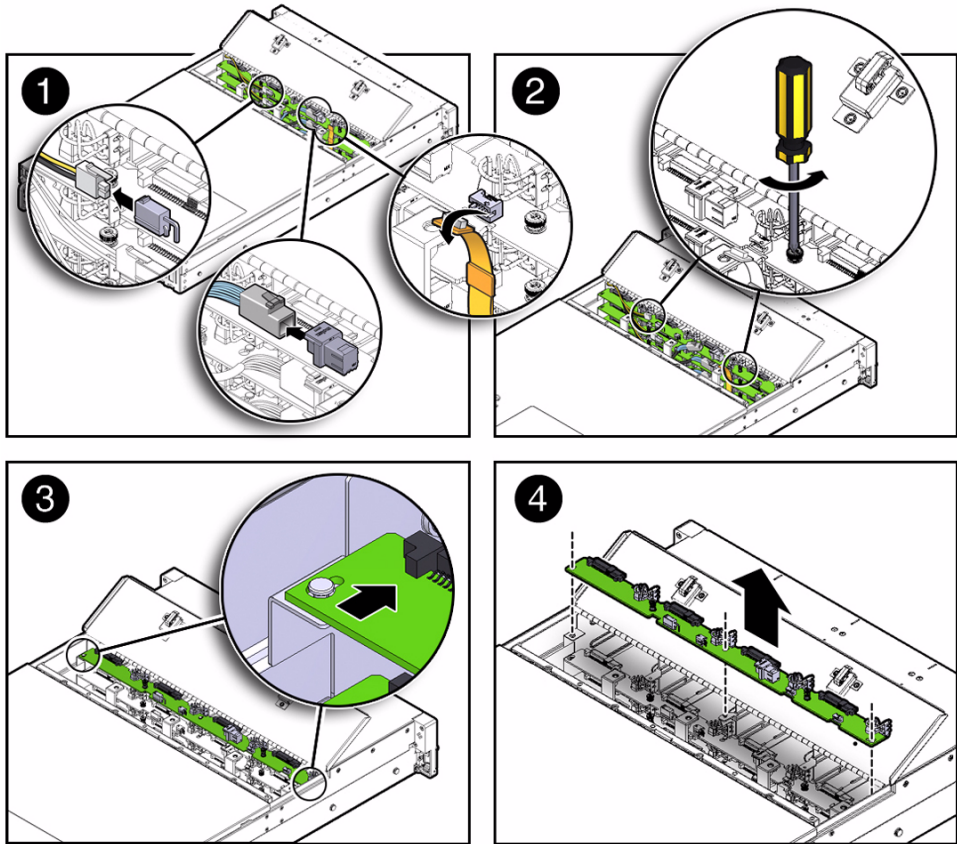
See [“Remove a Storage Drive” on page 47](#).

Note – Ensure that you note storage drive locations when removing the storage drives from the storage drive cage. Storage drives must be reinserted into the correct slots after storage drive backplane replacement.

3. Disconnect the cables from the storage drive backplane [1].

- a. Disconnect the SAS/SATA cable from the storage drive backplane. Note the cable connections in order to ease proper reconnection of the cables.
- b. Disconnect the power cable from the storage drive backplane.
- c. Disconnect the disk backplane LED cable from the storage drive backplane.
- d. Disconnect the DVD power cable (eight-drive system only) from the top storage drive backplane.

FIGURE: Removing the Storage Drive Backplane



4. Using a No. 2 Phillips screwdriver, loosen the two screws that secure the storage drive backplane to the chassis [2].
5. 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 [3 and 4].
6. Place the storage drive backplane on an antistatic mat.
7. Repeat [Step 3](#) through [Step 6](#) to remove the second storage drive backplane in an eight-drive system.
8. Repeat [Step 3](#) through [Step 6](#) to remove the third storage drive backplane in a twelve-drive system.

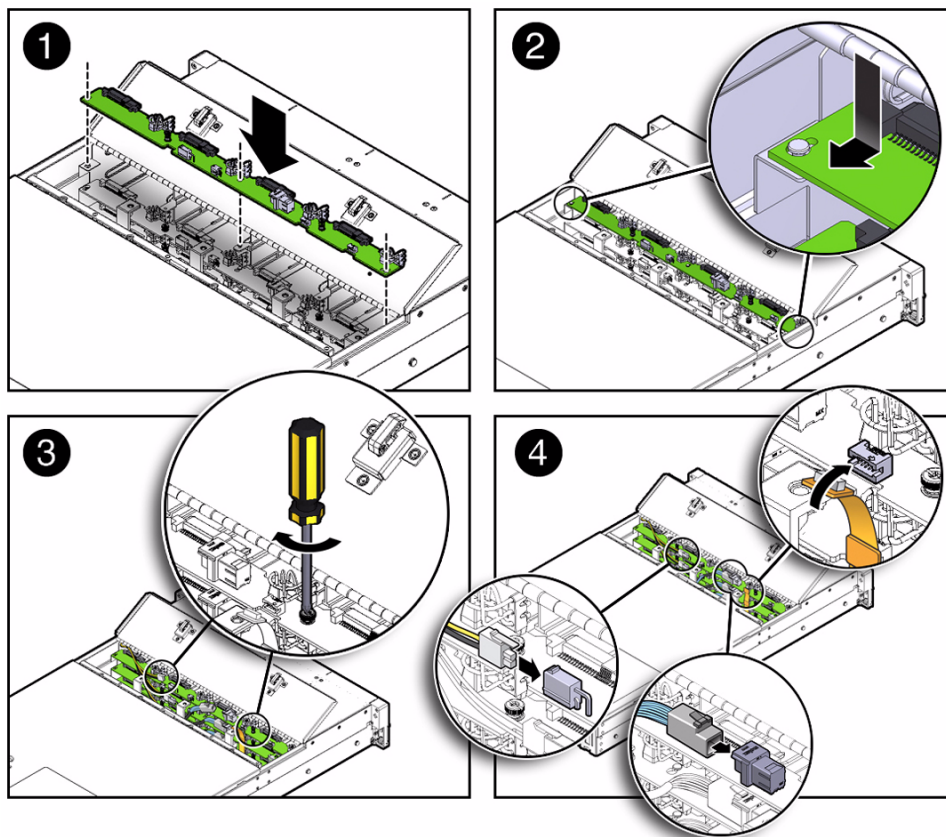
Related Information

- [“Install the Storage Drive Backplane for Eight-Drive and Twelve-Drive Systems” on page 118](#)

▼ Install the Storage Drive Backplane for Eight-Drive and Twelve-Drive Systems

1. Lower the storage drive backplane into the server, and position it to engage the three mushroom standoffs [1 and 2].

FIGURE: Installing the Storage Drive Backplane



2. Using a No. 2 Phillips screwdriver, install and tighten the two screws to secure the storage drive backplane to the chassis [3].
3. Reconnect the cables to the disk backplane [4].
 - a. Reconnect the disk backplane LED cable to the storage drive backplane.
 - b. Reconnect the power cable to the storage drive backplane.
 - c. Reconnect the SAS/SATA cable to the storage drive backplane.

- d. Reconnect the DVD power cable (eight-drive system only) to the top storage drive backplane.
4. Repeat [Step 1](#) through [Step 3](#) to install the second storage drive backplane in an eight-drive system.
5. Repeat [Step 1](#) through [Step 3](#) to install the third storage drive backplane in a twelve-drive system.
6. Return the server to operation.
 - a. Install the fan modules, and close the fan assembly door.
See [“Install a Fan Module”](#) on page 57.
 - b. Install all storage drives into the storage cage.
See [“Install a Storage Drive”](#) on page 50.
 - c. Return the server to the normal rack position.
 - d. Reconnect the power cords to the power supplies, and power on the server.
See [“Reconnect Power and Data Cables”](#) on page 165 and [“Power On the Server”](#) on page 165. Verify that the AC OK LED is lit.

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 Storage Drive Backplane for Eight-Drive and Twelve-Drive Systems”](#) on page 115

▼ Remove the Storage Drive Backplane for Twenty-Four Drive Systems

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 into the maintenance position.
See [“Extend the Server to the Maintenance Position”](#) on page 37.

c. Attach an antistatic wrist strap.

See [“Take Antistatic Measures”](#) on page 40.

d. Open the server fan assembly door, and remove the fan modules from the server.

See [“Remove a Fan Module”](#) on page 55.

e. Remove the fan assembly door from the server.

See [“Remove the Fan Assembly Door From a Server With 2.5-Inch Drives”](#) on page 42.

2. Remove all of the storage drives from the storage drive cage.

See [“Remove a Storage Drive”](#) on page 47.

