

Netra SPARC T3-1 Server

Service Manual



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Using This Documentation

This service manual explains how to replace parts in the Netra SPARC T3-1 server from Oracle, and how to use and maintain the system. This document is written for technicians, system administrators, authorized service providers, and users who have advanced experience troubleshooting and replacing hardware.

- [“Related Documentation” on page xi](#)
- [“Documentation, Support, and Training” on page xii](#)

Related Documentation

The Netra SPARC T3-1 server documents listed as online are available at:

<http://www.oracle.com/pls/topic/lookup?ctx=E20689-01&id=homepage>

Application	Title	Format	Location
Installation, administration, service	<i>Netra SPARC T3-1 Server Topic Set</i>	HTML	Online
Late-breaking information	<i>Netra SPARC T3-1 Server Product Notes</i>	PDF	Online
Getting started	<i>Netra Rack Server Getting Started Guide</i>	Printed	Ships with server
Installation and planning	<i>Netra SPARC T3-1 Server Installation Guide</i>	PDF HTML	Online

Application	Title	Format	Location
Administration	<i>Netra SPARC T3-1 Server Administration Guide</i>	PDF HTML	Online
Service	<i>Netra SPARC T3-1 Server Service Manual</i>	PDF HTML	Online
Safety and compliance	<i>Netra SPARC T3-1 Server Safety and Compliance Guide</i>	PDF	Online

The Oracle Integrated Lights Out Manager (ILOM) 3.0 documentation is online at:

<http://www.oracle.com/pls/topic/lookup?ctx=ilom30&id=homepage>

Application	Title	Location
Late-breaking news and issues	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Features Updates and Release Notes</i>	Online
Installation and configuration	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Getting Started Guide</i>	Online
Conceptual information	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide</i>	Online
Browser interface procedures	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide</i>	Online
CLI procedures	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide</i>	Online
SNMP and IPMI procedures	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Management Protocols Reference Guide: SNMP, IPMI, WS-Man, CIM</i>	Online

Documentation, Support, and Training

These web sites provide additional resources:

- Documentation (<http://www.oracle.com/technetwork/indexes/documentation/index.html>)
- Support (<https://support.oracle.com>)
- Training (<https://education.oracle.com>)

Identifying Components

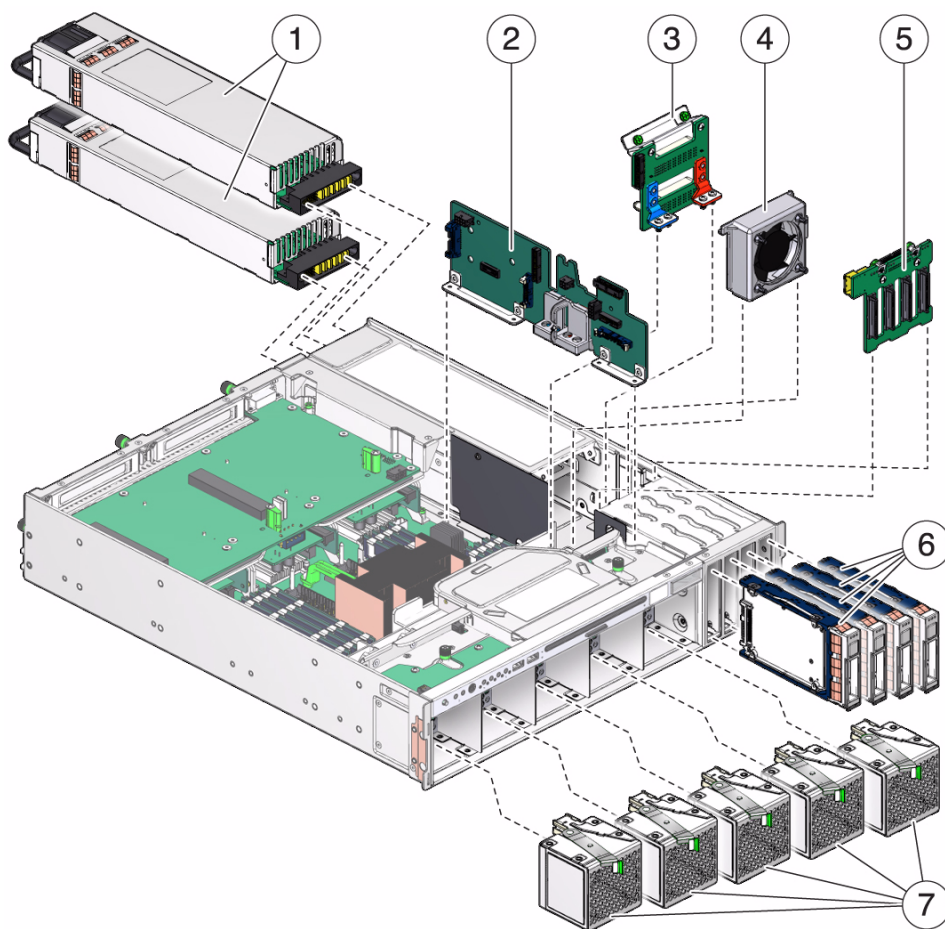
These topics identify key components of the server.

- [“Power Supply, Hard Drive, and Fan Module Locations” on page 2](#)
- [“Top Cover, Filter Tray, and DVD Tray Locations” on page 4](#)
- [“Motherboard, DIMMs, and PCI Board Locations” on page 6](#)

Related Information

- [“Detecting and Managing Faults” on page 9](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

Power Supply, Hard Drive, and Fan Module Locations



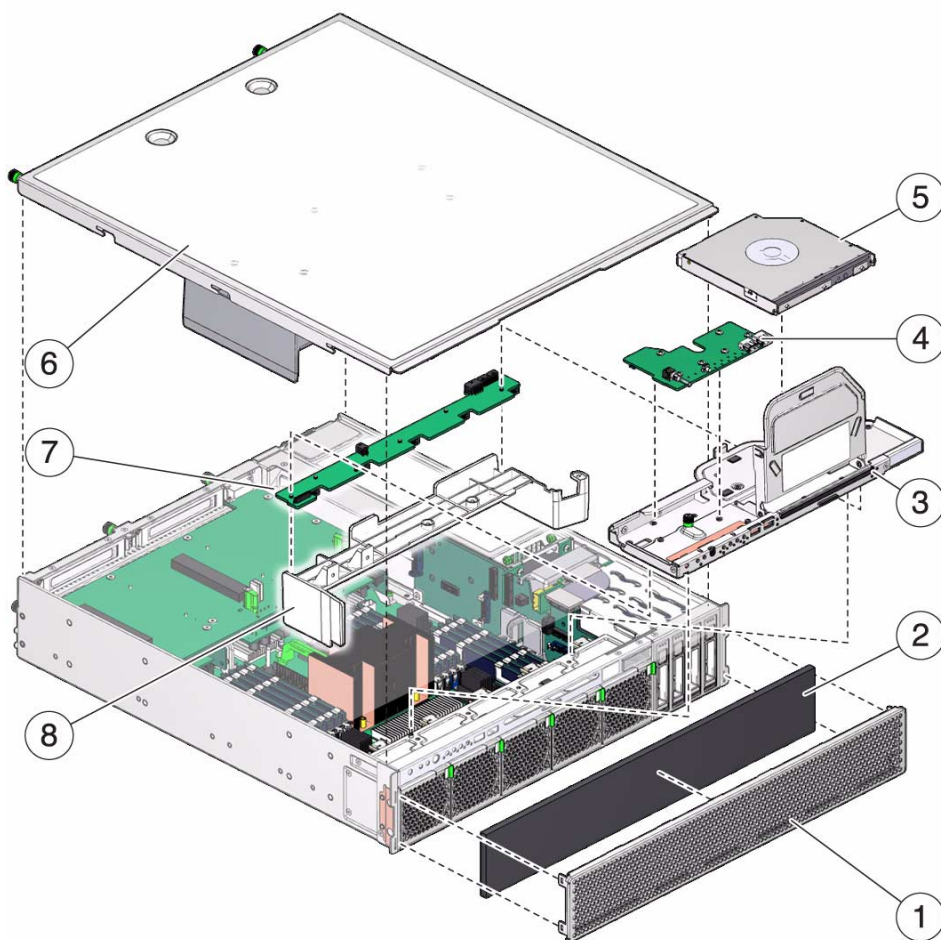
No.	Name	Service Link
1	Power supply	“Servicing Power Supplies” on page 91
2	Signal interface board	“Servicing the Signal Interface Board” on page 201
3	Power distribution board	“Servicing the Power Distribution Board” on page 131
4	Hard drive fan	“Servicing the Hard Drive Fan” on page 115

No.	Name	Service Link
5	Hard drive backplane	“Servicing the Hard Drive Backplane” on page 123
6	Hard drive	“Servicing Hard Drives” on page 103
7	Fan module	“Servicing Fan Modules” on page 83

Related Information

- [“Top Cover, Filter Tray, and DVD Tray Locations” on page 4](#)
- [“Motherboard, DIMMs, and PCI Board Locations” on page 6](#)

Top Cover, Filter Tray, and DVD Tray Locations



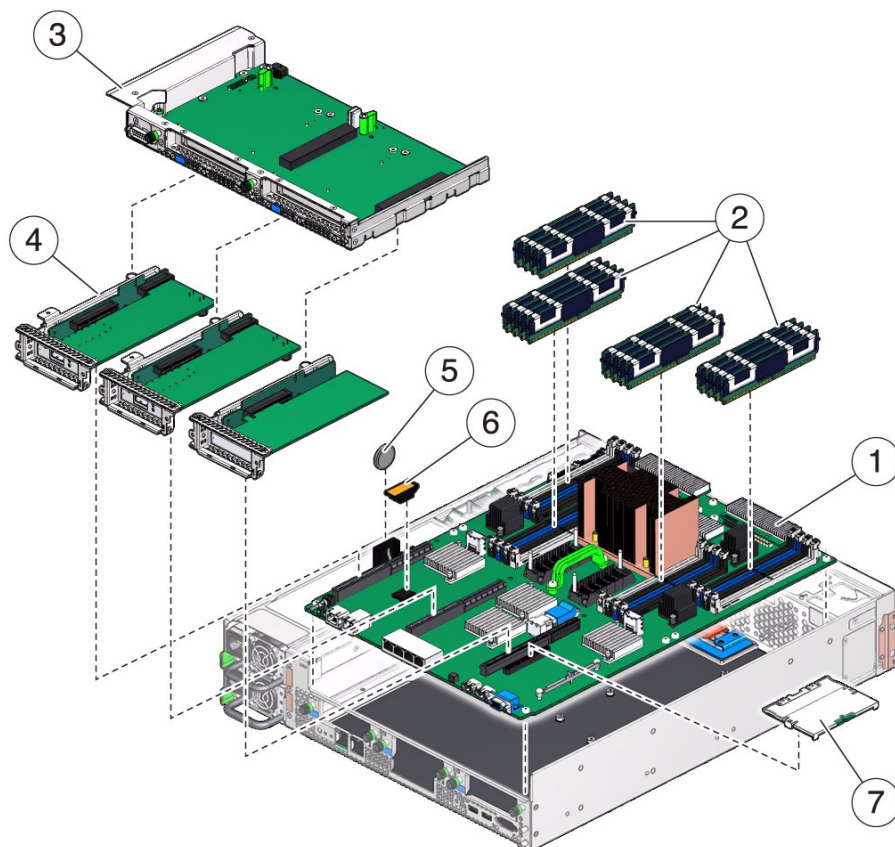
No.	Name	Service Link
1	Filter tray	"Servicing the Air Filter" on page 77
2	Air filter	"Servicing the Air Filter" on page 77
3	DVD bracket	"Servicing the DVD Tray" on page 147

No.	Name	Service Link
4	LED board	“Servicing the LED Board” on page 153
5	DVD drive	“Servicing the DVD Drive” on page 139
6	Top cover	“Remove the Top Cover” on page 73 “Install the Top Cover” on page 255
7	Fan board	“Servicing the Fan Board” on page 159
8	Air baffle	

Related Information

- [“Power Supply, Hard Drive, and Fan Module Locations” on page 2](#)
- [“Motherboard, DIMMs, and PCI Board Locations” on page 6](#)

Motherboard, DIMMs, and PCI Board Locations



No.	Name	Service Link
1	Motherboard	“Servicing the Motherboard” on page 245
2	DIMM	“Servicing DIMMs” on page 211
3	PCIe2 mezzanine board	“Servicing the PCIe2 Mezzanine Board” on page 169
4	PCIe2 riser card	“Servicing the PCIe2 Riser Card” on page 179

No.	Name	Service Link
5	Battery	“Servicing the Battery” on page 221
6	ID PROM	“Servicing the ID PROM” on page 237
7	SP	“Servicing the SP” on page 229

Related Information

- [“Power Supply, Hard Drive, and Fan Module Locations” on page 2](#)
- [“Top Cover, Filter Tray, and DVD Tray Locations” on page 4](#)

Detecting and Managing Faults

These topics explain how to use various diagnostic tools to monitor server status and troubleshoot faults in the server.

- [“Diagnostics Overview” on page 9](#)
- [“Diagnostics Process” on page 11](#)
- [“Interpreting Diagnostic LEDs” on page 17](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Verifying Oracle VTS Installation” on page 39](#)
- [“Managing Faults \(POST\)” on page 41](#)
- [“Managing Faults \(PSH\)” on page 51](#)
- [“Managing Components \(ASR\)” on page 57](#)

Related Information

- [“Identifying Components” on page 1](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

Diagnostics Overview

You can use a variety of diagnostic tools, commands, and indicators to monitor and troubleshoot a server:

- **LEDs** – Provide a quick visual notification of the status of the server and of some of the FRUs.

- **Oracle Integrated Lights-Out Manager (ILOM) 3.0 firmware** – Runs on the SP. In addition to providing the interface between the hardware and OS, Oracle ILOM also tracks and reports the health of key server components. Oracle ILOM works closely with POST and PSH to keep the system running even when there is a faulty component.
- **POST** – Performs diagnostics on system components upon system reset to ensure the integrity of those components. POST is configureable and works with Oracle ILOM to take faulty components offline if needed.
- **Oracle Solaris OS PSH** - Continuously monitors the health of the CPU, memory and other components, and works with Oracle ILOM to take a faulty component offline if needed. The PSH technology enables systems to accurately predict component failures and mitigate many serious problems before they occur.
- **Log files and command interface** – Provide the standard Oracle Solaris OS log files and investigative commands that can be accessed and displayed on the device of your choice.
- **Oracle VTS** – Exercises the system, provides hardware validation, and discloses possible faulty components with recommendations for repair.

The LEDs, Oracle ILOM, PSH, and many of the log files and console messages are integrated. For example, when the Oracle Solaris software detects a fault, the software displays the fault, logs the fault, and passes the information to Oracle ILOM where the fault is also logged. Depending on the fault, one or more LEDs might also be illuminated.

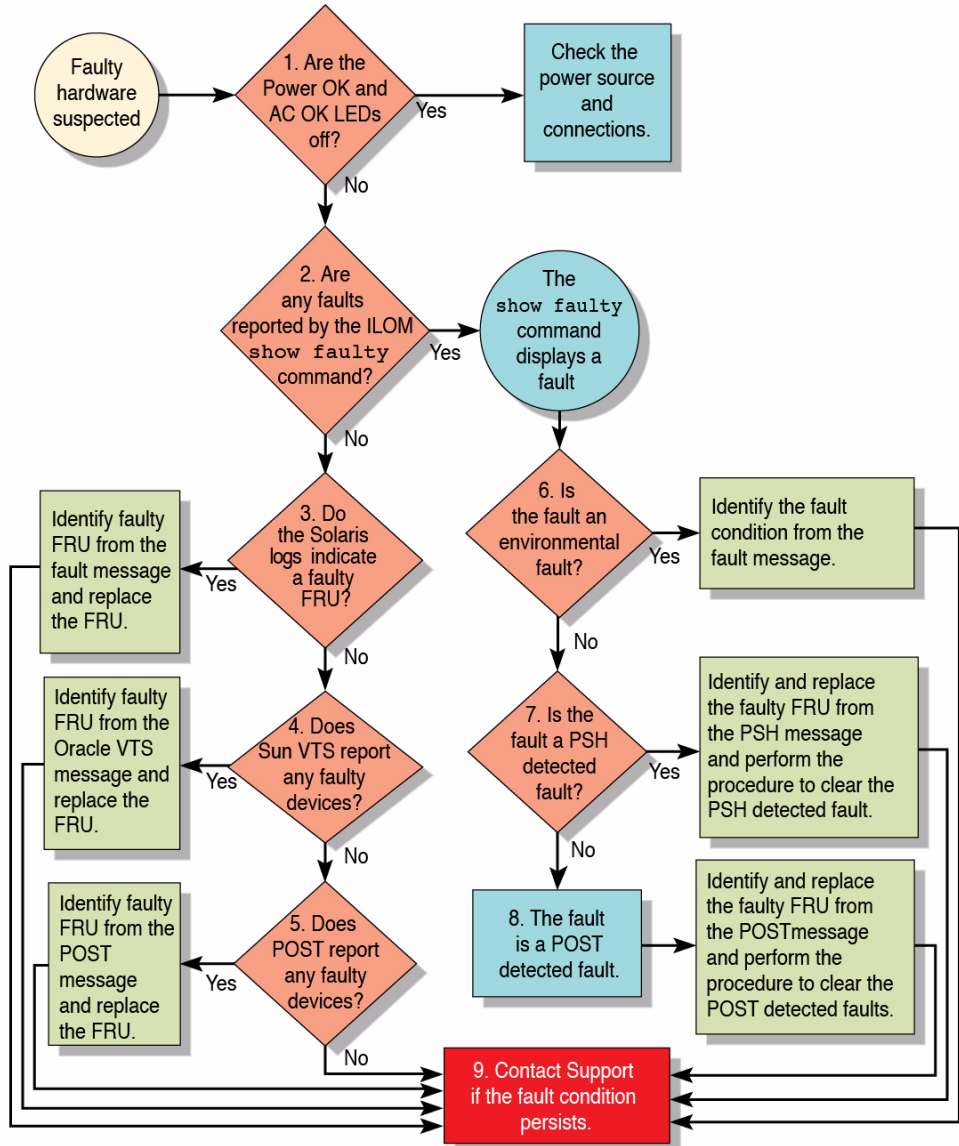
The diagnostic flow chart in [“Diagnostics Process” on page 11](#) describes an approach for using the server diagnostics to identify a faulty FRU. The diagnostics you use, and the order in which you use them, depend on the nature of the problem you are troubleshooting. So you might perform some actions and not others.

Related Information

- [“Diagnostics Process” on page 11](#)
- [“Locating Components, Ports, and LEDs” on page 14](#)
- [“Interpreting Diagnostic LEDs” on page 17](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Verifying Oracle VTS Installation” on page 39](#)
- [“Managing Faults \(POST\)” on page 41](#)
- [“Managing Faults \(PSH\)” on page 51](#)
- [“Managing Components \(ASR\)” on page 57](#)

Diagnostics Process

The following flowchart illustrates the complementary relationship of the different diagnostic tools and indicates a default sequence of use.



The following table provides brief descriptions of the troubleshooting actions shown in the flowchart. The table also provides links to topics with additional information on each diagnostic action.

Flowchart No.	Diagnostic Action	Possible Outcome	Additional Information
1	Check Power OK and AC Present LEDs on the server.	<p>The Power OK LED is located on the front and rear of the chassis.</p> <p>The AC Present LED is located on the rear of the server on each power supply.</p> <p>If these LEDs are not on, check the power source and power connections to the server.</p>	<ul style="list-style-type: none"> • “Interpreting Diagnostic LEDs” on page 17
2	Run the Oracle ILOM show faulty command to check for faults.	<p>The show faulty command displays the following kinds of faults:</p> <ul style="list-style-type: none"> • Environmental faults • PSH-detected faults • POST-detected faults <p>Faulty FRUs are identified in fault messages using the FRU name.</p>	<ul style="list-style-type: none"> • “Service-Related Oracle ILOM Commands” on page 36 • “Check for Faults (show faulty Command)” on page 27
3	Check the Oracle Solaris log files for fault information.	<p>The Oracle Solaris message buffer and log files record system events, and provide information about faults.</p> <ul style="list-style-type: none"> • If system messages indicate a faulty device, replace the FRU. • For more diagnostic information, review the Oracle VTS report (flowchart item 4). 	<ul style="list-style-type: none"> • “Interpreting Log Files and System Messages” on page 37
4	Run Oracle VTS software.	<p>Oracle VTS is an application you can run to exercise and diagnose FRUs. To run Oracle VTS, the server must be running the Oracle Solaris OS.</p> <ul style="list-style-type: none"> • If Oracle VTS reports a faulty device, replace the FRU. • If Oracle VTS does not report a faulty device, run POST (flowchart item 5). 	<ul style="list-style-type: none"> • “Verifying Oracle VTS Installation” on page 39
5	Run POST.	<p>POST performs basic tests of the server components and reports faulty FRUs.</p>	<ul style="list-style-type: none"> • “Managing Faults (POST)” on page 41 • “Oracle ILOM Properties That Affect POST Behavior” on page 42

Flowchart			
Flowchart No.	Diagnostic Action	Possible Outcome	Additional Information
6	Determine if the fault was detected by the Oracle ILOM fault management software.	<p>Determine if the fault is an environmental fault or a configuration fault.</p> <p>If the fault listed by the <code>show faulty</code> command displays a temperature or voltage fault, then the fault is an environmental fault. Environmental faults can be caused by faulty FRUs (power supply or fan), or by environmental conditions such as ambient temperature that is too high or lack of sufficient airflow through the server. When the environmental condition is corrected, the fault automatically clears.</p> <p>If the fault indicates that a fan or power supply is bad, you can replace the FRU. You can also use the fault LEDs on the server to identify the faulty FRU (fans and power supplies).</p>	<ul style="list-style-type: none"> • “Check for Faults (show faulty Command)” on page 27 • “Check for Faults (fmadm faulty Command)” on page 28
7	Determine if the fault was detected by PSH.	<p>If the fault displayed included a <i>uuid</i> and <i>sunw-msg-id</i> property, the fault was detected by the PSH software.</p> <p>If the fault is a PSH-detected fault, refer to the PSH Knowledge Article web site for additional information. The Knowledge Article for the fault is located at the following link:</p> <p>where <i>message-ID</i> is the value of the <i>sunw-msg-id</i> property displayed by the <code>show faulty</code> command.</p> <p>After you replace the FRU, perform the procedure to clear PSH-detected faults.</p>	<ul style="list-style-type: none"> • “Managing Faults (PSH)” on page 51 • “Clear PSH-Detected Faults” on page 56
8	Determine if the fault was detected by POST.	<p>POST performs basic tests of the server components and reports faulty FRUs. When POST detects a faulty FRU, POST logs the fault, and if possible, takes the FRU offline. POST-detected FRUs display the following text in the fault message:</p> <p>Forced fail <i>reason</i></p> <p>In a POST fault message, <i>reason</i> is the name of the power-on routine that detected the failure.</p>	<ul style="list-style-type: none"> • “Managing Faults (POST)” on page 41 • “Clear POST-Detected Faults” on page 48
9	Contact technical support.	The majority of hardware faults are detected by the server’s diagnostics. In rare cases a problem might require additional troubleshooting. If you are unable to determine the cause of the problem, contact your service representative for support.	

Related Information

- [“Diagnostics Overview” on page 9](#)
- [“Locating Components, Ports, and LEDs” on page 14](#)
- [“Interpreting Diagnostic LEDs” on page 17](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Verifying Oracle VTS Installation” on page 39](#)
- [“Managing Faults \(POST\)” on page 41](#)
- [“Managing Faults \(PSH\)” on page 51](#)
- [“Managing Components \(ASR\)” on page 57](#)

Locating Components, Ports, and LEDs

These topics enable you to identify the components, ports, LEDs located at the front and rear of the server.

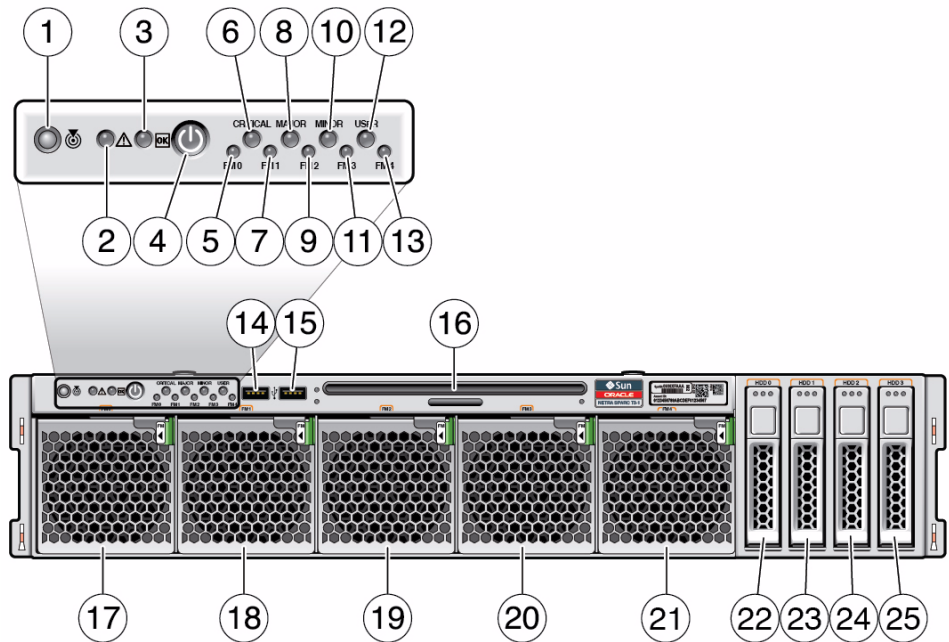
- [“Front Components and LEDs” on page 14](#)
- [“Rear Components, Ports, and LEDs” on page 16](#)

Related Information

- [“Diagnostics Overview” on page 9](#)
- [“Diagnostics Process” on page 11](#)
- [“Interpreting Diagnostic LEDs” on page 17](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Verifying Oracle VTS Installation” on page 39](#)
- [“Managing Faults \(POST\)” on page 41](#)
- [“Managing Faults \(PSH\)” on page 51](#)
- [“Managing Components \(ASR\)” on page 57](#)

Front Components and LEDs

In the following illustration, the filter tray has been removed.

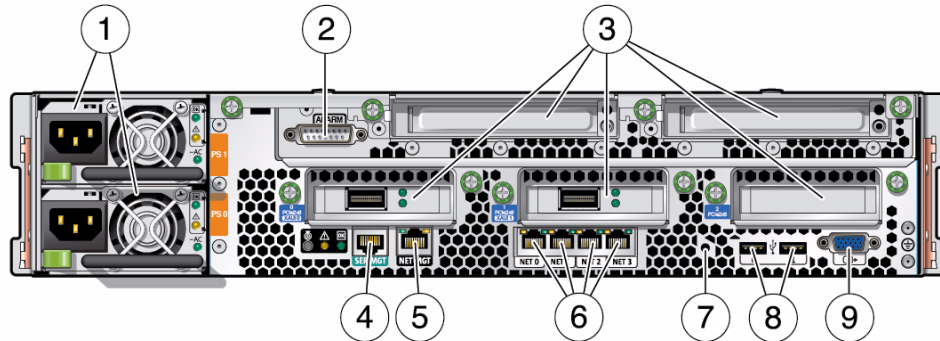


1	Locator LED/Locator button: white	14	USB 2.0 port (USB 3)
2	Service Action Required LED: amber	15	USB 2.0 port (USB 4)
3	Main Power/OK LED: green	16	DVD drive
4	Power button	17	Fan module (FM0)
5	Fan Fault (FM 0) LED: green (normal), amber (fault)	18	Fan module (FM1)
6	Critical Alarm LED: red	19	Fan module (FM2)
7	Fan Fault LED (FM 1): green (normal), amber (fault)	20	Fan module (FM3)
8	Major Alarm LED: red	21	Fan module (FM4)
9	Fan Fault LED (FM 2): green (normal), amber (fault)	22	Hard drive (HDD0)
10	Minor Alarm LED: amber	23	Hard drive (HDD1)
11	Fan Fault LED (FM 3): green (normal), amber (fault)	24	Hard drive (HDD2)
12	User Alarm LED: amber	25	Hard drive (HDD3)
13	Fan Fault LED (FM 4): green (normal), amber (fault)		Fan module (FM 5) (internal - not shown)

Related Information

- [“Rear Components, Ports, and LEDs” on page 16](#)
- [“Identifying Components” on page 1](#)

Rear Components, Ports, and LEDs



No.	Description	Links
1	Power supplies (PS1 - PS0, top to bottom)	“Servicing Power Supplies” on page 91
2	Alarm port (DB-15)	“Servicing the PCIe2 Mezzanine Board” on page 169 Refer to <i>Server Installation Guide</i> for pin outs and signal descriptions.
3	Expansion slots 0 (left) and 1 (middle) (PCIe 2.0 x8 or XAUI) Expansion slots 2 (right), 3 and 4 (upper row) (PCIe 2.0 x8)	“Servicing the PCIe2 Mezzanine Board” on page 169 “Servicing the PCIe2 Riser Card” on page 179 “Servicing PCIe2 Cards” on page 187
4	SP SER MGT port (RJ-45)	Refer to <i>Server Installation Guide</i> for pin outs and signal descriptions.
5	SP NET MGT port (RJ-45)	Refer to <i>Server Installation Guide</i> for pin outs and signal descriptions.
6	Network 10/100/1000 ports (NET0 - NET3, left to right)	Refer to <i>Server Installation Guide</i> for pin outs and signal descriptions.
7	Physical Presence button access hole	

No.	Description	Links
8	USB 2.0 ports (USB0 - USB1, left to right)	Refer to <i>Server Installation Guide</i> for pin outs and signal descriptions.
9	Video connector (HD-15)	Refer to <i>Server Installation Guide</i> for pin outs and signal descriptions.

Related Information

- [“Front Components and LEDs” on page 14](#)
- [“Identifying Components” on page 1](#)

Interpreting Diagnostic LEDs

Use the following diagnostic LEDs to determine if a component has failed in the server.





- [“Front Panel LEDs” on page 17](#)
- [“Rear Panel LEDs” on page 19](#)

Related Information

- [“Diagnostics Overview” on page 9](#)
- [“Diagnostics Process” on page 11](#)
- [“Locating Components, Ports, and LEDs” on page 14](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Verifying Oracle VTS Installation” on page 39](#)
- [“Managing Faults \(POST\)” on page 41](#)
- [“Managing Faults \(PSH\)” on page 51](#)
- [“Managing Components \(ASR\)” on page 57](#)

Front Panel LEDs

The system status is represented by six LEDs on the front panel. See [“Front Components and LEDs” on page 14](#) to identify the location of the LEDs. The numbers in the following table relate to the callouts of the illustration.

No.	LED	Icon	Description
1	Locator LED and button (white)		<p>The Locator LED can be turned on to identify a particular system. When on, the LED blinks rapidly. There are two methods for turning a Locator LED on:</p> <ul style="list-style-type: none"> • Typing the Oracle ILOM command <code>set /SYS/LOCATE value=Fast_Blink</code> • Pressing the Locator button
2	Service Action Required LED (amber)		<p>Indicates that service is required. POST and Oracle ILOM are two diagnostics tools that can detect a fault or failure resulting in this indication.</p> <p>The Oracle ILOM <code>show faulty</code> command provides details about any faults that cause this indicator to light.</p> <p>Under some fault conditions, individual component fault LEDs are turned on in addition to the Service Required LED.</p>
3	Main Power OK LED (green)		<p>Indicates the following conditions:</p> <ul style="list-style-type: none"> • Off – System is not running in its normal state. System power might be off. The SP might be running. • Steady on – System is powered on and is running in its normal operating state. No service actions are required. • Fast blink – System is running in standby mode and can be quickly returned to full function. • Slow blink – A normal but transitory activity is taking place. Slow blinking might indicate that system diagnostics are running or that the system is booting.
4	Power button		<p>The recessed Power button toggles the system on or off.</p> <ul style="list-style-type: none"> • Press once to turn the system on. • Press once to shut the system down in a normal manner. • Press and hold for 4 seconds to perform an emergency shutdown.
5	FM0 Fault LED (green/amber)	FM0	<p>Indicates the state of fan module FM0:</p> <ul style="list-style-type: none"> • Green – Indicates a steady state, no service action is required. • Amber – Indicates a fault with the fan.
6	Critical Alarm LED (red)	CRITICAL	Indicates a critical alarm condition.
7	FM1 Fault LED (green/amber)	FM1	<p>Indicates the state of fan module FM1:</p> <ul style="list-style-type: none"> • Green – Indicates a steady state, no service action is required. • Amber – Indicates a fault with the fan.
8	Major Alarm LED (red)	MAJOR	Indicates a major alarm condition.



No.	LED	Icon	Description
9	FM2 Fault LED (green/amber)	FM2	Indicates the state of fan module FM2: <ul style="list-style-type: none"> • Green – Indicates a steady state, no service action is required. • Amber – Indicates a fault with the fan.
10	Minor Alarm LED (amber)	MINOR	Indicates a minor alarm condition.
11	FM3 Fault LED (green/amber)	FM3	Indicates the state of fan module FM3: <ul style="list-style-type: none"> • Green – Indicates a steady state, no service action is required. • Amber – Indicates a fault with the fan.
12	User Alarm LED (amber)	USER	Indicates a user alarm condition.
13	FM4 Fault LED (green/amber)	FM4	Indicates the state of fan module FM4: <ul style="list-style-type: none"> • Green – Indicates a steady state, no service action is required. • Amber – Indicates a fault with the fan.




Related Information

- [“Rear Panel LEDs” on page 19](#)

Rear Panel LEDs

The rear panel has several LEDs, some of which give system status information, while others provide link information on the NET and QSFP ports. See [“Rear Components, Ports, and LEDs” on page 16](#) to identify the location of the LEDs. The numbers in the following table relate to the callouts of the illustration.

No.	LED	Icon	Description
3	Output Power OK LED (green)		Indicates that output power is without fault.
3	Service Action Required LED (amber)		Indicates that service for the power supply is required. POST and Oracle ILOM are two diagnostic tools that can detect a fault or failure resulting in this indication. The Oracle ILOM show <code>faulty</code> command provides details about any faults that cause this indicator to light.
3	AC or DC Input Power (green)		Indicates that input power is without fault.

No.	LED	Icon	Description
5,7	QSFP Link and Activity (green)		Indicates the following conditions: <ul style="list-style-type: none"> • Blinking – A link is established. • Off – No link is established.
10	System Locator LED and button (white)		The Locator LED can be turned on to identify a particular system. When on, the LED blinks rapidly. There are two methods for turning a Locator LED on: <ul style="list-style-type: none"> • Typing the Oracle ILOM command <code>set /SYS/LOCATE value=Fast_Blink</code> • Pressing the Locator button
10	System Service Required LED (amber)		Indicates that service is required. POST and Oracle ILOM are two diagnostic tools that can detect a fault or failure resulting in this indication. The Oracle ILOM <code>show faulty</code> command provides details about any faults that cause this indicator to light. Under some fault conditions, individual component fault LEDs are turned on in addition to the Service Required LED.
10	System Power OK LED (green)		Indicates the following conditions: <ul style="list-style-type: none"> • Off – System is not running in its normal state. System power might be off. The SP might be running. • Steady on – System is powered on and is running in its normal operating state. No service actions are required. • Fast blink – System is running in standby mode and can be quickly returned to full function. • Slow blink – A normal but transitory activity is taking place. Slow blinking might indicate that system diagnostics are running or that the system is booting.
12	Net Management Link and Activity (green)		Indicates the following conditions: <ul style="list-style-type: none"> • On or blinking – A link is established. • Off – No link is established.

No.	LED	Icon	Description
12	Net Management Speed (green)		Indicates the following conditions: <ul style="list-style-type: none"> • On or blinking – The link is operating as a 100-Mbps connection. • Off – The link is operating as a 10-Mbps connection.
13,14, 15,16	NET Link and Activity (green)		Indicates the following conditions: <ul style="list-style-type: none"> • Blinking – A link is established. • Off – No link is established.
13,14, 15,16	NET Speed (amber/green)		Indicates the following conditions: <ul style="list-style-type: none"> • Amber on – The link is operating as a 100-Mbps connection. • Green on – The link is operating as a 1-Gigabit connection (1000 Mbps). • Off – The link is operating as a 10-Mbps connection or there is no link.

Related Information

- [“Front Panel LEDs” on page 17](#)

Managing Faults (Oracle ILOM)

These topics explain how to use Oracle ILOM, the SP firmware, to diagnose faults and verify successful repairs.

- [“Oracle ILOM Troubleshooting Overview” on page 22](#)
- [“Access the SP \(Oracle ILOM\)” on page 24](#)
- [“Display FRU Information \(show Command\)” on page 26](#)
- [“Check for Faults \(show faulty Command\)” on page 27](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 28](#)
- [“Clear Faults \(clear_fault_action Property\)” on page 29](#)
- [“Understanding Fault Management Command Examples” on page 31](#)
- [“Service-Related Oracle ILOM Commands” on page 36](#)

Related Information

- [“POST Overview” on page 41](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 42](#)

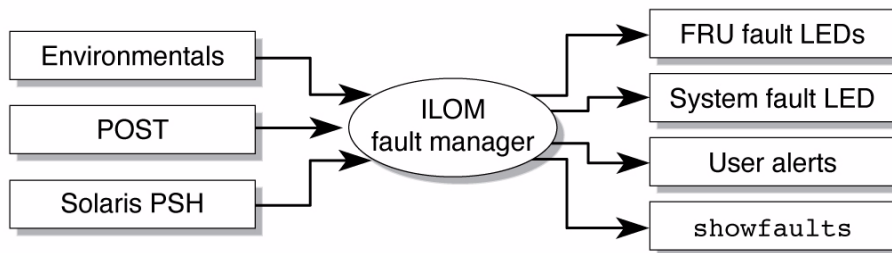
- “Diagnostics Overview” on page 9
- “Diagnostics Process” on page 11
- “Locating Components, Ports, and LEDs” on page 14
- “Interpreting Diagnostic LEDs” on page 17
- “Interpreting Log Files and System Messages” on page 37
- “Verifying Oracle VTS Installation” on page 39
- “Managing Faults (POST)” on page 41
- “Managing Faults (PSH)” on page 51
- “Managing Components (ASR)” on page 57

Oracle ILOM Troubleshooting Overview

The Oracle ILOM firmware enables you to remotely run diagnostics, such as POST, that would otherwise require physical proximity to the server’s serial port. You can also configure Oracle ILOM to send email alerts of hardware failures, hardware warnings, and other events related to the server or to Oracle ILOM.