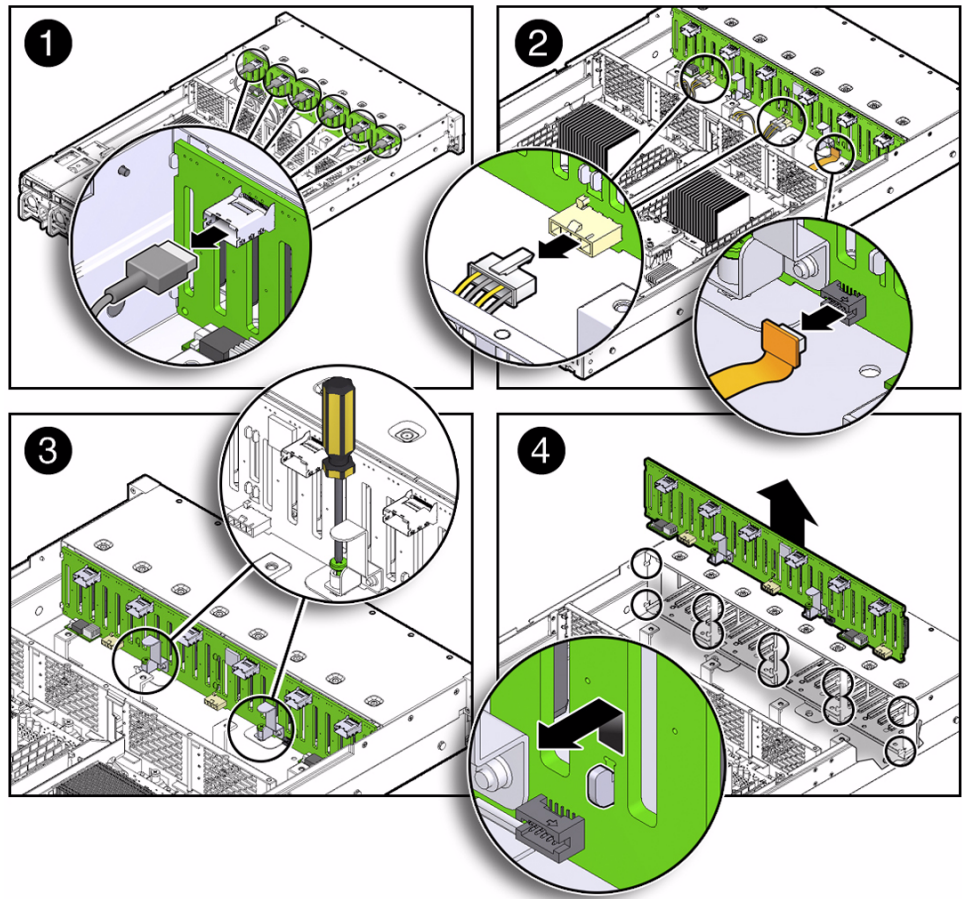
Note – Ensure that you note storage drive locations when removing the storage drives from the disk cage. Storage drives must be reinserted into the correct slots after disk backplane replacement.

3. Disconnect the cables from the storage drive backplane.

a. Disconnect the six SAS/SATA cables from the storage drive backplane. Note the cable connections in order to ease proper reconnection of the cables [1].

b. Disconnect the power cables and the LED cable from the storage drive backplane [2].

FIGURE: Removing the Storage Drive Backplane



4. Using a No. 2 Phillips screwdriver, loosen the two screws that secure the storage drive backplane to the chassis [3].
5. Lift the storage drive backplane up to release it from the standoff hooks [4].
6. Pull the storage drive backplane away from the standoff hooks and out of the chassis [4].
7. Place the storage drive backplane on an antistatic mat.

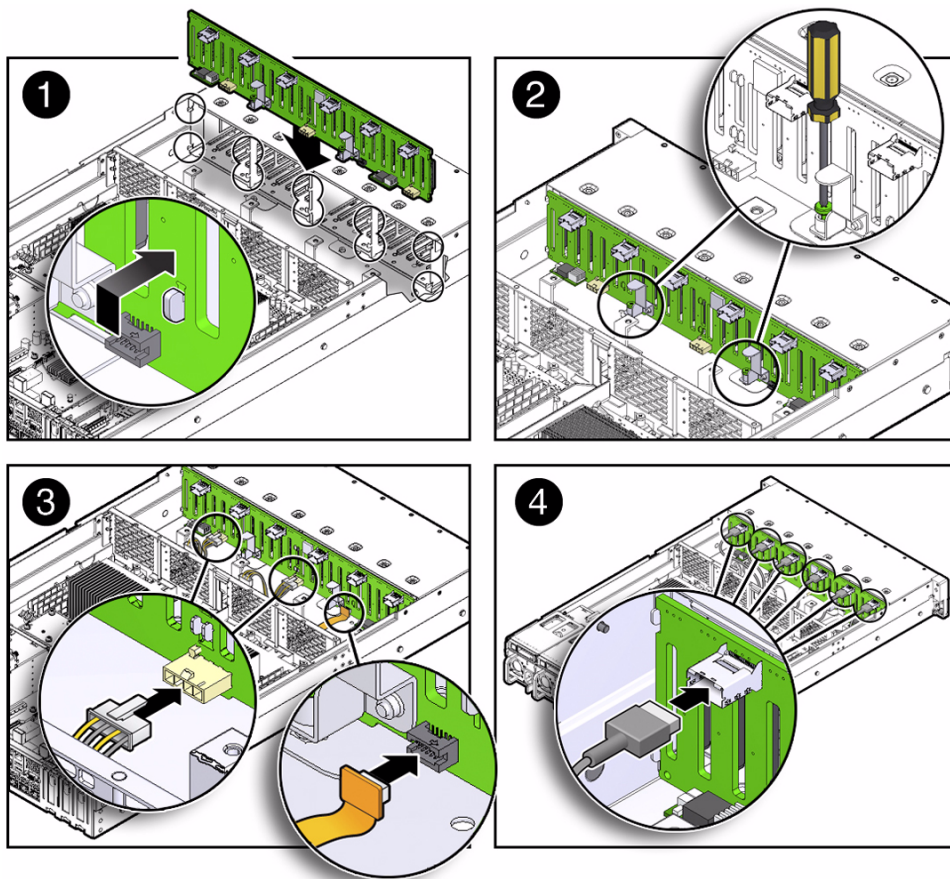
Related Information

- [“Install the Storage Drive Backplane for Twenty-Four Drive Systems” on page 122](#)

▼ Install the Storage Drive Backplane for Twenty-Four Drive Systems

1. Lower the storage drive backplane into the server, and position it to engage the standoff hooks [1].

FIGURE: Installing the Storage Drive Backplane



2. Using a No. 2 Phillips screwdriver, install and tighten the two screws to secure the storage drive backplane to the chassis [2].
3. Reconnect the cables to the storage drive backplane.
 - a. Reconnect the power cables and the LED cable to the storage drive backplane [3].

d. Remove the top cover.

See [“Remove the Server Top Cover”](#) on page 41.

2. Remove all of the rear-mounted storage drives from the storage drive cage.

See [“Remove a Rear Storage Drive”](#) on page 52.

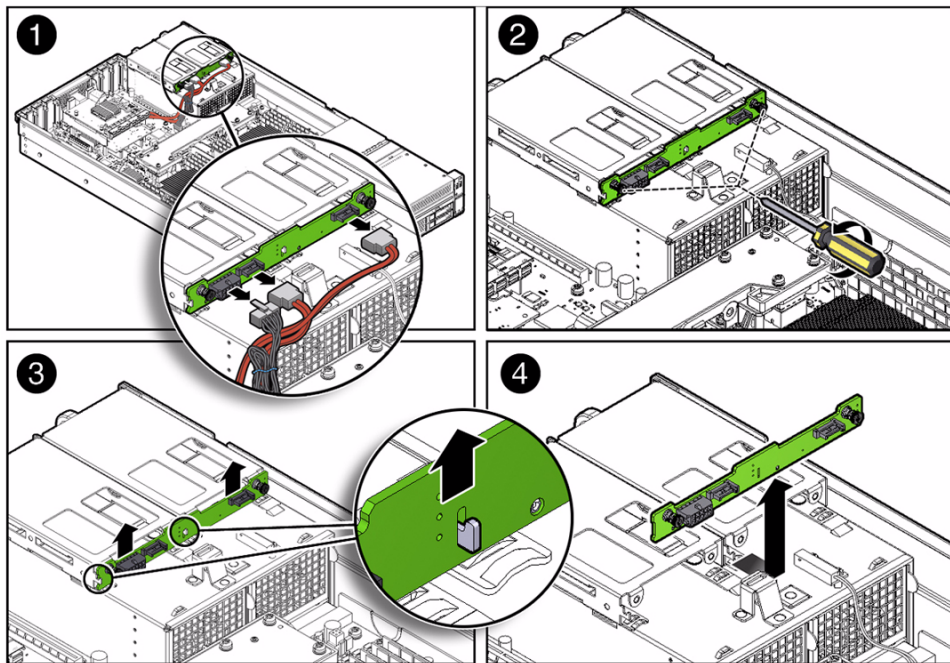
Note – Ensure that you note drive locations when removing the storage drives from the storage drive cage. Storage drives must be reinserted into the correct slots after storage drive backplane replacement.

3. Disconnect the cables from the storage drive backplane [1].

a. Disconnect the two SAS cables from the storage drive backplane.

b. Disconnect the power cable from the storage drive backplane.

FIGURE: Removing the Storage Drive Backplane for Rear-Mounted Storage Drives



4. Using a No. 2 Phillips screwdriver, loosen the two screws that secure the storage drive backplane to the storage drive cage [2].

5. Lift the storage drive backplane up to release it from the two sets of standoff hooks [3].

6. Pull the storage drive backplane away from the standoff hooks and out of the chassis [4].
7. Place the storage drive backplane on an antistatic mat.

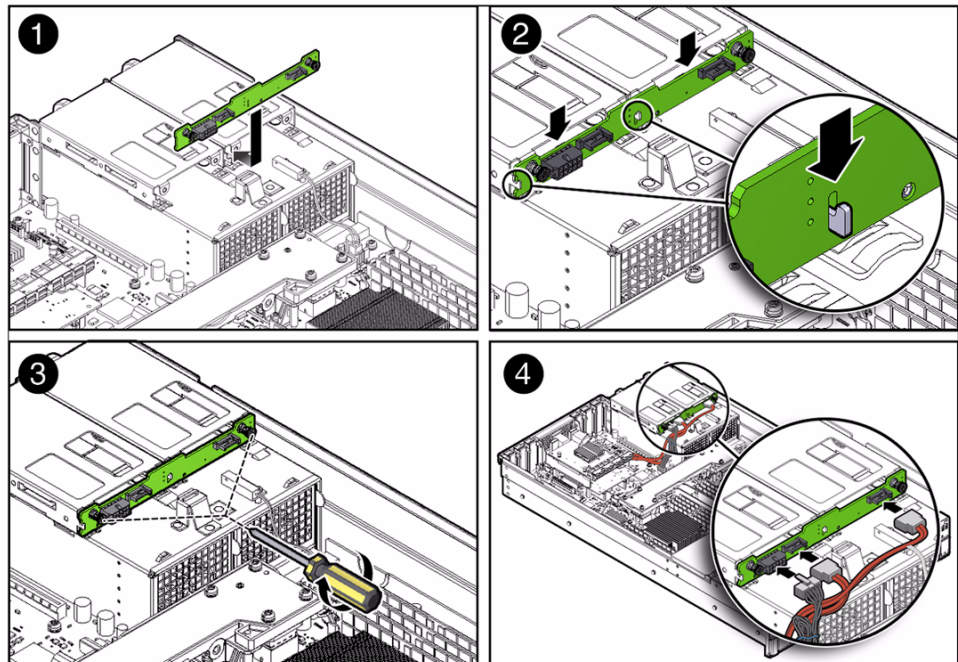
Related Information

- [“Install the Storage Drive Backplane for Rear-Mounted Storage Drives” on page 125](#)

▼ Install the Storage Drive Backplane for Rear-Mounted Storage Drives

1. Lower the storage drive backplane into the server, and position it to engage the two standoff hooks [1 and 2].

FIGURE: Installing the Storage Drive Backplane for Rear-Mounted Storage Drives.



2. Using a No. 2 Phillips screwdriver, install and tighten the two screws to secure the storage drive backplane to the storage drive cage [3].
3. Reconnect the cables to the storage drive backplane [4].

- a. Reconnect the power cable to the storage drive backplane.
 - b. Reconnect the two SAS cables to the storage drive backplane.
4. Return the server to operation.
 - a. Install the server top cover.

See [“Install the Top Cover”](#) on page 161.
 - b. Install all storage drives into the storage drive cage.

See [“Install a Rear Storage Drive”](#) on page 53.
 - c. Return the server to the normal rack position.
 - d. Reconnect the power cords to the power supplies, and power on the server.

See [“Reconnect Power and Data Cables”](#) on page 165 and [“Power On the Server”](#) on page 165. Verify that the AC OK LED is lit.

Related Information

- [“Remove the Storage Drive Backplane for Rear-Mounted Storage Drives”](#) on page 123

Servicing the Front LED/USB Indicator Modules (FRU)



Caution – Ensure that all power is removed from the server before removing or installing a front LED/USB indicator module. You must disconnect the power cables before performing this procedure.

To remove and install the front LED/USB indicator modules, follow the procedures in these sections.

- [“Remove the Left LED Indicator Module”](#) on page 127
- [“Install the Left LED Indicator Module”](#) on page 128
- [“Remove the Right LED/USB Indicator Module”](#) on page 129
- [“Install the Right LED/USB Indicator Module”](#) on page 131

Related Information

- [“About Server and Component LEDs”](#) on page 7

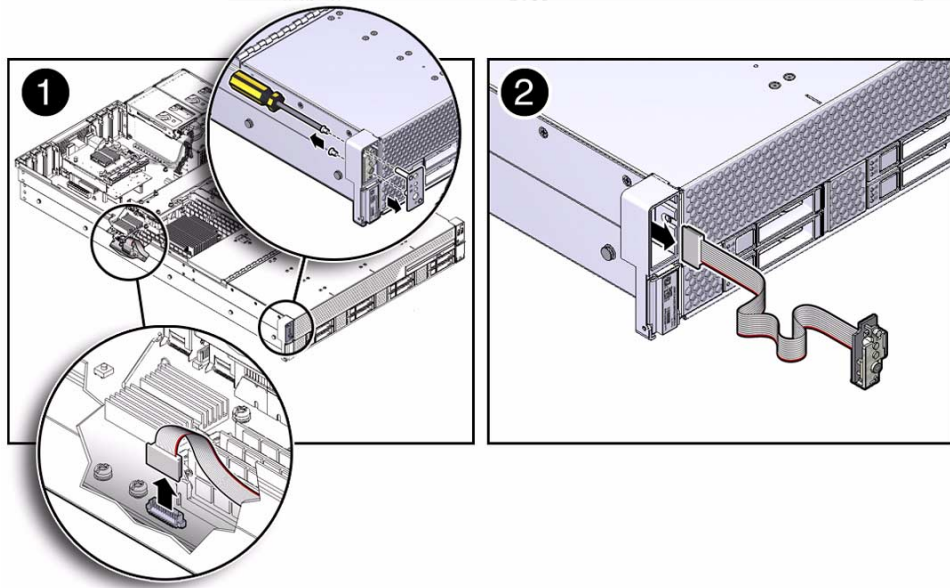
▼ Remove the Left LED Indicator Module

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 into the maintenance position.
See [“Extend the Server to the Maintenance Position”](#) on page 37.
 - 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 41.
2. Remove the left indicator module.
 - a. Remove the two No. 2 Phillips screws that secure the LED indicator module to the server front panel [1].
 - b. Disconnect the LED indicator module cable from the motherboard, and gently pull the cable through the chassis mid-plane and side wall of the server chassis [1 and 2].

Note – Alternatively, if you only need to replace the LED indicator, you do not need to pull the cable through the chassis mid-plane and side wall of the chassis.

- c. Remove the LED indicator module from the server front panel [2].

FIGURE: Removing the Left LED Indicator Module



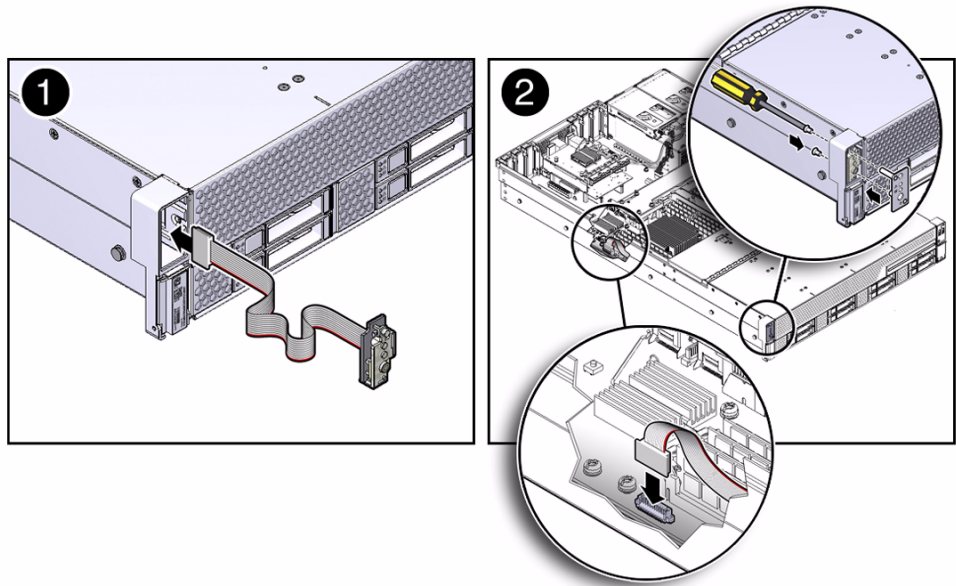
Related Information

- [“Server General Status Indicators” on page 8](#)
- [“Install the Left LED Indicator Module” on page 128](#)

▼ Install the Left LED Indicator Module

1. Install the left LED indicator module.
 - a. Push the LED indicator module cable through the side wall and mid-plane of the server chassis [1 and 2].
 - b. Reconnect the LED indicator module cable to the motherboard [2].
 - c. Insert and tighten the two No. 2 Phillips screws to secure the LED indicator module to the server front panel [2].

FIGURE: Installing the Left LED Indicator Module



2. Return the server to operation.

a. Install the server top cover.

See [“Install the Top Cover”](#) on page 161.

b. Return the server to the normal rack position.

c. Reconnect the power cords to the power supplies, and power on the server.

See [“Reconnect Power and Data Cables”](#) on page 165 and [“Power On the Server”](#) on page 165. Verify that the AC OK LED is lit.

Related Information

- [“Server General Status Indicators”](#) on page 8
- [“Remove the Left LED Indicator Module”](#) on page 127

▼ Remove the Right LED/USB Indicator Module

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 into the maintenance position.

See “Extend the Server to the Maintenance Position” on page 37.

- 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 41.