The SP runs independently of the server, using the server’s standby power. Therefore, Oracle ILOM firmware and software continue to function when the server OS goes offline or when the server is powered off.

Error conditions detected by Oracle ILOM, POST, and the PSH technology are forwarded to Oracle ILOM for fault handling.



The Oracle ILOM fault manager evaluates error messages the manager receives to determine whether the condition being reported should be classified as an alert or a fault.

- **Alerts** – When the fault manager determines that an error condition being reported does not indicate a faulty FRU, the fault manager classifies the error as an alert.

Alert conditions are often caused by environmental conditions, such as computer room temperature, which might improve over time. Alerts might also be caused by a configuration error, such as the wrong DIMM type being installed.

If the conditions responsible for the alert go away, the fault manager detects the change and stops logging alerts for that condition.

- **Faults** – When the fault manager determines that a particular FRU has an error condition that is permanent, that error is classified as a fault. This classification causes the Service Required LEDs to be turned on, the FRUID PROMs updated, and a fault message logged. If the FRU has status LEDs, the Service Required LED for that FRU is also turned on.

A FRU identified as having a *fault* condition must be replaced.

The SP can automatically detect when a FRU has been replaced. In many cases, the SP does this action even if the FRU is removed while the system is not running (for example, if the system power cables are unplugged during service procedures). This function enables Oracle ILOM to sense that a fault, diagnosed to a specific FRU, has been repaired.

Note – Oracle ILOM does not automatically detect hard drive replacement.

The PSH technology does not monitor hard drives for faults. As a result, the SP does not recognize hard drive faults and does not light the fault LEDs on either the chassis or the hard drive itself. Use the Oracle Solaris message files to view hard drive faults.

For general information about Oracle ILOM, refer to the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide*.

For detailed information about Oracle ILOM features that are specific to this server, refer to *Server Administration*.

Related Information

- [“Access the SP \(Oracle ILOM\)” on page 24](#)
- [“Display FRU Information \(show Command\)” on page 26](#)
- [“Check for Faults \(show faulty Command\)” on page 27](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 28](#)
- [“Clear Faults \(clear_fault_action Property\)” on page 29](#)
- [“Understanding Fault Management Command Examples” on page 31](#)
- [“Service-Related Oracle ILOM Commands” on page 36](#)

▼ Access the SP (Oracle ILOM)

There are two approaches to interacting with the SP:

- **Oracle ILOM CLI shell (default)** – The Oracle ILOM shell provides access to Oracle ILOM's features and functions through a command-line interface.
- **Oracle ILOM browser interface** – The Oracle ILOM browser interface supports the same set of features and functions as the shell, but through windows on a browser interface.

Note – Unless indicated otherwise, all examples of interaction with the SP are depicted with Oracle ILOM shell commands.

Note – The CLI includes a feature that enables you to access Oracle Solaris fault manager commands, such as `fmadm`, `fmdump`, and `fmstat`, from within the Oracle ILOM shell. This feature is referred to as the Oracle ILOM `faultmgmt` shell. For more information about the Oracle Solaris fault manager commands, refer to *Server Administration* and the Oracle Solaris documentation.

You can log into multiple SP accounts simultaneously and have separate Oracle ILOM shell commands executing concurrently under each account.

1. Establish connectivity to the SP, using one of the following methods:

- **SER MGT** – Connect a terminal device (such as an ASCII terminal or laptop with terminal emulation) to the serial management port.

Set up your terminal device for 9600 baud, 8 bit, no parity, 1 stop bit and no handshaking. Use a null-modem configuration (transmit and receive signals crossed over to enable DTE-to-DTE communication). The crossover adapters supplied with the server provide a null-modem configuration.

- **NET MGT** – Connect this port to an Ethernet network. This port requires an IP address. By default, the port is configured for DHCP, or you can assign an IP address.

2. Decide which interface to use, the Oracle ILOM CLI or the Oracle ILOM browser interface.

3. Log in to Oracle ILOM.

The default Oracle ILOM login account is `root` with a default password `changeme`.

Example of logging in to the Oracle ILOM CLI:

```
ssh root@xxx.xxx.xxx.xxx
Password:
Waiting for daemons to initialize...
Daemons ready
Oracle (R) Integrated Lights Out Manager
Version 3.0.12.1 r57146
Copyright (c) 2010, Oracle and/or its affiliates, Inc. All rights reserved.
->
```

The Oracle ILOM `->` prompt indicates that you are accessing the SP with the Oracle ILOM CLI.

4. Perform Oracle ILOM commands that provide the diagnostic information you need.

The following Oracle ILOM commands are commonly used for fault management:

- `show command` – Displays information about individual FRUs. See [“Display FRU Information \(show Command\)” on page 26](#).
- `show faulty command` – Displays environmental, POST-detected, and PSH-detected faults. See [“Check for Faults \(show faulty Command\)” on page 27](#).

Note – You can use `fmadm faulty` in the `faultmgmt` shell as an alternative to the `show faulty command`. See [“Check for Faults \(fmadm faulty Command\)” on page 28](#).

- `clear_fault_action property of the set command` – Manually clears PSH-detected faults. See [“Clear Faults \(clear_fault_action Property\)” on page 29](#).

Related Information

- [“Oracle ILOM Troubleshooting Overview” on page 22](#)
- [“Display FRU Information \(show Command\)” on page 26](#)
- [“Check for Faults \(show faulty Command\)” on page 27](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 28](#)
- [“Clear Faults \(clear_fault_action Property\)” on page 29](#)
- [“Understanding Fault Management Command Examples” on page 31](#)
- [“Service-Related Oracle ILOM Commands” on page 36](#)

▼ Display FRU Information (show Command)

Use the Oracle ILOM show command to display information about individual FRUs.

- **At the -> prompt, type the show command.**

In the following example, the show command displays information about a DIMM.

```
-> show /SYS/PM0/CMP0/BOB0/CH0/D0

/SYS/PM0/CMP0/BOB0/CH0/D0
Targets:
  PRSNT
  T_AMB
  SERVICE

Properties:
  Type = DIMM
  ipmi_name = BOB0/CH0/D0
  component_state = Enabled
  fru_name = 2048MB DDR3 SDRAM
  fru_description = DDR3 DIMM 2048 Mbytes
  fru_manufacturer = Samsung
  fru_version = 0
  fru_part_number = M393B5673FH0-CH9
  fru_serial_number = 80CE01100506036C9D
  fault_state = OK
  clear_fault_action = (none)

Commands:
cd
set
show
```

Related Information

- Oracle ILOM 3.0 documentation
- [“Oracle ILOM Troubleshooting Overview” on page 22](#)
- [“Access the SP \(Oracle ILOM\)” on page 24](#)
- [“Check for Faults \(show faulty Command\)” on page 27](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 28](#)
- [“Clear Faults \(clear_fault_action Property\)” on page 29](#)
- [“Understanding Fault Managment Command Examples” on page 31](#)
- [“Service-Related Oracle ILOM Commands” on page 36](#)

▼ Check for Faults (show faulty Command)

Use the show faulty command to display information about faults and alerts diagnosed by the system.

See “Understanding Fault Managment Command Examples” on page 31 for examples of the kind of information the command displays for different types of faults.

- At the -> prompt, enter the show faulty command.

-> show faulty		
Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/PS0
/SP/faultmgmt/0/faults/0	class	fault.chassis.power.volt-fail
/SP/faultmgmt/0/faults/0	sunw-msg-id	SPT-8000-LC
/SP/faultmgmt/0/faults/0	uuid	59654226-50d3-cdc6-9f09-e591f39792ca
/SP/faultmgmt/0/faults/0	timestamp	2010-08-11/14:54:23
/SP/faultmgmt/0/faults/0	fru_part_number	3002235
/SP/faultmgmt/0/faults/0	fru_serial_number	003136
/SP/faultmgmt/0/faults/0	product_serial_number	BDL1024FDA
/SP/faultmgmt/0/faults/0	chassis_serial_number	BDL1024FDA
/SP/faultmgmt/0/faults/0	detector	/SYS/PS0/VOLT_FAULT

Related Information

- “Diagnostics Process” on page 11
- “Oracle ILOM Troubleshooting Overview” on page 22
- “Access the SP (Oracle ILOM)” on page 24
- “Display FRU Information (show Command)” on page 26
- “Check for Faults (fmadm faulty Command)” on page 28
- “Clear Faults (clear_fault_action Property)” on page 29
- “Understanding Fault Managment Command Examples” on page 31
- “Service-Related Oracle ILOM Commands” on page 36

▼ Check for Faults (fmadm faulty Command)

The following is an example of the `fmadm faulty` command reporting on the same power supply fault as shown in the `show faulty` example. Note that the two examples show the same UUID value.

The `fmadm faulty` command was run from within the Oracle ILOM `faultmgmt` shell.

Note – The characters “SPT” at the beginning of the message ID indicate that the fault was detected by Oracle ILOM.

1. At the `->` prompt, access the `faultmgmt` shell.

```
-> start /SP/faultmgmt/shell  
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
```

2. At the `faultmgmtsp>` prompt, enter the `fmadm faulty` command.

```
faultmgmtsp> fmadm faulty  
-----  
Time                UUID                msgid                Severity  
-----  
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC Critical  
  
Fault class : fault.chassis.power.volt-fail  
  
Description : A Power Supply voltage level has exceeded acceptable limits.  
  
Response    : The service required LED on the chassis and on the affected  
              Power Supply might be illuminated.  
  
Impact      : Server will be powered down when there are insufficient  
              operational power supplies  
  
Action      : The administrator should review the ILOM event log for  
              additional information pertaining to this diagnosis. Please  
              refer to the Details section of the Knowledge Article for  
              additional information.  
  
faultmgmtsp>
```

3. Exit the `faultmgmt` shell.

```
faultmgmtsp> exit  
->
```

Related Information

- [“Diagnostics Process” on page 11](#)
- [“Oracle ILOM Troubleshooting Overview” on page 22](#)
- [“Access the SP \(Oracle ILOM\)” on page 24](#)
- [“Display FRU Information \(show Command\)” on page 26](#)
- [“Check for Faults \(show faulty Command\)” on page 27](#)
- [“Clear Faults \(clear_fault_action Property\)” on page 29](#)
- [“Understanding Fault Management Command Examples” on page 31](#)
- [“Service-Related Oracle ILOM Commands” on page 36](#)

▼ Clear Faults (`clear_fault_action` Property)

Use the `clear_fault_action` property of a FRU with the `set` command to manually clear Oracle ILOM-detected faults from the SP.

If Oracle ILOM detects the FRU replacement, Oracle ILOM automatically clears the fault so that you do not need to clear the fault. For PSH-diagnosed faults, if the replacement of the FRU is detected by the system or you manually clear the fault on the host, the fault is also cleared from the SP. In such cases, you do not need to clear the fault manually.

Note – For PSH-detected faults, this procedure clears the fault from the SP but not from the host. If the fault persists in the host, clear the fault manually as described in [“Clear PSH-Detected Faults” on page 56](#).

- **At the `->` prompt, use the `set` command with the `clear_fault_action=True` property.**

This example begins with an excerpt from the `fmadm faulty` command showing power supply 0 with a voltage failure. After the fault condition is corrected (a new power supply has been installed), the fault state is cleared manually.

Note – In this example, the characters “SPT” at the beginning of the message ID indicate that the fault was detected by Oracle ILOM.

```
[...]  
faultmgmtsp> fmadm faulty  
-----  
Time                UUID                msgid                Severity  
-----  
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC    Critical  
  
Fault class : fault.chassis.power.volt-fail  
  
Description : A Power Supply voltage level has exceeded acceptable limits.  
  
[...]  
  
-> set /SYS/PS0 clear_fault_action=true  
Are you sure you want to clear /SYS/PS0 (y/n)? y  
  
-> show  
  
/SYS/PS0  
Targets:  
    VINOK  
    PWROK  
    CUR_FAULT  
    VOLT_FAULT  
    FAN_FAULT  
    TEMP_FAULT  
    V_IN  
    I_IN  
    V_OUT  
    I_OUT  
    INPUT_POWER  
    OUTPUT_POWER  
Properties:  
    type = Power Supply  
    ipmi_name = PS0  
    fru_name = /SYS/PS0  
    fru_description = Powersupply  
    fru_manufacturer = Delta Electronics  
    fru_version = 03  
    fru_part_number = 3002235  
    fru_serial_number = 003136  
    fault_state = OK
```



```
clear_fault_action = (none)
```

Commands:

```
cd  
set  
show
```

Related Information

- [“Oracle ILOM Troubleshooting Overview” on page 22](#)
- [“Access the SP \(Oracle ILOM\)” on page 24](#)
- [“Display FRU Information \(show Command\)” on page 26](#)
- [“Check for Faults \(show faulty Command\)” on page 27](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 28](#)
- [“Understanding Fault Management Command Examples” on page 31](#)
- [“Service-Related Oracle ILOM Commands” on page 36](#)

Understanding Fault Management Command Examples

The following topics provide example output from use of the `show faulty` and `fmadm faulty` commands.

- [“Example of No Faults Detected” on page 32](#)
- [“show faulty Example of a Power Supply Fault” on page 32](#)
- [“fmadm faulty Example of a Power Supply Fault” on page 33](#)
- [“show faulty Example of a POST-Detected Fault” on page 34](#)
- [“show faulty Example of a PSH-Detected Fault” on page 35](#)

Related Information

- [“Oracle ILOM Troubleshooting Overview” on page 22](#)
- [“Access the SP \(Oracle ILOM\)” on page 24](#)
- [“Display FRU Information \(show Command\)” on page 26](#)
- [“Check for Faults \(show faulty Command\)” on page 27](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 28](#)
- [“Clear Faults \(clear_fault_action Property\)” on page 29](#)
- [“Service-Related Oracle ILOM Commands” on page 36](#)

Example of No Faults Detected

When no faults have been detected, the `show faulty` command output looks like the following:

-> show faulty		
Target	Property	Value
-----+-----+-----		

->		

Related Information

- [“show faulty Example of a Power Supply Fault” on page 32](#)
- [“fmadm faulty Example of a Power Supply Fault” on page 33](#)
- [“show faulty Example of a POST-Detected Fault” on page 34](#)
- [“show faulty Example of a PSH-Detected Fault” on page 35](#)

show faulty Example of a Power Supply Fault

The following is an example of the `show faulty` command reporting a power supply fault.

Note – The characters “SPT” at the beginning of the message ID indicate that the fault was detected by Oracle ILOM.

-> show faulty		
Target	Property	Value
-----+-----+-----		
/SP/faultmgmt/0	fru	/SYS/PS0
/SP/faultmgmt/0/ faults/0	class	fault.chassis.power.volt-fail
/SP/faultmgmt/0/ faults/0	sunw-msg-id	SPT-8000-LC
/SP/faultmgmt/0/ faults/0	uuid	59654226-50d3-cdc6-9f09-e591f39792ca
/SP/faultmgmt/0/ faults/0	timestamp	2010-08-11/14:54:23
/SP/faultmgmt/0/ faults/0	fru_part_number	3002235
/SP/faultmgmt/0/ faults/0	fru_serial_number	003136

/SP/faultmgmt/0/ faults/0	product_serial_number	BDL1024FDA
/SP/faultmgmt/0/ faults/0	chassis_serial_number	BDL1024FDA
/SP/faultmgmt/0/ faults/0	detector	/SYS/PS0/VOLT_FAULT

Related Information

- [“Example of No Faults Detected” on page 32](#)
- [“fmadm faulty Example of a Power Supply Fault” on page 33](#)
- [“show faulty Example of a POST-Detected Fault” on page 34](#)
- [“show faulty Example of a PSH-Detected Fault” on page 35](#)

fmadm faulty Example of a Power Supply Fault

The following is an example of the `fmadm faulty` command reporting on the same power supply fault as shown in the `show faulty` example. See [“show faulty Example of a Power Supply Fault” on page 32](#). The two examples show the same UUID value.

The `fmadm faulty` command was invoked from within the Oracle ILOM `faultmgmt` shell.

Note – The characters “SPT” at the beginning of the message ID indicate that the fault was detected by Oracle ILOM.

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y

faultmgmtsp> fmadm faulty

-----
Time                UUID                                msgid              Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC      Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.

Response    : The service required LED on the chassis and on the affected
               Power Supply might be illuminated.
```

Impact	: Server will be powered down when there are insufficient operational power supplies
Action	: The administrator should review the ILOM event log for additional information pertaining to this diagnosis. Please refer to the Details section of the Knowledge Article for additional information.
faultmgmtsp> exit	

Related Information

- [“Example of No Faults Detected” on page 32](#)
- [“show faulty Example of a Power Supply Fault” on page 32](#)
- [“show faulty Example of a POST-Detected Fault” on page 34](#)
- [“show faulty Example of a PSH-Detected Fault” on page 35](#)

show faulty Example of a POST-Detected Fault

The following is an example of the `show faulty` command displaying a fault that was detected by POST. These kinds of faults are identified by the message `Forced fail reason`, where *reason* is the name of the power-on routine that detected the fault.

-> show faulty		
Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/PM0/CMP0/B0B0/CH0/D0
/SP/faultmgmt/0	timestamp	Oct 12 16:40:56
/SP/faultmgmt/0/ faults/0	timestamp	Oct 12 16:40:56
/SP/faultmgmt/0/ faults/0	sp_detected_fault	/SYS/PM0/CMP0/B0B0/CH0/D0 Forced fail (POST)

Related Information

- [“Managing Faults \(POST\)” on page 41](#)
- [“Example of No Faults Detected” on page 32](#)
- [“show faulty Example of a Power Supply Fault” on page 32](#)
- [“fmadm faulty Example of a Power Supply Fault” on page 33](#)
- [“show faulty Example of a PSH-Detected Fault” on page 35](#)

show faulty Example of a PSH-Detected Fault

The following is an example of the `show faulty` command displaying a fault that was detected by the PSH technology. These kinds of faults are identified by the absence of the characters “SPT” at the beginning of the message ID.

-> show faulty		
Target	Property	Value

/SP/faultmgmt/0	fru	/SYS/PM0
/SP/faultmgmt/0/ faults/0	class	fault.cpu.generic-sparc.strand
/SP/faultmgmt/0/ faults/0	sunw-msg-id	SUN4V-8002-6E
/SP/faultmgmt/0/ faults/0	uuid	21a8b59e-89ff-692a-c4bc-f4c5cccc 7a8a
/SP/faultmgmt/0/ faults/0	timestamp	2010-08-13/15:48:33
/SP/faultmgmt/0/ faults/0	chassis_serial_number	BDL1024FDA
/SP/faultmgmt/0/ faults/0	product_serial_number	BDL1024FDA
/SP/faultmgmt/0/ faults/0	fru_serial_number	1005LCB-1018B2009T
/SP/faultmgmt/0/ faults/0	fru_part_number	541-3857-07
/SP/faultmgmt/0/ faults/0	mod-version	1.16
/SP/faultmgmt/0/ faults/0	mod-name	eft
/SP/faultmgmt/0/ faults/0	fault_diagnosis	/HOST
/SP/faultmgmt/0/ faults/0	severity	Major

Related Information

- [“Managing Faults \(POST\)” on page 41](#)
- [“Example of No Faults Detected” on page 32](#)
- [“show faulty Example of a Power Supply Fault” on page 32](#)
- [“fmadm faulty Example of a Power Supply Fault” on page 33](#)
- [“show faulty Example of a POST-Detected Fault” on page 34](#)

Service-Related Oracle ILOM Commands

These are the Oracle ILOM shell commands most frequently used when performing service-related tasks.

Oracle ILOM Command	Description
<code>help [command]</code>	Displays a list of all available commands with syntax and descriptions. Specifying a command name as an option displays help for that command.
<code>set /HOST send_break_action=break</code>	Takes the host server from the OS to either <code>kmdb</code> or <code>OPB</code> (equivalent to a Stop-A), depending on the mode Oracle Solaris software was booted.
<code>set /SYS/component clear_fault_action=true</code>	Manually clears host-detected faults.
<code>start /SP/console</code>	Connects you to the host system.
<code>show /SP/console/history</code>	Displays the contents of the system's console buffer.
<code>set /HOST/bootmode property=value</code> [where <i>property</i> is <i>state</i> , <i>config</i> , or <i>script</i>]	Controls the host server OPB firmware method of booting.
<code>stop /SYS; start /SYS</code>	Performs a <code>poweroff</code> followed by <code>poweron</code> .
<code>stop /SYS</code>	Powers off the host server.
<code>start /SYS</code>	Powers on the host server.
<code>set /SYS/PSUx prepare_to_remove_action=true</code>	Indicates that hot-swapping of a power supply is OK. This command does not perform any action. But this command provides a warning if the power supply should not be removed because the other power supply is not enabled.
<code>reset /SYS</code>	Generates a hardware reset on the host server.
<code>reset /SP</code>	Reboots the SP.
<code>set /SYS/keys witch_state=value</code> <code>normal standby diag locked</code>	Sets the virtual keyswitch.
<code>set /SYS/LOCATE value=value</code> [<code>Fast_blink</code> <code>Off</code>]	Turns the Locator LED on the server on or off.
<code>show faulty</code>	Displays current system faults. See “Check for Faults (show faulty Command)” on page 27 .
<code>show /SYS/keys witch_state</code>	Displays the status of the virtual keyswitch.

Oracle ILOM Command	Description
<code>show /SYS/LOCATE</code>	Displays the current state of the Locator LED as either on or off.
<code>show /SP/logs/event/list</code>	Displays the history of all events logged in the SP event buffers (in RAM or the persistent buffers).
<code>show /HOST</code>	Displays information about the operating state of the host system, the system serial number, and whether the hardware is providing service.

Related Information

- [“Managing Components \(ASR\)” on page 57](#)
- [“Oracle ILOM Troubleshooting Overview” on page 22](#)
- [“Access the SP \(Oracle ILOM\)” on page 24](#)
- [“Display FRU Information \(show Command\)” on page 26](#)
- [“Check for Faults \(show faulty Command\)” on page 27](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 28](#)
- [“Clear Faults \(clear_fault_action Property\)” on page 29](#)
- [“Understanding Fault Management Command Examples” on page 31](#)

Interpreting Log Files and System Messages

With the Oracle Solaris OS running on the server, you have the full complement of Oracle Solaris OS files and commands available for collecting information and for troubleshooting.

If POST or PSH do not indicate the source of a fault, check the message buffer and log files for notifications for faults. Hard disk drive faults are usually captured by the Oracle Solaris message files.

- [“Check the Message Buffer” on page 38](#)
- [“View System Message Log Files” on page 38](#)

Related Information

- [“Diagnostics Overview” on page 9](#)

- “Diagnostics Process” on page 11
- “Locating Components, Ports, and LEDs” on page 14
- “Interpreting Diagnostic LEDs” on page 17
- “Managing Faults (Oracle ILOM)” on page 21
- “Verifying Oracle VTS Installation” on page 39
- “Managing Faults (POST)” on page 41
- “Managing Faults (PSH)” on page 51
- “Managing Components (ASR)” on page 57

▼ Check the Message Buffer

The `dmesg` command checks the system buffer for recent diagnostic messages and displays them.

1. **Log in as superuser.**
2. **Type:**

```
# dmesg
```

Related Information

- “View System Message Log Files” on page 38

▼ View System Message Log Files

The error logging daemon, `syslogd`, automatically records various system warnings, errors, and faults in message files. These messages can alert you to system problems such as a device that is about to fail.

The `/var/adm` directory contains several message files. The most recent messages are in the `/var/adm/messages` file. After a period of time (usually every week), a new messages file is automatically created. The original contents of the messages file are rotated to a file named `messages.1`. Over a period of time, the messages are further rotated to `messages.2` and `messages.3`, and then deleted.

1. **Log in as superuser.**
2. **Type:**

```
# more /var/adm/messages
```


3. If you want to view all logged messages, type:

```
# more /var/adm/messages*
```

Related Information

[“Check the Message Buffer” on page 38](#)

Verifying Oracle VTS Installation

Oracle VTS is a validation test suite that you can use to test this server. These topics provide an overview and a way to check if the Oracle VTS software is installed. For comprehensive Oracle VTS information, refer to the SunVTS 6.1 and Oracle VTS 7.0 documentation.

- [“Oracle VTS Overview” on page 39](#)
- [“Verify Oracle VTS Installation” on page 40](#)

Related Information

- [“Diagnostics Overview” on page 9](#)
- [“Diagnostics Process” on page 11](#)
- [“Locating Components, Ports, and LEDs” on page 14](#)
- [“Interpreting Diagnostic LEDs” on page 17](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Managing Faults \(POST\)” on page 41](#)
- [“Managing Faults \(PSH\)” on page 51](#)
- [“Managing Components \(ASR\)” on page 57](#)

Oracle VTS Overview

Oracle VTS is a validation test suite that you can use to test this server. The Oracle VTS software provides multiple diagnostic hardware tests that verify the connectivity and functionality of most hardware controllers and devices for this server. The Oracle VTS software provides these kinds of test categories:

- Audio

- Communication (serial and parallel)
- Graphic and video
- Memory
- Network
- Peripherals (hard drives, CD-DVD devices, and printers)
- Processor
- Storage

Use the Oracle VTS software to validate a system during development, production, receiving inspection, troubleshooting, periodic maintenance, and system or subsystem stressing.

You can run the Oracle VTS software through a browser UI, terminal UI, or command UI.

You can run tests in a variety of modes for online and offline testing.

The Oracle VTS software also provides a choice of security mechanisms.

The Oracle VTS software is provided on the preinstalled Oracle Solaris OS that shipped with the server, however Oracle VTS might not be installed.

Related Information

- Oracle VTS documentation
- [“Verify Oracle VTS Installation” on page 40](#)

▼ Verify Oracle VTS Installation

1. Log in as superuser.
2. Check for the presence of Oracle VTS packages using the `pkginfo` command.

```
# pkginfo -l SUNvts SUNwvtsr SUNwvtsls SUNwvtsmn
```

- If information about the packages is displayed, then the Oracle VTS software is installed.
- If you receive messages reporting `ERROR: information for package was not found`, then the Oracle VTS software is not installed. You must take action to install the software before you can use it. You can obtain the Oracle VTS software from the following places:
 - Oracle Solaris OS media kit (DVDs)

- As a download from the web

Related Information

- [“Oracle VTS Overview” on page 39](#)
- Oracle VTS documentation

Managing Faults (POST)

These topics explain how to use POST as a diagnostic tool.

- [“POST Overview” on page 41](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 42](#)
- [“Configure POST” on page 45](#)
- [“Run POST With Maximum Testing” on page 46](#)
- [“Interpret POST Fault Messages” on page 47](#)
- [“Clear POST-Detected Faults” on page 48](#)
- [“POST Output Reference” on page 49](#)

Related Information

- [“Diagnostics Overview” on page 9](#)
- [“Diagnostics Process” on page 11](#)
- [“Locating Components, Ports, and LEDs” on page 14](#)
- [“Interpreting Diagnostic LEDs” on page 17](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Verifying Oracle VTS Installation” on page 39](#)
- [“Managing Faults \(PSH\)” on page 51](#)
- [“Managing Components \(ASR\)” on page 57](#)

POST Overview

POST is a group of PROM-based tests that run when the server is powered on or is reset. POST checks the basic integrity of the critical hardware components in the server (CMP, memory, and I/O subsystem).

You can also run POST as system-level hardware diagnostic tool. Use the Oracle ILOM `set` command to set the parameter `keyswitch_state` to `diag`.

You can also set other Oracle ILOM properties to control various other aspects of POST operations. For example, you can specify the events that cause POST to run, the level of testing POST performs, and the amount of diagnostic information POST displays. These properties are listed and described in [“Oracle ILOM Properties That Affect POST Behavior”](#) on page 42.

If POST detects a faulty component, the component is disabled automatically. If the system is able to run without the disabled component, the system boots when POST completes its tests. For example, if POST detects a faulty processor core, the core is disabled. Once POST completes its test sequence, the system boots and run using the remaining cores.

Related Information

- [“Oracle ILOM Properties That Affect POST Behavior”](#) on page 42
- [“Configure POST”](#) on page 45
- [“Run POST With Maximum Testing”](#) on page 46
- [“Interpret POST Fault Messages”](#) on page 47
- [“Clear POST-Detected Faults”](#) on page 48
- [“POST Output Reference”](#) on page 49

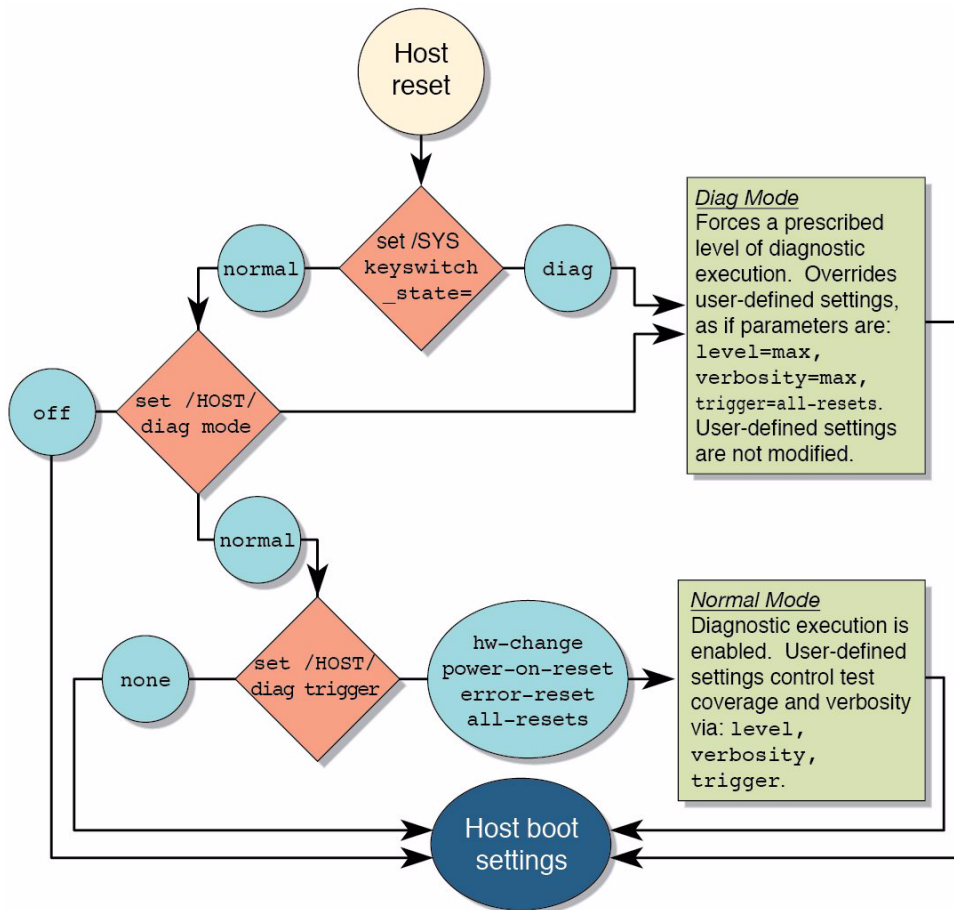
Oracle ILOM Properties That Affect POST Behavior

The following table describes the Oracle ILOM properties that determine how POST performs its operations.

Note – The value of `keyswitch_state` must be `normal` when individual POST parameters are changed.

Parameter	Values	Description
/SYS keyswitch_state	normal	The system can power on and run POST (based on the other parameter settings). This parameter overrides all other commands.
	diag	The system runs POST based on predetermined settings: level=max, verbosity=max, trigger=all-reset
	standby	The system cannot power on.
	locked	The system can power on and run POST, but no flash updates can be made.
/HOST/diag mode	off	POST does not run.
	normal	Runs POST according to diag level value.
	service	Runs POST with preset values for diag level and diag verbosity.
/HOST/diag level	max	If mode = normal, runs all the minimum tests plus extensive processor and memory tests.
	min	If mode = normal, runs minimum set of tests.
/HOST/diag trigger	none	Does not run POST on reset.
	hw-change	(Default) Runs POST following an AC power cycle and when the top cover is removed.
	power-on-reset	Only runs POST for the first power on.
	error-reset	(Default) Runs POST if fatal errors are detected.
	all-resets	Runs POST after any reset.
/HOST/diag verbosity	normal	POST output displays all test and informational messages.
	min	POST output displays functional tests with a banner and pinwheel.
	max	POST displays all test, informational, and some debugging messages.
	debug	POST displays extensive debugging output on the system console, including devices being tested and debug output of each test.
	none	No POST output is displayed.

The following flowchart illustrates the same set of Oracle ILOM set command variables.



Related Information

- “POST Overview” on page 41
- “Configure POST” on page 45
- “Run POST With Maximum Testing” on page 46
- “Interpret POST Fault Messages” on page 47
- “Clear POST-Detected Faults” on page 48
- “POST Output Reference” on page 49

▼ Configure POST

1. Access the Oracle ILOM -> prompt.

See [“Access the SP \(Oracle ILOM\)”](#) on page 24.

2. Set the virtual keyswitch to the value that corresponds to the POST configuration you want to run.

The following example sets the virtual keyswitch to normal, which configures POST to run according to other parameter values.

```
-> set /SYS keyswitch_state=normal
Set 'keyswitch_state' to 'Normal'
```

For possible values for the keyswitch_state parameter, see [“Oracle ILOM Properties That Affect POST Behavior”](#) on page 42.

3. If the virtual keyswitch is set to normal, and you want to define the mode, level, verbosity, or trigger, set the respective parameters.

Syntax:

```
set /HOST/diag property=value
```

See [“Oracle ILOM Properties That Affect POST Behavior”](#) on page 42 for a list of parameters and values.

Examples:

```
-> set /HOST/diag mode=normal
-> set /HOST/diag verbosity=max
```

4. To see the current values for settings, use the show command.

Example:

```
-> show /HOST/diag

/HOST/diag
  Targets:

  Properties:
    level = min
    mode = normal
    trigger = power-on-reset error-reset
    verbosity = normal

  Commands:
    cd
```

```
set
show
->
```

Related Information

- [“POST Overview” on page 41](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 42](#)
- [“Run POST With Maximum Testing” on page 46](#)
- [“Interpret POST Fault Messages” on page 47](#)
- [“Clear POST-Detected Faults” on page 48](#)
- [“POST Output Reference” on page 49](#)

▼ Run POST With Maximum Testing

This procedure describes how to configure the server to run the maximum level of POST.

1. Access the Oracle ILOM -> prompt:

See [“Access the SP \(Oracle ILOM\)” on page 24](#).

2. Set the virtual keyswitch to diag so that POST runs in service mode.

```
-> set /SYS/keyswitch_state=diag
Set 'keyswitch_state' to 'Diag'
```

3. Reset the system so that POST runs.

There are several ways to initiate a reset. The following example shows a reset by using commands that power cycle the host.

```
-> stop /SYS
Are you sure you want to stop /SYS (y/n)? y
Stopping /SYS
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
->
```

Note – The server takes about one minute to power off. Use the `show /HOST` command to determine when the host has been powered off. The console displays `status=Powered Off`.

4. Switch to the system console to view the POST output.

```
-> start /HOST/console
```

5. If you receive POST error messages, learn how to interpret them.

See [“Interpret POST Fault Messages”](#) on page 47.

Related Information

- [“POST Overview”](#) on page 41
- [“Oracle ILOM Properties That Affect POST Behavior”](#) on page 42
- [“Configure POST”](#) on page 45
- [“Interpret POST Fault Messages”](#) on page 47
- [“Clear POST-Detected Faults”](#) on page 48
- [“POST Output Reference”](#) on page 49

▼ Interpret POST Fault Messages

1. Run POST.

See [“Run POST With Maximum Testing”](#) on page 46.

2. View the output and watch for messages that look similar to the POST syntax.

See [“POST Output Reference”](#) on page 49.

3. To obtain more information on faults, run the `show faulty` command.

See [“Check for Faults \(show faulty Command\)”](#) on page 27.

Related Information

- [“POST Overview”](#) on page 41
- [“Oracle ILOM Properties That Affect POST Behavior”](#) on page 42
- [“Configure POST”](#) on page 45
- [“Run POST With Maximum Testing”](#) on page 46
- [“Clear POST-Detected Faults”](#) on page 48
- [“POST Output Reference”](#) on page 49

▼ Clear POST-Detected Faults

Use this procedure if you suspect that a fault was not automatically cleared. This procedure describes how to identify a POST-detected fault and, if necessary, manually clear the fault.

In most cases, when POST detects a faulty component, POST logs the fault and automatically takes the failed component out of operation by placing the component in the ASR blacklist. See [“Managing Components \(ASR\)” on page 57](#).

Usually, when a faulty component is replaced, the replacement is detected when the SP is reset or power cycled. The fault is automatically cleared from the system.

1. **After replacing a faulty FRU, at the Oracle ILOM prompt, use the `show faulty` command to identify POST-detected faults.**

POST-detected faults are distinguished from other kinds of faults by the text: Forced fail. No UUID number is reported. Example:

-> show faulty

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/PM0/CMP0/BOB1/CH0/D0
/SP/faultmgmt/0	timestamp	Dec 21 16:40:56
/SP/faultmgmt/0/ faults/0	timestamp	Dec 21 16:40:56
/SP/faultmgmt/0/ faults/0	sp_detected_fault	/SYS/PM0/CMP0/BOB1/CH0/D0
		Forced fail (POST)

2. **Take one of the following actions based on the `show faulty` output:**

- No fault is reported – The system cleared the fault and you do not need to manually clear the fault. Do not perform the subsequent steps.
- Fault reported – Go to the next step in this procedure.

3. **Use the `component_state` property of the component to clear the fault and remove the component from the ASR blacklist.**

Use the FRU name that was reported in the fault in [Step 1](#). Example:

-> set /SYS/PM0/CMP0/BOB1/CH0/D0 component_state=Enabled

The fault is cleared and should not show up when you run the `show faulty` command. Additionally, the System Fault (Service Required) LED is no longer lit.

4. Reset the server.

You must reboot the server for the `component_state` property to take effect.

5. At the Oracle ILOM prompt, use the `show faulty` command to verify that no faults are reported.

Example:

```
-> show faulty
Target                | Property                | Value
-----+-----+-----
->
```

Related Information

- [“POST Overview” on page 41](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 42](#)
- [“Configure POST” on page 45](#)
- [“Run POST With Maximum Testing” on page 46](#)
- [“Interpret POST Fault Messages” on page 47](#)
- [“POST Output Reference” on page 49](#)

POST Output Reference

POST error messages use the following syntax:

```
n:c:s > ERROR: TEST = failing-test
n:c:s > H/W under test = FRU
n:c:s > Repair Instructions: Replace items in order listed by H/W
under test above
n:c:s > MSG = test-error-message
n:c:s > END_ERROR
```

In this syntax, *n* = the node number, *c* = the core number, *s* = the strand number.

Warning messages use the following syntax:

```
WARNING: message
```

Informational messages use the following syntax:

INFO: <i>message</i>

In the following example, POST reports an uncorrectable memory error affecting DIMM locations /SYS/PM0/CMP0/B0B0/CH0/D0 and /SYS/PM0/CMP0/B0B1/CH0/D0. The error was detected by POST running on node 0, core 7, strand 2.