2. Remove the right LED/USB indicator module.

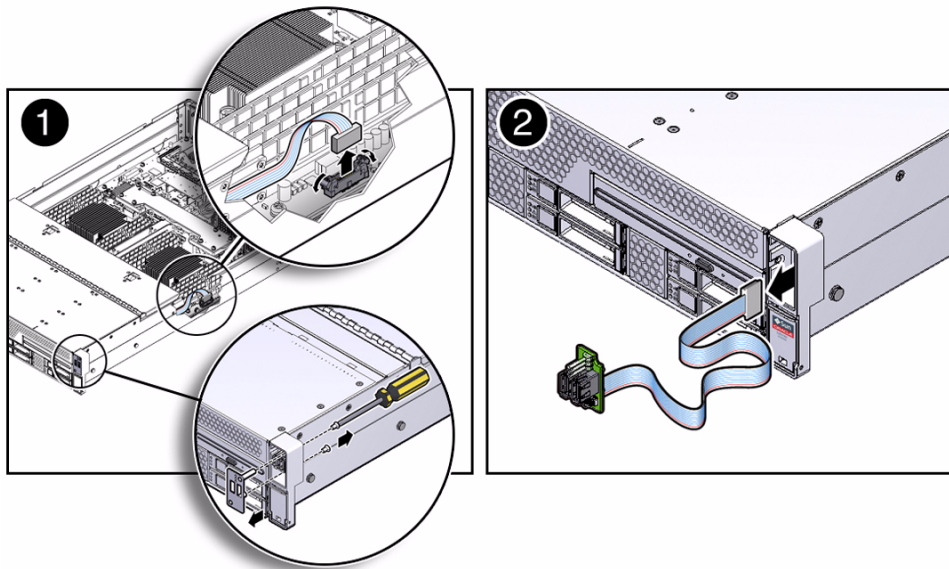
- a. Remove the two No. 2 Phillips screws that secure the LED/USB indicator module to the server front panel [1].

- b. Disconnect the LED/USB indicator module cable from the motherboard, and gently pull the cable through the chassis mid-plane and side wall of the server chassis [1 and 2].

Note – Alternatively, if you only need to replace the LED/USB indicator, you do not need to pull the cable through the chassis mid-plane and side wall of the chassis.

- c. Remove the LED/USB indicator module from the server front panel [2].

FIGURE: Removing the Right LED/USB Indicator Module



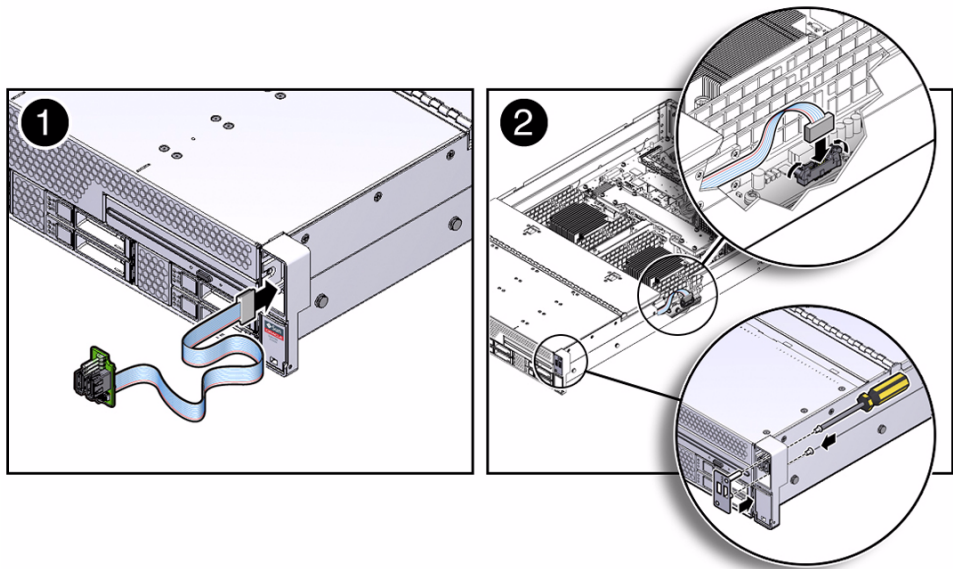
Related Information

- [“Server General Status Indicators” on page 8](#)
- [“Install the Left LED Indicator Module” on page 128](#)

▼ Install the Right LED/USB Indicator Module

1. Install the right LED/USB indicator module.
 - a. Push the LED/USB indicator module cable through the side wall and mid-plane of the server chassis [1 and 2].
 - b. Reconnect the LED/USB indicator module cable to the motherboard [2].
 - c. Insert and tighten the two No. 2 Phillips screws to secure the LED/USB indicator module to the server front panel [2].

FIGURE: Installing the Right LED/USB Indicator Module



2. Return the server to operation.
 - a. Install the server top cover.
See [“Install the Top Cover” on page 161](#).
 - b. Return the server to the normal rack position.

- c. **Reconnect the power cords to the power supplies, and power on the server.**

See [“Reconnect Power and Data Cables” on page 165](#) and [“Power On the Server” on page 165](#). Verify that the AC OK LED is lit.

Related Information

- [“Server General Status Indicators” on page 8](#)
- [“Remove the Right LED/USB Indicator Module” on page 129](#)

Servicing Cables (FRU)



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 Cables From a SAS/SATA Configuration” on page 132](#)
- [“Install Storage Drive Cables in a SAS/SATA Configuration” on page 135](#)

Related Information

- [“Servicing Storage Drives and Rear Drives \(CRU\)” on page 45](#)
- [“Servicing the SAS Expander Module \(CRU\)” on page 81](#)

▼ Remove Storage Drive Cables From a SAS/SATA Configuration

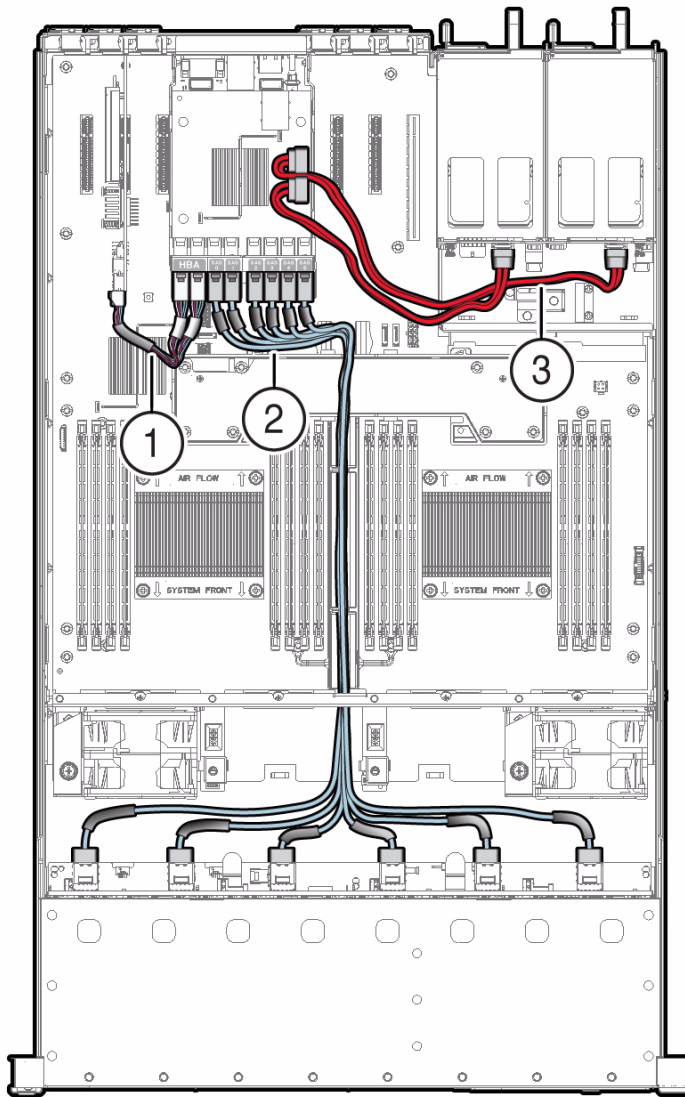
1. **Prepare the server for service.**
 - a. **Power off the server and disconnect the power cords from the power supplies.**

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 37](#).

- c. **Attach an antistatic wrist strap.**
See [“Electrostatic Discharge Safety”](#) on page 30.
 - d. **Remove the top cover.**
See [“Remove the Server Top Cover”](#) on page 41.
 - e. **Remove the air baffle.**
See [“Remove the Air Baffle”](#) on page 85.
 - f. **Remove fan modules 1 and 2, leaving fan modules 0 and 3 in place.**
See [“Remove a Fan Module”](#) on page 55.
 - g. **If you are removing the SAS/SATA cables from a server with twenty-four 2.5-inch storage drives, remove the server’s front fan assembly door cover.**
See [“Remove the Fan Assembly Door From a Server With 2.5-Inch Drives”](#) on page 42.
2. **Disconnect SAS/SATA cables from the SAS expander module.**
- a. **To disconnect the HBA cable and the SAS/SATA cables from the SAS expander module, press the latch, and then pull out to disengage each cable from the SAS expander module [1].**
See also [“Remove a PCIe Card”](#) on page 78.
 - b. **To disconnect the SAS/SATA cables from the front storage drive backplane and the SAS expander module, press the latch, and then pull out to disengage the cables from each storage drive backplane [2].**
 - c. **(Optional) To disconnect the rear storage drive SAS cables from the SAS expander module, press the latch, and then pull up to disengage the disk drive SAS drive cable from the SAS expander module [3].**

FIGURE: Removing SAS/SATA Storage Drive Cables



3. Remove the SAS expander module from the chassis.

See [“Remove the SAS Expander Module”](#) on page 82.

4. Remove the SAS/SATA cables from the server.

Be careful not to snag the cables on the server components.

Related Information

- [“Remove the SAS Expander Module” on page 82](#)
- [“Remove a PCIe Card” on page 78](#)
- [“Install Storage Drive Cables in a SAS/SATA Configuration” on page 135](#)

▼ Install Storage Drive Cables in a SAS/SATA Configuration

1. Install storage drive cables.

- Install the cable connectors into the front storage drive backplane.**
- Route the cables between the fan modules and between processors and DIMMs.**

There is a trough between the fan modules and processors for routing the cables.

- (Optional) Install the cable connectors into the rear-mounted storage drive backplane.**

2. Reconnect the SAS/SATA cables to the SAS expander module.

- To reconnect the HBA cable and the SAS/SATA cables to the SAS expander module, plug each cable into its SAS expander module connector until you hear an audible click [1].**

See also [“Install a PCIe Card” on page 79](#).

In eight drive systems, attach the HBA cables directly to disk backplanes (DBPs) 0 and 1. In twelve and twenty-four drive systems, attach the HBA cables to the HBA port on the SAS expander.

- To reconnect the front storage drive SAS/SATA cables to the SAS expander module, plug each cable into its SAS expander module connector until you hear an audible click [2].**

Use the following table to ensure proper SAS/SATA cable connections for twelve and twenty-four storage drive systems.

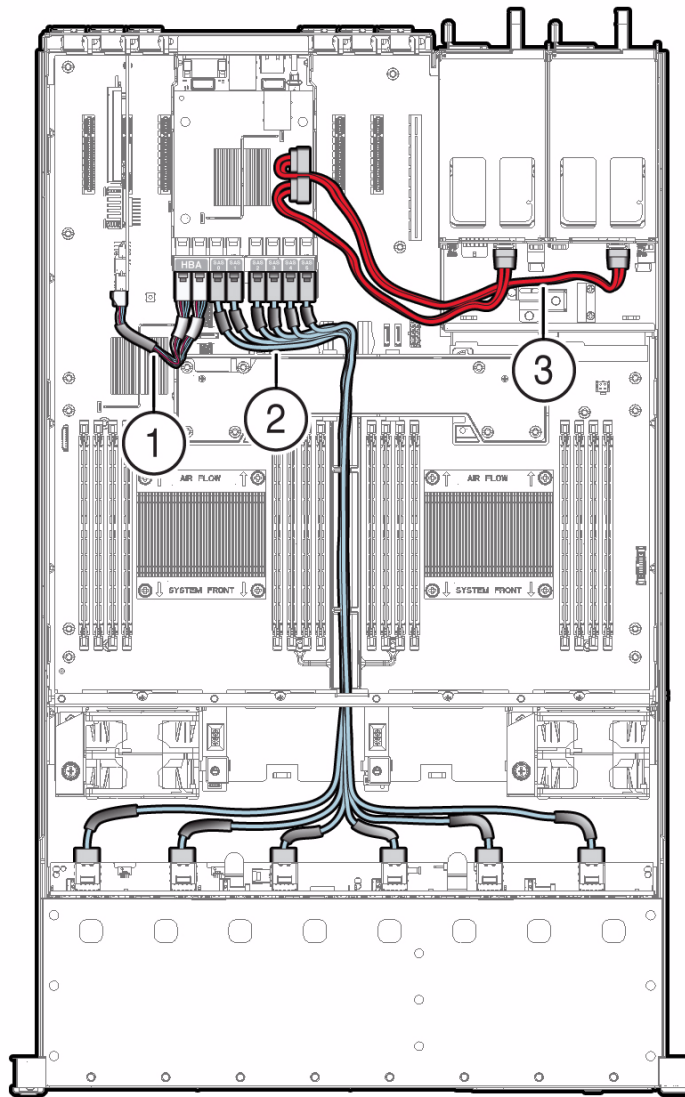
System Disk Configuration	SAS Expander Ports	Disk Backplane Ports
Twelve storage drives	SAS0	DBP0, slots 0-3
	SAS1	DBP1, slots 4-7
	SAS2	DBP2, slots 8-11

System Disk Configuration	SAS Expander Ports	Disk Backplane Ports
Twenty-four storage drives	SAS0	DBP slots 0-3
	SAS1	DBP slots 4-7
	SAS2	DBP slots 8-11
	SAS3	DBP slots 12-15
	SAS4	DBP slots 16-19
	SAS5	DBP slots 20-23

- c. (Optional) To reconnect the rear-mounted storage drive SAS cables to the SAS expander module, plug each cable into its top SAS expander module connector until you hear an audible click [3].**

In twelve and twenty-four drive systems, attach SAS expander ports RHDD0 and RHDD1 to their corresponding RHDD0 and RHDD1 rear-mounted storage drive connectors.

FIGURE: Installing SAS/SATA Storage Drive Cables



3. Place the cables into cable tie-downs, and secure them with the tie-downs [3].
4. Return the server to operation.
 - a. Install fan modules 1 and 2.
See [“Install a Fan Module”](#) on page 57.

b. If required, install the server's front fan assembly door.

See ["Install the Fan Assembly Door"](#) on page 163.

c. Install the air baffle.

See ["Install the Air Baffle"](#) on page 86.

d. Install the top cover.

See ["Install the Top Cover"](#) on page 161.

e. Return the server to the normal rack position.

See ["Reinstall the Server Chassis in the Rack"](#) on page 164.

f. Reconnect the power cords to the power supplies, and power on the server.

See ["Reconnect Power and Data Cables"](#) on page 165 and ["Power On the Server"](#) on page 165. Verify that the AC OK LED is lit.

Related Information

- ["Install the SAS Expander Module"](#) on page 83
- ["Install a PCIe Card"](#) on page 79
- ["Remove Storage Drive Cables From a SAS/SATA Configuration"](#) on page 132

Servicing the Motherboard Assembly (FRU)



Caution – The motherboard assembly should be removed only by a qualified Oracle 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 electrostatic discharge. This discharge can cause server components to fail. To avoid damage, ensure that you follow the antistatic practices as described in [“Electrostatic Discharge Safety” on page 30](#).

To remove and install the motherboard assembly, follow the procedures in these sections:

- [“Remove the Motherboard Assembly” on page 139](#)
- [“Install the Motherboard Assembly” on page 147](#)

Related Information

- [“About System Components” on page 14](#)

▼ Remove the Motherboard Assembly

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 into the maintenance position.
See [“Extend the Server to the Maintenance Position” on page 37](#).

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

See [“Take Antistatic Measures”](#) on page 40.

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

See [“Remove the Server Top Cover”](#) on page 41.

2. To remove components, follow these instructions:



Caution – During the motherboard removal procedure, it is important to label 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 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 X3-2L Administration Guide*, [“FRU TLI Auto-Update”](#) on page 97.

- [“Remove the Air Baffle”](#) on page 85
- [“Remove a Fan Module”](#) on page 55
- [“Remove Storage Drive Cables From a SAS/SATA Configuration”](#) on page 132
- [“Remove the SAS Expander Module”](#) on page 82
- [“Remove a PCIe Card”](#) on page 78
- [“Remove a Power Supply”](#) on page 60

3. Disconnect the ribbon cables from the left front I/O module and right front I/O modules [1].

See [“Servicing the Front LED/USB Indicator Modules \(FRU\)”](#) on page 126.

4. Disconnect the LED cable between the motherboard to the disk backplane [2].

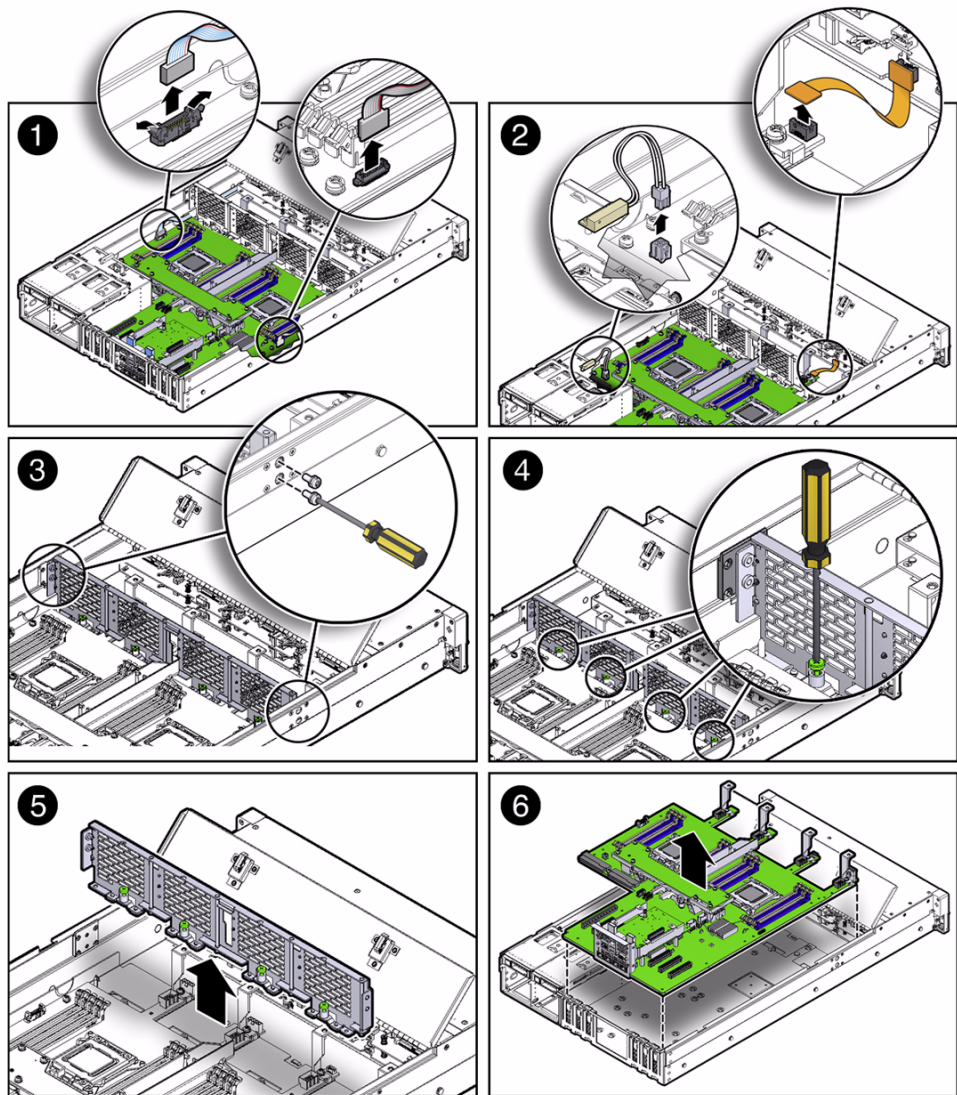
See [“Servicing the Front and Rear Storage Drive Backplanes \(FRU\)”](#) on page 114.