```
2010-07-03 18:44:13.359 0:7:2>Decode of Disrupting Error Status Reg
(DESR HW Corrected) bits 00300000.00000000
2010-07-03 18:44:13.517 0:7:2>          1    DESR_SOCSRE:      SOC
(non-local) sw_recoverable_error.
2010-07-03 18:44:13.638 0:7:2>          1    DESR_SOCHCCE:      SOC
(non-local) hw_corrected_and_cleared_error.
2010-07-03 18:44:13.773 0:7:2>
2010-07-03 18:44:13.836 0:7:2>Decode of NCU Error Status Reg bits
00000000.22000000
2010-07-03 18:44:13.958 0:7:2>          1    NESR_MCU1SRE:      MCU1 issued
a Software Recoverable Error Request
2010-07-03 18:44:14.095 0:7:2>          1    NESR_MCU1HCCE:      MCU1
issued a Hardware Corrected-and-Cleared Error Request
2010-07-03 18:44:14.248 0:7:2>
2010-07-03 18:44:14.296 0:7:2>Decode of Mem Error Status Reg Branch 1
bits 33044000.00000000
2010-07-03 18:44:14.427 0:7:2>          1    MEU 61      R/W1C Set to 1
on an UE if VEU = 1, or VEF = 1, or higher priority error in same cycle.
2010-07-03 18:44:14.614 0:7:2>          1    MEC 60      R/W1C Set to 1
on a CE if VEC = 1, or VEU = 1, or VEF = 1, or another error in same cycle.
2010-07-03 18:44:14.804 0:7:2>          1    VEU 57      R/W1C Set to 1
on an UE, if VEF = 0 and no fatal error is detected in same cycle.
2010-07-03 18:44:14.983 0:7:2>          1    VEC 56      R/W1C Set to 1
on a CE, if VEF = VEU = 0 and no fatal or UE is detected in same cycle.
2010-07-03 18:44:15.169 0:7:2>          1    DAU 50      R/W1C Set to 1
if the error was a DRAM access UE.
2010-07-03 18:44:15.304 0:7:2>          1    DAC 46      R/W1C Set to 1
if the error was a DRAM access CE.
2010-07-03 18:44:15.440 0:7:2>
2010-07-03 18:44:15.486 0:7:2>          DRAM Error Address Reg for Branch
1 = 00000034.8647d2e0
2010-07-03 18:44:15.614 0:7:2>          Physical Address is
00000005.d21bc0c0
2010-07-03 18:44:15.715 0:7:2>          DRAM Error Location Reg for Branch
1 = 00000000.00000800
2010-07-03 18:44:15.842 0:7:2>          DRAM Error Syndrome Reg for Branch
1 = dd1676ac.8c18c045
2010-07-03 18:44:15.967 0:7:2>          DRAM Error Retry Reg for Branch 1
```

```

= 00000000.00000004
2010-07-03 18:44:16.086 0:7:2>          DRAM Error RetrySyndrome 1 Reg for
Branch 1 = a8a5f81e.f6411b5a
2010-07-03 18:44:16.218 0:7:2>          DRAM Error Retry Syndrome 2 Reg
for Branch 1 = a8a5f81e.f6411b5a
2010-07-03 18:44:16.351 0:7:2>          DRAM Failover Location 0 for
Branch 1 = 00000000.00000000
2010-07-03 18:44:16.475 0:7:2>          DRAM Failover Location 1 for
Branch 1 = 00000000.00000000
2010-07-03 18:44:16.604 0:7:2>
2010-07-03 18:44:16.648 0:7:2>ERROR: POST terminated prematurely. Not
all system components tested.
2010-07-03 18:44:16.786 0:7:2>POST: Return to VBSC
2010-07-03 18:44:16.795 0:7:2>ERROR:
2010-07-03 18:44:16.839 0:7:2>    POST toplevel status has the following
failures:
2010-07-03 18:44:16.952 0:7:2>    Node 0 -----
2010-07-03 18:44:17.051 0:7:2>          /SYS/PM0/CMP0/BOB0/CH1/D0 (J1001)
2010-07-03 18:44:17.145 0:7:2>          /SYS/PM0/CMP0/BOB1/CH1/D0 (J3001)
2010-07-03 18:44:17.241 0:7:2>END_ERROR

```

Related Information

- [“POST Overview” on page 41](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 42](#)
- [“Configure POST” on page 45](#)
- [“Run POST With Maximum Testing” on page 46](#)
- [“Interpret POST Fault Messages” on page 47](#)
- [“Clear POST-Detected Faults” on page 48](#)

Managing Faults (PSH)

The following topics describe PSH and how to use it:

- [“PSH Overview” on page 52](#)
- [“PSH-Detected Fault Example” on page 53](#)
- [“Check for PSH-Detected Faults” on page 54](#)
- [“Clear PSH-Detected Faults” on page 56](#)

Related Information

- [“Diagnostics Overview” on page 9](#)
- [“Diagnostics Process” on page 11](#)
- [“Locating Components, Ports, and LEDs” on page 14](#)
- [“Interpreting Diagnostic LEDs” on page 17](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Verifying Oracle VTS Installation” on page 39](#)
- [“Managing Faults \(POST\)” on page 41](#)
- [“Managing Components \(ASR\)” on page 57](#)

PSH Overview

PSH enables the server to diagnose problems while the Oracle Solaris OS is running and mitigate many problems before they negatively affect operations.

The Oracle Solaris OS uses the fault manager daemon, `fmd(1M)`, which starts at boot time and runs in the background to monitor the system. If a component generates an error, the daemon correlates the error with data from previous errors and other relevant information to diagnose the problem. Once diagnosed, the fault manager daemon assigns a UUID to the error. This value distinguishes this error across any set of systems.

When possible, the fault manager daemon initiates steps to self-heal the failed component and take the component offline. The daemon also logs the fault to the `syslogd` daemon and provides a fault notification with a MSGID. You can use the MSGID to get additional information about the problem from the knowledge article database.

The PSH technology covers the following server components:

- CPU
- Memory
- I/O subsystem

The PSH console message provides the following information about each detected fault:

- Type
- Severity
- Description
- Automated response

- Impact
- Suggested action for system administrator

If the PSH facility detects a faulty component, use the `fmadm faulty` command to display information about the fault. Alternatively, you can use the Oracle ILOM command `show faulty` for the same purpose.

Related Information

- [“PSH-Detected Fault Example” on page 53](#)
- [“Check for PSH-Detected Faults” on page 54](#)
- [“Clear PSH-Detected Faults” on page 56](#)

PSH-Detected Fault Example

When a PSH fault is detected, an Oracle Solaris console message similar to the following example is displayed.

```
SUNW-MSG-ID: SUN4V-8000-DX, TYPE: Fault, VER: 1, SEVERITY: Minor
EVENT-TIME: Wed Jun 17 10:09:46 EDT 2009
PLATFORM: SUNW,system_name, CSN: -, HOSTNAME: server48-37
SOURCE: cpumem-diagnosis, REV: 1.5
EVENT-ID: f92e9fbe-735e-c218-cf87-9e1720a28004
DESC: The number of errors associated with this memory module has
exceeded acceptable levels. Refer to
http://sun.com/msg/SUN4V-8000-DX for more information.
AUTO-RESPONSE: Pages of memory associated with this memory module
are being removed from service as errors are reported.
IMPACT: Total system memory capacity will be reduced
as pages are retired.
REC-ACTION: Schedule a repair procedure to replace the affected
memory module. Use fmddump -v -u <EVENT_ID> to identify the module.
```

Note – The Service Required LED is also turned on for PSH-diagnosed faults.

Related Information

- [“PSH Overview” on page 52](#)
- [“Check for PSH-Detected Faults” on page 54](#)
- [“Clear PSH-Detected Faults” on page 56](#)

▼ Check for PSH-Detected Faults

The `fmadm faulty` command displays the list of faults detected by PSH. You can run this command either from the host or through the Oracle ILOM `fmadm` shell.

As an alternative, you can display fault information by running the Oracle ILOM command `show`.

1. Check the event log:

# fmadm faulty			
TIME	EVENT-ID	MSG-ID	SEVERITY
Aug 13 11:48:33	21a8b59e-89ff-692a-c4bc-f4c5cccca8c8	SUN4V-8002-6E	Major
Platform : sun4v Chassis_id :			
Product_sn :			
Fault class : fault.cpu.generic-sparc.strand			
Affects : cpu:///cpuid=21/serial=00000000000000000000000000000000			
faulted and taken out of service			
FRU : "/SYS/PM0"			
(hc:///product-id=sun4v:product-sn=BDL1024FDA:server-id=s4v-t5160a-bur02:chassis-id=BDL1024FDA:serial=1005LCB-1019B100A2:part=511127809:revision=05/chassis=0/motherboard=0)			
faulty			
Description : The number of correctable errors associated with this strand has exceeded acceptable levels.			
Refer to http://sun.com/msg/SUN4V-8002-6E for more information.			
Response : The fault manager will attempt to remove the affected strand from service.			
Impact : System performance might be affected.			
Action : Schedule a repair procedure to replace the affected resource, the identity of which can be determined using 'fmadm faulty'.			

In this example, a fault is displayed, indicating the following details:

- Date and time of the fault (Aug 13 11:48:33)
- UUID, which is unique for every fault (21a8b59e-89ff-692a-c4bc-f4c5cccca8c8)
- MSGID, which can be used to obtain additional fault information (SUN4V-8002-6E)

- Faulted FRU. The information provided in the example includes the part number of the FRU (part=511127809) and the serial number of the FRU (serial=1005LCB-1019B100A2). The FRU field provides the name of the FRU (/SYS/PM0 for processor module 1 in this example).

2. Use the message ID to obtain more information about this type of fault:

- Obtain the MSGID from console output or from the Oracle ILOM `show faulty` command.**
- Enter the MSGID at the end of the PSH Knowledge Article web site,**
<http://www.sun.com/msg>.

For the current example, type this URL:

<http://www.sun.com/msg/SUN4V-8002-6E>

The following example shows the message ID SUN4V-8002-6E and provides information for corrective action.

```
Correctable strand errors exceeded acceptable levels

Type
  Fault
Severity
  Major
Description
  The number of correctable errors associated with this strand has exceeded
  acceptable levels.
Automated Response
  The fault manager will attempt to remove the affected strand from service.
Impact
  System performance might be affected.
Suggested Action for System Administrator
  Schedule a repair procedure to replace the affected resource, the identity
  of which can be determined using fmadm faulty.
Details
  There is no more information available at this time.
```

3. Follow the suggested actions to repair the fault.

Related Information

- “PSH Overview” on page 52
- “PSH-Detected Fault Example” on page 53
- “Clear PSH-Detected Faults” on page 56

▼ Clear PSH-Detected Faults

When the PSH detects faults, the faults are logged and displayed on the console. In most cases, after the fault is repaired, the server detects the corrected state and automatically repairs the fault. However, you should verify this repair. In cases where the fault condition is not automatically cleared, you must clear the fault manually.

1. After replacing a faulty FRU, power on the server.
2. At the host prompt, use the `fmadm faulty` command to determine whether the replaced FRU still shows a faulty state.

```
# fmadm faulty
TIME          EVENT-ID          MSG-ID          SEVERITY
Aug 13 11:48:33 21a8b59e-89ff-692a-c4bc-f4c5cccca8c8  SUN4V-8002-6E  Major

Platform      : sun4v          Chassis_id      :
Product_sn    :

Fault class   : fault.cpu.generic-sparc.strand
Affects       : cpu:///cpuid=21/serial=00000000000000000000
                faulted and taken out of service
FRU           : "/SYS/PM0"
(hc:///product-id=sun4v:product-sn=BDL1024FDA:server-id=
s4v-t5160a-bur02:chassis-id=BDL1024FDA:serial=1005LCB-1019B100A2:part=
511127809:revision=05/chassis=0/motherboard=0)
                faulty

Description   : The number of correctable errors associated with this strand has
                exceeded acceptable levels.
                Refer to http://sun.com/msg/SUN4V-8002-6E for more information.

Response      : The fault manager will attempt to remove the affected strand
                from service.

Impact        : System performance might be affected.

Action        : Schedule a repair procedure to replace the affected resource, the
                identity of which can be determined using 'fmadm faulty'.
```

- If no fault is reported, you do not need to do anything else. Do not perform the subsequent steps.
- If a fault is reported, continue to [Step 3](#).

3. Clear the fault from all persistent fault records.

In some cases, even though the fault is cleared, some persistent fault information remains and results in erroneous fault messages at boot time. To ensure that these messages are not displayed, type the following Oracle Solaris command:

```
# fmadm repair UUID
```

For the UUID in the example shown in [Step 2](#), type this command:

```
# fmadm repair 21a8b59e-89ff-692a-c4bc-f4c5cccc
```

4. Use the `clear_fault_action` property of the FRU to clear the fault.

```
-> set /SYS/PM0 clear_fault_action=True  
Are you sure you want to clear /SYS/PM0 (y/n)? y  
set 'clear_fault_action' to 'true'
```

Related Information

- [“PSH Overview” on page 52](#)
- [“PSH-Detected Fault Example” on page 53](#)
- [“Check for PSH-Detected Faults” on page 54](#)

Managing Components (ASR)

The following topics explain the role played by ASR and how to manage the components ASR controls.

- [“ASR Overview” on page 58](#)
- [“Display System Components” on page 59](#)
- [“Disable System Components” on page 60](#)
- [“Enable System Components” on page 60](#)

Related Information

- [“Diagnostics Overview” on page 9](#)
- [“Diagnostics Process” on page 11](#)
- [“Locating Components, Ports, and LEDs” on page 14](#)
- [“Interpreting Diagnostic LEDs” on page 17](#)

- “Managing Faults (Oracle ILOM)” on page 21
- “Interpreting Log Files and System Messages” on page 37
- “Verifying Oracle VTS Installation” on page 39
- “Managing Faults (POST)” on page 41
- “Managing Faults (PSH)” on page 51

ASR Overview

The ASR feature enables the server to automatically configure failed components out of operation until they can be replaced. In the server, ASR manages the following components:

- CPU strands
- Memory DIMMs
- I/O subsystem

The database that contains the list of disabled components is referred to as the ASR blacklist (`asr-db`).

In most cases, POST automatically disables a faulty component. After the cause of the fault is repaired (FRU replacement, loose connector reseated, and so on), you might need to remove the component from the ASR blacklist.

The following ASR commands enable you to view and add or remove components (`asrkeys`) from the ASR blacklist. You run these commands from the Oracle ILOM `->` prompt.

Command	Description
<code>show components</code>	Displays system components and their current state.
<code>set <i>asrkey</i> component_state=Enabled</code>	Removes a component from the <code>asr-db</code> blacklist, where <i>asrkey</i> is the component to enable.
<code>set <i>asrkey</i> component_state=Disabled</code>	Adds a component to the <code>asr-db</code> blacklist, where <i>asrkey</i> is the component to disable.

Note – The `asrkeys` vary from system to system, depending on how many cores and memory are present. Use the `show components` command to see the `asrkeys` on a given system.

After you enable or disable a component, you must reset (or power cycle) the system for the component’s change of state to take effect.

Related Information

- [“Display System Components” on page 59](#)
- [“Disable System Components” on page 60](#)
- [“Enable System Components” on page 60](#)

▼ Display System Components

The `show components` command displays the system components (`asrkeys`) and reports their status.

- **At the `->` prompt, type `show components`.**

In the following example, PCI-EM3 is shown as disabled.

```
-> show components
```

Target	Property	Value
/SYS/MB/REM0/ SASHBA0	component_state	Enabled
/SYS/MB/REM1/ SASHBA1	component_state	Enabled
/SYS/MB/VIDEO	component_state	Enabled
/SYS/MB/PCI- SWITCH0	component_state	Enabled
<...>		
/SYS/PCI-EM0	component_state	Enabled
/SYS/PCI-EM1	component_state	Enabled
/SYS/PCI-EM2	component_state	Enabled
/SYS/PCI-EM3	component_state	Disabled
/SYS/PCI-EM4	component_state	Enabled
/SYS/PCI-EM5	component_state	Enabled
/SYS/PCI-EM6	component_state	Enabled
<...>		

Related Information

- [“ASR Overview” on page 58](#)
- [“Disable System Components” on page 60](#)
- [“Enable System Components” on page 60](#)

▼ Disable System Components

You disable a component by setting its `component_state` property to Disabled. This action adds the component to the ASR blacklist.

1. At the `->` prompt, set the `component_state` property to Disabled.

```
-> set /SYS/PM0/CMP0/BOB1/CH0/D0 component_state=Disabled
```

2. Reset the server so that the ASR command takes effect.

```
-> stop /SYS
Are you sure you want to stop /SYS (y/n)? y
Stopping /SYS
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
```

Note – In the Oracle ILOM shell there is no notification when the system is powered off. Powering off takes about a minute. Use the `show /HOST` command to determine if the host has powered off.

Related Information

- [“View System Message Log Files” on page 38](#)
- [“ASR Overview” on page 58](#)
- [“Display System Components” on page 59](#)
- [“Enable System Components” on page 60](#)

▼ Enable System Components

You enable a component by setting its `component_state` property to Enabled. This removes the component from the ASR blacklist.

1. At the `->` prompt, set the `component_state` property to Enabled.

```
-> set /SYS/PM0/CMP0/BOB1/CH0/D0 component_state=Enabled
```

2. Reset the server so that the ASR command takes effect.

```
-> stop /SYS  
Are you sure you want to stop /SYS (y/n)? y  
Stopping /SYS  
-> start /SYS  
Are you sure you want to start /SYS (y/n)? y  
Starting /SYS
```

Note – In the Oracle ILOM shell there is no notification when the system is powered off. Powering off takes about a minute. Use the `show /HOST` command to determine if the host has powered off.

Related Information

- [“View System Message Log Files” on page 38](#)
- [“ASR Overview” on page 58](#)
- [“Display System Components” on page 59](#)
- [“Disable System Components” on page 60](#)

Preparing for Service

These topics describe how to prepare the Netra SPARC T3-1 server for servicing.

- [“Safety Information” on page 63](#)
- [“Find the Chassis Serial Number” on page 65](#)
- [“Locate the Server” on page 67](#)
- [“Component FRU Names and Service Links” on page 67](#)
- [“Removing Power From the Server” on page 69](#)
- [“Accessing Internal Components” on page 72](#)

Related Information

- [“Identifying Components” on page 1](#)
- [“Detecting and Managing Faults” on page 9](#)
- [“Returning the Server to Operation” on page 255](#)

Safety Information

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

- Follow all cautions and instructions marked on the equipment and described in the documentation shipped with your system.
- Follow all cautions and instructions marked on the equipment and described in the *Netra SPARC T3-1 Server Safety and Compliance Guide*.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment’s electrical rating label.
- Follow the electrostatic discharge safety practices as described here.

Safety Symbols

Note the meanings of the following symbols that might appear in this document:



Caution – There is a risk of personal injury or equipment damage. To avoid personal injury and 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.

ESD Measures

Electrostatic discharge-sensitive devices, such as the express modules, hard drives, and DIMMs require special handling.



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



Caution – You must disconnect all power supplies before servicing any of the components that are inside the chassis.

Antistatic Wrist Strap Use

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

Antistatic Mat

Place ESD-sensitive components such as motherboards, memory, and other PCBs on an antistatic mat. The following items can be used as an antistatic mat:

- Antistatic bag used to wrap a replacement part
- ESD mat
- A disposable ESD mat (shipped with some replacement parts or optional system components)

Tools Needed for Service

You need the following tools for most service operations:

- Antistatic wrist strap
- Antistatic mat
- No. 1 Phillips screwdriver
- No. 2 Phillips screwdriver
- No. 1 flat-blade screwdriver (battery removal)

Related Information

- [“Find the Chassis Serial Number” on page 65](#)
- [“Locate the Server” on page 67](#)
- [“Component FRU Names and Service Links” on page 67](#)
- [“Removing Power From the Server” on page 69](#)
- [“Accessing Internal Components” on page 72](#)

▼ Find the Chassis Serial Number

If you require technical support for your server, you will be asked to provide the chassis serial number. You can find the chassis serial number on a sticker located on the front of the server and on another sticker on the side of the server.

If it is not convenient to read either sticker, you can type the Oracle ILOM `show /SYS` command to obtain the chassis serial number.

- **Type `show /SYS` at the Oracle ILOM prompt.**

```
-> show /SYS

/SYS
  Targets:
    MB
    MB_ENV
    RIO
    PM0
    PM1
    FM0
  ...
  Properties:
    type = Host System
    ipmi_name = /SYS
    keyswitch_state = Normal
    product_name = T3-4
    product_part_number = 602-1234-01
    product_serial_number = 0723BBC006
    fault_state = OK
    clear_fault_action = (none)
    power_state = On

  Commands:
    cd
    reset
    set
    show
    start
    stop
```

Related Information

- [“Safety Information” on page 63](#)
- [“Locate the Server” on page 67](#)
- [“Component FRU Names and Service Links” on page 67](#)
- [“Removing Power From the Server” on page 69](#)
- [“Accessing Internal Components” on page 72](#)

▼ Locate the Server

You can use the Locator LEDs to pinpoint the location of a server. This procedure is helpful when you need to identify one particular server from many other servers.

1. At the Oracle ILOM command line, type:

```
-> set /SYS/LOCATE value=Fast_Blink
```

The white Locator LEDs (one on the front panel and one on the rear panel) blink.

2. After locating the server with the blinking Locator LED, turn the LED off by pressing the Locator button.

Note – Alternatively, you can turn off the Locator LED by running the Oracle ILOM `set /SYS/LOCATE value=off` command.

Related Information

- [“Safety Information” on page 63](#)
- [“Find the Chassis Serial Number” on page 65](#)
- [“Component FRU Names and Service Links” on page 67](#)
- [“Removing Power From the Server” on page 69](#)
- [“Accessing Internal Components” on page 72](#)

Component FRU Names and Service Links

The following table identifies the server components that are FRUs or that you must remove as part of a service operation.

Name	FRU Name	Service Link
Air filter		“Servicing the Air Filter” on page 77
Battery	/SYS/MB/BAT	“Servicing the Battery” on page 221
DIMM	/SYS/MB/CMP0/BOBx/CHy/Dz	“Servicing DIMMs” on page 211
DVD bracket		“Servicing the DVD Tray” on page 147
DVD drive		“Servicing the DVD Drive” on page 139
Fan board	/SYS/FANBD	“Servicing the Fan Board” on page 159
Fan module	/SYS/FANBD/FMx	“Servicing Fan Modules” on page 83
LED board		“Servicing the LED Board” on page 153
Hard drive	/SYS/HDDx	“Servicing Hard Drives” on page 103
Hard drive backplane	/SYS/SASBP	“Servicing the Hard Drive Backplane” on page 123
Hard drive fan	/SYS/FANBD/FM5	“Servicing the Hard Drive Fan” on page 115
Motherboard	/SYS/MB	“Servicing the Motherboard” on page 245
ID PROM	/SYS/MB/SCC	“Servicing the ID PROM” on page 237
PCIe2 card	/SYS/MB/PCI_MEZZ/PCIEx/card_type /SYS/MB/RISERy/card_type	“Servicing PCIe2 Cards” on page 187
PCIe2 mezzanine board	/SYS/MB/PCI_MEZZ	“Servicing the PCIe2 Mezzanine Board” on page 169
PCIe2 riser card	/SYS/MB/RISERx	“Servicing the PCIe2 Riser Card” on page 179
Power distribution board		“Servicing the Power Distribution Board” on page 131
Power supply	/SYS/PSx	“Servicing Power Supplies” on page 91
SP	/SYS/MB/SP	“Servicing the SP” on page 229
Signal interface board	/SYS/SIB	“Servicing the Signal Interface Board” on page 201

Related Information

- [“Safety Information” on page 63](#)
- [“Find the Chassis Serial Number” on page 65](#)
- [“Locate the Server” on page 67](#)
- [“Removing Power From the Server” on page 69](#)

- [“Accessing Internal Components” on page 72](#)

Removing Power From the Server

These topics describe different procedures for removing power from the chassis.

- [“Prepare to Power Off the Server” on page 69](#)
- [“Power Off the Server \(SP Command\)” on page 70](#)
- [“Power Off the Server \(Power Button - Graceful\)” on page 71](#)
- [“Power Off the Server \(Emergency Shutdown\)” on page 71](#)
- [“Disconnect Power Cords From the Server” on page 71](#)

Related Information

- [“Safety Information” on page 63](#)
- [“Find the Chassis Serial Number” on page 65](#)
- [“Locate the Server” on page 67](#)
- [“Component FRU Names and Service Links” on page 67](#)
- [“Accessing Internal Components” on page 72](#)

▼ Prepare to Power Off the Server

Perform this procedure before powering off the server.

1. Notify affected users that the server will be shut down.

Refer to the Oracle Solaris system administration documentation for additional information.

2. Save any open files and quit all running programs.

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

3. Shut down all logical domains.

Refer to the Oracle Solaris system administration documentation for additional information.

4. Shut down the Oracle Solaris OS.

Refer to the Oracle Solaris system administration documentation for additional information.

5. Power off the server.

See:

- [“Power Off the Server \(SP Command\)” on page 70](#)
- [“Power Off the Server \(Power Button - Graceful\)” on page 71](#)
- [“Power Off the Server \(Emergency Shutdown\)” on page 71](#)

Related Information

- [“Power Off the Server \(SP Command\)” on page 70](#)
- [“Power Off the Server \(Power Button - Graceful\)” on page 71](#)
- [“Power Off the Server \(Emergency Shutdown\)” on page 71](#)
- [“Disconnect Power Cords From the Server” on page 71](#)

▼ Power Off the Server (SP Command)

You can use the SP to perform a graceful shutdown of the server. This type of shutdown ensures that all of your data is saved and that the server is ready for restart.

Note – Additional information about powering off the server is provided in *Server Administration*.

1. Log in as superuser or equivalent.

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

2. Switch from the system console to the -> prompt by typing the #. (Hash Period) key sequence.

3. At the -> prompt, type the `stop /SYS` command.

Note – You can also use the Power button on the front of the server to initiate a graceful server shutdown. (See [“Power Off the Server \(Power Button - Graceful\)” on page 71](#).) This button is recessed to prevent accidental server power off.

Related Information

- [“Prepare to Power Off the Server” on page 69](#)
- [“Power Off the Server \(Power Button - Graceful\)” on page 71](#)
- [“Power Off the Server \(Emergency Shutdown\)” on page 71](#)
- [“Disconnect Power Cords From the Server” on page 71](#)

▼ Power Off the Server (Power Button - Graceful)

This procedure places the server in the power standby mode. In this mode, the Power OK LED blinks rapidly.

- **Press and release the recessed Power button.**

Related Information

- [“Prepare to Power Off the Server” on page 69](#)
- [“Power Off the Server \(SP Command\)” on page 70](#)
- [“Power Off the Server \(Emergency Shutdown\)” on page 71](#)
- [“Disconnect Power Cords From the Server” on page 71](#)

▼ Power Off the Server (Emergency Shutdown)



Caution – For this procedure, all applications and files are closed abruptly without saving changes. File system corruption might occur.

- **Press and hold the Power button for four seconds.**

Related Information

- [“Prepare to Power Off the Server” on page 69](#)
- [“Power Off the Server \(SP Command\)” on page 70](#)
- [“Power Off the Server \(Power Button - Graceful\)” on page 71](#)
- [“Disconnect Power Cords From the Server” on page 71](#)

▼ Disconnect Power Cords From the Server

1. **Power off the server.**

See:

- “Power Off the Server (SP Command)” on page 70
- “Power Off the Server (Power Button - Graceful)” on page 71
- “Power Off the Server (Emergency Shutdown)” on page 71

2. Unplug all power cords from the server.



Caution – Because 3.3 VDC standby power is always present in the system, you must unplug the power cords before accessing any cold-serviceable components.

Related Information

- “Prepare to Power Off the Server” on page 69
- “Power Off the Server (SP Command)” on page 70
- “Power Off the Server (Power Button - Graceful)” on page 71
- “Power Off the Server (Emergency Shutdown)” on page 71

Accessing Internal Components

The following topics provide procedures and guidelines when accessing internal components.

- “Prevent ESD Damage” on page 73
- “Remove the Top Cover” on page 73
- “Filler Panels” on page 75

Related Information

- “Safety Information” on page 63
- “Find the Chassis Serial Number” on page 65
- “Locate the Server” on page 67
- “Component FRU Names and Service Links” on page 67
- “Removing Power From the Server” on page 69

▼ Prevent ESD Damage

Many components housed within the chassis can be damaged by electrostatic discharge. To protect these components from damage, perform the following steps before opening the chassis for service. See [“Safety Information” on page 63](#).

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

Place ESD-sensitive components such as the printed circuit boards on an antistatic mat.

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.

Related Information

- [“Safety Information” on page 63](#)
- [“Remove the Top Cover” on page 73](#)
- [“Filler Panels” on page 75](#)

▼ Remove the Top Cover

1. **Shut down the server.**

See [“Removing Power From the Server” on page 69](#).

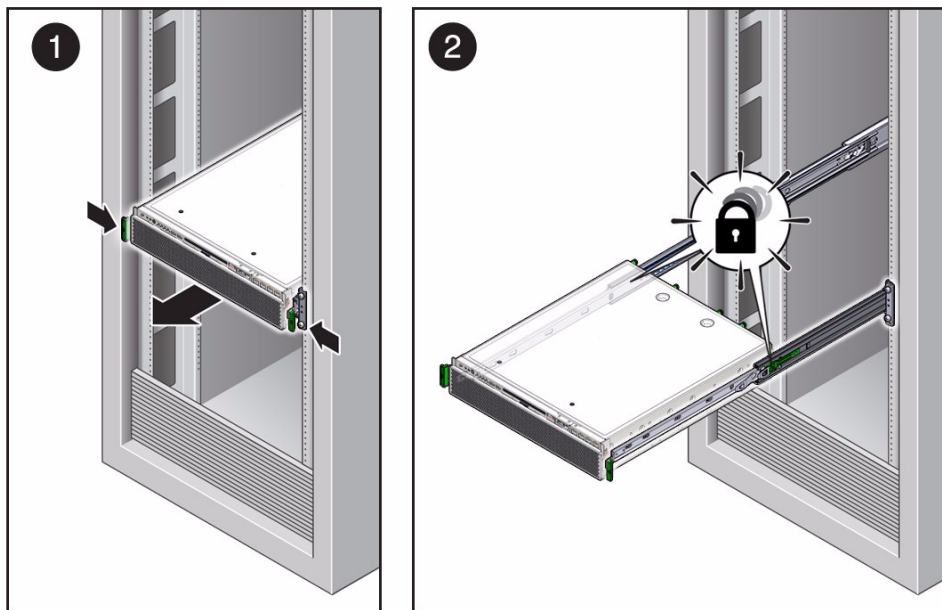
2. **Remove the power cords from the server.**

See [“Remove a Power Supply” on page 95](#).

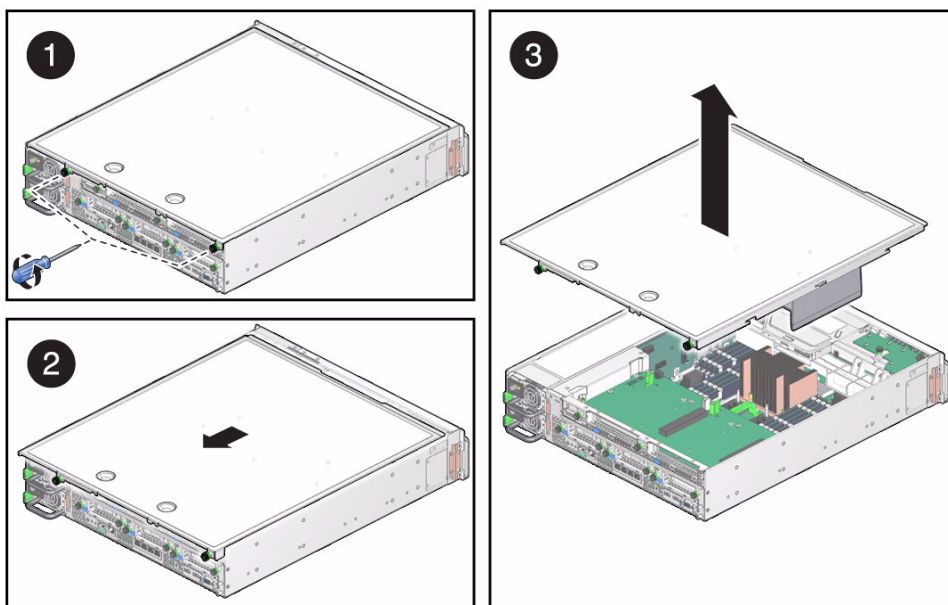
3. **Disconnect all cables from the rear of the server.**

Label the cables for ease of reconnection.

4. **Release the latches at the front of the server and slide the server out of the rack to its service position.**



5. Loosen the two captive screws at the rear of the top cover and slide the cover back and off the chassis.



You are now able to perform any of these service procedures:

- [“Servicing the Battery” on page 221](#)

- “Servicing DIMMs” on page 211
- “Servicing the DVD Tray” on page 147
- “Servicing the DVD Drive” on page 139
- “Servicing the Fan Board” on page 159
- “Servicing the LED Board” on page 153
- “Servicing the Hard Drive Backplane” on page 123
- “Servicing the Hard Drive Fan” on page 115
- “Servicing the Motherboard” on page 245
- “Servicing the ID PROM” on page 237
- “Servicing PCIe2 Cards” on page 187
- “Servicing the PCIe2 Mezzanine Board” on page 169
- “Servicing the PCIe2 Riser Card” on page 179
- “Servicing the Power Distribution Board” on page 131
- “Servicing the SP” on page 229
- “Servicing the Signal Interface Board” on page 201

Related Information

- “Safety Information” on page 63
- “Prevent ESD Damage” on page 73
- “Install the Top Cover” on page 255

Filler Panels

Each server is shipped with module-replacement filler panels for processor modules, disk drives, and express modules. A filler panel is an empty metal or plastic enclosure that does not contain any functioning system hardware or cable connectors.

The filler panels are installed at the factory and must remain in the server until you replace them with a purchased module to ensure proper airflow through the system. If you remove a filler panel and continue to operate your system with an empty module slot, the server might overheat due to improper airflow. For instructions on removing or installing a filler panel for a server component, refer to the topic in this document about servicing that component.

Related Information

- “Prevent ESD Damage” on page 73
- “Remove the Top Cover” on page 73

Servicing the Air Filter

The air filter is constructed of foam rubber and is used to trap larger particles from entering the server chassis. The air filter is located within the filter tray, at the air intake end of the server. See [“Top Cover, Filter Tray, and DVD Tray Locations”](#) on [page 4](#).

These topics describe service information and procedures for the air filter.

- [“Remove the Air Filter”](#) on [page 77](#)
- [“Install the Air Filter”](#) on [page 79](#)

Related Information

- [“Identifying Components”](#) on [page 1](#)
- [“Detecting and Managing Faults”](#) on [page 9](#)
- [“Preparing for Service”](#) on [page 63](#)
- [“Returning the Server to Operation”](#) on [page 255](#)

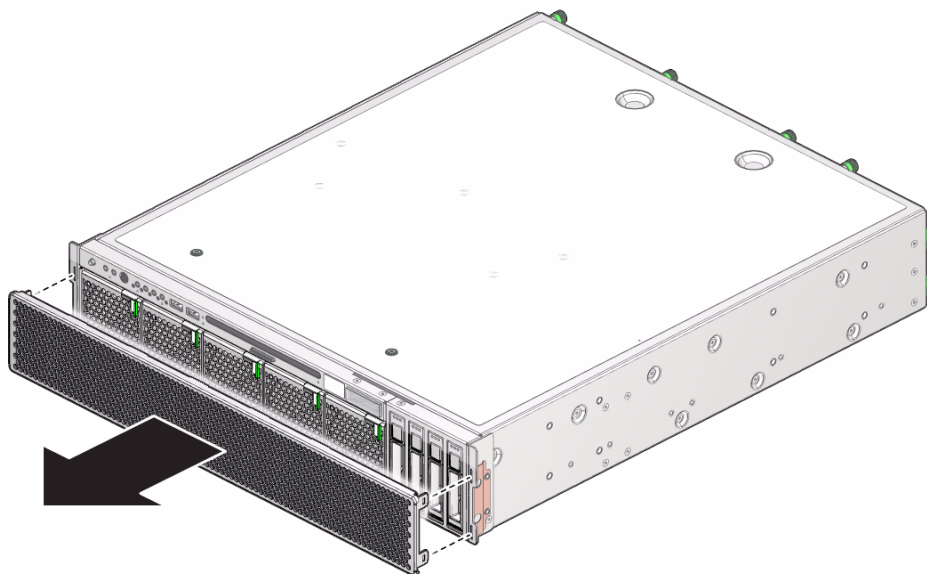
▼ Remove the Air Filter

Removing the air filter is a hot-plug operation. You do not need to power off the server before you remove the air filter.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service”](#) on [page 63](#).
- If you are removing the filter tray as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Grasp the left and right sides of the filter tray and pull it straight off.



3. Consider your next steps:

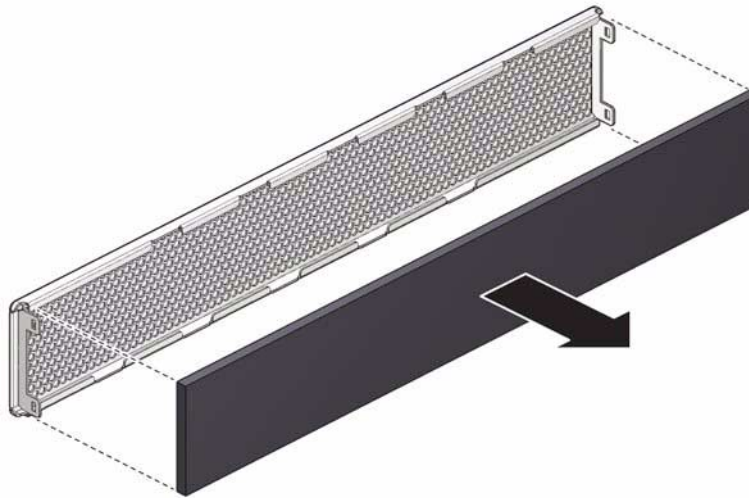
- If you removed the filter tray as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.
- If you removed the filter tray to service the air filter, go to [Step 4](#).

4. Flip the filter tray over to access the air filter.

5. Consider your next steps:

- If you are cleaning the air filter, blow compressed air from the exposed surface, through the air filter, and out the grill of the filter tray. Then install the filter tray. See ["Install the Air Filter"](#) on page 79.
- If you are replacing the air filter, go to [Step 6](#).

6. Carefully compress the air filter and feed it out from the restraining hooks of the filter tray.



7. Set the air filter aside.

8. Install a new air filter.

See [“Install the Air Filter”](#) on page 79.

Related Information

- [“Install the Air Filter”](#) on page 79
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

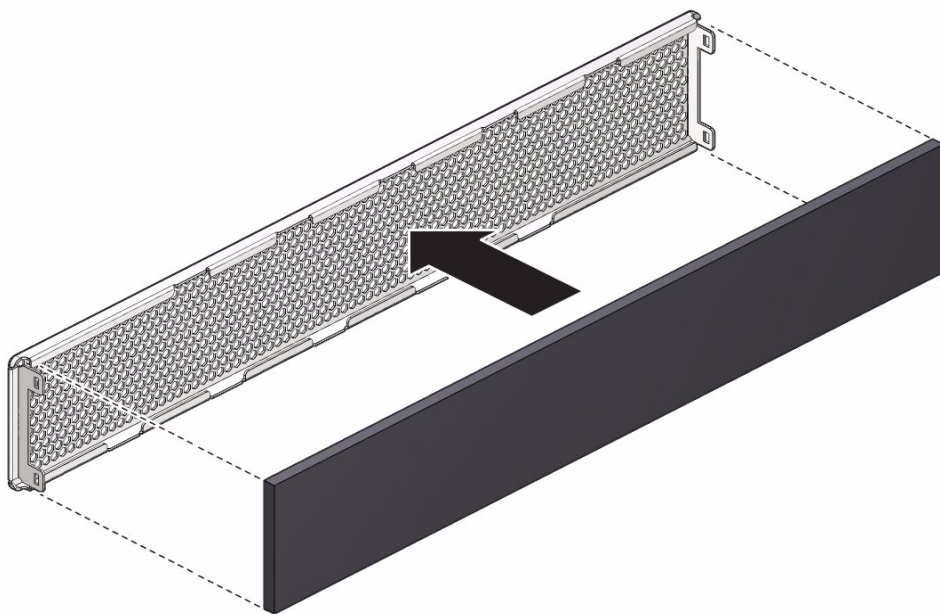
▼ Install the Air Filter

Installing the air filter is a hot-plug operation. You do not need to power off the server before installing the air filter.

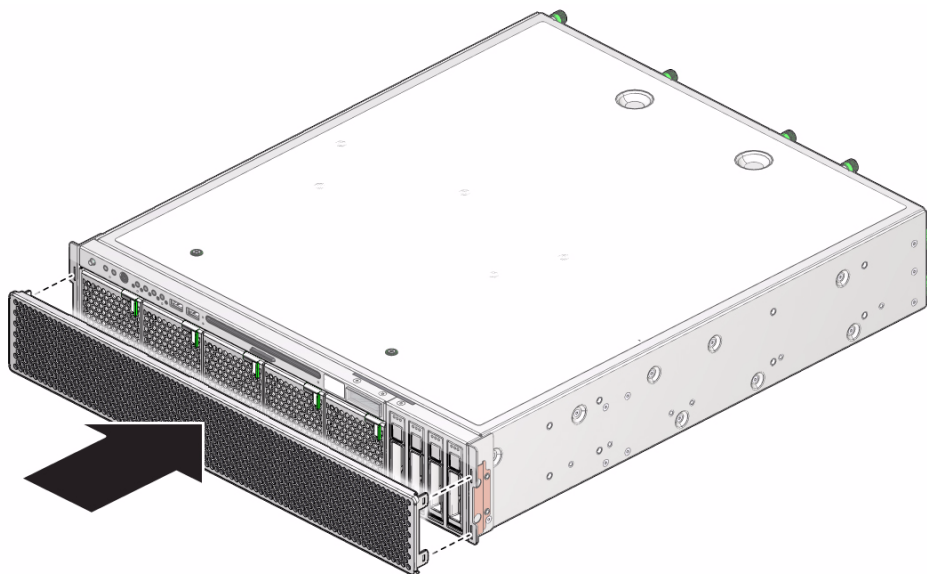
1. Consider your first steps:

- If you are replacing an air filter, remove the faulty air filter first, then return to this procedure, [Step 2](#). See [“Remove the Air Filter”](#) on page 77.
- If you are installing the filter tray as part of another component’s removal or installation procedure, go to [Step 4](#).

2. Feed the edges of the air filter under the restraining hooks of the filter tray.



3. Massage the filter in the filter tray so that there are no folds or wrinkles, and so that the air filter lies flat against the filter tray.
4. Install the filter tray to the server, with the indicators in the upper left corner.
The bezel snaps into place.



5. Consider your next steps:

- If you installed the filter tray as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links" on page 67](#) for assistance.
- If you installed the air filter as part of a replacement operation, you are finished.

Related Information

- ["Remove the Air Filter" on page 77](#)
- ["Preparing for Service" on page 63](#)
- ["Returning the Server to Operation" on page 255](#)

Servicing Fan Modules

The fan module is comprised of redundant fan elements. This redundancy enables the fan module to continuously supply air flow, even if one fan element fails. The five fan modules are located at the front of the chassis, behind the filter tray. See [“Power Supply, Hard Drive, and Fan Module Locations” on page 2](#). The fan modules force air through the chassis from the front to the rear.

These topics describe service information and procedures for the fan.

- [“Fan Module LEDs” on page 83](#)
- [“Locate a Faulty Fan Module” on page 84](#)
- [“Remove a Fan Module” on page 86](#)
- [“Install a Fan Module” on page 88](#)
- [“Verify a Fan Module” on page 89](#)

Related Information

- [“Identifying Components” on page 1](#)
- [“Detecting and Managing Faults” on page 9](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

Fan Module LEDs

Icon	Name	State and Meaning
FM	Fault/OK	Amber – Fatal fault detected. Green – No faults detected.

Related Information

- [“Locate a Faulty Fan Module” on page 84](#)
- [“Remove a Fan Module” on page 86](#)
- [“Install a Fan Module” on page 88](#)
- [“Verify a Fan Module” on page 89](#)

▼ Locate a Faulty Fan Module

You must determine if the fan module is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs” on page 17](#).
2. **Visually inspect the fan module to see if any of its status LEDs are lit or flashing.**
See [“Fan Module LEDs” on page 83](#).
3. **If the fan module is faulty, replace it.**
See [“Remove a Fan Module” on page 86](#).
4. **Within the Oracle ILOM interface, type the `show faulty` command to verify that the fan module is faulty.**

If the fan module is faulty, you will see `/SYS/FANBD/FMx` under the Value heading. For example:

-> show faulty		
Target	Property	Value
-----+-----+-----		
/SP/faultmgmt/0	fru	/SYS/FANBD/FM4
.		
.		
.		
->		

where *x* is 0 (left fan module) to 4 (right fan module).

If the fan module is faulty, replace it. See [“Remove a Fan Module” on page 86](#).

If a FRU value different from `/SYS/FANBD/FMx` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

5. Start the Oracle ILOM faultmgmt shell:

```
-> start /SP/faultmgmt/shell  
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y  
  
faultmgmtsp>
```

6. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty  
-----  
Time                UUID                                msgid                Severity  
-----  
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC          Critical  
  
Fault class : fault.chassis.power.volt-fail  
  
Description : A Power Supply voltage level has exceeded acceptable limits.  
.  
.  
.  
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the fan module is faulty, replace it. See [“Remove a Fan Module” on page 86](#).

7. Exit the Oracle ILOM faultmgmt shell:

```
faultmgmtsp> exit  
->
```

8. Within the Oracle ILOM interface, verify the fan module speeds.

```
-> show /SYS/FANBD/FMx/Fy/TACH value  
/SYS/FANBD/FM0/F0/TACH  
Properties:  
value = 5000.000 RPM  
->
```

where:

- *x* is the fan module, 0 (left fan module) to 4 (right fan module).
- *y* is the fan element, 0 (primary) or 1 (secondary).

If the fan module is faulty, replace it. See [“Remove a Fan Module” on page 86](#).

9. If you are unable to identify the faulty fan module, seek further information.
See [“Detecting and Managing Faults”](#) on page 9.

Related Information

- [“Fan Module LEDs”](#) on page 83
- [“Remove a Fan Module”](#) on page 86
- [“Install a Fan Module”](#) on page 88
- [“Verify a Fan Module”](#) on page 89
- [“Detecting and Managing Faults”](#) on page 9

▼ Remove a Fan Module

Removing a fan module is a hot-plug operation. You do not need to power off the server before you remove the fan module.

Note – For proper thermal management, there must always be at least three fan modules operating.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service”](#) on page 63.
- If you are removing the fan module as part of another component’s removal or installation procedure, go to [Step 2](#).

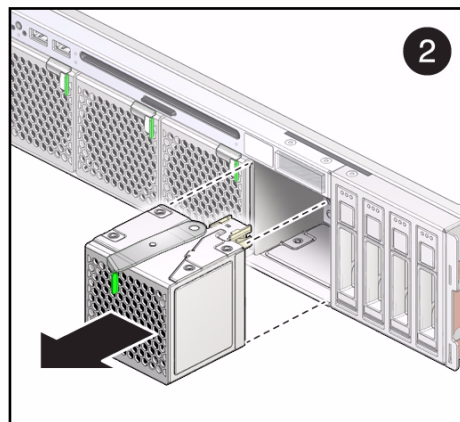
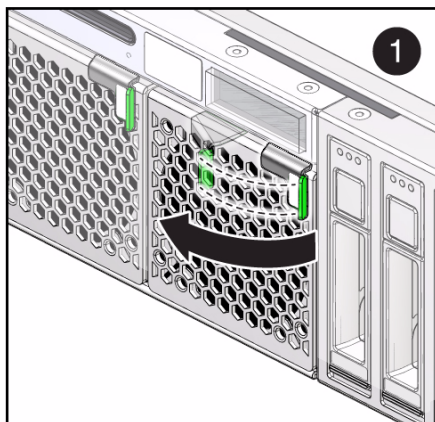
2. Remove the filter tray.

See [“Remove the Air Filter”](#) on page 77.

3. Determine which fan module to remove.

See [“Locate a Faulty Fan Module”](#) on page 84.

4. Grasp the lever at the bottom of the fan module and move the lever to the left (pane 1).



5. Pull the fan module out from the chassis by the lever (pane 2).
6. Set the fan module aside.
7. Consider your next steps:
 - If you removed the fan module as part of a replacement operation, install a new fan module. See [“Install a Fan Module”](#) on page 88.
 - If you removed the fan module as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.
 - If you are not replacing the fan module, go to [Step 8](#).
8. Install the filter tray.
See [“Install the Air Filter”](#) on page 79.
9. Finish the removal procedure.
See [“Returning the Server to Operation”](#) on page 255.

Related Information

- [“Fan Module LEDs”](#) on page 83
- [“Locate a Faulty Fan Module”](#) on page 84
- [“Install a Fan Module”](#) on page 88
- [“Verify a Fan Module”](#) on page 89
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Install a Fan Module

Installing a fan module is a hot-plug operation. You do not need to power off the server before installing the fan module.

Note – The fan module automatically spins up on insertion.

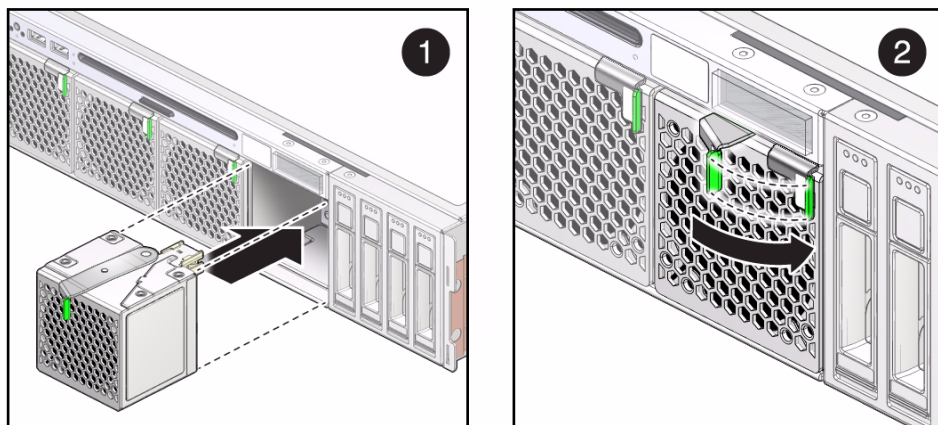
1. Consider your first steps:

- If you are replacing a fan module, remove the faulty or obsolete fan module first, then return to this procedure, [Step 2](#). See [“Remove a Fan Module” on page 86](#).
- If you are installing a new or additional fan module, see the following topics in order:
 - [“Remove the Air Filter” on page 77](#)
 - [“Preparing for Service” on page 63](#).
- If you are installing the fan module as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the fan module to the location where it installs into the chassis.

The lever is on the bottom front of the fan module, the connector is on the top rear.

3. Move the lever to the left and slide the fan module into the chassis (pane 1).



4. Push the fan module into the chassis until the lever moves slightly to the right (pane 2).

5. Move the lever to the right to fully seat the fan module into the chassis.

6. Consider your next steps:

- If you installed the fan module as part of a replacement operation, go to [Step 7](#).
- If you installed the fan module as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

7. Install the filter tray.

See ["Install the Air Filter"](#) on page 79.

8. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 255
- ["Verify a Fan Module"](#) on page 89

Related Information

- ["Fan Module LEDs"](#) on page 83
- ["Locate a Faulty Fan Module"](#) on page 84
- ["Remove a Fan Module"](#) on page 86
- ["Verify a Fan Module"](#) on page 89
- ["Preparing for Service"](#) on page 63
- ["Returning the Server to Operation"](#) on page 255

▼ Verify a Fan Module

After you install a fan module, you can verify its functionality.

1. Reset the fan module:

```
-> set /SYS/FANBD/FMx clear_fault_action=true
Are you sure you want to clear /SYS/FANBD/FM4 (y/n)? y
Set 'clear_fault_action' to 'true'

->
```

where *x* is 0 (left fan module) to 4 (right fan module).

2. Verify that the fan module is no longer considered faulty, then return to this procedure.

See ["Locate a Faulty Fan Module"](#) on page 84.

3. Verify the fan module speeds.

```
-> show /SYS/FANBD/FM $x$ /F $y$ /TACH value  
/SYS/FANBD/FM0/F0/TACH  
Properties:  
value = 5000.000 RPM  
->
```

where:

- x is the fan module, 0 (left fan module) to 4 (right fan module).
- y is the fan element, 0 (primary) or 1 (secondary).

Related Information

- [“Fan Module LEDs” on page 83](#)
- [“Locate a Faulty Fan Module” on page 84](#)
- [“Remove a Fan Module” on page 86](#)
- [“Install a Fan Module” on page 88](#)

Servicing Power Supplies

The power supply takes a supplied -50VDC and converts the power to 12 VDC main power and 3.3 VDC standby power. The two power supplies are located at the rear of the chassis, on the left side. See [“Power Supply, Hard Drive, and Fan Module Locations” on page 2](#). Fans within the power supplies draw air from the chassis interior and expell the air out the rear of the chassis.




These topics describe service information and procedures for the power supply.

- [“Power Supply LEDs” on page 92](#)
- [“Locate a Faulty Power Supply” on page 92](#)
- [“Remove a Power Supply” on page 95](#)
- [“Install a Power Supply” on page 98](#)
- [“Verify a Power Supply” on page 100](#)

Related Information

- [“Identifying Components” on page 1](#)
- [“Detecting and Managing Faults” on page 9](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

Power Supply LEDs

Icon	Location	Name	Color	State and Meaning
	Top	OK	Green	On – Power supply is functional without fault. Off – Power supply is off or initializing. Flashing – No function.
	Middle	Attention	Amber	On – Normal fault detected. Off – No faults detected. Flashing – No function.
	Bottom	AC	Green	On – AC power present and good. Off – AC power not present. Flashing – No function.

Related Information

- [“Locate a Faulty Power Supply” on page 92](#)
- [“Remove a Power Supply” on page 95](#)
- [“Install a Power Supply” on page 98](#)
- [“Verify a Power Supply” on page 100](#)

▼ Locate a Faulty Power Supply

You must determine which power supply is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs” on page 17](#).
2. **Visually inspect the power supply to see if any of its status LEDs are lit or flashing.**
See [“Power Supply LEDs” on page 92](#).
If the power supply is faulty, replace it. See [“Remove a Power Supply” on page 95](#).

3. Within the Oracle ILOM interface, type the `show faulty` command to verify that the power supply is faulty.

If the power supply is faulty, you will see `/SYS/PSx` under the Value heading. For example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/PS0
.		
.		
.		

```
->
```

where x is 0 (lower power supply) or 1 (upper power supply).

If the power supply is faulty, replace it. See [“Remove a Power Supply” on page 95](#).

If a FRU value different from `/SYS/PSx` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

4. Start the Oracle ILOM `faultmgmt` shell:

```
-> start /SP/faultmgmt/shell
```

```
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
```

```
faultmgmtsp>
```

5. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC         Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the power supply is faulty, replace it. See [“Remove a Power Supply” on page 95](#).

6. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit
->
```

7. Within the Oracle ILOM interface, verify the voltage output.

```
-> show /SYS//PSx/V_OUT value
/SYS/PS0/V_OUT
Properties:
value = 12.000 Volts
->
```

where *x* is 0 (lower power supply) or 1 (upper power supply).

If the power supply is faulty, replace it. See [“Remove a Power Supply” on page 95](#).

8. If you are unable to identify the faulty power supply, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Power Supply LEDs” on page 92](#)
- [“Remove a Power Supply” on page 95](#)
- [“Install a Power Supply” on page 98](#)
- [“Verify a Power Supply” on page 100](#)

- [“Detecting and Managing Faults” on page 9](#)

▼ Remove a Power Supply

Removing the power supply is a hot-plug operation. You do not need to power off the server before you remove the power supply.

Note – The server can still function with one power supply, however removing both power supplies effectively powers off the server.

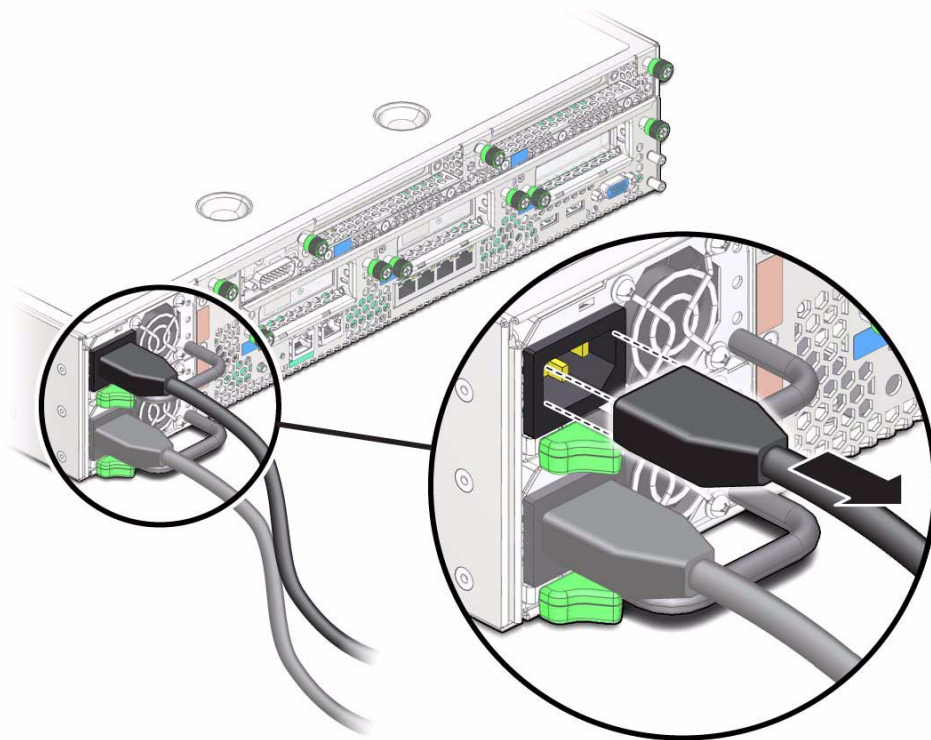
1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the power supply as part of another component’s removal or installation procedure, go to [Step 2](#).

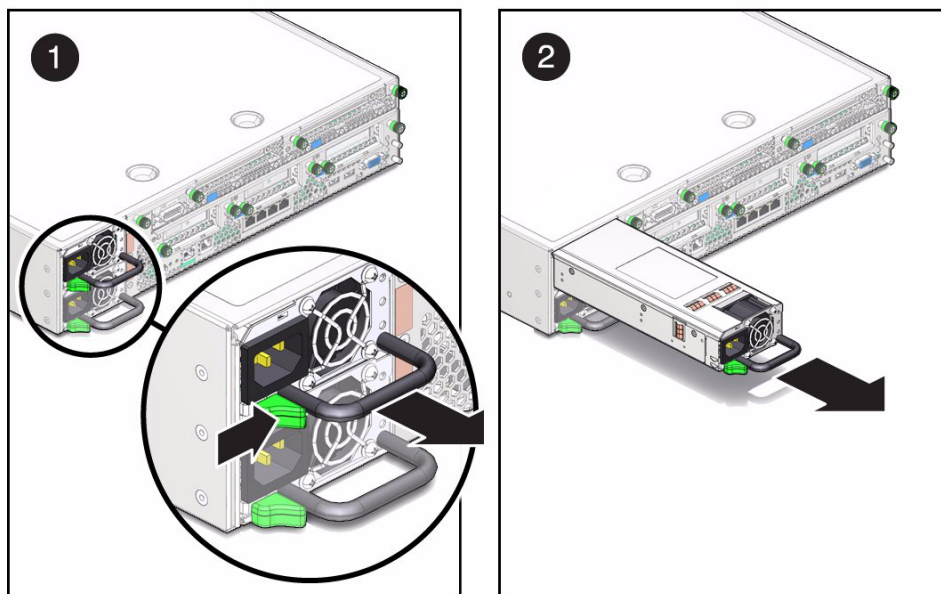
2. Determine which power supply to remove.

See [“Locate a Faulty Power Supply” on page 92](#).

3. Disconnect the power cord from the power supply.



4. Move the release tab to the right and pull on the handle (pane 1).



5. Continue to pull on the handle to slide the power supply out of the chassis (pane 2).
6. When the power supply is almost free of the chassis, use your other hand to support the weight of the power supply.
7. Set the power supply aside.
8. Consider your next steps:
 - If you removed the power supply as part of a replacement operation, install a new power supply. See [“Install a Power Supply” on page 98](#).
 - If you removed the power supply as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.
 - If you are not replacing the power supply, go to [Step 9](#).
9. Finish the removal procedure.
See [“Returning the Server to Operation” on page 255](#).

Related Information

- [“Power Supply LEDs” on page 92](#)
- [“Locate a Faulty Power Supply” on page 92](#)
- [“Install a Power Supply” on page 98](#)
- [“Verify a Power Supply” on page 100](#)

- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Install a Power Supply

Installing the power supply is a hot-plug operation. You do not need to power off the server before installing the power supply.

Note – The power supply automatically transitions from standby voltage to main power when you attach the power cord.

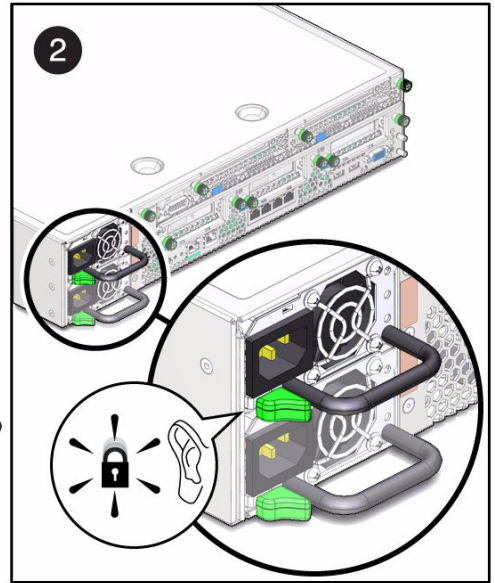
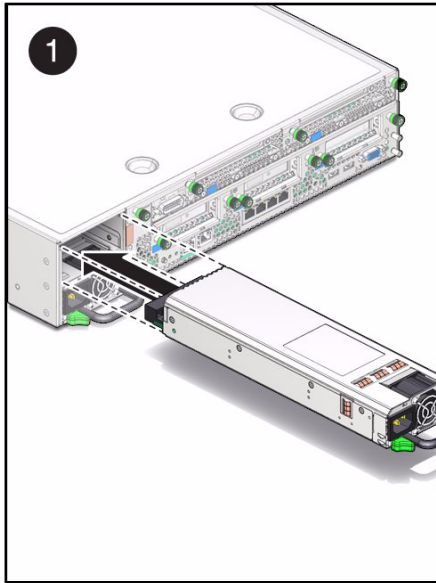
1. Consider your first steps:

- If you are replacing a power supply, remove the faulty or obsolete power supply first, then return to this procedure, [Step 2](#). See [“Remove a Power Supply” on page 95](#).
- If you are installing a new or an additional power supply, see [“Preparing for Service” on page 63](#).
- If you are installing the power supply as part of another component’s removal or installation procedure, go to [Step 2](#).

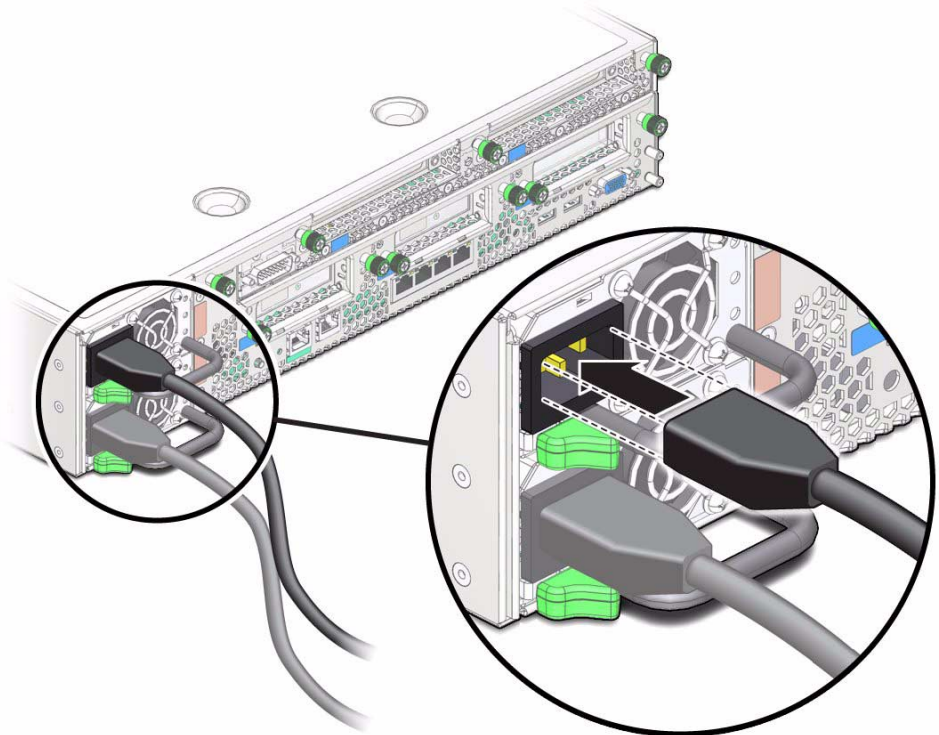
2. Align the power supply to the location where it installs into the chassis.

The power distribution board connector is toward the chassis, and the release tab is on the left.

3. Slide the power supply into the chassis until the power supply seats and the release tab clicks.



4. Attach the power cord.



5. Consider your next steps:

- If you installed the power supply as part of a replacement operation, go to [Step 6](#).
- If you installed the power supply as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

6. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 255
- ["Verify a Power Supply"](#) on page 100

Related Information

- ["Power Supply LEDs"](#) on page 92
- ["Locate a Faulty Power Supply"](#) on page 92
- ["Remove a Power Supply"](#) on page 95
- ["Verify a Power Supply"](#) on page 100
- ["Preparing for Service"](#) on page 63
- ["Returning the Server to Operation"](#) on page 255

▼ Verify a Power Supply

After you install a power supply, you can verify its functionality.

1. Reset the power supply:

```
-> set /SYS/PSx clear_fault_action=true
Are you sure you want to clear /SYS/PS0 (y/n)? y
Set 'clear_fault_action' to 'true'

->
```

where x is 0 (lower power supply) or 1 (upper power supply).

2. Verify that the power supply is no longer considered faulty, then return to this procedure.

See ["Locate a Faulty Power Supply"](#) on page 92.

3. Within the Oracle ILOM interface, verify the voltage output.

```
-> show /SYS//PSx/V_OUT value  
/SYS/PS0/V_OUT  
Properties:  
value = 12.000 Volts  
->
```

where x is 0 (lower power supply) or 1 (upper power supply).

Related Information

- [“Power Supply LEDs” on page 92](#)
- [“Locate a Faulty Power Supply” on page 92](#)
- [“Remove a Power Supply” on page 95](#)
- [“Install a Power Supply” on page 98](#)

Servicing Hard Drives

The four hard drives are located at the front right of the chassis, behind the filter tray. See [“Power Supply, Hard Drive, and Fan Module Locations”](#) on page 2.

These topics describe service information and procedures for the hard drive.

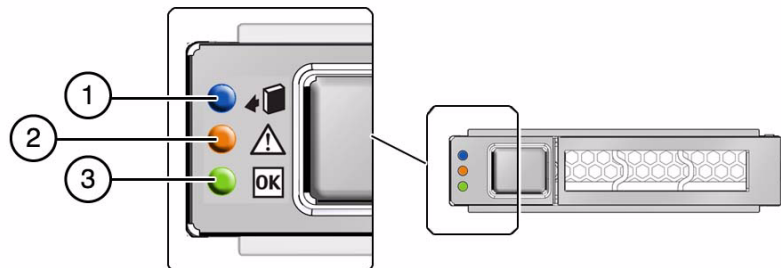
- [“Hard Drive LEDs”](#) on page 103
- [“Locate a Faulty Hard Drive”](#) on page 104
- [“Remove a Hard Drive”](#) on page 106
- [“Install a Hard Drive”](#) on page 110
- [“Verify a Hard Drive”](#) on page 112




Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

Hard Drive LEDs

The status of each drive is represented by the same three LEDs.



No.	LED	Icon	Description
1	Ready to Remove (blue)		Indicates that a drive can be removed during a hot-plug operation.
2	Service Required (amber)		Indicates that the drive has experienced a fault condition.
3	OK/Activity (green)		Indicates the drive's availability for use. <ul style="list-style-type: none"> • On – Read or write activity is in progress. • Off – Drive is idle and available for use.

Related Information

- [“Locate a Faulty Hard Drive” on page 104](#)
- [“Remove a Hard Drive” on page 106](#)
- [“Install a Hard Drive” on page 110](#)
- [“Verify a Hard Drive” on page 112](#)

▼ Locate a Faulty Hard Drive

You must determine which if the hard drive is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs” on page 17](#).
2. **Visually inspect the hard drive to see if any of its status LEDs are lit or flashing.**
See [“Hard Drive LEDs” on page 103](#).
If the hard drive is faulty, replace it. See [“Remove a Hard Drive” on page 106](#).

3. Within the Oracle ILOM interface, type the `show faulty` command to verify that the hard drive is faulty.

If the hard drive is faulty, you will see `/SYS/HDDx` under the Value heading. For example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/HDD0
.		
.		
.		

```
->
```

where x is 0 to 3.

If the hard drive is faulty, replace it. See [“Remove a Hard Drive”](#) on page 106.

If a FRU value different from `/SYS/HDDx` is displayed, see [“Component FRU Names and Service Links”](#) on page 67 to identify which component is faulty.

4. Start the Oracle ILOM `faultmgmt shell`:

```
-> start /SP/faultmgmt/shell
```

```
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
```

```
faultmgmtsp>
```

5. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC         Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the hard drive is faulty, replace it. See [“Remove a Hard Drive” on page 106](#).

6. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit
->
```

7. If you are unable to identify the faulty hard drive, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Hard Drive LEDs” on page 103](#)
- [“Remove a Hard Drive” on page 106](#)
- [“Install a Hard Drive” on page 110](#)
- [“Verify a Hard Drive” on page 112](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove a Hard Drive

Removing the hard drive is a hot-swap operation. You must run commands on the server before you remove the hard drive.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the hard drive as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Remove the filter tray.

See [“Remove the Air Filter” on page 77](#).

3. Determine which hard drive to remove.

See [“Locate a Faulty Hard Drive” on page 104](#).

4. Determine if you need to shut down the OS to replace the drive, and perform one of the following actions:

- If the drive cannot be taken offline without shutting down the OS, follow instructions in [“Power Off the Server \(SP Command\)” on page 70](#) then go to [Step 6](#).
- If the drive can be taken offline without shutting down the OS, go to [Step 5](#).

5. Take the drive offline:

- a. At the Oracle Solaris prompt, type the `cfgadm -al` command to list all drives in the device tree, including drives that are not configured:

```
# cfgadm -al
```

This command lists dynamically reconfigurable hardware resources and shows their operational status. In this case, look for the status of the drive you plan to remove. This information is listed in the Occupant column.

Example:

Ap_id	Type	Receptacle	Occupant	Condition
.				
.				
c2	scsi-sas	connected	configured	unknown
.				
c3	scsi-sas	connected	configured	unknown
c2::w5000cca00a76d1f5,0	disk-path	connected	configured	unknown
c3::w5000cca00a772bd1,0	disk-path	connected	configured	unknown
c4	scsi-sas	connected	configured	unknown
c4::w5000cca00a59b0a9,0	disk-path	connected	configured	unknown
.				
.				
.				

You must unconfigure any drive whose status is listed as configured, as described in [Step b](#).

- b. Unconfigure the drive using the `cfgadm -c unconfigure` command.

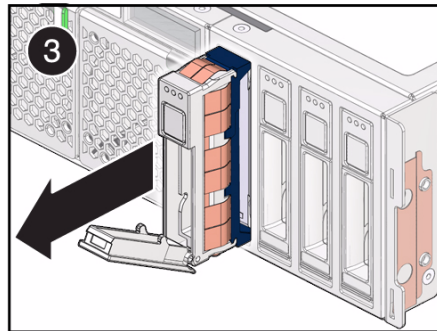
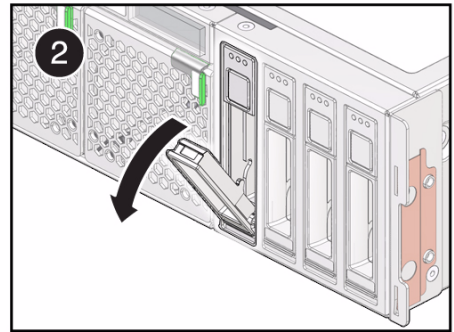
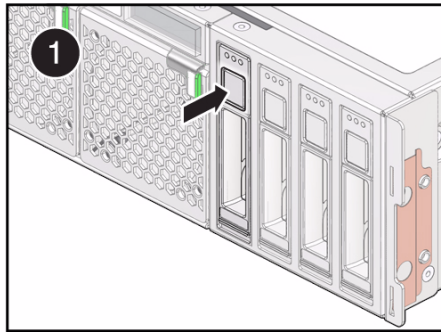
Example:

```
# cfgadm -c unconfigure c2::w5000cca00a76d1f5,0
```

Replace `c2::w5000cca00a76d1f5,0` with the drive name that applies to your situation.

- c. Verify that the drive's blue Ready-to-Remove LED is lit.

6. Push the release button of the hard drive and pull the release lever down (pane 1 and pane 2).



7. Grasp the release lever and pull the hard drive out of the chassis (pane 3).
8. Set the hard drive aside.
9. Consider your next steps:
 - If you removed the hard drive as part of a replacement operation, install a new hard drive. See [“Install a Hard Drive” on page 110](#).
 - If you removed the hard drive as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.
 - If you are not replacing the hard drive, go to [Step 10](#).
10. Install a hard drive filler.
See [“Install a Hard Drive” on page 110](#).
11. Install the filter tray.
See [“Install the Air Filter” on page 79](#).
12. Finish the removal procedure.
See [“Returning the Server to Operation” on page 255](#).

Related Information

- [“Hard Drive LEDs” on page 103](#)
- [“Locate a Faulty Hard Drive” on page 104](#)
- [“Install a Hard Drive” on page 110](#)
- [“Verify a Hard Drive” on page 112](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Install a Hard Drive

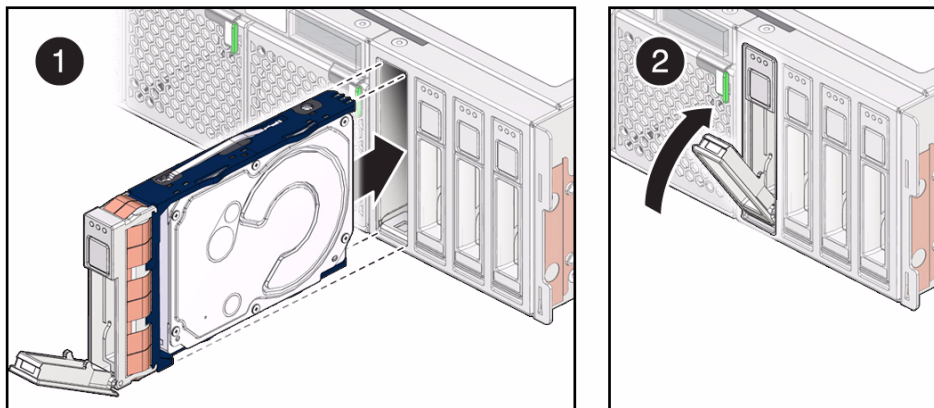
Installing the hard drive is a hot-plug operation. You do not need to power off the server before installing the hard drive.

1. Consider your first steps:

- If you are replacing a hard drive, remove the faulty or obsolete hard drive first, then return to this procedure, [Step 2](#). See [“Remove a Hard Drive” on page 106](#).
- If you are installing a new or an additional hard drive, see the following topics in order:
 - [“Remove the Air Filter” on page 77](#)
 - [“Preparing for Service” on page 63](#).
- If you are installing the hard drive as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Push the release button of the hard drive.

3. Align the hard drive with the slot where the hard drive installs into the chassis (pane 1).



The connector is at the rear of the hard drive. The release lever is at the bottom front of the hard drive.

4. Push on the area below the release button and slide the hard drive into the chassis until the release lever rises slightly (pane 1).
5. Press the release lever closed to fully seat the hard drive into the chassis (pane 2).
6. Consider your next steps:
 - If you installed the hard drive as part of a replacement operation, go to [Step 7](#).
 - If you installed the hard drive as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.
7. Install the filter tray.
See ["Install the Air Filter"](#) on page 79.
8. Finish the installation procedure.
See:
 - ["Returning the Server to Operation"](#) on page 255
 - ["Verify a Hard Drive"](#) on page 112

Related Information

- ["Hard Drive LEDs"](#) on page 103
- ["Locate a Faulty Hard Drive"](#) on page 104
- ["Remove a Hard Drive"](#) on page 106
- ["Verify a Hard Drive"](#) on page 112
- ["Preparing for Service"](#) on page 63

- [“Returning the Server to Operation” on page 255](#)

▼ Verify a Hard Drive

After you install a hard drive, you can verify its functionality.

1. Reset the hard drive:

```
-> set /SYS/HDDx clear_fault_action=true
Are you sure you want to clear /SYS/HDD0 (y/n)? y
Set 'clear_fault_action' to 'true'

->
```

where x is 0 to 3.

2. Consider your next steps:

- If you installed a new hard drive as part of a replacement operation, verify that the hard drive is no longer considered faulty, then return to this procedure. See [“Locate a Faulty Hard Drive” on page 104](#).
- If you installed a new hard drive to increase functionality, go to [Step 3](#).

3. If the OS is shut down, and the drive you replaced was not the boot device, boot the OS.

Depending on the nature of the replaced drive, you might need to perform administrative tasks to reinstall software before the server can boot. Refer to the Oracle Solaris OS administration documentation for more information.

4. At the Oracle Solaris prompt, type the `cfgadm -al` command to list all drives in the device tree, including any drives that are not configured:

```
# cfgadm -al
```

This command helps you identify the drive you installed. Example:

Ap_id	Type	Receptacle	Occupant	Condition
.				
.				
c2	scsi-sas	connected	configured	unknown
.				
c3	scsi-sas	connected	configured	unknown

c2::w500cca00a76d1f5,0	disk-path	connected	configured	unknown
c3::sd2	disk-path	connected	unconfigured	unknown
c4	scsi-sas	connected	configured	unknown
c4::w500cca00a59b0a9,0	disk-path	connected	configured	unknown
.				
.				
.				

5. Configure the drive using the `cfgadm -c configure` command.

Example:

```
# cfgadm -c configure c2::w500cca00a76d1f5,0
```

Replace `c2::w500cca00a76d1f5,0` with the drive name for your configuration.

6. Verify that the blue Ready-to-Remove LED is no longer lit on the drive that you installed.

See [“Hard Drive LEDs” on page 103](#).

7. At the Oracle Solaris prompt, type the `cfgadm -al` command to list all drives in the device tree, including any drives that are not configured:

```
# cfgadm -al
```

The replacement drive is now listed as configured. Example:

Ap_id	Type	Receptacle	Occupant	Condition
.				
.				
c2	scsi-sas	connected	configured	unknown
.				
c3	scsi-sas	connected	configured	unknown
c2::w500cca00a76d1f5,0	disk-path	connected	configured	unknown
c3::w500cca00a772bd1,0	disk-path	connected	configured	unknown
c4	scsi-sas	connected	configured	unknown
c4::w500cca00a59b0a9,0	disk-path	connected	configured	unknown
.				
.				
.				

8. Perform one of the following tasks based on your verification results:

- If the previous steps did not verify the drive, see [“Diagnostics Process” on page 11](#).
- If the previous steps indicate that the drive is functioning properly, perform the tasks required to configure the drive. These tasks are covered in the Oracle Solaris OS administration documentation.

For additional drive verification, you can run the Oracle VTS software. Refer to the Oracle VTS documentation for details.

Related Information

- [“Hard Drive LEDs” on page 103](#)
- [“Locate a Faulty Hard Drive” on page 104](#)
- [“Remove a Hard Drive” on page 106](#)
- [“Install a Hard Drive” on page 110](#)

Servicing the Hard Drive Fan

The hard drive fan is used to supplement the cooling of the hard drives, in addition to the air flow induced by the power supplies. The hard drive fan is located between the power distribution board and the hard drive backplane. See [“Power Supply, Hard Drive, and Fan Module Locations”](#) on page 2.

These topics describe service information and procedures for the hard drive fan.

- [“Determine if the Hard Drive Fan Is Faulty”](#) on page 115
- [“Remove the Hard Drive Fan”](#) on page 118
- [“Install the Hard Drive Fan”](#) on page 119
- [“Verify the Hard Drive Fan”](#) on page 121

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the Hard Drive Fan Is Faulty

You must determine if the hard drive fan is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the hard drive fan is faulty.

If the hard drive fan is faulty, you will see `/SYS/FANBD/FM5` under the `Value` heading. For example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/FANBD/FM5
.		
.		
.		
->		

If the hard drive fan is faulty, replace it. See [“Remove the Hard Drive Fan”](#) on page 118.

If a FRU value different from `/SYS/FANBD/FM5` is displayed, see [“Component FRU Names and Service Links”](#) on page 67 to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt` shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC    Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the hard drive fan is faulty, replace it. See [“Remove the Hard Drive Fan” on page 118](#).

5. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit
->
```

6. Within the Oracle ILOM interface, verify the hard drive fan speed:

```
-> show /SYS/FANBD/FM5/F0/TACH value
/SYS/FANBD/FM5/F0/TACH
Properties:
value = 5000.000 RPM
->
```

If the hard drive fan is faulty, replace it. See [“Remove the Hard Drive Fan” on page 118](#).

7. If you are unable to determine if the hard drive fan is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the Hard Drive Fan” on page 118](#)
- [“Install the Hard Drive Fan” on page 119](#)

- [“Verify the Hard Drive Fan” on page 121](#)
- [“Detecting and Managing Faults” on page 9](#)

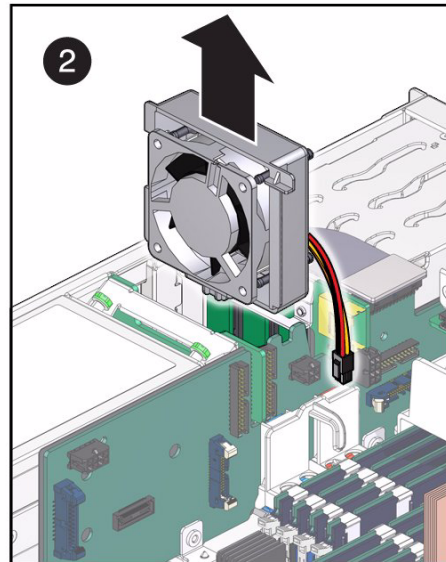
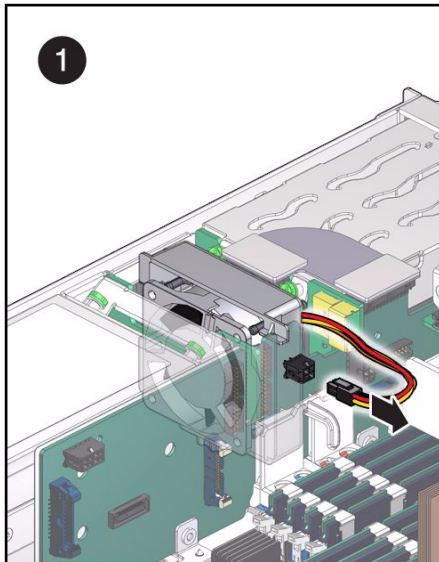
▼ Remove the Hard Drive Fan

Removing the hard drive fan is a cold-service operation. You must power off the server before you remove the hard drive fan.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the hard drive fan as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Disconnect the hard drive fan power cable from the signal interface board (pane 1).



3. Lift the hard drive fan up and out of the chassis (pane 2).

4. Consider your next steps:

- If you removed the hard drive fan as part of a replacement operation, install a new hard drive fan. See [“Install the Hard Drive Fan” on page 119](#).

- If you removed the hard drive fan as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

Related Information

- ["Determine if the Hard Drive Fan Is Faulty"](#) on page 115
- ["Install the Hard Drive Fan"](#) on page 119
- ["Verify the Hard Drive Fan"](#) on page 121
- ["Preparing for Service"](#) on page 63
- ["Returning the Server to Operation"](#) on page 255

▼ Install the Hard Drive Fan

Installing the hard drive fan is a cold-service operation. You must power off the server before installing the hard drive fan.

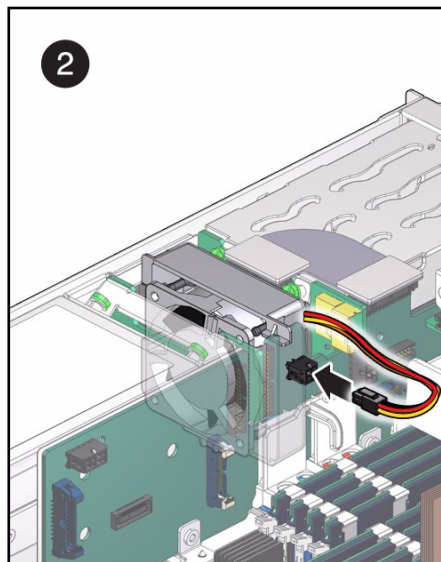
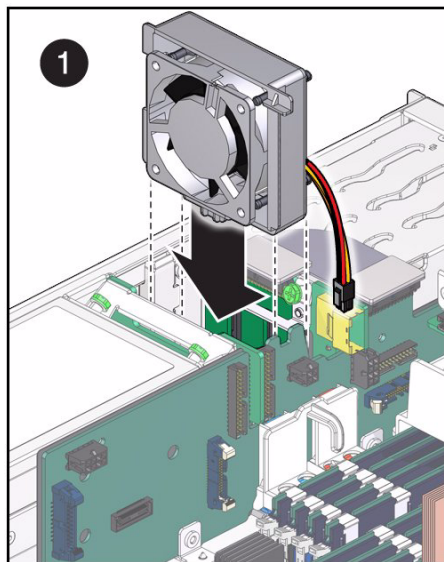
1. Consider your first steps:

- If you are replacing a hard drive fan, remove the faulty or obsolete hard drive fan first, then return to this procedure, [Step 2](#). See ["Remove the Hard Drive Fan"](#) on page 118.
- If you are installing the hard drive fan as part of another component's removal or installation procedure, go to [Step 2](#).

2. Align the hard drive fan to the location where it installs into the chassis.

The arrow is on the top and is pointing towards the power supplies. The power cable is toward the motherboard.

3. Lower the hard drive fan into the chassis (pane 1).



4. Connect the hard drive fan power cable to the signal interface board (pane 2).

5. Consider your next steps:

- If you installed the hard drive fan as part of a replacement operation, go to [Step 6](#).
- If you installed the hard drive fan as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

6. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 255
- ["Verify the Hard Drive Fan"](#) on page 121

Related Information

- ["Determine if the Hard Drive Fan Is Faulty"](#) on page 115
- ["Remove the Hard Drive Fan"](#) on page 118
- ["Verify the Hard Drive Fan"](#) on page 121
- ["Preparing for Service"](#) on page 63
- ["Returning the Server to Operation"](#) on page 255

▼ Verify the Hard Drive Fan

After you install a hard drive fan, you can verify its functionality.

1. Reset the hard drive fan:

```
-> set /SYS/FANBD/FM5 clear_fault_action=true  
Are you sure you want to clear /SYS/FANBD/FM5 (y/n)? y  
Set 'clear_fault_action' to 'true'  
  
->
```

2. Verify that the hard drive fan is no longer considered faulty, then return to this procedure.

See [“Determine if the Hard Drive Fan Is Faulty”](#) on page 115.

3. Verify the hard drive fan speed:

```
-> show /SYS/FANBD/FM5/F0/TACH value  
/SYS/FANBD/FM5/F0/TACH  
Properties:  
value = 5000.000 RPM  
  
->
```

Related Information

- [“Determine if the Hard Drive Fan Is Faulty”](#) on page 115
- [“Remove the Hard Drive Fan”](#) on page 118
- [“Install the Hard Drive Fan”](#) on page 119

Servicing the Hard Drive Backplane

The hard drive backplane is a mechanical interconnect for hard drives to the signal interface board and the motherboard. The hard drive backplane is located vertically between the hard drive fan and the hard drives. See [“Power Supply, Hard Drive, and Fan Module Locations”](#) on page 2.

These topics describe service information and procedures for the hard drive backplane.

- [“Determine if the Hard Drive Backplane Is Faulty”](#) on page 123
- [“Remove the Hard Drive Backplane”](#) on page 125
- [“Install the Hard Drive Backplane”](#) on page 128
- [“Verify the Hard Drive Backplane”](#) on page 130

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the Hard Drive Backplane Is Faulty

You must determine if the hard drive backplane is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the hard drive backplane is faulty.

If the hard drive backplane is faulty, you will see `/SYS/SASBP` under the Value heading. For example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/SASBP
.		
.		
.		
->		

If the hard drive backplane is faulty, replace it. See [“Remove the Hard Drive Backplane” on page 125](#).

If a FRU value different from `/SYS/SASBP` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt shell`:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC          Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the hard drive backplane is faulty, replace it. See [“Remove the Hard Drive Backplane” on page 125](#).

5. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit
->
```

6. If you are unable to determine if the hard drive backplane is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the Hard Drive Backplane” on page 125](#)
- [“Install the Hard Drive Backplane” on page 128](#)
- [“Verify the Hard Drive Backplane” on page 130](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove the Hard Drive Backplane

Removing the hard drive backplane is a cold-service operation. You must power off the server before you remove the hard drive backplane.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service”](#) on page 63.
- If you are removing the hard drive backplane as part of another component’s removal or installation procedure, go to [Step 2](#).

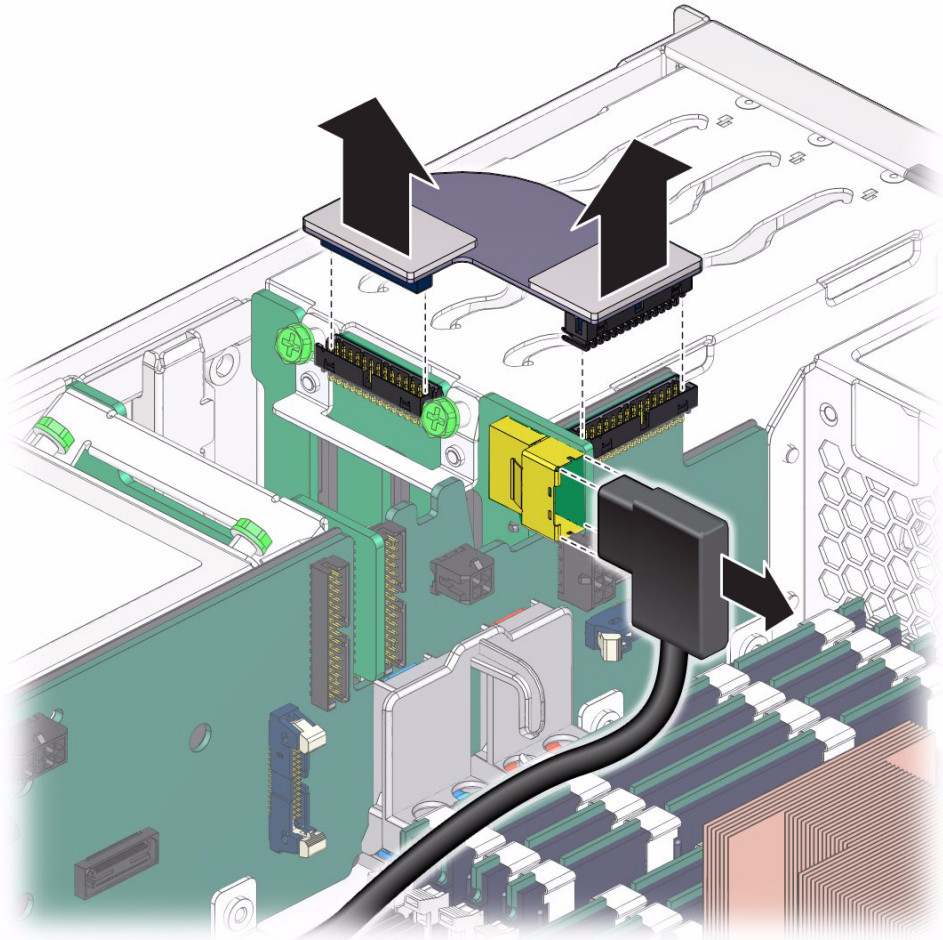
2. Remove all of the hard drives.

See [“Remove a Hard Drive”](#) on page 106.

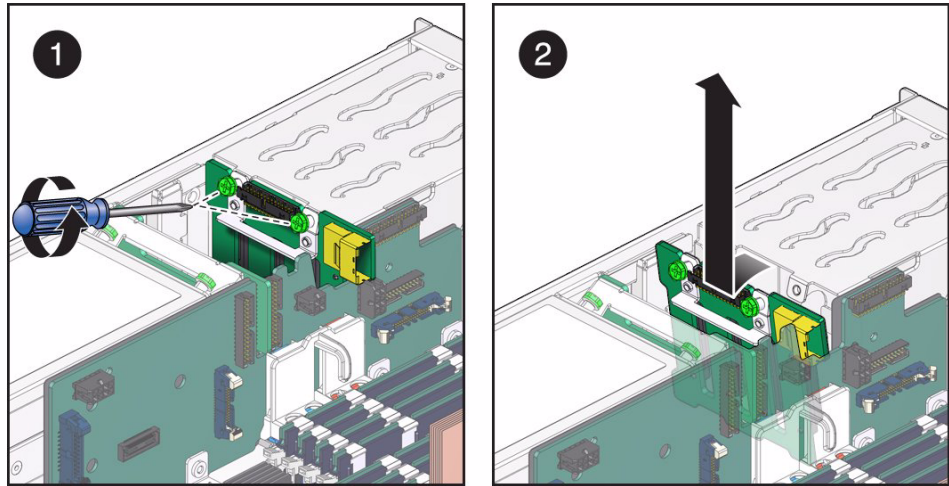
3. Remove the hard drive fan.

See [“Remove the Hard Drive Fan”](#) on page 118.

4. Remove the flat flexible cable from the signal interface board to the hard drive backplane.



5. Remove the signal cable from the hard drive backplane.
6. Fully loosen the two captive screws from the hard drive backplane (pane 1).



7. Tilt the hard drive backplane toward the power supplies and lift the hard drive backplane straight up and out of the chassis (pane 2).
8. Consider your next steps:
 - If you removed the hard drive backplane as part of a replacement operation, install a new hard drive backplane. See [“Install the Hard Drive Backplane”](#) on page 128.
 - If you removed the hard drive backplane as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.

Related Information

- [“Determine if the Hard Drive Backplane Is Faulty”](#) on page 123
- [“Install the Hard Drive Backplane”](#) on page 128
- [“Verify the Hard Drive Backplane”](#) on page 130
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Install the Hard Drive Backplane

Installing the hard drive backplane is a cold-service operation. You must power off the server before installing the hard drive backplane.

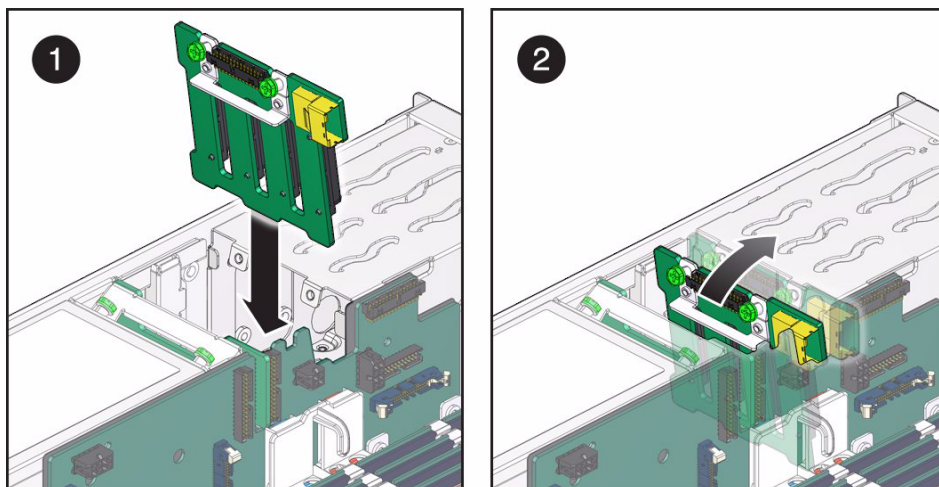
1. Consider your first steps:

- If you are replacing a hard drive backplane, remove the faulty or obsolete hard drive backplane first, then return to this procedure, [Step 2](#). See [“Remove the Hard Drive Backplane”](#) on page 125.
- If you are installing the hard drive backplane as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the hard drive backplane to the location where it installs into the chassis.

The flat flexible connector points up and the hard drive connectors are towards the front of the chassis.

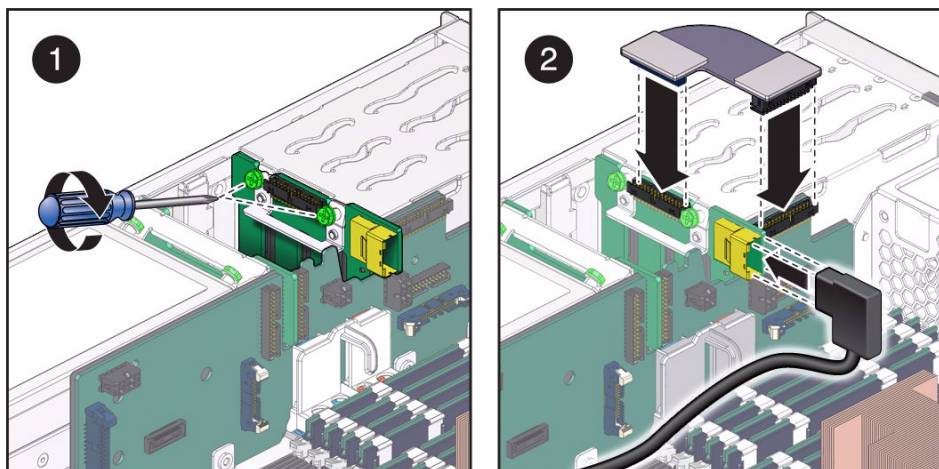
3. Tilt the hard drive backplane slightly backwards and lower it into the chassis (pane 1).



4. Align the bottom edge of the hard drive backplane with the tabs in the chassis.

5. Tilt the hard drive backplane forward against the hard drive bay (pane 2).

6. Tighten the captive screws (pane 1).



7. Attach the signal cable to the hard drive backplane (pane 2).
8. Attach the flat flexible cable from the signal interface board to the hard drive backplane (pane 2).
9. Consider your next steps:
 - If you installed the hard drive backplane as part of a replacement operation, go to [Step 10](#).
 - If you installed the hard drive backplane as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.
10. Install the hard drive fan.
See ["Install the Hard Drive Fan"](#) on page 119.
11. Install the hard drives.
See ["Install a Hard Drive"](#) on page 110.
12. Finish the installation procedure.
See:
 - ["Returning the Server to Operation"](#) on page 255
 - ["Verify the Hard Drive Backplane"](#) on page 130

Related Information

- ["Determine if the Hard Drive Backplane Is Faulty"](#) on page 123
- ["Remove the Hard Drive Backplane"](#) on page 125
- ["Verify the Hard Drive Backplane"](#) on page 130
- ["Preparing for Service"](#) on page 63

- [“Returning the Server to Operation” on page 255](#)

▼ Verify the Hard Drive Backplane

After you install a hard drive backplane, you can verify its functionality.

1. Reset the hard drive backplane:

```
-> set /SYS/SASBP clear_fault_action=true
Are you sure you want to clear /SYS/SASBP (y/n)? y
Set 'clear_fault_action' to 'true'

->
```

2. Verify that the hard drive backplane is no longer considered faulty, then return to this procedure.

See [“Determine if the Hard Drive Backplane Is Faulty” on page 123](#).

3. Verify the hard drive backplane by reporting each installed drive’s presence:

```
-> show /SYS/HDDx type
/SYS/HDD0
Properties:
    type = Hard Disk

->
```

where x is 0 to 3.

Related Information

- [“Determine if the Hard Drive Backplane Is Faulty” on page 123](#)
- [“Remove the Hard Drive Backplane” on page 125](#)
- [“Install the Hard Drive Backplane” on page 128](#)

Servicing the Power Distribution Board

The power distribution board is routes power and signals from the power supplies to the bus bars and the signal interface board. The power distribution board is located vertically between the power supplies and the hard drive fan. See [“Power Supply, Hard Drive, and Fan Module Locations”](#) on page 2.

These topics describe service information and procedures for the power distribution board.

- [“Determine if the Power Distribution Board Is Faulty”](#) on page 131
- [“Remove the Power Distribution Board”](#) on page 133
- [“Install the Power Distribution Board”](#) on page 135
- [“Verify the Power Distribution Board”](#) on page 136

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the Power Distribution Board Is Faulty

You must determine if the power distribution board is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, verify the power distribution board.

```
-> show /SYS/MB/V_+12V0 value
/SYS/MB/V_+12V0
Properties:
value = 12.036 Volts
-> show /SYS/MB/V_+3V3_STBY value
/SYS/MB/V_+3V3_STBY
Properties:
value = 3.360 Volts
->
```

If the power distribution board is faulty, replace it. See [“Remove the Power Distribution Board” on page 133](#).

3. Start the Oracle ILOM faultmgmt shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y

faultmgmtsp>
```

4. Identify the faulty component:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC    Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the power distribution board is faulty, replace it. See [“Remove the Power Distribution Board” on page 133](#).

5. Exit the Oracle ILOM faultmgmt shell:

```
faultmgmtsp> exit
->
```

6. If you are unable to determine if the power distribution board is faulty, seek further information.

See [“Detecting and Managing Faults”](#) on page 9.

Related Information

- [“Remove the Power Distribution Board”](#) on page 133
- [“Install the Power Distribution Board”](#) on page 135
- [“Verify the Power Distribution Board”](#) on page 136
- [“Detecting and Managing Faults”](#) on page 9

▼ Remove the Power Distribution Board

Removing the power distribution board is a cold-service operation. You must run commands on the server before you remove the power distribution board.

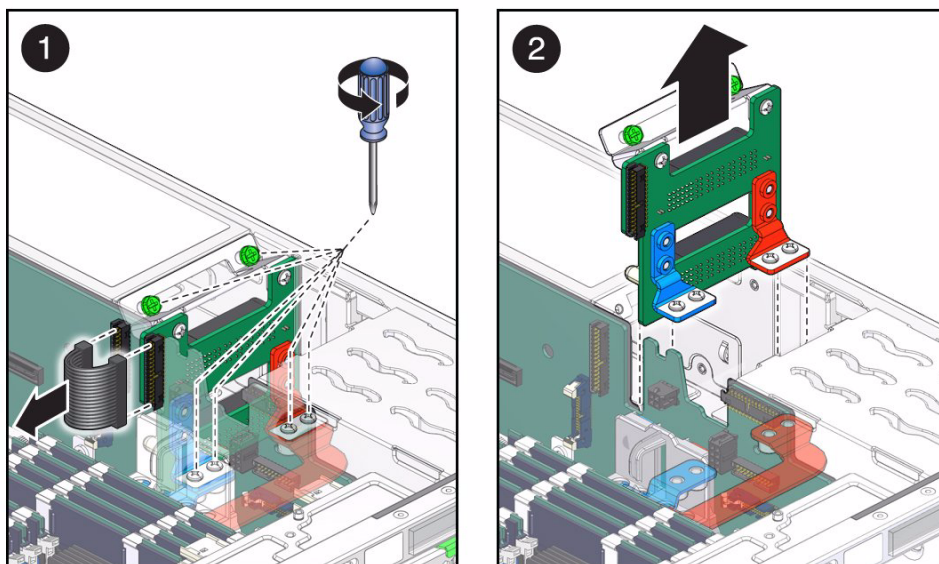
1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service”](#) on page 63.
- If you are removing the power distribution board as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Remove the power supplies.

See [“Remove a Power Supply”](#) on page 95.

3. Remove the ribbon cable from the signal interface board to the power distribution board (pane 1).



4. Remove the two screws from each bus bar of the power distribution board (pane 1).
5. Fully loosen the two captive screws from the power distribution board (pane 1).
6. Lift the power distribution board straight up and out of the chassis (pane 2).
7. Consider your next steps:
 - If you removed the power distribution board as part of a replacement operation, install a new power distribution board. See [“Install the Power Distribution Board”](#) on page 135.
 - If you removed the power distribution board as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.

Related Information

- [“Determine if the Power Distribution Board Is Faulty”](#) on page 131
- [“Install the Power Distribution Board”](#) on page 135
- [“Verify the Power Distribution Board”](#) on page 136
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Install the Power Distribution Board

Installing the power distribution board is a cold-service operation.

1. Consider your first steps:

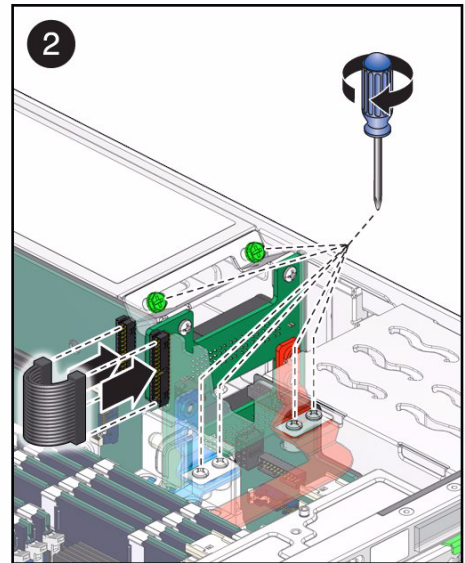
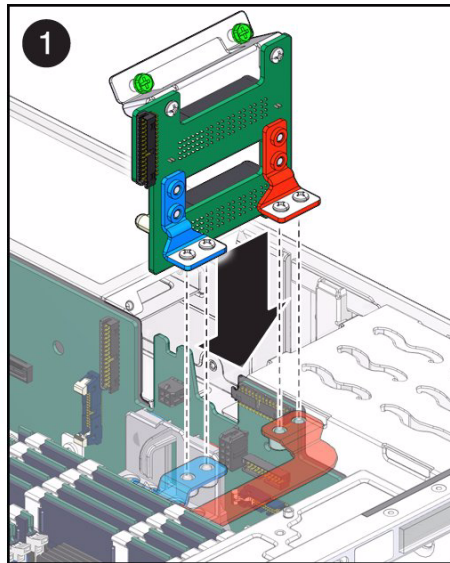
- If you are replacing a power distribution board, remove the faulty or obsolete power distribution board first, then return to this procedure, [Step 2](#). See [“Remove the Power Distribution Board” on page 133](#).
- If you are installing the power distribution board as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the power distribution board to the location where it installs into the chassis.

The bus bars point down and the power connectors are toward the rear of the chassis.

3. Lower the power distribution board straight down into the chassis (pane 1).

Ensure that the board slides into the guides.



4. Install and tighten the four bus bar screws and tighten the captive screws (pane 2).

Note – Ensure that the bus bar screws are securely tightened.

5. **Attach the ribbon cable from the signal interface board to the power distribution board (pane 2).**
6. **Consider your next steps:**
 - If you installed the power distribution board as part of a replacement operation, go to [Step 7](#).
 - If you installed the power distribution board as part of another component's removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.
7. **Install the power supplies.**

See [“Install a Power Supply”](#) on page 98.
8. **Finish the installation procedure.**

See:

 - [“Returning the Server to Operation”](#) on page 255
 - [“Verify the Power Distribution Board”](#) on page 136

Related Information

- [“Determine if the Power Distribution Board Is Faulty”](#) on page 131
- [“Remove the Power Distribution Board”](#) on page 133
- [“Verify the Power Distribution Board”](#) on page 136
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Verify the Power Distribution Board

After you install a power distribution board, you can verify its functionality.

- **Verify the power distribution board.**

```
-> show /SYS/MB/V_+12V0 value
/SYS/MB/V_+12V0
Properties:
value = 12.036 Volts
-> show /SYS/MB/V_+3V3_STBY value
```

```
/SYS/MB/V_+3V3_STBY  
Properties:  
value = 3.360 Volts  
->
```

Related Information

- [“Determine if the Power Distribution Board Is Faulty” on page 131](#)
- [“Remove the Power Distribution Board” on page 133](#)
- [“Install the Power Distribution Board” on page 135](#)

Servicing the DVD Drive

The DVD drive is an eSATA optical storage device with DVD DL-RW capabilities. The DVD drive is located in the center of the DVD bracket at the front of the chassis. See [“Top Cover, Filter Tray, and DVD Tray Locations”](#) on page 4.

These topics describe service information and procedures for the DVD drive.

- [“Determine if the DVD Drive Is Faulty”](#) on page 139
- [“Remove the DVD Drive”](#) on page 141
- [“Install the DVD Drive”](#) on page 143
- [“Verify the DVD Drive”](#) on page 145

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the DVD Drive Is Faulty

You must determine if the DVD drive is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.
2. **Visually inspect the DVD drive to see if any of its status LEDs are lit or flashing.**

If the DVD drive is faulty, replace it. See [“Remove the DVD Drive”](#) on page 141.

3. Within the Oracle ILOM interface, verify the presence of the DVD drive:

```
-> show /SYS/DVD type  
/SYS/DVD  
Properties:  
    type = DVD  
->
```

If the DVD drive is not recognized, replace it. See [“Remove the DVD Drive” on page 141](#).

4. Start the Oracle ILOM faultmgmt shell:

```
-> start /SP/faultmgmt/shell  
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y  
  
faultmgmtsp>
```

5. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty  
-----  
Time                UUID                                msgid                Severity  
-----  
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC    Critical  
  
Fault class : fault.chassis.power.volt-fail  
  
Description : A Power Supply voltage level has exceeded acceptable limits.  
.  
.  
.  
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the DVD drive is faulty, replace it. See [“Remove the DVD Drive” on page 141](#).

6. Exit the Oracle ILOM faultmgmt shell:

```
faultmgmtsp> exit  
->
```

7. If you are unable to determine if the DVD drive is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the DVD Drive” on page 141](#)
- [“Install the DVD Drive” on page 143](#)
- [“Verify the DVD Drive” on page 145](#)
- [“Detecting and Managing Faults” on page 9](#)

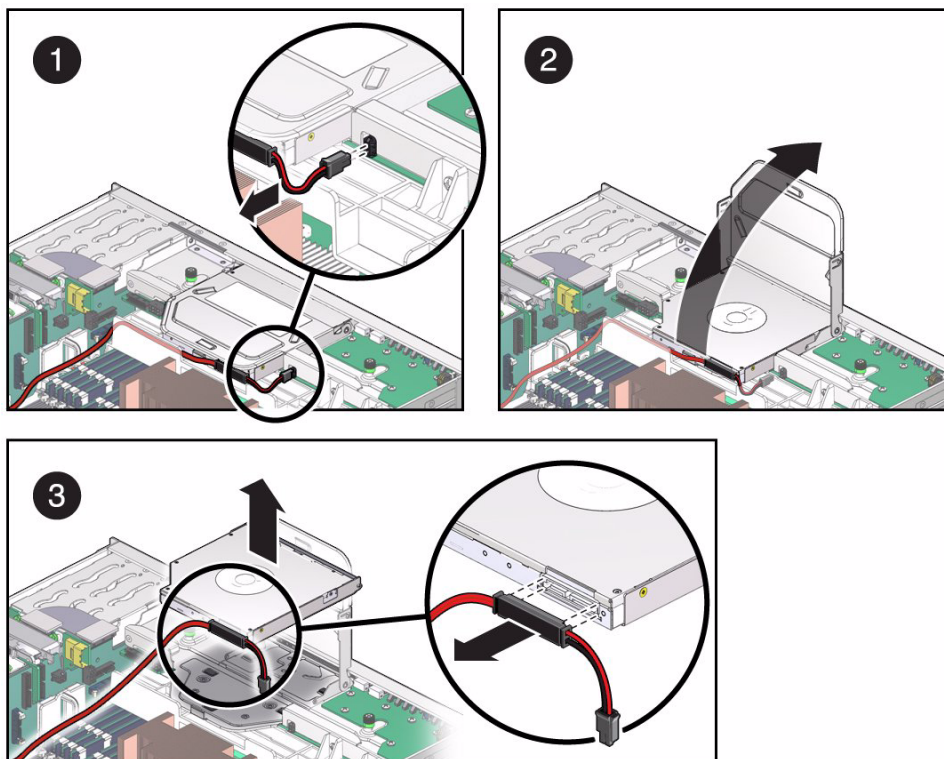
▼ Remove the DVD Drive

Removing the DVD drive is a cold-service operation. You must power off the server before you remove the DVD drive.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the DVD drive as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Disconnect the two-wire cable from the DVD bracket (pane 1).