5. Disconnect the signal cable from the server intrusion switch [2].

6. Remove the mid-wall from the chassis.

- a. Using a No. 2 Phillips screwdriver, remove the two screws on each side of the chassis that secure the mid-wall to the chassis [3].
- b. Using a No. 2 Phillips screwdriver, loosen the four green captive screws that secure the chassis mid-wall to the bottom of the chassis [4].
- c. Lift the mid-wall out of the chassis [5].

FIGURE: Removing the Motherboard Assembly



7. With the server in the extended maintenance position, remove the motherboard from the server with all reusable components that populate the motherboard in place.
 - a. Carefully slide the motherboard forward, and lift it out of the chassis [6].
 - b. Place the motherboard assembly on an antistatic mat, and next to the replacement motherboard.

8. Remove the following reusable components from the motherboard and install them on to the replacement motherboard.

- **DDR3 DIMMs**

See [“Remove Faulty DIMMs” on page 72](#) and [“Install DDR3 DIMMs” on page 75](#).

Note – Install the DDR3 DIMMs only in the slots (connectors) from which they were removed. Performing a one-to-one replacement of DIMMs significantly reduces the possibility that 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.

- **USB flash drives**

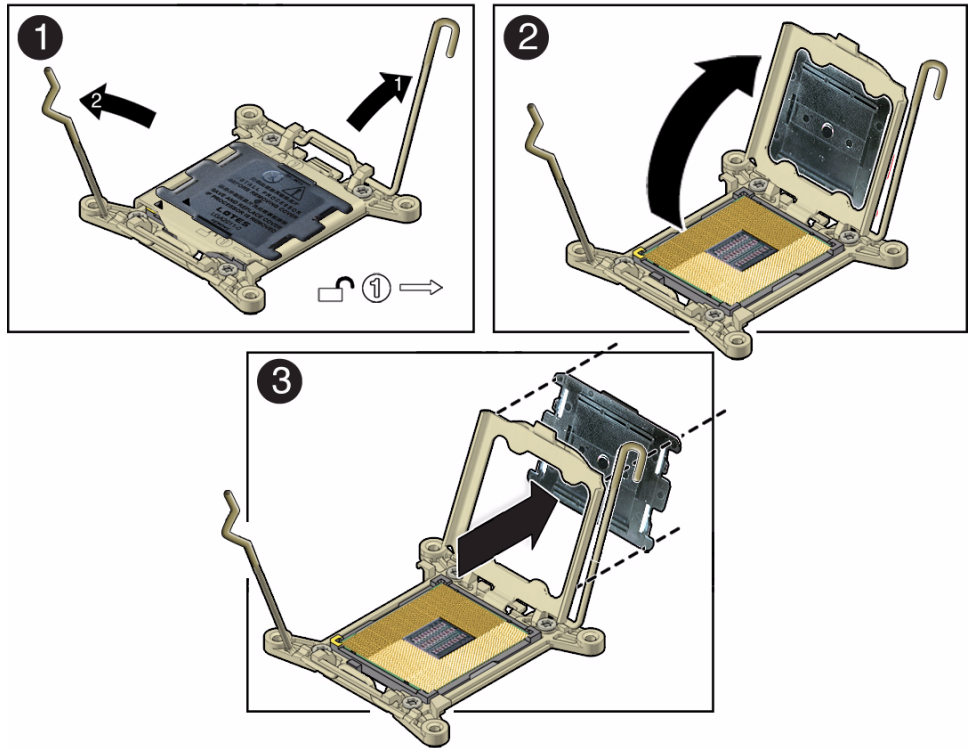
See [“Remove an Internal USB Flash Drive” on page 91](#) and [“Install an Internal USB Flash Drive” on page 92](#).

- **Processors**

See [“Remove a Processor” on page 103](#) and [“Install a Processor” on page 109](#).

9. 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.

10. Install the processor socket covers on the faulty motherboard.

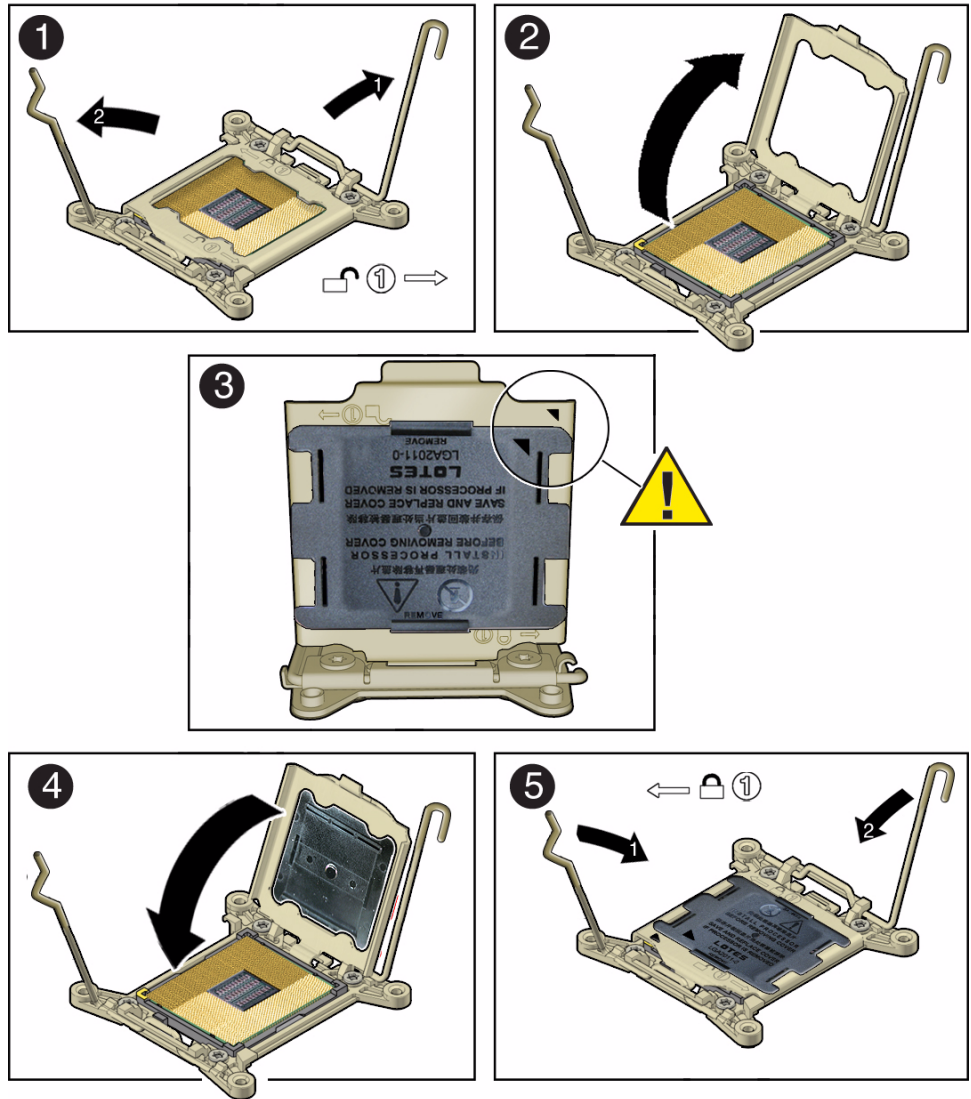


Caution – The processor socket covers must be installed on the faulty motherboard; otherwise, damage might result to the processor sockets during handling and shipping.