3. Raise the DVD cover (pane 2)
4. Lift the DVD drive out of the DVD bracket (pane 3).
5. Remove the cable from the rear of the DVD drive (pane 3).
6. Set the DVD drive aside.
7. Consider your next steps:
 - If you removed the DVD drive as part of a replacement operation, install a new DVD drive. See [“Install the DVD Drive” on page 143](#).
 - If you removed the DVD drive as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.

Related Information

- [“Determine if the DVD Drive Is Faulty” on page 139](#)
- [“Install the DVD Drive” on page 143](#)
- [“Verify the DVD Drive” on page 145](#)
- [“Preparing for Service” on page 63](#)

- [“Returning the Server to Operation” on page 255](#)

▼ Install the DVD Drive

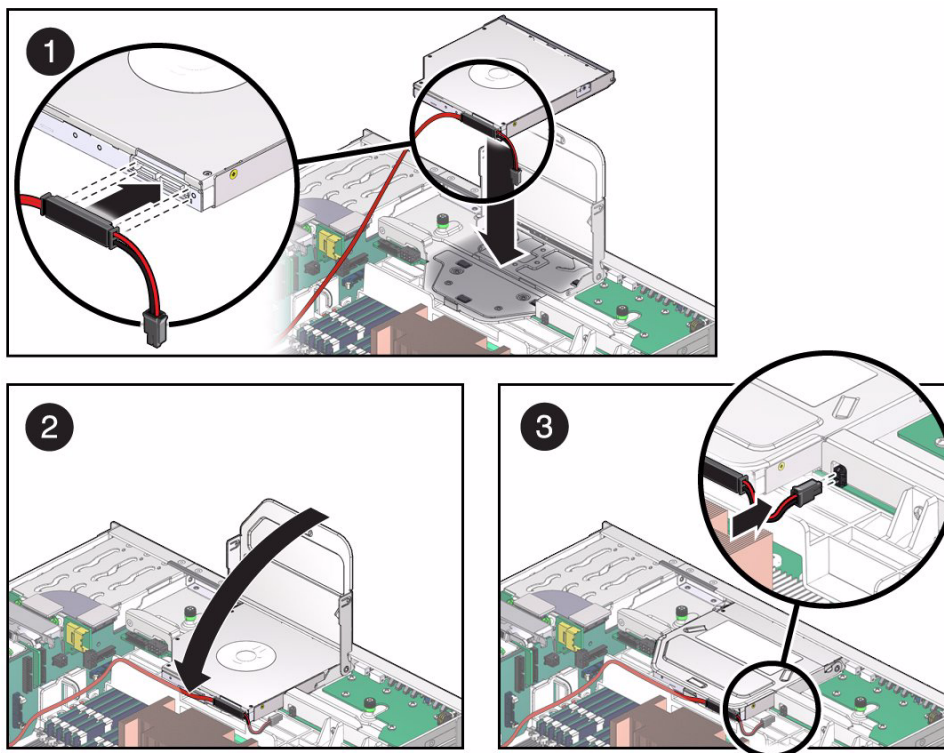
Installing the DVD drive is a cold-service operation. You must power off the server before installing the DVD drive.

1. Consider your first steps:

- If you are replacing a DVD drive, remove the faulty or obsolete DVD drive first, then return to this procedure, [Step 2](#). See [“Remove the DVD Drive” on page 141](#).
- If you are installing the DVD drive as part of another component’s removal or installation procedure, go to [Step 2](#).

2. If not done already, remove the two-wire cable from the DVD bracket and open the DVD cover.

3. Attach the cable to the rear of the DVD drive (pane 1).



4. **Align the DVD drive to the location where it installs into the chassis.**
The slot of the DVD drive is toward the front of the chassis. The cable connector is to the left.
5. **Lower the front of the DVD drive into the DVD bracket (pane 1).**
6. **While lowering the rear of the DVD drive, slide it forward into the DVD bracket (pane 1).**
7. **Close the DVD cover (pane 2).**
8. **Attach the two-wire cable to the DVD bracket (pane 3).**
9. **Consider your next steps:**
 - If you installed the DVD drive as part of a replacement operation, go to [Step 10](#).
 - If you installed the DVD drive as part of another component's removal or installation procedure, return to that procedure. See "[Component FRU Names and Service Links](#)" on [page 67](#) for assistance.
10. **Finish the installation procedure.**
See:

- [“Returning the Server to Operation” on page 255](#)
- [“Verify the DVD Drive” on page 145](#)

Related Information

- [“Determine if the DVD Drive Is Faulty” on page 139](#)
- [“Remove the DVD Drive” on page 141](#)
- [“Verify the DVD Drive” on page 145](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Verify the DVD Drive

After you install a DVD drive, you can verify its functionality.

- **Verify the presence of the DVD drive:**

```
-> show /SYS/DVD type  
/SYS/DVD  
Properties:  
    type = DVD  
->
```

Related Information

- [“Determine if the DVD Drive Is Faulty” on page 139](#)
- [“Remove the DVD Drive” on page 141](#)
- [“Install the DVD Drive” on page 143](#)

Servicing the DVD Tray

The DVD tray is mechanical fixture to support the DVD drive, the LED board, and the fan board. The DVD tray is located at the upper front of the chassis. See [“Top Cover, Filter Tray, and DVD Tray Locations”](#) on page 4.

These topics describe service information and procedures for the DVD tray.

- [“Remove the DVD Tray”](#) on page 147
- [“Install the DVD Tray”](#) on page 150

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Remove the DVD Tray

Removing the DVD tray is a cold-service operation. You must power off the server before you remove the DVD tray.

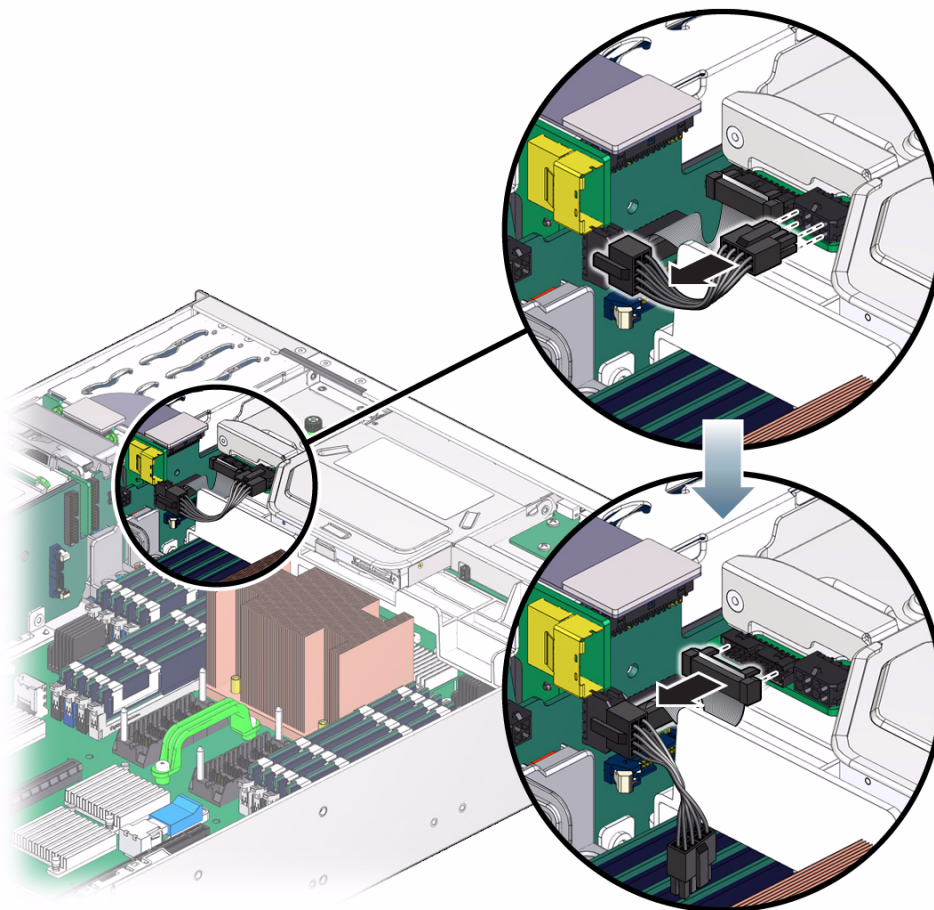
1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service”](#) on page 63.
- If you are removing the DVD tray as part of another component’s removal or installation procedure, go to [Step 2](#).

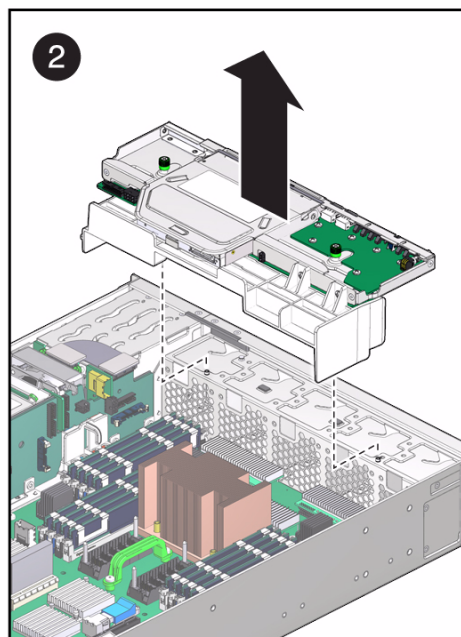
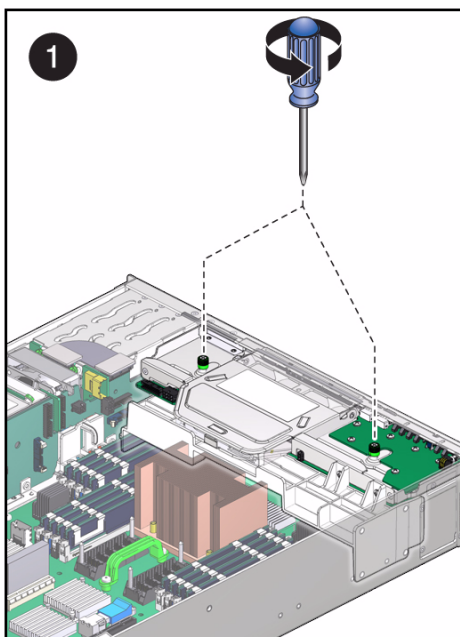
2. Remove the DVD drive.

See [“Remove the DVD Drive”](#) on page 141.

3. Disconnect from the DVD tray the power cable and the signal cable connected to the signal interface board.



4. Fully loosen the two captive screws from the DVD tray (pane 1).



5. Slide the DVD tray rearward and lift it out of the chassis (pane 2).

6. Set the DVD tray aside.

7. Consider your next steps:

- If you removed the DVD tray as part of a replacement operation, install a new DVD tray. See [“Install the DVD Tray” on page 150](#).
- If you removed the DVD tray as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.

Related Information

- [“Install the DVD Tray” on page 150](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Install the DVD Tray

Installing the DVD tray is a cold-service operation. You do not need to must run commands on power off the server before installing the DVD tray.

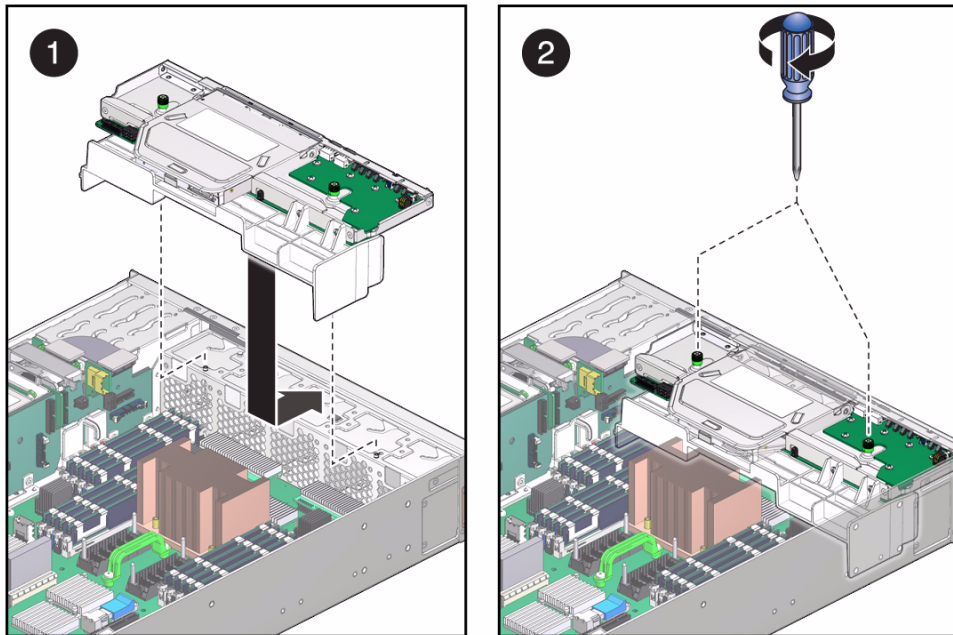
1. Consider your first steps:

- If you are replacing a DVD tray, remove the faulty or obsolete DVD tray first, then return to this procedure, [Step 2](#). See [“Remove the DVD Tray” on page 147](#).
- If you are installing the DVD tray as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the DVD tray to the location where it installs into the chassis.

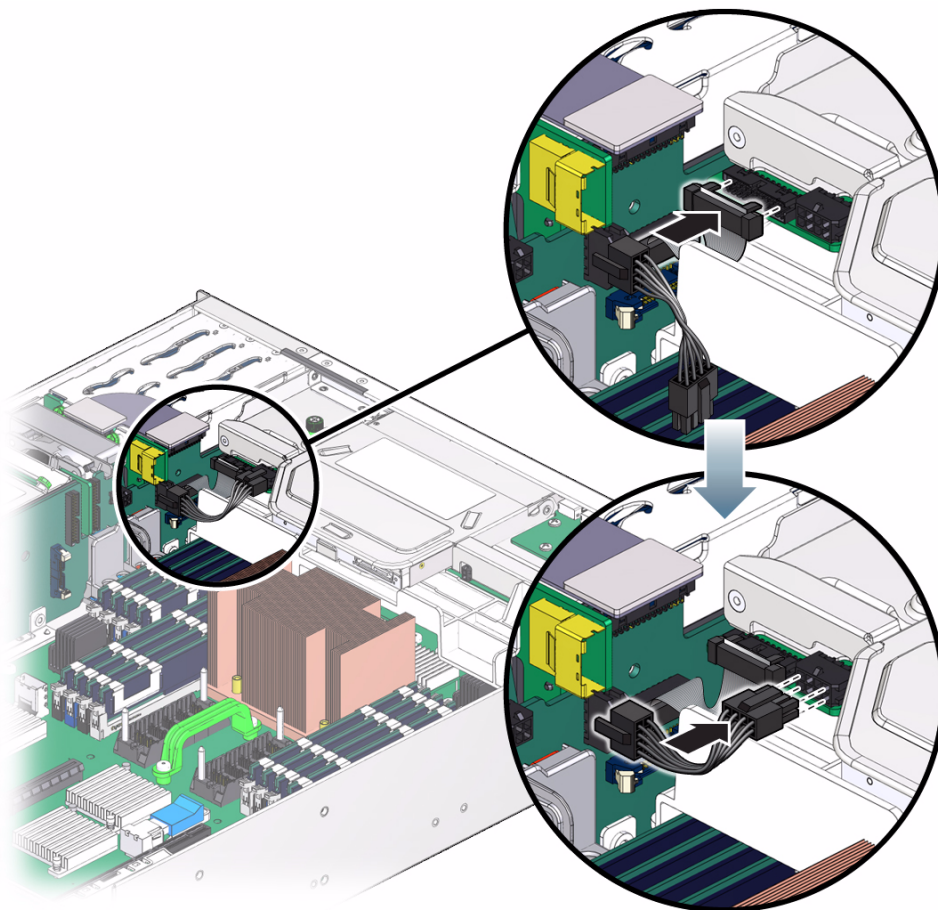
The DVD tray has the LED board to the front left top.

3. Lower the DVD tray to the chassis and slide the DVD tray forward (pane 1).



4. Tighten the two captive screws (pane 2).

5. Attach the signal cable and power cable from the signal interface board to the DVD tray.



6. Consider your next steps:

- If you installed the DVD tray as part of a replacement operation, go to [Step 7](#).
- If you installed the DVD tray as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

7. Install the DVD drive.

See ["Install the DVD Drive"](#) on page 143.

8. Finish the installation procedure.

See ["Returning the Server to Operation"](#) on page 255.

Related Information

- ["Remove the DVD Tray"](#) on page 147

- “Preparing for Service” on page 63
- “Returning the Server to Operation” on page 255

Servicing the LED Board

The LED board provides an extension of the signal interface board and hosts the chassis, fan, and DVD status LEDs. The LED board is located on the DVD tray on the left side. See [“Top Cover, Filter Tray, and DVD Tray Locations”](#) on page 4.

These topics describe service information and procedures for the LED board.

- [“Determine if the LED Board Is Faulty”](#) on page 153
- [“Remove the LED Board”](#) on page 155
- [“Install the LED Board”](#) on page 156
- [“Verify the LED Board”](#) on page 158

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the LED Board Is Faulty

You must determine if the LED board is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.
2. **Visually inspect the LED board to see that the chassis status LEDs match the chassis status LEDs at the rear of the chassis.**
If the LED board is faulty, replace it. See [“Remove the LED Board”](#) on page 155.

3. Within the Oracle ILOM interface, verify if the LED board is faulty:

```
-> set /SYS/LOCATE value=Fast_Blink
Set 'value' to 'Fast_Blink'
->
```

If the Locator LED is not flashing, the LED board is faulty. Replace it. See [“Remove the LED Board” on page 155](#).

4. Start the Oracle ILOM faultmgmt shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

5. Identify the faulty component:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC    Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the Fault class and Description fields for more information.

If the LED board is faulty, replace it. See [“Remove the LED Board” on page 155](#).

6. Exit the Oracle ILOM faultmgmt shell:

```
faultmgmtsp> exit
->
```

7. If you are unable to determine if the LED board is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the LED Board” on page 155](#)
- [“Install the LED Board” on page 156](#)
- [“Verify the LED Board” on page 158](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove the LED Board

Removing the LED board is a cold-service operation. You must power off the server before you remove the LED board.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the LED board as part of another component’s removal or installation procedure, go to [Step 2](#).

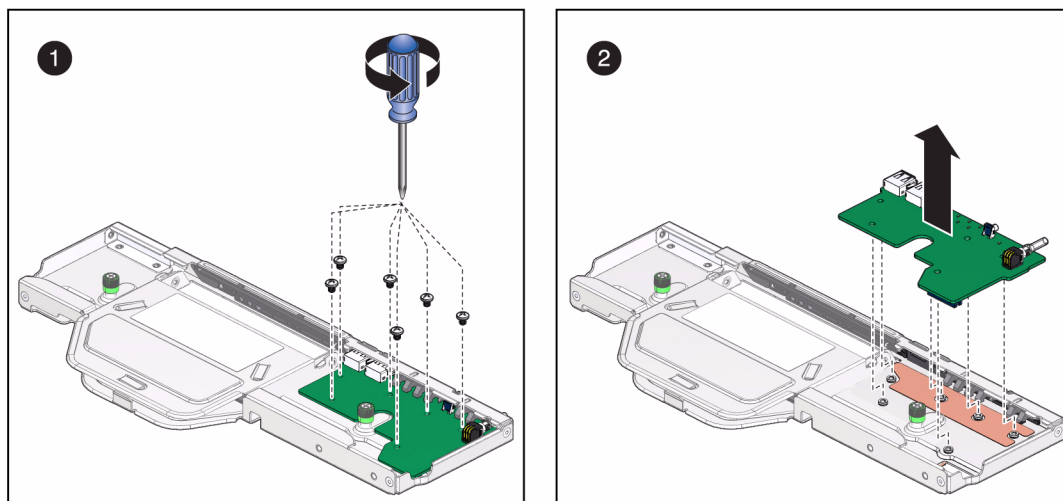
2. Remove the DVD tray.

See [“Remove the DVD Tray” on page 147](#).

3. Remove the fan board.

See [“Remove the Fan Board” on page 161](#).

4. Remove the six screws that secure the LED board to the DVD tray (pane 1).



5. Gently lift the board from the bracket (pane 2).
6. Lift the LED board away from the DVD tray and set the LED board aside.
7. Consider your next steps:
 - If you removed the LED board as part of a replacement operation, install a new LED board. See [“Install the LED Board”](#) on page 156.
 - If you removed the LED board as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.

Related Information

- [“Determine if the LED Board Is Faulty”](#) on page 153
- [“Install the LED Board”](#) on page 156
- [“Verify the LED Board”](#) on page 158
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Install the LED Board

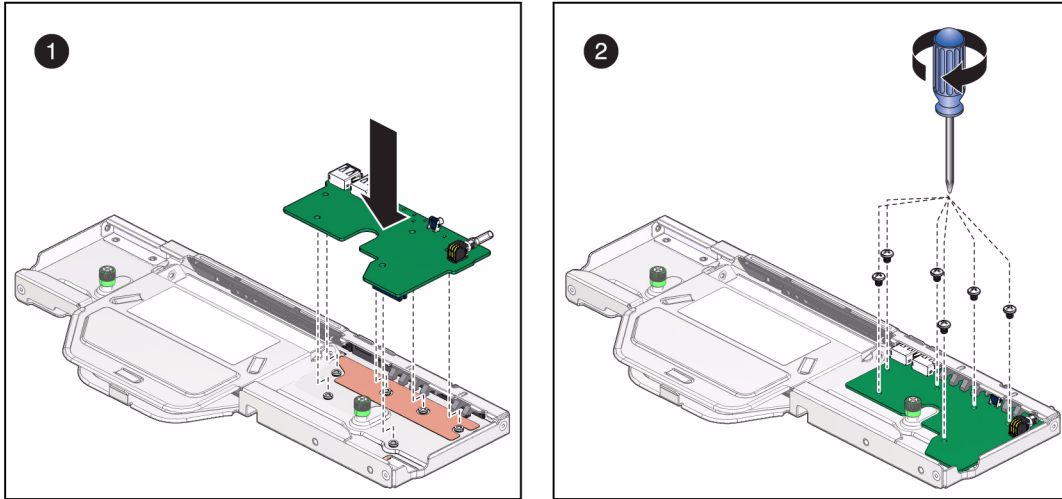
Installing the LED board is a cold-service operation. You must power off the server before installing the LED board.

1. Consider your first steps:

- If you are replacing a LED board, remove the faulty or obsolete LED board first, then return to this procedure, [Step 2](#). See [“Remove the LED Board” on page 155](#).
- If you are installing the LED board as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the LED board to the location where it installs onto the DVD tray (pane 1).

The LEDs are the front of the bracket.



3. Secure the LED board to the DVD tray with the six screws (pane 2).

4. Consider your next steps:

- If you installed the LED board as part of a replacement operation, go to [Step 5](#).
- If you installed the LED board as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.

5. Install the fan board.

See [“Install the Fan Board” on page 164](#).

6. Install the DVD tray.

See [“Install the DVD Tray” on page 150](#).

7. Finish the installation procedure.

See:

- [“Returning the Server to Operation” on page 255](#)

- “Verify the LED Board” on page 158

Related Information

- “Determine if the LED Board Is Faulty” on page 153
- “Remove the LED Board” on page 155
- “Verify the LED Board” on page 158
- “Preparing for Service” on page 63
- “Returning the Server to Operation” on page 255

▼ Verify the LED Board

After you install a LED board, you can verify its functionality.

1. Within the Oracle ILOM interface, turn on the locator LED:

```
-> set /SYS/LOCATE value=Fast_Blink
Set 'value' to 'Fast_Blink'
->
```

2. Visually inspect that the Locator LED is flashing.

3. Turn off the Locator LED:

```
-> set /SYS/LOCATE value=Off
Set 'value' to 'Off'
->
```

Related Information

- “Determine if the LED Board Is Faulty” on page 153
- “Remove the LED Board” on page 155
- “Install the LED Board” on page 156

Servicing the Fan Board

The fan board is an extension of the signal interface board and provides an interconnect for the fan modules. The fan board is located across the underside of the DVD tray. See [“Top Cover, Filter Tray, and DVD Tray Locations”](#) on page 4.

These topics describe service information and procedures for the fan board.

- [“Determine if the Fan Board Is Faulty”](#) on page 159
- [“Remove the Fan Board”](#) on page 161
- [“Install the Fan Board”](#) on page 164
- [“Verify the Fan Board”](#) on page 167

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the Fan Board Is Faulty

You must determine if the fan board is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the fan board is faulty.

If the fan board is faulty, you will see `/SYS/FANBD` under the Value heading. For example:

```
-> show faulty
Target                | Property                | Value
-----+-----+-----
/SP/faultmgmt/0       | fru                     | /SYS/FANBD
.
.
.
->
```

If the fan board is faulty, replace it. See [“Remove the Fan Board” on page 161](#).

If a FRU value different from `/SYS/FANBD` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt` shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----+-----+-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC         Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the fan board is faulty, replace it. See [“Remove the Fan Board” on page 161](#).

5. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit  
->
```

6. Within the Oracle ILOM interface, verify the fan module speeds.

```
-> show /SYS/FANBD/FMx/Fy/TACH value  
/SYS/FANBD/FM0/F0/TACH  
Properties:  
value = 5000.000 RPM  
->
```

where:

- *x* is the fan module, 0 (left fan module) to 4 (right fan module), 5 (hard drive fan).
- *y* is the fan element, 0 (primary) or 1 (secondary).

If the fan board is faulty, replace it. See [“Remove the Fan Board” on page 161](#).

7. If you are unable to determine if the fan board is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the Fan Board” on page 161](#)
- [“Install the Fan Board” on page 164](#)
- [“Verify the Fan Board” on page 167](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove the Fan Board

Removing the fan board is a cold-service operation. You must power off the server before you remove the fan board.

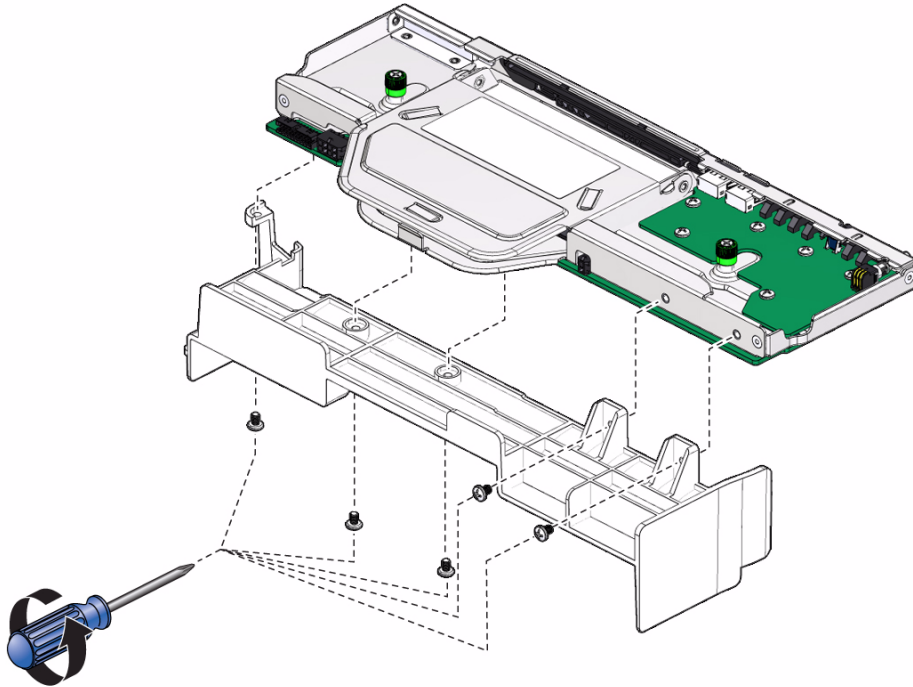
1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the fan board as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Remove the DVD tray.

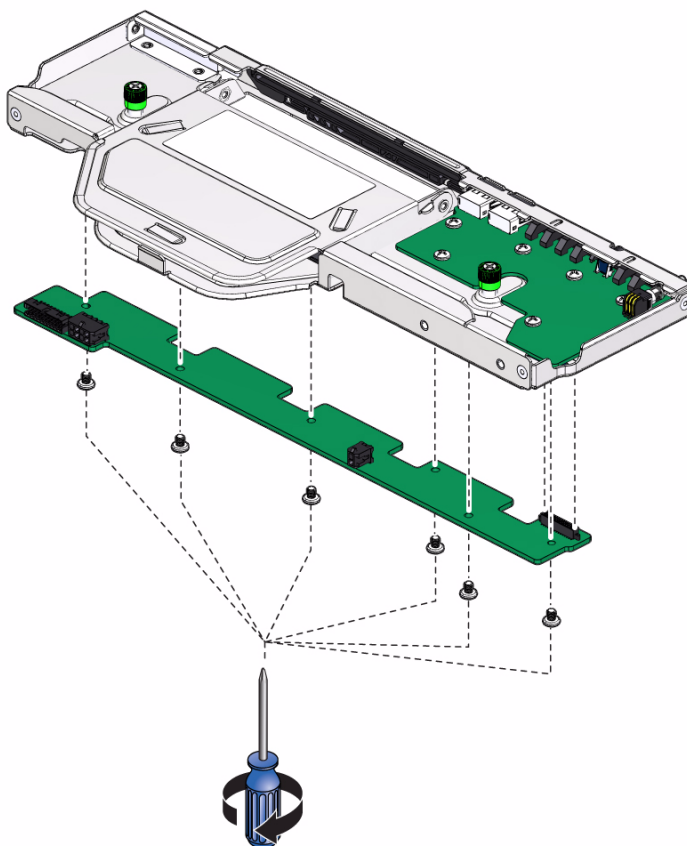
See [“Remove the DVD Tray” on page 147](#).

3. Flip the DVD tray over and remove the five screws that secure the air baffle to the DVD tray, and remove the air baffle.



4. Remove the six screws that secure the fan board to the DVD tray, and gently lift the board from the bracket.

Note – Use care when separating the interface connector.



5. Lift the fan board away from the DVD tray and set the fan board aside.

6. Consider your next steps:

- If you removed the fan board as part of a replacement operation, install a new fan board. See [“Install the Fan Board” on page 164](#).
- If you removed the fan board as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.

Related Information

- [“Determine if the Fan Board Is Faulty” on page 159](#)
- [“Install the Fan Board” on page 164](#)
- [“Verify the Fan Board” on page 167](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Install the Fan Board

Installing the fan board is a cold-service operation. You must power off the server before installing the fan board.

1. Consider your first steps:

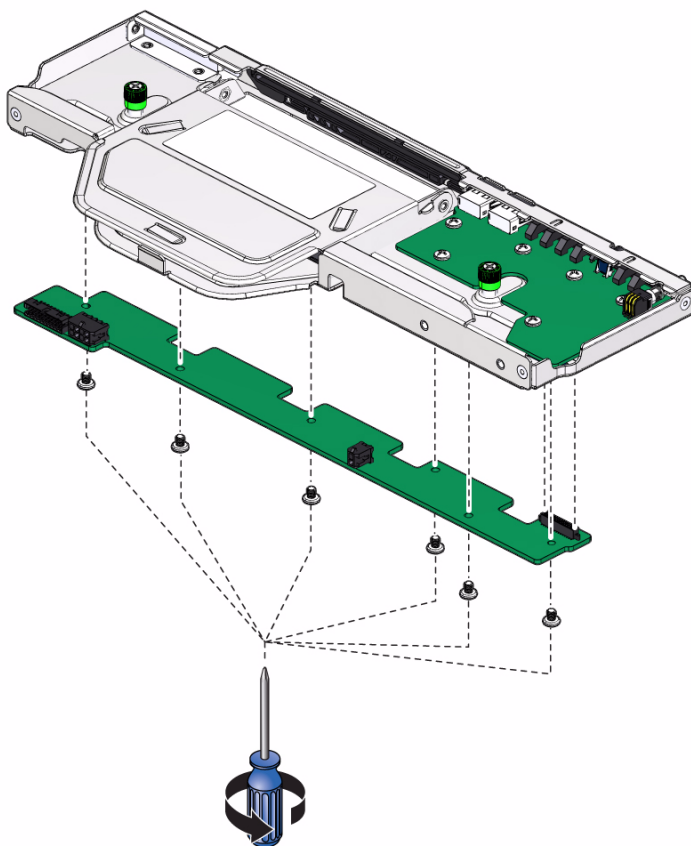
- If you are replacing a fan board, remove the faulty or obsolete fan board first, then return to this procedure, [Step 2](#). See [“Remove the Fan Board” on page 161](#).
- If you are installing the fan board as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the fan board to the location where it installs onto the DVD tray.

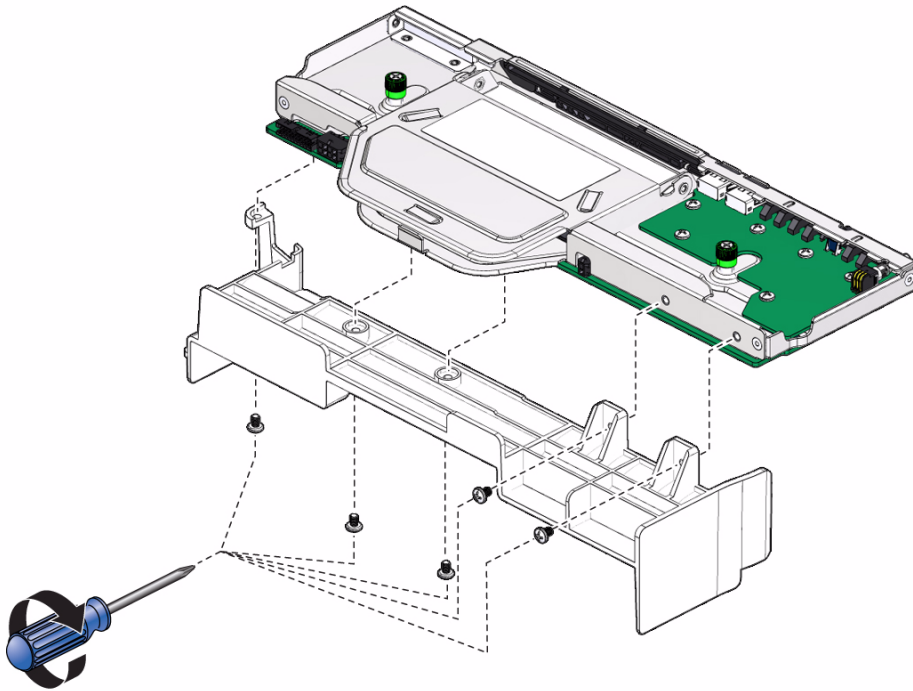
The power and signal connectors fit into the cut-outs of the DVD tray.

3. Secure the fan board to the DVD tray with the six screws.

Note – Make sure that the interface connector connects properly.



4. Secure the air baffle to the DVD tray with the five screws.



5. Consider your next steps:

- If you installed the fan board as part of a replacement operation, go to [Step 6](#).
- If you installed the fan board as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

6. Install the DVD tray.

See ["Install the DVD Tray"](#) on page 150.

7. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 255
- ["Verify the Fan Board"](#) on page 167

Related Information

- ["Determine if the Fan Board Is Faulty"](#) on page 159
- ["Remove the Fan Board"](#) on page 161
- ["Verify the Fan Board"](#) on page 167
- ["Preparing for Service"](#) on page 63
- ["Returning the Server to Operation"](#) on page 255

▼ Verify the Fan Board

After you install a fan board, you can verify its functionality.

1. Reset the fan board:

```
-> set /SYS/FANBD clear_fault_action=true  
Are you sure you want to clear /SYS/FANBD/FM4 (y/n)? y  
Set 'clear_fault_action' to 'true'  
  
->
```

2. Verify that the fan board is no longer considered faulty, then return to this procedure.

See [“Determine if the Fan Board Is Faulty” on page 159](#).

3. Verify the fan module speeds.