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

- [“About System Components”](#) on page 14
- [“Field-Replaceable Units”](#) on page 18
- [“Install the Motherboard Assembly”](#) on page 147

▼ Install the Motherboard Assembly

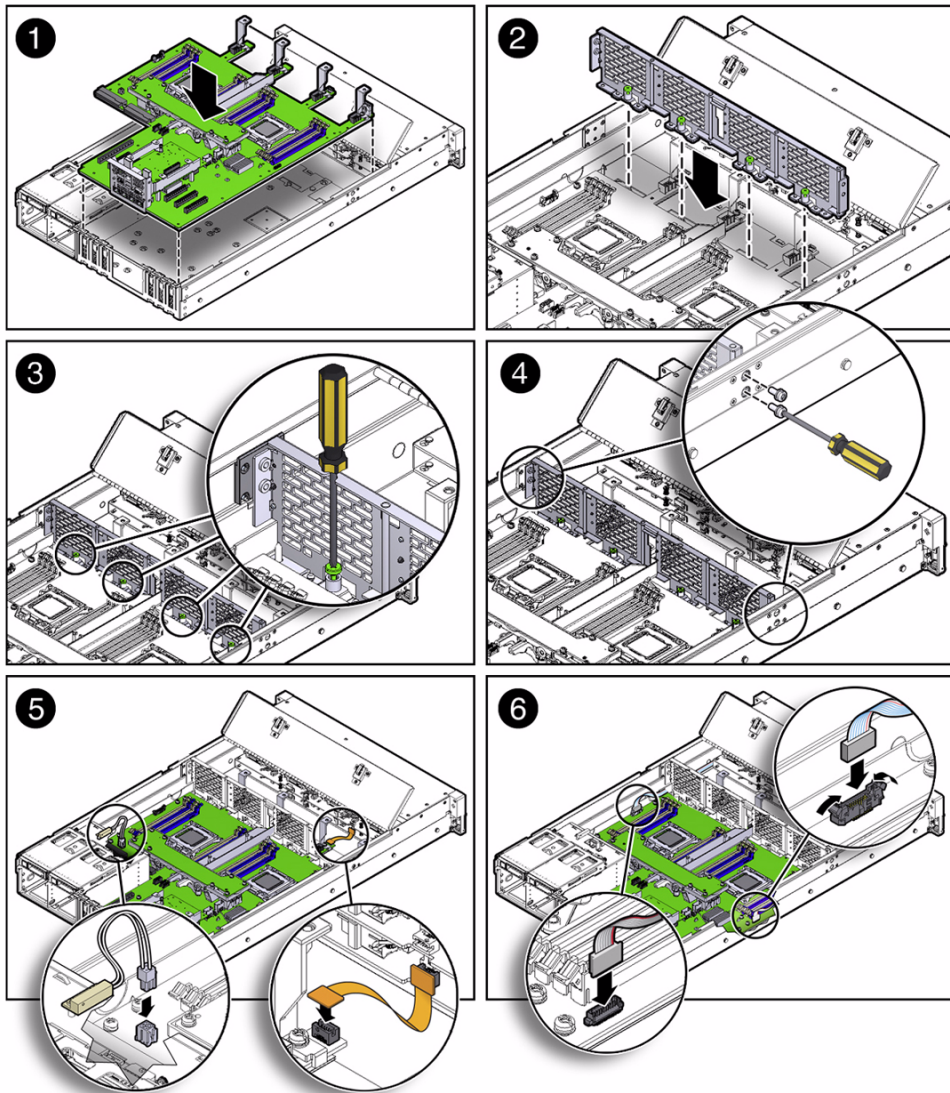
1. **Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.**

See [“Take Antistatic Measures”](#) on page 40.

2. **Carefully lift and place the motherboard assembly into the chassis [1].**

Tilt the motherboard to the right side to fit under the power supply assembly, level the motherboard and place it into the server chassis, then slide it to the rear of the server to engage the mushroom standoffs.

FIGURE: Installing the Motherboard Assembly



3. Install the mid-wall into the chassis.

- a. Lift and place the mid-wall into the chassis [2].
- b. Using a No. 2 Phillips screwdriver, tighten the four green captive screws that secure the mid-wall to the bottom of the chassis [3].
- c. Using a No. 2 Phillips screwdriver, insert and tighten the two screws on each side of the chassis to secure the mid-wall in the chassis [4].

4. **Reconnect the server intrusion switch cable to the motherboard [5].**
5. **Reconnect the signal cable from the storage drive backplane to the motherboard [5].**
See [“Servicing the Front and Rear Storage Drive Backplanes \(FRU\)”](#) on page 114.
6. **Reconnect the ribbon cables from left and right LED/USB indicator modules to the motherboard [6].**
See [“Servicing the Front LED/USB Indicator Modules \(FRU\)”](#) on page 126.
7. **To reinstall components, follow these instructions:**



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 X3-2L Administration Guide, “Managing the Server Using Oracle ILOM”](#) on page 91.

- [“Install a Power Supply”](#) on page 61
 - [“Install a PCIe Card”](#) on page 79
 - [“Install the SAS Expander Module”](#) on page 83
 - [“Install Storage Drive Cables in a SAS/SATA Configuration”](#) on page 135
 - [“Install a Fan Module”](#) on page 57
 - [“Install the Air Baffle”](#) on page 86
8. **Return the server to operation.**
 - a. **Install the top cover.**
See [“Install the Top Cover”](#) on page 161.
 - b. **Return the server to the normal rack position.**
 - c. **Reconnect the power cords to the power supplies, and power on the server.**
See [“Reconnect Power and Data Cables”](#) on page 165 and [“Power On the Server”](#) on page 165. Verify that the AC OK LED is lit.

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 more than one of the quorum members during any given service procedure, a secondary quorum member might need to be programmed with the PSN.

Related Information

- [“About System Components” on page 14](#)
- [“Customer-Replaceable Units” on page 17](#)
- [“Field-Replaceable Units” on page 18](#)
- [“Remove the Motherboard Assembly” on page 139](#)

Identifying the Server Ports

These sections describe the pinouts of the server connectors

Description	Links
Review the Gigabit-Ethernet ports.	“Gigabit-Ethernet Ports” on page 151
Review the network management ports.	“Network Management Port” on page 153
Review the serial management ports.	“Serial Management Port” on page 153
Review the video connectors.	“Video Connector” on page 155
Review the USB ports.	“USB Ports” on page 156

Related Information

- [“About the Sun Server X3-2L” on page 1](#)

Gigabit-Ethernet Ports

The server has four auto-negotiating 100/1000BASE-T Gigabit-Ethernet (10GbE) system domain ports. All four Ethernet ports use a standard RJ-45 connector. The transfer rates are shown in the following table.

Note – Ethernet ports NET2 and NET3 are nonfunctional in single-processor systems.

TABLE: Ethernet Transfer Rates

Connection Type	IEEE Terminology	Transfer Rate
Fast Ethernet	100BASE-TX	100 Mbps
Gigabit Ethernet	1000BASE-T	1000 Mbps
10 Gigabit Ethernet	10GBASE-T	10000 Mbps

The following figure and table describe the 10GbE port pin signals.

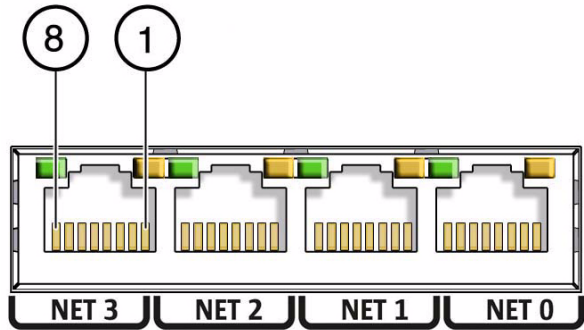


TABLE: 10GbE Port Signals

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

- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Server General Status Indicators” on page 8](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Reconnect Power and Data Cables” on page 165](#)

Network Management Port

The server has one auto-negotiating 10/100BASE-T Ethernet management domain interface, labeled NET MGT. For information about 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

- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Server General Status Indicators” on page 8](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Reconnect Power and Data Cables” on page 165](#)

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

TABLE: RJ-45 to DB-9 Adapter Crossovers Wiring Reference *(Continued)*

Serial Port (RJ-45 Connector)		DB-9 Adapter	
Pin	Signal Description	Pin	Signal Description
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

- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Reconnect Power and Data Cables” on page 165](#)



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

- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Reconnect Power and Data Cables” on page 165](#)

USB Ports

The server has six USB ports for attaching supported USB 2.0–compliant devices. Two USB ports are on the rear panel, two USB ports are on the front panel, and two USB ports are located on the motherboard.

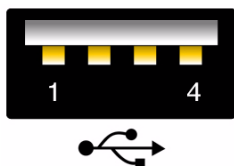


TABLE: USB Port Signals

Pin	Signal Description
1	+5 V
2	DAT-
3	DAT+
4	Ground

Related Information

- [“Rear Panel Components and Cable Connections” on page 6](#)
- [“Disconnect Cables From the Server” on page 37](#)
- [“Reconnect Power and Data Cables” on page 165](#)

Returning the Server to Operation

After replacing components inside of the server, perform the procedures in the following sections.

Description	Links
Note server filler panel requirements.	“Server Filler Panel Requirements” on page 159
Install the top cover.	“Install the Top Cover” on page 161
Install the fan door assembly top cover.	“Install the Fan Assembly Door” on page 163
Remove any antistatic measures.	“Remove Antistatic Measures” on page 163
Reinstall the server chassis in the rack.	“Reinstall the Server Chassis in the Rack” on page 164
Reconnect power and data cables.	“Reconnect Power and Data Cables” on page 165
Power on the server.	“Power On the Server” on page 165

Related Information

- [“Preparing for Service” on page 29](#)

Server Filler Panel Requirements

The 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.

Note – In single-processor systems, the server ships with a DIMM filler panel installed in processor 1 (P1) socket D7. This DIMM filler panel must not be removed from the system because it supports proper air flow for cooling.

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 for the component removed or a filler panel.

Related Information

- [“Preparing for Service” on page 29](#)

▼ 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	Installation Procedure
Storage drive	<ol style="list-style-type: none"> 1. Locate the storage drive filler panel to be removed from the server. 2. To unlatch the storage drive filler panel, press the release lever button, and then tilt the lever up into a fully opened position. 3. To remove the filler panel from the slot, hold the opened release lever, and gently slide the filler panel toward you. 	<ol style="list-style-type: none"> 1. Locate the vacant storage drive module slot in the server, and then ensure that the release lever on the filler panel is fully opened. Slide the filler panel into the vacant slot by pressing the middle of the filler panel faceplate with your thumb or finger. 2. The release lever will lower as it makes contact with the chassis. Do not slide the filler panel in all the way. Leave the filler panel out approximately 0.25 to 0.50 inch (6 to 12 mm) from the opening. 3. Using your thumb or finger, press on the middle of the filler panel faceplate until the release lever engages with the chassis. 4. Close the release lever until it clicks into place and is flush with the front of the server.
PCIe slot	<ol style="list-style-type: none"> 1. Remove the server top cover. 2. Remove the PCIe slot filler panel from the location into which you intend to install the PCIe card. <p>Note - PCIe slots 1, 2, and 3 are nonfunctional in single-processor systems.</p>	<ol style="list-style-type: none"> 1. Remove the server top cover. 2. Press the PCIe filler panel into the vacant PCIe slot.

▼ Install the Top Cover

1. Place the top cover on the chassis.

Set the cover down so that it hangs over the rear of the server by about an inch (25 mm) and the side latches align with the cutouts in the chassis.

2. Check both sides of the chassis to ensure that the top cover is fully down and flush with the chassis.

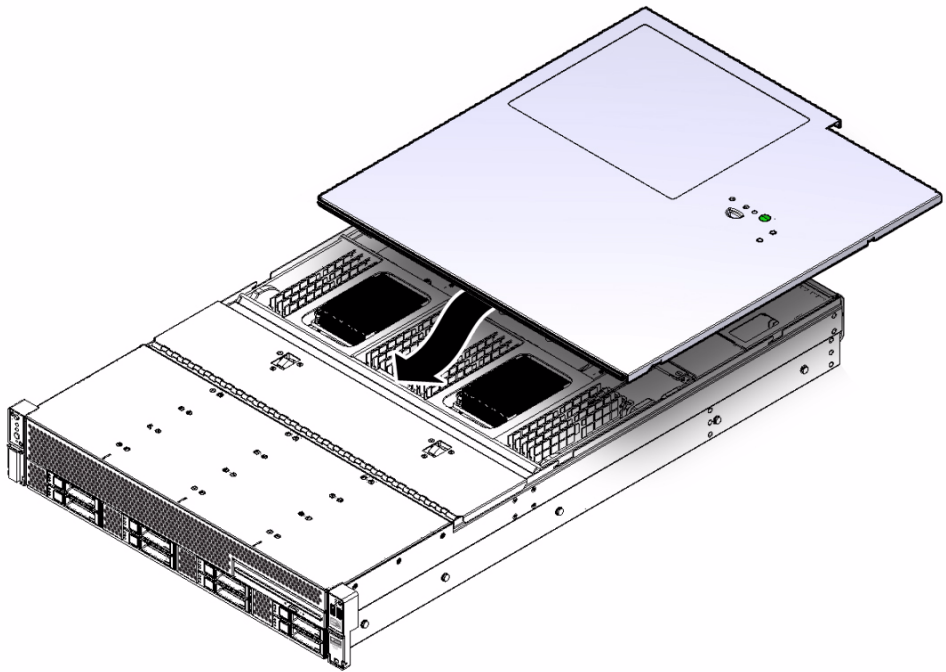
If the cover is not fully down and flush with the chassis, slide the cover towards the rear of the chassis to position the cover in the correct position.

Note – If the top cover is not correctly positioned before attempting to latch the cover, the internal latch that is located on the underside of the cover might be damaged.

3. Gently slide the cover forward until it latches into place (you hear an audible click).

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 Server Top Cover



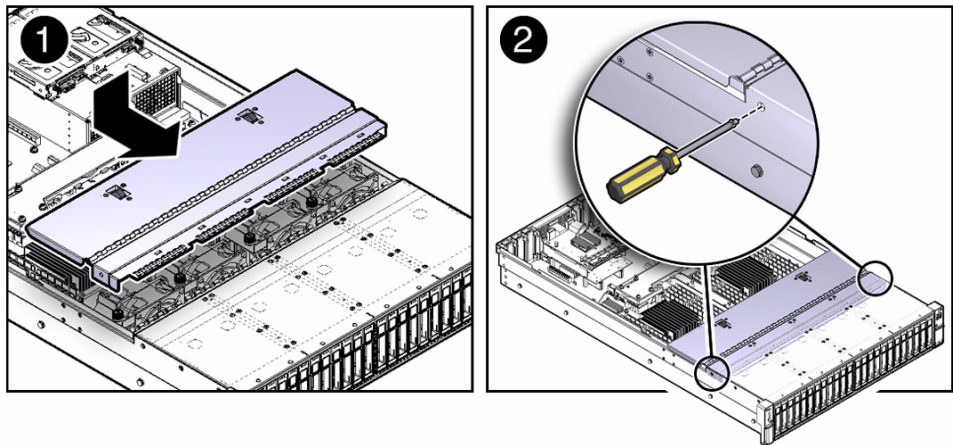
Related Information

- [“Remove the Server Top Cover” on page 41](#)

▼ Install the Fan Assembly Door

1. Place the fan assembly door on the chassis and slightly over the fan assembly.
2. Slide the fan assembly door forward and under the lip of the forward top cover until it latches into place [1].

FIGURE: Installing the Fan Assembly Door



3. Using a No. 2 Phillips screwdriver, install and tighten the screws on each side of the chassis to secure the fan assembly door [2].

Related Information

- [“Remove the Fan Assembly Door From a Server With 2.5-Inch Drives” on page 42](#)
- [“Remove the Server Top Cover” on page 41](#)

▼ Remove Antistatic Measures

1. Remove any antistatic straps or conductors from the server chassis.
2. Remove the antistatic wrist strap from yourself.

Related Information

- [“Take Antistatic Measures” on page 40](#)

▼ Reinstall the Server Chassis in the Rack

After servicing the system, reinstall it into the rack.



Caution – Deploy any rack anti-tilt mechanism before installing the server into the rack.



Caution – The server weighs approximately 70 pounds (31.75 kg). Two people are required to carry the chassis and install it in the rack.

1. Lift the server from the antistatic mat, and reinstall the server into the rack.

Refer to the *Sun Server X3-2L Installation Guide*, “Installing the Server Into a Rack” on page 23 for the installation instructions specific to your rackmount kit.

2. If the cable management arm (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 X3-2L Installation Guide*, “Install the Second-Generation Cable Management Arm” on page 37
- *Sun Server X3-2L Installation Guide*, “Install the First-Generation Cable Management Arm” on page 54

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 Power and Data Cables” on page 165.
- For detailed information on connecting cables to the rear of the server, see *Sun Server X3-2L Installation Guide*, “Rear Cable Connections and Ports” on page 61.

Related Information

- “Remove the Server From the Rack” on page 39
- “Reconnect Power and Data Cables” on page 165

▼ Reconnect Power and Data Cables

1. **Reconnect the data cables to the rear of the server, as appropriate.**

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.**
3. **If necessary, reinstall the cables into the cable management arm and secure them with Velcro straps or cable straps, depending on which version of the CMA you are using.**

4. **Power on the server.**

See [“Power On the Server” on page 165](#).

Related Information

- [“Disconnect Cables From the Server” on page 37](#)
- [“Reinstall the Server Chassis in the Rack” on page 164](#)
- [“Power On the Server” on page 165](#)

▼ Power On the Server

As soon as the power cords are connected, standby power is applied. In standby power mode, the Power/OK LED on the server front panel blinks steadily. Depending on the configuration of the firmware, the system might boot. If it does not, follow this procedure.

- **Power on the server by performing one of the following actions:**
 - Press the Power button on the front bezel.
 - Log in to the Oracle ILOM SP, and type the following command at the Oracle ILOM prompt.

```
-> start /System
```

When main power is applied to the server, the green Power/OK LED on the front panel of the server lights and remains lit.

Related Information

- [“Powering Down the Server” on page 32](#)
- [“Reconnect Power and Data Cables” on page 165](#)

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 167
Learn about options for accessing firmware and software.	“Firmware and Software Access Options” on page 168
Review available firmware and software releases.	“Software Releases” on page 169
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 170
Install firmware and software updates using other methods.	“Installing Updates Using Other Methods” on page 174

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 X3-2L 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 169.

For instructions on how to download software releases from My Oracle Support, see “Download Firmware and Software Using My Oracle Support” on page 170.

- **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 172.

- **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 174.

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
X3-2L (X4270 M3) <i>SWversion</i> – Firmware Pack	All the system firmware, including Oracle ILOM, BIOS, and option card firmware.	You need the latest firmware.
X3-2L (X4270 M3) <i>SWversion</i> – 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.
X3-2L (X4270 M3) <i>SWversion</i> – 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
X3-2L (X4270 M3) <i>SWversion</i> – Diagnostics	Oracle VTS diagnostics image.	You need the Oracle VTS diagnostics image.
X3-2L (X4270 M3) <i>SWversion</i> – Oracle System Assistant Updater	Oracle System Assistant recovery and ISO update image.	You need to manually recover or update Oracle System Assistant.

Each of the downloads 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.

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 X3 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 170
- “Requesting Physical Media” on page 171

▼ 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 X3-2L (formerly Sun Fire X4270 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 169](#) 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 172](#)
- [“Request Physical Media \(Online\)” on page 172](#)
- [“Request Physical Media \(By Phone\)” on page 174](#)

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 170 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 169 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 172 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?	<i>Product Name:</i> Sun Server X3-2L <i>Version:</i> 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 172 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 X3-2L.**

- 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 X3-2L.

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** – Ops Center Enterprise Controller can 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** – The fwupdate CLI Tool within the Oracle Hardware Management Pack can be used 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** – Oracle ILOM and BIOS firmware are the only firmware that can be updated using either the Oracle ILOM web interface or the command-line interface.

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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