```
-> show /SYS/FANBD/FM $x$ /F $y$ /TACH value  
/SYS/FANBD/FM0/F0/TACH  
Properties:  
value = 5000.000 RPM  
  
->
```

where:

- x is the fan module, 0 (left fan module) to 4 (right fan module), 5 (hard drive fan).
- y is the fan element, 0 (primary) or 1 (secondary).

Related Information

- [“Determine if the Fan Board Is Faulty” on page 159](#)
- [“Remove the Fan Board” on page 161](#)
- [“Install the Fan Board” on page 164](#)

Servicing the PCIe2 Mezzanine Board

The PCIe2 mezzanine board hosts the PCIe slots 3 and 4. The PCIe2 mezzanine board is located at the rear of the chassis and interconnects through the three PCIe2 riser cards to the motherboard. See [“Motherboard, DIMMs, and PCI Board Locations”](#) on page 6.

These topics describe service information and procedures for the PCIe2 mezzanine board.

- [“Determine if the PCIe2 Mezzanine Board Is Faulty”](#) on page 169
- [“Remove the PCIe2 Mezzanine Board”](#) on page 172
- [“Install the PCIe2 Mezzanine Board”](#) on page 175
- [“Verify the PCIe2 Mezzanine Board”](#) on page 177

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the PCIe2 Mezzanine Board Is Faulty

You must determine if the PCIe2 mezzanine board is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the PCIe2 mezzanine board is faulty.

If the PCIe2 mezzanine board is faulty, you will see `/SYS/MB/PCI_MEZZ` under the Value heading. For example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/PCI_MEZZ
.		
.		
.		
->		

If the PCIe2 mezzanine board is faulty, replace it. See [“Remove the PCIe2 Mezzanine Board”](#) on page 172.

If a FRU value different from `/SYS/MB/PCI_MEZZ` is displayed, see [“Component FRU Names and Service Links”](#) on page 67 to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt` shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC          Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the PCIe2 mezzanine board is faulty, replace it. See [“Remove the PCIe2 Mezzanine Board” on page 172](#).

5. Exit the Oracle ILOM `faultmgmt shell`:

```
faultmgmtsp> exit
->
```

6. Within the Oracle ILOM interface, verify that the PCIe2 cards installed in the PCIe2 mezzanine board are enabled.

```
-> show /SYS/MB/PCI_MEZZ/PCIEx component_state
/SYS/MB/PCI_MEZZ/PCIE3
Properties:
component_state = Enabled
->
```

where *x* is the PCIe2 slot, 3 (left slot) or 4 (right slot).

If the PCIe2 mezzanine board is faulty, replace it. See [“Remove the PCIe2 Mezzanine Board” on page 172](#).

7. If you are unable to determine if the PCIe2 mezzanine board is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the PCIe2 Mezzanine Board” on page 172](#)

- [“Install the PCIe2 Mezzanine Board” on page 175](#)
- [“Verify the PCIe2 Mezzanine Board” on page 177](#)
- [“Detecting and Managing Faults” on page 9](#)

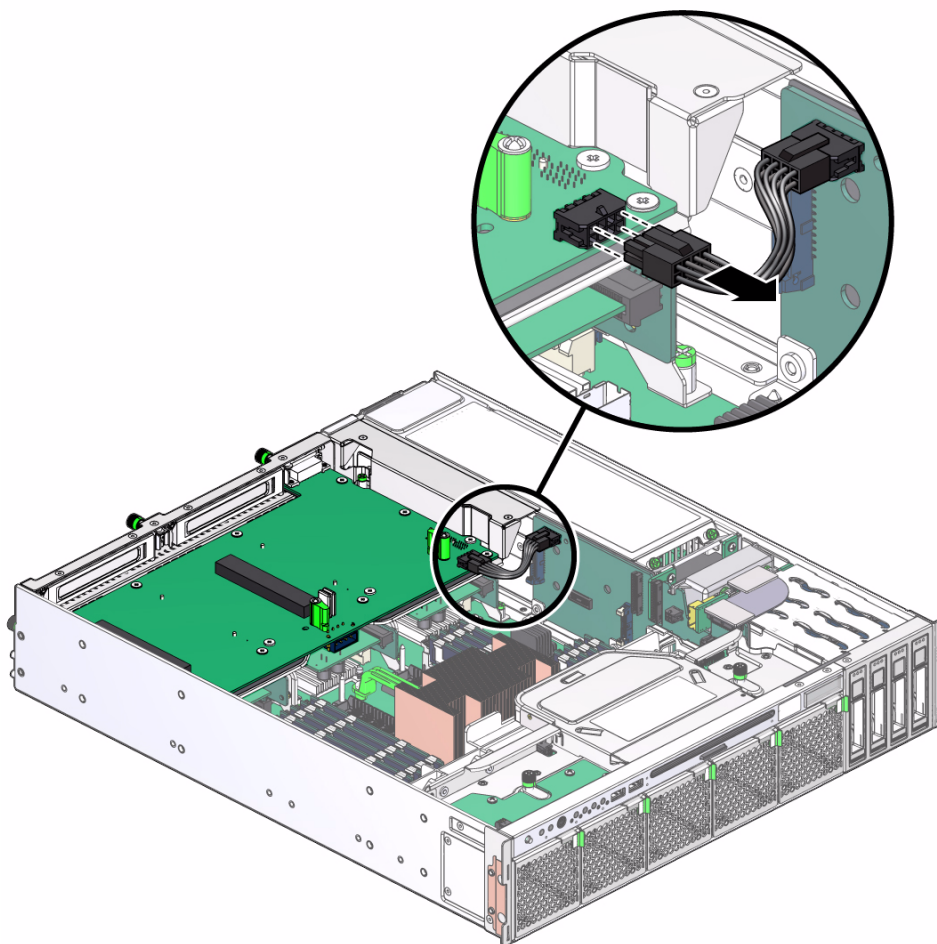
▼ Remove the PCIe2 Mezzanine Board

Removing the PCIe2 mezzanine board is a cold-service operation. You must power off the server before you remove the PCIe2 mezzanine board.

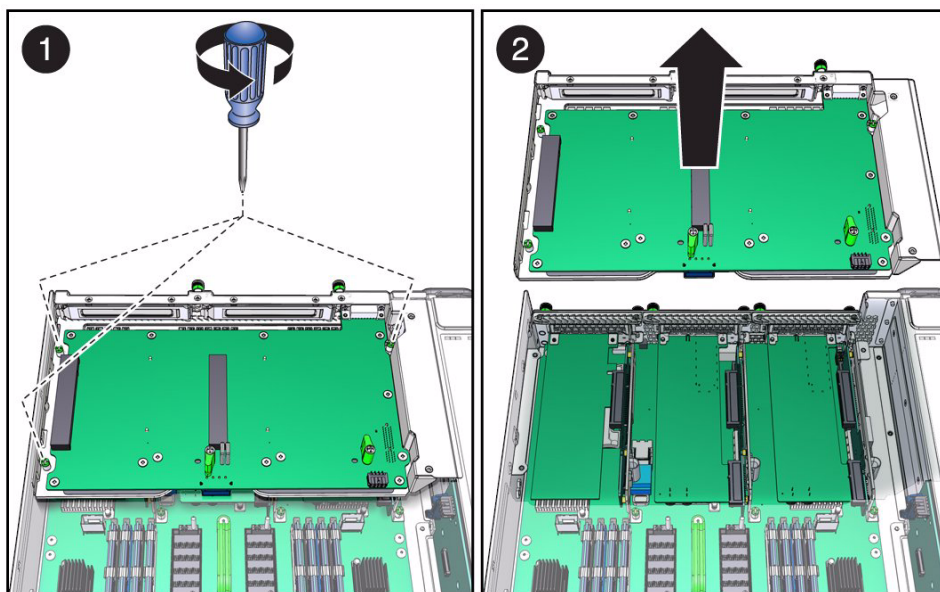
1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the PCIe2 mezzanine board as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Remove the cable from the signal interface board to the PCIe2 mezzanine board.



3. Fully loosen the three captive screws from the PCIe2 mezzanine board (pane 1).



4. Lift the PCIe2 mezzanine board up and off of the PCIe2 riser cards (pane 2).

5. Consider your next steps:

- If you removed the PCIe2 mezzanine board as part of a replacement operation:
 - Remove any installed PCIe2 cards. See [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board”](#) on page 190.
 - Install a new PCIe2 mezzanine board. See [“Install the PCIe2 Mezzanine Board”](#) on page 175.
- If you removed the PCIe2 mezzanine board as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.

Related Information

- [“Determine if the PCIe2 Mezzanine Board Is Faulty”](#) on page 169
- [“Install the PCIe2 Mezzanine Board”](#) on page 175
- [“Verify the PCIe2 Mezzanine Board”](#) on page 177
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Install the PCIe2 Mezzanine Board

Installing the PCIe2 mezzanine board is a cold-service operation. You must power off the server before installing the PCIe2 mezzanine board.

1. Consider your first steps:

- If you are replacing a PCIe2 mezzanine board, remove the faulty or obsolete PCIe2 mezzanine board first, then return to this procedure, [Step 2](#). See [“Remove the PCIe2 Mezzanine Board”](#) on page 172.
- If you are installing the PCIe2 mezzanine board as part of another component’s removal or installation procedure, go to [Step 3](#).

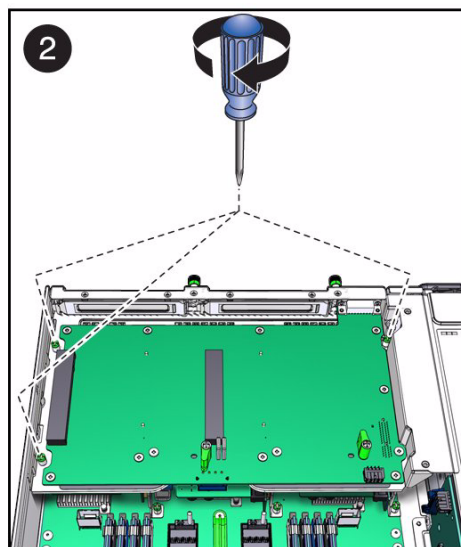
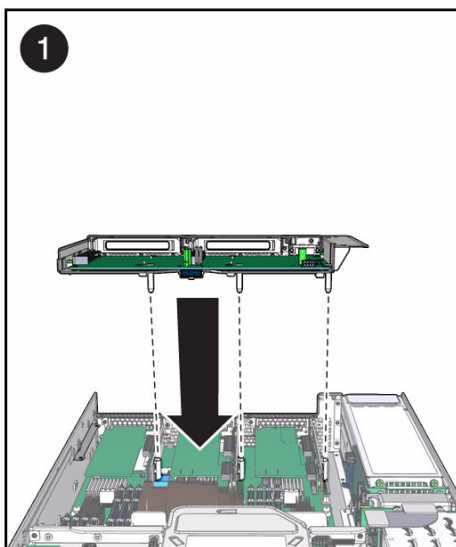
2. If the PCIe2 cards were previously removed, install them.

See [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 193.

3. Align the PCIe2 mezzanine board to the location where it installs into the chassis.

Two captive screws are to the left, one captive screw is to the right.

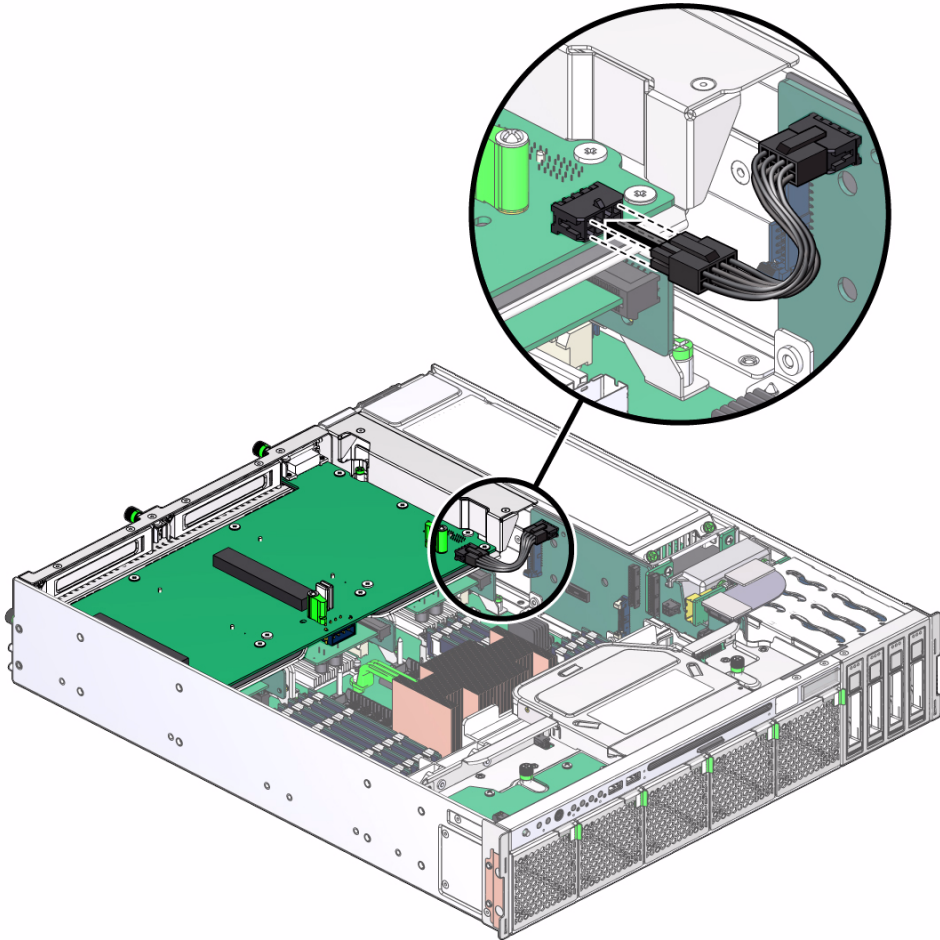
4. Lower the PCIe2 mezzanine board onto the PCIe2 riser cards and press the board securely in place (pane 1).



Press down at the center and the right edge of the PCIe2 mezzanine board.

5. Tighten the three captive screws (pane 2).

6. Attach the cable from the signal interface board to the PCIe2 mezzanine board.



7. Consider your next steps:

- If you installed the PCIe2 mezzanine board as part of a replacement operation, go to [Step 8](#).
- If you installed the PCIe2 mezzanine board as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

8. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 255
- ["Verify the PCIe2 Mezzanine Board"](#) on page 177

Related Information

- [“Determine if the PCIe2 Mezzanine Board Is Faulty” on page 169](#)
- [“Remove the PCIe2 Mezzanine Board” on page 172](#)
- [“Verify the PCIe2 Mezzanine Board” on page 177](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Verify the PCIe2 Mezzanine Board

After you install a PCIe2 mezzanine board, you can verify its functionality.

1. Reset the PCIe2 mezzanine board:

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

->
```

2. Verify that the PCIe2 mezzanine board is no longer considered faulty, then return to this procedure.

See [“Determine if the PCIe2 Mezzanine Board Is Faulty” on page 169](#).

3. Verify that the PCIe2 cards installed in the PCIe2 mezzanine board are enabled.

```
-> show /SYS/MB/PCI_MEZZ/PCIEx component_state
/SYS/MB/PCI_MEZZ/PCIE3
Properties:
component_state = Enabled

->
```

where *x* is the PCIe2 slot, 3 (left slot) or 4 (right slot).

Related Information

- [“Determine if the PCIe2 Mezzanine Board Is Faulty” on page 169](#)
- [“Remove the PCIe2 Mezzanine Board” on page 172](#)
- [“Install the PCIe2 Mezzanine Board” on page 175](#)

Servicing the PCIe2 Riser Card

The PCIe2 riser cards host the PCIx slots 0, 1, and 2. There is one slot per riser. The PCIe2 riser cards are vertically located at the rear of the chassis and connect to the motherboard through three sockets. See [“Motherboard, DIMMs, and PCI Board Locations”](#) on page 6.

These topics describe service information and procedures for the PCIe2 riser card.

- [“Locate a Faulty PCIe2 Riser Card”](#) on page 179
- [“Remove a PCIe2 Riser Card”](#) on page 182
- [“Install a PCIe2 Riser Card”](#) on page 184
- [“Verify a PCIe2 Riser Card”](#) on page 186

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Locate a Faulty PCIe2 Riser Card

You must determine which PCIe2 riser card is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the PCIe2 riser card is faulty.

If the PCIe2 riser card is faulty, you will see `/SYS/MB/RISERx` under the Value heading. For example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/RISERx
.		
.		
.		
->		

where x is 0 (left riser card) to 2 (right riser card).

If the PCIe2 riser card is faulty, replace it. See [“Remove a PCIe2 Riser Card” on page 182](#).

If a FRU value different from `/SYS/MB/RISERx` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt` shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y

faultmgmtsp>
```

4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC         Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the PCIe2 riser card is faulty, replace it. See [“Remove a PCIe2 Riser Card” on page 182](#).

5. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit
->
```

6. Within the Oracle ILOM interface, verify the PCIe2 card installed in the PCIe2 riser card is enabled.

```
-> show /SYS/MB/RISERx/PCIEx component_state
/SYS/MB/RISER0/PCIE0
Properties:
component_state = Enabled
->
```

where x is the PCIe2 slot, 0 (left slot) to 2 (right slot).

If the PCIe2 riser card is faulty, replace it. See [“Remove a PCIe2 Riser Card” on page 182](#).

7. If you are unable to identify the faulty PCIe2 riser card, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove a PCIe2 Riser Card” on page 182](#)

- [“Install a PCIe2 Riser Card” on page 184](#)
- [“Verify a PCIe2 Riser Card” on page 186](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove a PCIe2 Riser Card

Removing the PCIe2 riser card is a cold-service operation. You must power off the server before you remove the PCIe2 riser card.

Note – The three PCIe2 riser cards appear to be nearly identical, however they are not. If you are removing two or all three PCIe2 riser cards, do not confuse their respective installation locations in the chassis. Riser card A installs on the left, riser card B installs in the center, and riser card C installs on the right.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the PCIe2 riser card as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Remove the PCIe2 mezzanine board.

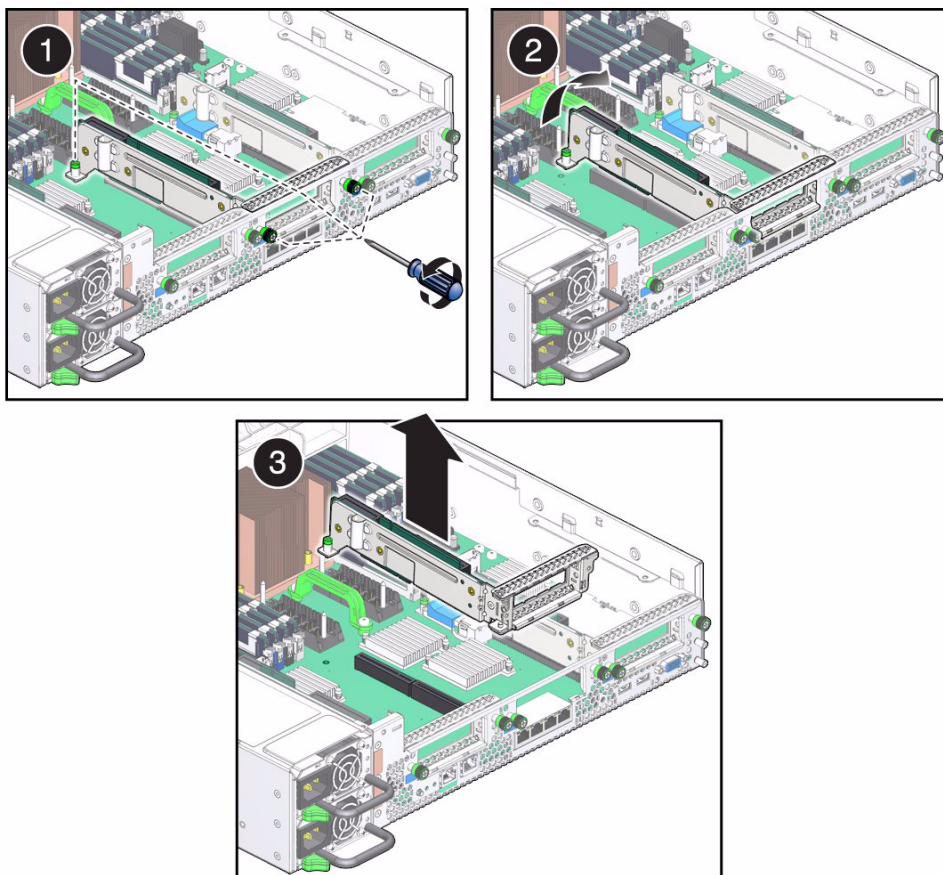
See [“Remove the PCIe2 Mezzanine Board” on page 172](#).

3. Determine which PCIe2 riser card to remove.

See [“Locate a Faulty PCIe2 Riser Card” on page 179](#).

4. Fully loosen the three captive screws that secure the PCIe2 riser card to the chassis (pane 1).

Two captive screws secure the PCIe2 riser card to the rear panel. One captive screw secures the PCIe2 riser card to the motherboard.



5. Pull up on the PCIe2 riser card to unseat it from the motherboard (pane 2)
6. Lift the PCIe2 riser card at an angle so that any protrusions from the installed PCIe2 card clear the opening on the rear panel (pane 3).
7. Consider your next steps:
 - If you removed the PCIe2 riser card as part of a replacement operation:
 - Remove any installed PCIe2 card. See [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 192.
 - Install a new PCIe2 riser card. See [“Install a PCIe2 Riser Card”](#) on page 184.
 - If you removed the PCIe2 riser card as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.

Related Information

- [“Locate a Faulty PCIe2 Riser Card”](#) on page 179

- [“Install a PCIe2 Riser Card” on page 184](#)
- [“Verify a PCIe2 Riser Card” on page 186](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Install a PCIe2 Riser Card

Installing the PCIe2 riser card is a cold-service operation. You must power off the server before installing the PCIe2 riser card.

Note – The three PCIe2 riser cards appear to be nearly identical, however they are not. If you are installing two or all three PCIe2 riser cards, do not confuse their respective installation locations in the chassis. Riser card A installs on the left, riser card B installs in the center, and riser card C installs on the right.

1. Consider your first steps:

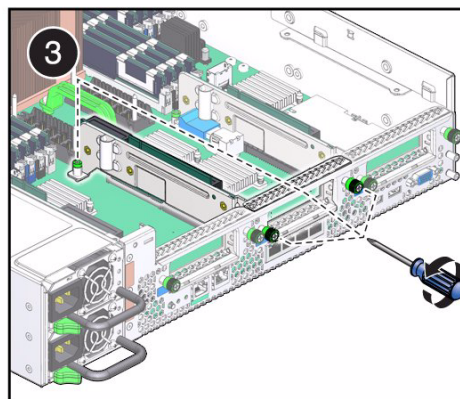
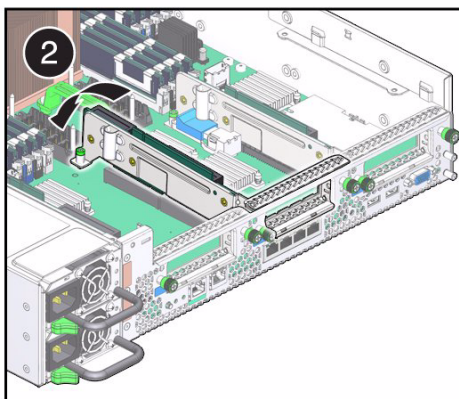
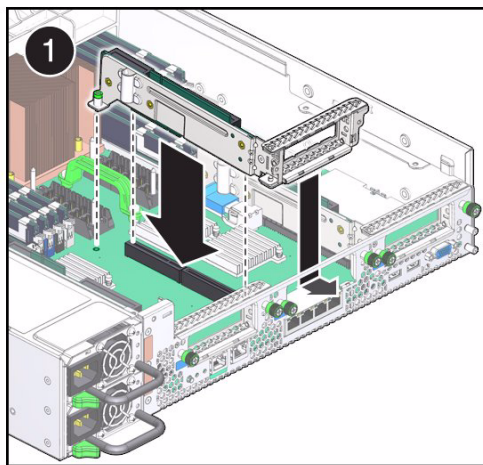
- If you are replacing a PCIe2 riser card, remove the faulty or obsolete PCIe2 riser card first, then return to this procedure, [Step 2](#). See [“Remove a PCIe2 Riser Card” on page 182](#).
- If you are installing the PCIe2 riser card as part of another component’s removal or installation procedure, go to [Step 3](#).

2. If any PCIe2 card was previously removed, install it.

See [“Install a PCIe2 Card Into the PCIe2 Riser Card” on page 195](#).

3. Align the PCIe2 riser card to the location where it installs into the chassis (pane 1).

The captive screw is on the right and toward the front of the chassis.



4. Lower the PCIe2 riser card onto the motherboard and press the card edge connector securely into place (pane 2).
5. Tighten the three captive screws (pane 3).
6. Consider your next steps:
 - If you installed the PCIe2 riser card as part of a replacement operation, go to [Step 7](#).
 - If you installed the PCIe2 riser card as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.
7. Finish the installation procedure.

See:

 - ["Returning the Server to Operation"](#) on page 255
 - ["Verify a PCIe2 Riser Card"](#) on page 186

Related Information

- [“Locate a Faulty PCIe2 Riser Card” on page 179](#)
- [“Remove a PCIe2 Riser Card” on page 182](#)
- [“Verify a PCIe2 Riser Card” on page 186](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Verify a PCIe2 Riser Card

After you install a PCIe2 riser card, you can verify its functionality.

1. Reset the PCIe2 riser card:

```
-> set /SYS/MB/RISER $x$  clear_fault_action=true
Are you sure you want to clear /SYS/MB/RISER0 (y/n)? y
Set 'clear_fault_action' to 'true'

->
```

where x is the PCIe2 slot, 0 (left slot) to 2 (right slot).

2. Verify that the PCIe2 riser card is no longer considered faulty, then return to this procedure.

See [“Locate a Faulty PCIe2 Riser Card” on page 179](#).

3. Verify that the PCIe2 card installed in the PCIe2 riser card is enabled.

```
-> show /SYS/MB/RISER $x$ /PCIE $x$  component_state
/SYS/MB/RISER0/PCIE0
Properties:
component_state = Enabled

->
```

where x is the PCIe2 slot, 0 (left slot) to 2 (right slot).

Related Information

- [“Locate a Faulty PCIe2 Riser Card” on page 179](#)
- [“Remove a PCIe2 Riser Card” on page 182](#)
- [“Install a PCIe2 Riser Card” on page 184](#)

Servicing PCIe2 Cards

The PCIe2 card is an industry-standard form factor peripheral component. The PCIe2 card can be of either PCIe or PCIx technology. The PCIe2 cards are located in either the PCIe2 riser cards (PCIx) or in the PCIe2 mezzanine board (PCIe). See [“Motherboard, DIMMs, and PCI Board Locations”](#) on page 6.

These topics describe service information and procedures for the PCIe2 card.

- [“Locate a Faulty PCIe2 Card”](#) on page 187
- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board”](#) on page 190
- [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 192
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 193
- [“Install a PCIe2 Card Into the PCIe2 Riser Card”](#) on page 195
- [“Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal”](#) on page 197
- [“Verify a PCIe2 Card”](#) on page 199

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Locate a Faulty PCIe2 Card

You must determine which PCIe2 card is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Visually inspect the PCIe2 card to see if any of its status LEDs are lit or flashing.

If the PCIe2 card is faulty, replace it. See [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 190](#) or [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 192](#).

3. Within the Oracle ILOM interface, type the `show faulty` command to verify that the PCIe2 card is faulty.

If the PCIe2 card is faulty, you will see `/SYS/MB/PCI_MEZZ/PCIEx/card_type` or `/SYS/MB/RISERy/card_type` under the Value heading. For example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/RISER0/XAUI0
.		
.		
.		
->		

where:

- x is 3 or 4.
- y is 0 to 2.
- `card_type` is the Oracle ILOM target for the type of PCIe2 card.

If the PCIe2 card is faulty, replace it. See [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 190](#) or [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 192](#).

If a FRU value different from `/SYS/MB/PCI_MEZZ/PCIEx/card_type` or `/SYS/MB/RISERy/card_type` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

4. Start the Oracle ILOM `faultmgmt` shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y

faultmgmtsp>
```

5. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC    Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the PCIe2 card is faulty, replace it. See [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 190](#) or [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 192](#).

6. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit
->
```

7. Within the Oracle ILOM interface, verify the presence of the PCIe2 card.

```
-> show -d targets /SYS/MB/PCI_MEZZ/PCIEx
/SYS/MB/PCI_MEZZ/PCIEx
Targets:
XAUI0
.
.
.
-> show -d targets /SYS/MB/RISERy
/SYS/MB/RISER0
Targets:
XAUI0
PCIE0
T_RISER0
->
```

where:

- x is the PCIe2 slot, 3 (left slot) or 4 (right slot).
- y is the PCIe2 slot, 0 (left slot) to 2 (right slot).

If the PCIe2 card is faulty, replace it. See [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 190](#) or [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 192](#).

8. If you are unable to identify the faulty PCIe2 card, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 190](#)
- [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 192](#)
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board” on page 193](#)
- [“Install a PCIe2 Card Into the PCIe2 Riser Card” on page 195](#)
- [“Verify a PCIe2 Card” on page 199](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove a PCIe2 Card From the PCIe2 Mezzanine Board

Removing the PCIe2 card is a cold-service operation. You must power off the server before you remove the PCIe2 card.

1. Determine if you are removing the PCIe2 card from the PCIe2 mezzanine board or from a PCIe2 riser card.

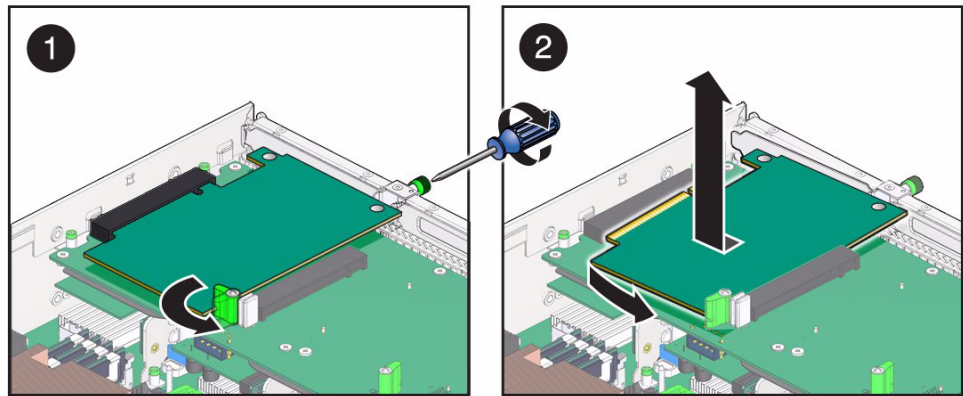
See [“Locate a Faulty PCIe2 Card” on page 187](#).

- If you are removing the PCIe2 card from the PCIe2 mezzanine board, go to [Step 2](#).
- If you are removing the PCIe2 card from a PCIe2 riser card, see [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 192](#).

2. Consider your next step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the PCIe2 card as part of another component’s removal or installation procedure, go to [Step 3](#).

3. Fully loosen the captive screw on the rear panel of the PCIe2 mezzanine board and swivel the clasp away from the PCIe2 card bracket (pane 1).



4. Unseat the PCIe2 card from the card edge connector and rotate the PCIe2 card to the right, unhooking the PCIe2 card bracket tang.
5. Lift the PCIe2 card out of the chassis and set the PCIe2 card aside (pane 2).
6. Consider your next steps:
 - If you removed the PCIe2 card as part of a replacement operation, install a new PCIe2 card. See [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 193.
 - If you removed the PCIe2 card as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.
 - If you are not replacing the PCIe2 card, go to [Step 7](#).
7. Finish the removal procedure.

See [“Returning the Server to Operation”](#) on page 255.

Related Information

- [“Locate a Faulty PCIe2 Card”](#) on page 187
- [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 192
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 193
- [“Install a PCIe2 Card Into the PCIe2 Riser Card”](#) on page 195
- [“Verify a PCIe2 Card”](#) on page 199
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Remove a PCIe2 Card From the PCIe2 Riser Card

Removing the PCIe2 card is a cold-service operation. You must power off the server before you remove the PCIe2 card.

1. Determine if you are removing the PCIe2 card from a PCIe2 riser card or from the PCIe2 mezzanine board.

See [“Locate a Faulty PCIe2 Card” on page 187](#).

- If you are removing the PCIe2 card from a PCIe2 riser card, go to [Step 2](#).
- If you are removing the PCIe2 card from the PCIe2 mezzanine board, see [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 190](#).
- If you are removing a Sun Storage 6 Gb SAS PCIe RAID HBA, Internal, see [“Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal” on page 197](#) for the SAS cable connections.

2. Consider your next step:

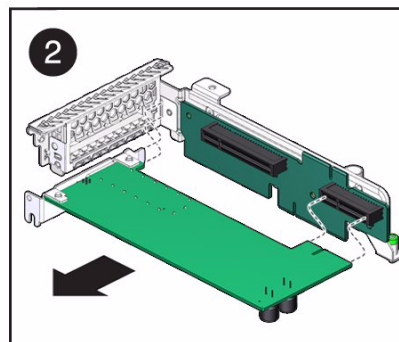
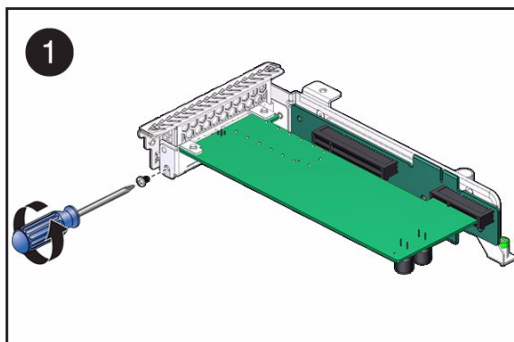
- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the PCIe2 card as part of another component’s removal or installation procedure, go to [Step 3](#).

3. Remove the respective PCIe2 riser card.

See [“Remove a PCIe2 Riser Card” on page 182](#).

4. Remove the screw securing the PCIe2 card bracket to the PCIe2 riser card.

5. Unseat the PCIe2 card from the card edge connector and rotate the PCIe2 card out of the PCIe2 riser card, unhooking the PCIe2 card bracket tang.



6. Set the PCIe2 card aside.

7. Consider your next steps:

- If you removed the PCIe2 card as part of a replacement operation, install a new PCIe2 card. See [“Install a PCIe2 Card Into the PCIe2 Riser Card” on page 195](#).
- If you removed the PCIe2 card as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.
- If you are not replacing the PCIe2 card, go to [Step 8](#).
- If you are installing a Sun Storage 6 Gb SAS PCIe RAID HBA, Internal, go to [“Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal” on page 197](#).

8. Install the PCIe2 riser card.

See [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board” on page 193](#).

9. Finish the removal procedure.

See [“Returning the Server to Operation” on page 255](#).

Related Information

- [“Locate a Faulty PCIe2 Card” on page 187](#)
- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 190](#)
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board” on page 193](#)
- [“Install a PCIe2 Card Into the PCIe2 Riser Card” on page 195](#)
- [“Verify a PCIe2 Card” on page 199](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Install a PCIe2 Card Into the PCIe2 Mezzanine Board

Installing the PCIe2 card is a cold-service operation. You must power off the server before installing the PCIe2 card.

1. Consider your first steps:

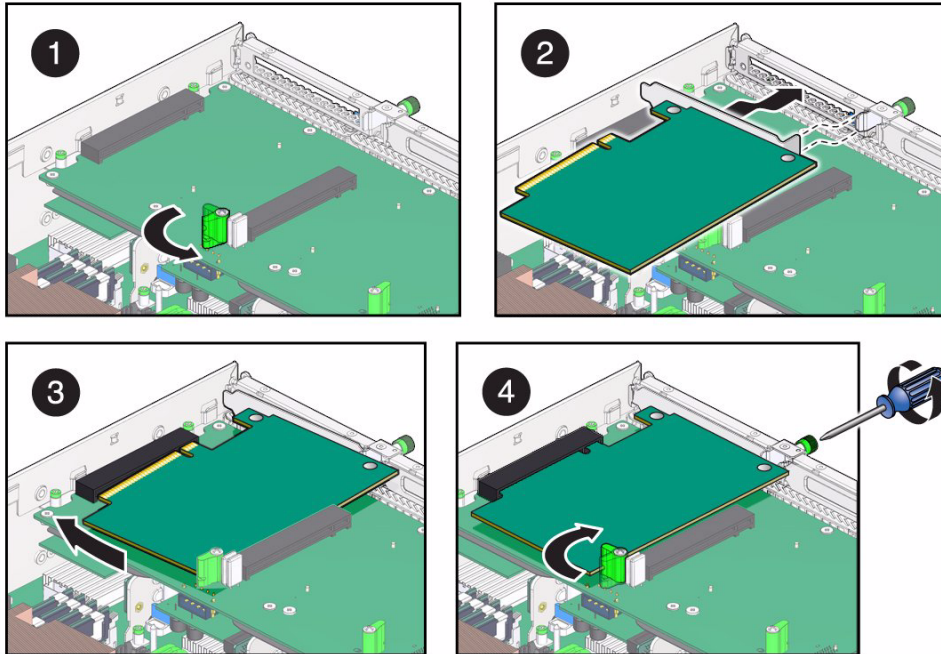
- If you are replacing a PCIe2 card, remove the faulty or obsolete PCIe2 card first, then return to this procedure, [Step 2](#). See [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board” on page 193](#).

- If you are installing a new or an additional PCIe2 card, see [“Preparing for Service” on page 63.](#)
- If you are installing the PCIe2 card as part of another component’s removal or installation procedure, go to [Step 2.](#)

2. Align the PCIe2 card to the location where it installs into the PCIe2 mezzanine board.

The component side of the PCIe2 card is up, and the PCIe2 card bracket is to the rear of the chassis.

3. Swivel the clasp open to provide clearance for the PCIe2 card bracket (pane 1).



4. Rotate the PCIe2 card to the left so that the tang of the PCIe2 card bracket enters the slot on the PCIe2 mezzanine board rear panel, and the card edge begins to enter the connector (pane 2 and pane 3).

5. Press the PCIe2 card into the card edge connector so that the PCIe2 card is fully seated (pane 3).

6. Swivel the clasp closed to secure the PCIe2 card bracket and tighten the captive screw (pane 4).

7. Consider your next steps:

- If you installed the PCIe2 card as part of a replacement operation, go to [Step 8.](#)

- If you installed the PCIe2 card as part of another component's removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.
 - If you have installed a new PCIe2 card, go to [Step 8](#).
- 8. Finish the installation procedure.**
- See:
- [“Returning the Server to Operation”](#) on page 255
 - [“Verify a PCIe2 Card”](#) on page 199

Related Information

- [“Locate a Faulty PCIe2 Card”](#) on page 187
- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board”](#) on page 190
- [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 192
- [“Install a PCIe2 Card Into the PCIe2 Riser Card”](#) on page 195
- [“Verify a PCIe2 Card”](#) on page 199
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Install a PCIe2 Card Into the PCIe2 Riser Card

Installing the PCIe2 card is a cold-service operation. You must power off the server before installing the PCIe2 card.

1. Consider your first steps:

- If you are replacing a PCIe2 card, remove the faulty or obsolete PCIe2 card first, then return to this procedure, [Step 3](#). See [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 192.
- If you are installing a new or an additional PCIe2 card, see the following topics in order:
 - [“Preparing for Service”](#) on page 63.
 - Remove the PCIe2 riser card. See [“Remove a PCIe2 Riser Card”](#) on page 182.
 - Go to [Step 2](#).

- If you are installing a Sun Storage 6 Gb SAS PCIe RAID HBA, Internal, go to [“Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal”](#) on page 197.
- If you are installing the PCIe2 card as part of another component’s removal or installation procedure, go to [Step 3](#).

2. Remove the screw that secures the PCIe2 card bracket to the PCIe2 riser card.

3. Align the PCIe2 card to the location where it installs into the PCIe2 riser card.

The component side of the PCIe2 card is down, and the PCIe2 card bracket is to the rear of the chassis.

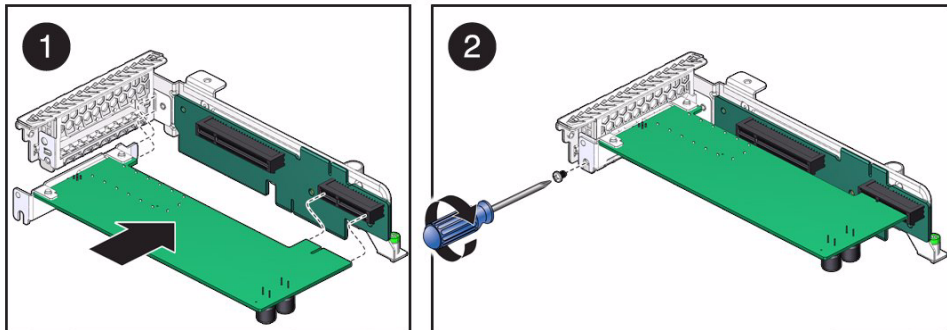


Caution – Verify the PCI card you are installing matches the slot. The PCIe 0 and PCI 1 slots are different than the PCIe 2 slot.

Note – The Sun Storage 6 Gb SAS PCIe RAID HBA, Internal PCIe card must be installed in PCIe slot 0 only. This HBA also requires a special SAS cable. See [“Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal”](#) on page 197 for more information.

4. Rotate the PCIe2 card so that the tab of the PCIe2 card bracket enters the slot on the PCIe2 riser card and the card edge begins to enter the connector.

5. Press the PCIe2 card into the card edge connector so that the card is fully seated (pane 1).



6. Fasten the screw to secure the PCIe2 card bracket to the PCIe2 riser card (pane 2).

7. Consider your next steps:

- If you installed the PCIe2 card as part of a replacement operation, go to [Step 8](#).

- If you installed the PCIe2 card as part of another component's removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.
 - If you are installed a Sun Storage 6 Gb SAS PCIe RAID HBA, Internal, go to [“Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal”](#) on page 197.
 - If you have installed a new PCIe2 card, go to [Step 8](#).
8. **Install the PCIe2 riser card.**
See [“Install a PCIe2 Riser Card”](#) on page 184.
9. **Finish the installation procedure.**
See:
 - [“Returning the Server to Operation”](#) on page 255
 - [“Verify a PCIe2 Card”](#) on page 199

Related Information

- [“Locate a Faulty PCIe2 Card”](#) on page 187
- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board”](#) on page 190
- [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 192
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 193
- [“Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal”](#) on page 197
- [“Verify a PCIe2 Card”](#) on page 199
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255
- *Sun Storage 6 Gb SAS PCIe RAID HBA, Internal Installation Guide*

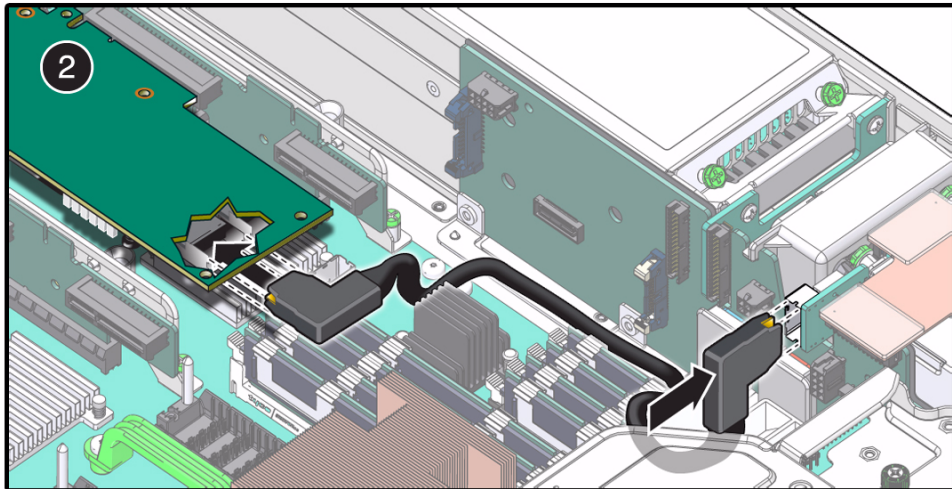
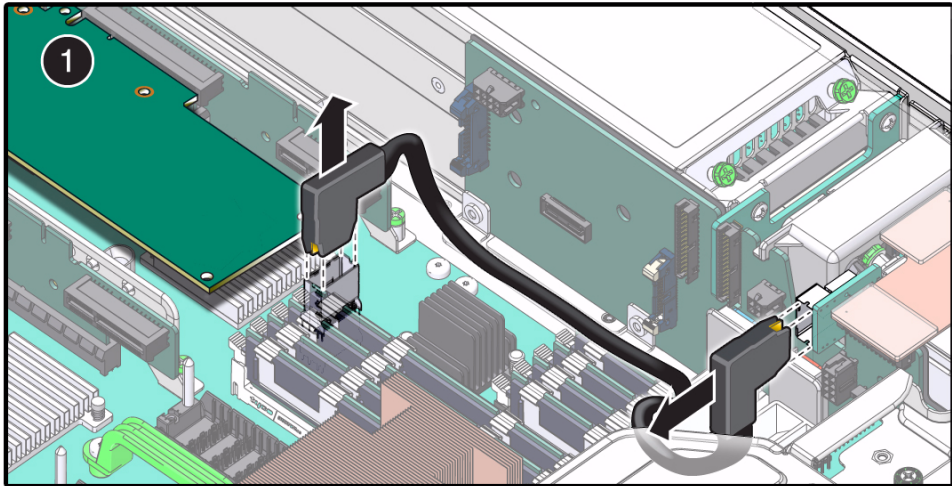
▼ Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal

This HBA requires a special SAS cable (530-4088-01) that ships with the card, or that you order separately as an option (X8224A-N). Also refer to the *Sun Storage 6 Gb SAS PCIe RAID HBA, Internal Installation Guide* for additional details.

1. Install the card in PCIe slot 0.

See [“Install a PCIe2 Card Into the PCIe2 Riser Card”](#) on page 195.

2. Remove the existing SAS cable connected to the hard drive backplane connector and the motherboard near slot 0 (pane 1).
3. Connect the new SAS cable's PCIe connector to port SAS0 on the HBA (pane 2).
4. Route the SAS cable as shown in the figure and connect the SAS connector to the connector on the hard drive backplane (pane 2).



5. Finish the installation procedure.

See:

- [“Returning the Server to Operation” on page 255](#)
- [“Verify a PCIe2 Card” on page 199](#)

Related Information

- [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 192](#)
- [“Install a PCIe2 Card Into the PCIe2 Riser Card” on page 195](#)
- [“Verify a PCIe2 Card” on page 199](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)
- *Sun Storage 6 Gb SAS PCIe RAID HBA, Internal Installation Guide*

▼ Verify a PCIe2 Card

After you install a PCIe2 card, you can verify its functionality.

1. Reset the PCIe2 card:

```
-> set /SYS/MB/PCI_MEZZ/PCIEx/card_type clear_fault_action=true
Are you sure you want to clear /SYS/MB/PCI_MEZZ/PCIE4/XAUI0 (y/n)?
y
Set 'clear_fault_action' to 'true'

-> set /SYS/MB/RISERy/card_type clear_fault_action=true
Are you sure you want to clear /SYS/MB/RISER0/XAUI0 (y/n)? y
Set 'clear_fault_action' to 'true'

->
```

where:

- x is 3 or 4.
- y is 0 to 2.
- *card_type* is the Oracle ILOM target for the type of PCIe2 card.

2. Consider your next steps:

- If you installed a new PCIe2 card as part of a replacement operation, verify that the PCIe2 card is no longer considered faulty, then return to this procedure. See [“Locate a Faulty PCIe2 Card” on page 187](#).
- If you installed a new PCIe2 card to increase functionality, go to [Step 3](#).

3. Verify the presence of the PCIe2 card.

```
-> show -d targets /SYS/MB/PCI_MEZZ/PCIE $x$ 
/SYS/MB/PCI_MEZZ/PCIE4
Targets:
XAUI0
.
.
.
-> show -d targets /SYS/MB/RISER $y$ 
/SYS/MB/RISER0
Targets:
XAUI0
PCIE0
T_RISER0
->
```

where:

- x is the PCIe2 slot, 3 (left slot) or 4 (right slot).
- y is the PCIe2 slot, 0 (left slot) to 2 (right slot).

Related Information

- [“Locate a Faulty PCIe2 Card” on page 187](#)
- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 190](#)
- [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 192](#)
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board” on page 193](#)
- [“Install a PCIe2 Card Into the PCIe2 Riser Card” on page 195](#)

Servicing the Signal Interface Board

The signal interface board provides a power and control interface between the motherboard and the fans, LEDs, hard drives, and power supplies. The signal interface board is located vertically between the motherboard and the power supplies. See [“Power Supply, Hard Drive, and Fan Module Locations”](#) on page 2.

These topics describe service information and procedures for the signal interface board.

- [“Determine if the Signal Interface Board Is Faulty”](#) on page 201
- [“Remove the Signal Interface Board”](#) on page 204
- [“Install the Signal Interface Board”](#) on page 206
- [“Verify the Signal Interface Board”](#) on page 208

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the Signal Interface Board Is Faulty

You must determine if the signal interface board is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the signal interface board is faulty.

If the signal interface board is faulty, you will see `/SYS/SIB` under the Value heading. For example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/SIB
.		
.		
.		

```
->
```

If the signal interface board is faulty, replace it. See [“Remove the Signal Interface Board” on page 204](#).

If a FRU value different from `/SYS/SIB` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt shell`:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC        Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the signal interface board is faulty, replace it. See [“Remove the Signal Interface Board” on page 204](#).

5. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit
->
```

6. Within the Oracle ILOM interface, verify the presence of the signal interface board:

```
-> show /SYS/SIB fru_description
/SYS/SIB
Properties:
    fru_description = MADRID_SIGNAL_INTERFACE_BOARD
->
```

If the signal interface board does not report its description, replace it. See [“Remove the Signal Interface Board” on page 204](#).

7. If you are unable to determine if the signal interface board is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the Signal Interface Board” on page 204](#)
- [“Install the Signal Interface Board” on page 206](#)

- [“Verify the Signal Interface Board” on page 208](#)
 - [“Detecting and Managing Faults” on page 9](#)
-

▼ Remove the Signal Interface Board

Removing the signal interface board is a cold-service operation. You must power off the server before you remove the signal interface board.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the signal interface board as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Remove the fan module on the far right.

See [“Remove a Fan Module” on page 86](#).

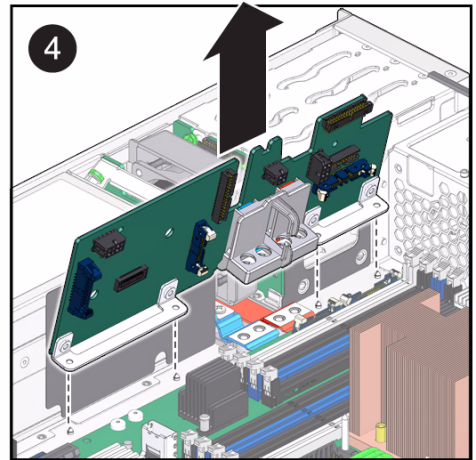
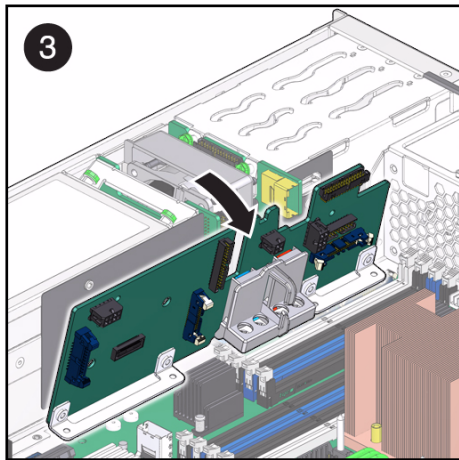
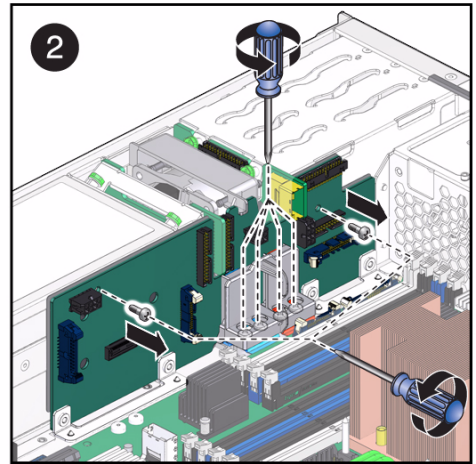
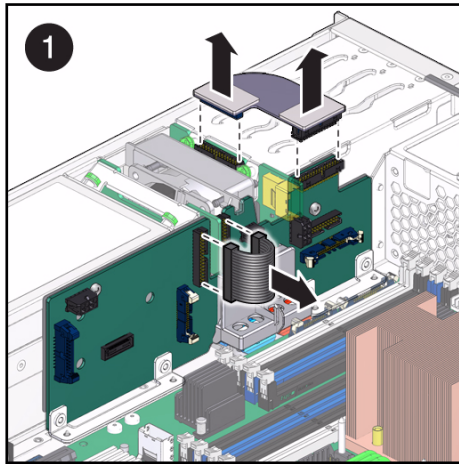
3. Remove the hard drive fan.

See [“Remove the Hard Drive Fan” on page 118](#).

4. Remove the DVD tray.

See [“Remove the DVD Tray” on page 147](#).

5. Remove the signal cable from the hard drive backplane and remove all cables from the signal interface board (pane 1).



6. Remove the two screws that secure the signal interface board to the chassis (pane 2).
7. Remove the two screws from each bus bar of the signal interface board (pane 2).
8. Tilt the signal interface board in toward the center of the chassis, and lift the board in that direction out of the chassis (pane 3 and pane 4).
9. Set the signal interface board aside.
10. Consider your next steps:
 - If you removed the signal interface board as part of a replacement operation, install a new signal interface board. See [“Install the Signal Interface Board” on page 206](#).

- If you removed the signal interface board as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

Related Information

- ["Determine if the Signal Interface Board Is Faulty"](#) on page 201
- ["Install the Signal Interface Board"](#) on page 206
- ["Verify the Signal Interface Board"](#) on page 208
- ["Preparing for Service"](#) on page 63
- ["Returning the Server to Operation"](#) on page 255

▼ Install the Signal Interface Board

Installing the signal interface board is a cold-service operation. You must power off the server before installing the signal interface board.

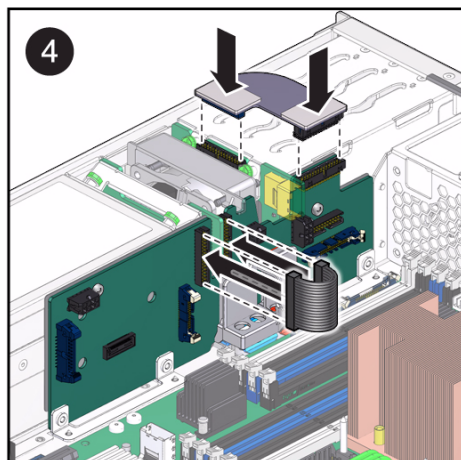
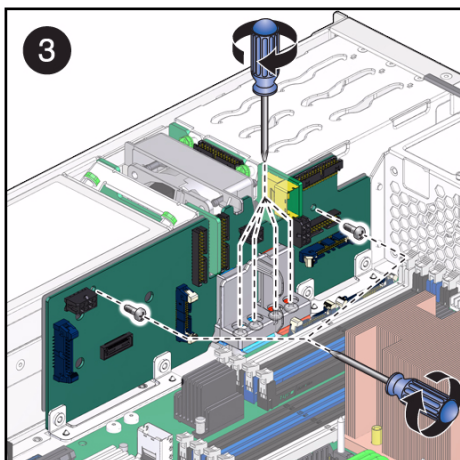
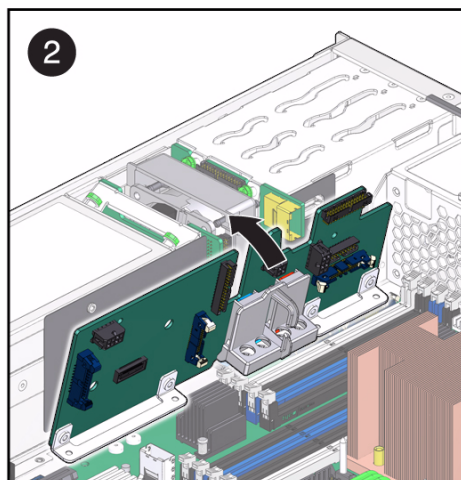
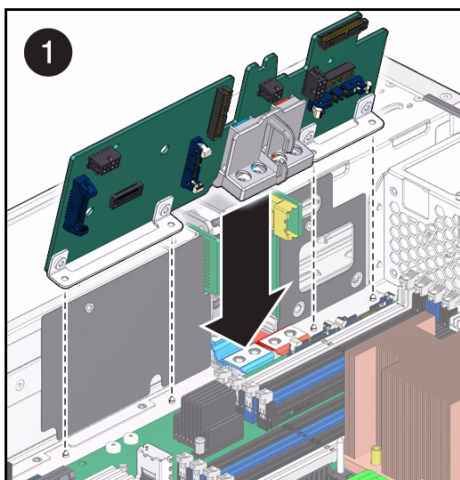
1. Consider your first steps:

- If you are replacing a signal interface board, remove the faulty or obsolete signal interface board first, then return to this procedure, [Step 2](#). See ["Remove the Signal Interface Board"](#) on page 204.
- If you are installing the signal interface board as part of another component's removal or installation procedure, go to [Step 2](#).

2. Align the signal interface board to the location where it installs into the chassis.

The bus bars are toward the center of the chassis, with the red bus bar toward the front of the chassis.

3. Lower the signal interface board into the chassis (pane 1).



4. Loosely install the two screws that secure the signal interface board to the chassis.
5. Install and tighten the four bus bar screws and tighten the two screws securing the signal interface board to the chassis (pane 3).

Note – Ensure that the bus bar screws are securely tightened.

6. Attach all cables to the signal interface board and attach the signal cable to the hard drive backplane (pane 4).
7. Consider your next steps:

- If you installed the signal interface board as part of a replacement operation, go to [Step 8](#).
- If you installed the signal interface board as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

8. Install the DVD tray.

See ["Install the DVD Tray"](#) on page 150.

9. Install the hard drive fan.

See ["Install the Hard Drive Fan"](#) on page 119.

10. Install the right most fan.

See ["Install a Fan Module"](#) on page 88.

11. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 255
- ["Verify the Signal Interface Board"](#) on page 208

Related Information

- ["Determine if the Signal Interface Board Is Faulty"](#) on page 201
- ["Remove the Signal Interface Board"](#) on page 204
- ["Verify the Signal Interface Board"](#) on page 208
- ["Preparing for Service"](#) on page 63
- ["Returning the Server to Operation"](#) on page 255

▼ Verify the Signal Interface Board

After you install the signal interface board, you can verify its functionality.

1. Reset the signal interface board:

```
-> set /SYS/SIB clear_fault_action=true
Are you sure you want to clear /SYS/SIB (y/n)? y
Set 'clear_fault_action' to 'true'

->
```

2. Verify that the signal interface board is no longer considered faulty, then return to this procedure.

See [“Determine if the Signal Interface Board Is Faulty”](#) on page 201.

3. Verify the presence of the signal interface board:

```
-> show /SYS/SIB fru_description
/SYS/SIB
Properties:
    fru_description = MADRID_SIGNAL_INTERFACE_BOARD
->
```

Related Information

- [“Determine if the Signal Interface Board Is Faulty”](#) on page 201
- [“Remove the Signal Interface Board”](#) on page 204
- [“Install the Signal Interface Board”](#) on page 206

Servicing DIMMs

The DIMM is a random access memory device. The DIMMs are located symmetrically on both the left and right sides of the CPU. See [“Motherboard, DIMMs, and PCI Board Locations”](#) on page 6.

These topics describe service information and procedures for the DIMM.

- [“DIMM Configuration”](#) on page 211
- [“DIMM LEDs”](#) on page 212
- [“Locate a Faulty DIMM”](#) on page 213
- [“Remove a DIMM”](#) on page 215
- [“Install a DIMM”](#) on page 217
- [“Verify a DIMM”](#) on page 218

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

DIMM Configuration

You must follow these rules when configuring DIMMs into the server.

- Only 4 GB and 8 GB DIMM capacities are supported.
- All DIMMs must be of the same capacity.
- All DIMMs of the same branch must be of the same Sun or Oracle part number.
- Populate the blue slots first. There are 4 slots.
- Populate the white slots second. There are 4 slots.
- Populate the black slots third. There are 8 slots.

Use the following table as a guide.

Populate	Slot Color	Motherboard Labels	ILOM Target	Total Capacity 4 GB DIMMs	Total Capacity 8 GB DIMMs
first	blue	J1001	/SYS/MB/CMP0/BOB0/CH1/D0	4 x 4 GB = 16 GB	4 x 8 GB = 32 GB
		J2001	/SYS/MB/CMP0/BOB2/CH1/D0		
		J3001	/SYS/MB/CMP0/BOB1/CH1/D0		
		J4001	/SYS/MB/CMP0/BOB3/CH1/D0		
second	white	J1201	/SYS/MB/CMP0/BOB0/CH0/D0	8 x 4 GB = 32 GB	8 x 8 GB = 64 GB
		J2201	/SYS/MB/CMP0/BOB2/CH0/D0		
		J3201	/SYS/MB/CMP0/BOB1/CH0/D0		
		J4201	/SYS/MB/CMP0/BOB3/CH0/D0		
third	black	J1101	/SYS/MB/CMP0/BOB0/CH1/D1	16 x 4 GB = 64 GB	16 x 8 GB = 128 GB
		J1301	/SYS/MB/CMP0/BOB0/CH0/D1		
		J2101	/SYS/MB/CMP0/BOB2/CH1/D1		
		J2301	/SYS/MB/CMP0/BOB2/CH0/D1		
		J3101	/SYS/MB/CMP0/BOB1/CH1/D1		
		J3301	/SYS/MB/CMP0/BOB1/CH0/D1		
		J4101	/SYS/MB/CMP0/BOB3/CH1/D1		
		J4301	/SYS/MB/CMP0/BOB3/CH0/D1		

Related Information

- [“DIMM LEDs” on page 212](#)
- [“Locate a Faulty DIMM” on page 213](#)
- [“Remove a DIMM” on page 215](#)
- [“Install a DIMM” on page 217](#)
- [“Verify a DIMM” on page 218](#)

DIMM LEDs

The motherboard has a feature that enables you to locate a faulty DIMM, even when power has been removed from the system. A SuperCapacitor provides sufficient current to keep the faulty DIMM locating circuit active for several minutes after the power cords have been disconnected. If you see the DIMM Fault Remind Power LED illuminated, the feature is still available. By pressing the Remind button adjacent to the lit LED, any faulty DIMMs are identified by their respective LEDs lighting.

The Remind button is located on the motherboard, just under the PCI mezzanine board, against the left wall of the chassis. The Faulty DIMM LEDs are located to the rear of each DIMM slot.

Related Information

- [“DIMM Configuration” on page 211](#)
- [“Locate a Faulty DIMM” on page 213](#)
- [“Remove a DIMM” on page 215](#)
- [“Install a DIMM” on page 217](#)
- [“Verify a DIMM” on page 218](#)

▼ Locate a Faulty DIMM

You must determine which DIMM is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**

See [“Interpreting Diagnostic LEDs” on page 17](#).

2. **Visually inspect the DIMM to see if any of its status LEDs are lit or flashing.**

See [“DIMM LEDs” on page 212](#).

If the DIMM is faulty, replace it. See [“Remove a DIMM” on page 215](#).

3. **Within the Oracle ILOM interface, type the `show faulty` command to verify that the DIMM is faulty.**

If the DIMM is faulty, you will see `/SYS/MB/CMP0/BOBx/CHy/Dz` under the Value heading where:

- `x` is 0 to 3.
- `y` is 0 or 1.

■ z is 0 or 1.

For example:

```
-> show faulty
Target          | Property          | Value
-----+-----+-----
/SP/faultmgmt/0 | fru              | /SYS/MB/CMP0/BOB3/CH0/D1
.
.
.
->
```

If the DIMM is faulty, replace it. See [“Remove a DIMM” on page 215](#).

If a FRU value different from /SYS/MB/CMP0/BOBx/CHy/Dz is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

4. Start the Oracle ILOM faultmgmt shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

5. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time          UUID                               msgid          Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC    Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the Fault class and Description fields for more information.

If the DIMM is faulty, replace it. See [“Remove a DIMM” on page 215](#).

6. Exit the Oracle ILOM faultmgmt shell:

```
faultmgmtsp> exit  
->
```

7. Within the Oracle ILOM interface, verify the DIMM temperature is normal.

```
-> show /SYS/MB/CMP0/BOBx/CHy/Dz/T_AMB value  
/SYS/MB/CMP0/BOB3/CH0/D1/T_AMB  
Properties:  
value = 32.000 degree C  
->
```

where:

- *x* is 0 to 3.
- *y* is 0 or 1.
- *z* is 0 or 1.

If the DIMM is faulty, replace it. See [“Remove a DIMM” on page 215](#).

8. If you are unable to identify the faulty DIMM, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“DIMM Configuration” on page 211](#)
- [“DIMM LEDs” on page 212](#)
- [“Remove a DIMM” on page 215](#)
- [“Install a DIMM” on page 217](#)
- [“Verify a DIMM” on page 218](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove a DIMM

Removing a DIMM is a cold-service operation. You must power off the server before you remove the DIMM.

1. Determine which DIMM to remove.

See [“Locate a Faulty DIMM” on page 213](#).

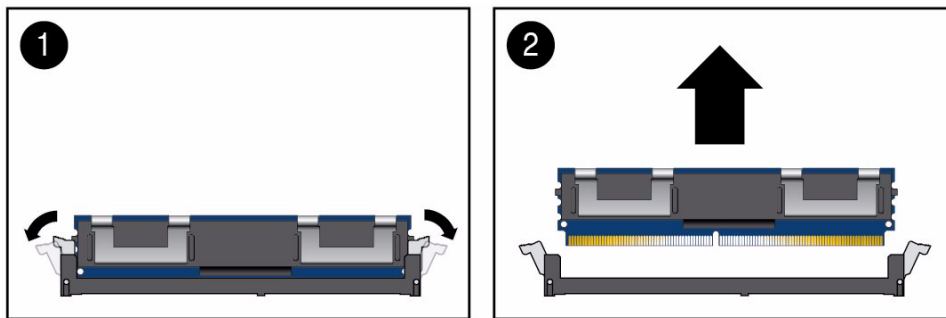
2. Consider your next step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the DIMM as part of another component’s removal or installation procedure, go to [Step 3](#).

3. (Optional) Remove the DVD tray.

See [“Remove the DVD Tray” on page 147](#).

4. Press down and out on the release levers at both ends of the DIMM slot (pane 1).



5. Lift the DIMM up and out the chassis (pane 2).

6. Set the DIMM aside.

7. Repeat from [Step 4](#) for any additional DIMMs to be removed.

8. Consider your next steps:

- If you removed the DIMM as part of a replacement operation, install a new DIMM. See [“Install a DIMM” on page 217](#).
- If you removed the DIMM as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.
- If you are not replacing the DIMM, go to [Step 9](#).

9. Install the DVD tray (if removed).

See [“Install the DVD Tray” on page 150](#).

10. Finish the removal procedure.

See [“Returning the Server to Operation” on page 255](#).

Related Information

- [“DIMM Configuration” on page 211](#)

- “DIMM LEDs” on page 212
- “Locate a Faulty DIMM” on page 213
- “Install a DIMM” on page 217
- “Verify a DIMM” on page 218
- “Preparing for Service” on page 63
- “Returning the Server to Operation” on page 255

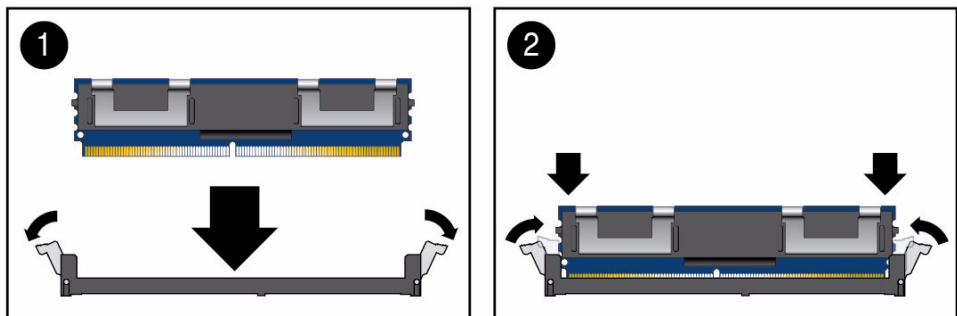
▼ Install a DIMM

Installing a DIMM is a cold-service operation. You must power off the server before installing a DIMM.

1. Consider your first steps:

- If you are replacing a DIMM, remove the faulty or obsolete DIMM first, then return to this procedure, [Step 2](#).
See “[Remove a DIMM](#)” on page 215.
- If you are installing a new or an additional DIMM, see the following topics in order:
 - “[Preparing for Service](#)” on page 63.
 - (Optional) Remove the DVD tray. See “[Remove the DVD Tray](#)” on page 147.
- If you are installing the DIMM as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Open the release levers of the slot where you are installing the DIMM (pane 1).



3. Align the DIMM to the location where it installs into the chassis.

Ensure that the notch in the DIMM lines up with the key in the slot.

4. Insert the DIMM into the slot, pressing firmly so that both release levers click closed (pane 2).
5. Repeat from [Step 2](#) for any additional DIMMs to be installed.
6. Consider your next steps:
 - If you installed the DIMM as part of a replacement operation, go to [Step 7](#).
 - If you installed the DIMM as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.
 - If you have installed a new DIMM, go to [Step 7](#).
7. Install the DVD tray (if removed).
See ["Install the DVD Tray"](#) on page 150.
8. Finish the installation procedure.
See:
 - ["Returning the Server to Operation"](#) on page 255
 - ["Verify a DIMM"](#) on page 218

Related Information

- ["DIMM Configuration"](#) on page 211
- ["DIMM LEDs"](#) on page 212
- ["Locate a Faulty DIMM"](#) on page 213
- ["Remove a DIMM"](#) on page 215
- ["Verify a DIMM"](#) on page 218
- ["Preparing for Service"](#) on page 63
- ["Returning the Server to Operation"](#) on page 255

▼ Verify a DIMM

After you install a DIMM, you can verify its functionality.

1. Reset the DIMM:

```
-> set /SYS/MB/CMP0/BOBx/CHy/Dz clear_fault_action=true
Are you sure you want to clear /SYS/MB/CMP0/BOB3/CH0/D1 (y/n)? y
```

```
Set 'clear_fault_action' to 'true'

->
```

2. Consider your next steps:

- If you installed a new DIMM as part of a replacement operation, verify that the DIMM is no longer considered faulty, then return to this procedure. See [“Locate a Faulty DIMM” on page 213](#).
- If you installed a new DIMM to increase functionality, go to [Step 3](#).

3. Verify that the DIMM temperature is normal.

```
-> show /SYS/MB/CMP0/BOBx/CHy/Dz/T_AMB value
/SYS/MB/CMP0/BOB3/CH0/D1/T_AMB
Properties:
value = 32.000 degree C
->
```

where:

- x is 0 to 3.
- y is 0 or 1.
- z is 0 or 1.

Related Information

- [“DIMM Configuration” on page 211](#)
- [“DIMM LEDs” on page 212](#)
- [“Locate a Faulty DIMM” on page 213](#)
- [“Remove a DIMM” on page 215](#)
- [“Install a DIMM” on page 217](#)

Servicing the Battery

The battery is a type CR2032 3 volt lithium disc battery. The battery is located vertically at the right rear of the motherboard. See [“Motherboard, DIMMs, and PCI Board Locations”](#) on page 6.

These topics describe service information and procedures for the battery.

- [“Determine if the Battery Is Faulty”](#) on page 221
- [“Remove the Battery”](#) on page 223
- [“Install the Battery”](#) on page 225
- [“Verify the Battery”](#) on page 227

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the Battery Is Faulty

You must determine if the battery is faulty before you replace it.

1. Check to see if any System Service Required LEDs are lit or flashing.
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the battery is faulty.

If the battery is faulty, you will see `/SYS/MB/BAT` under the Value heading. For example:

```
-> show faulty
Target                | Property                | Value
-----+-----+-----
/SP/faultmgmt/0      | fru                     | /SYS/MB/BAT
.
.
.
->
```

If the battery is faulty, replace it. See [“Remove the Battery” on page 223](#).

If a FRU value different from `/SYS/MB/BAT` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt shell`:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----+-----+-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC         Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the battery is faulty, replace it. See [“Remove the Battery” on page 223](#).

5. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit  
->
```

6. Within the Oracle ILOM interface, verify the battery voltage:

```
-> show /SYS/MB/V_BAT value  
/SYS/MB/V_BAT  
Properties:  
value = 3.120 Volts  
->
```

If the battery voltage is below 2.95 VDC, replace the battery. See [“Remove the Battery” on page 223](#).

7. If you are unable to determine if the battery is faulty, seek further information.
See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the Battery” on page 223](#)
- [“Install the Battery” on page 225](#)
- [“Verify the Battery” on page 227](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove the Battery

Removing the battery is a cold-service operation. You must power off the server before you remove the battery.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the battery as part of another component’s removal or installation procedure, go to [Step 2](#).

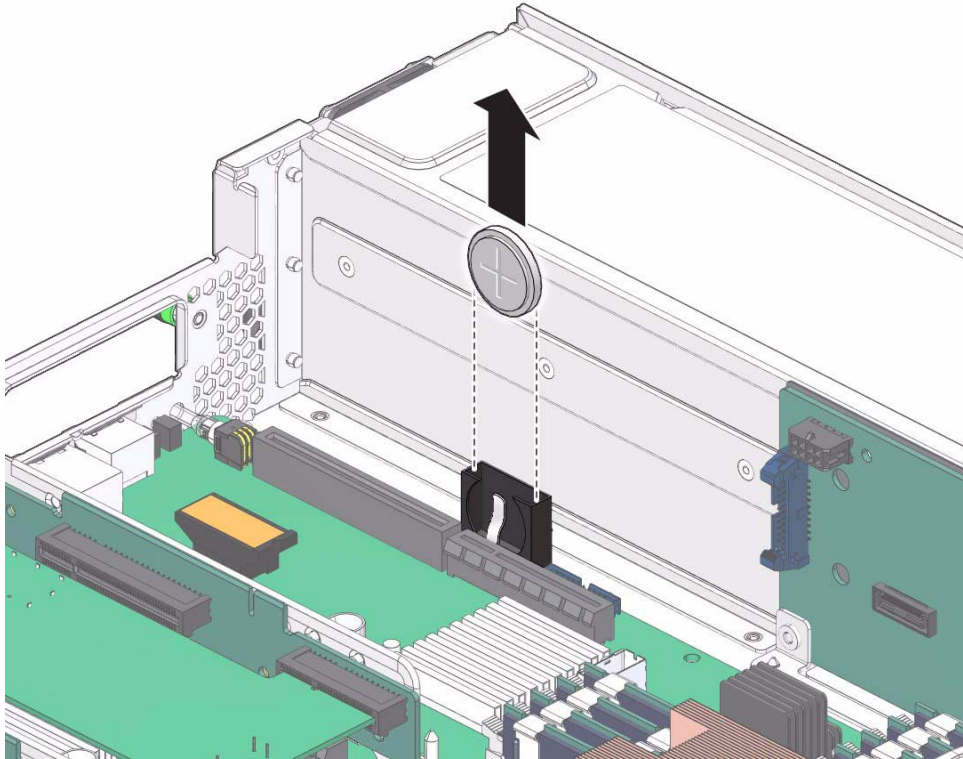
2. Remove the PCIe2 mezzanine board.

See [“Remove the PCIe2 Mezzanine Board” on page 172](#).

3. Remove the right PCIe2 riser card.

See [“Remove a PCIe2 Riser Card”](#) on page 182.

4. Grasp the battery, and pull it straight up and out of its receptacle.



5. Set the battery aside.

6. Consider your next steps:

- If you removed the battery as part of a replacement operation, install a new battery. See [“Install the Battery”](#) on page 225.
- If you removed the battery as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links”](#) on page 67 for assistance.

Related Information

- [“Determine if the Battery Is Faulty”](#) on page 221
- [“Install the Battery”](#) on page 225
- [“Verify the Battery”](#) on page 227
- [“Preparing for Service”](#) on page 63

- [“Returning the Server to Operation” on page 255](#)

▼ Install the Battery

Installing the battery is a cold-service operation. You must power off the server before installing the battery.

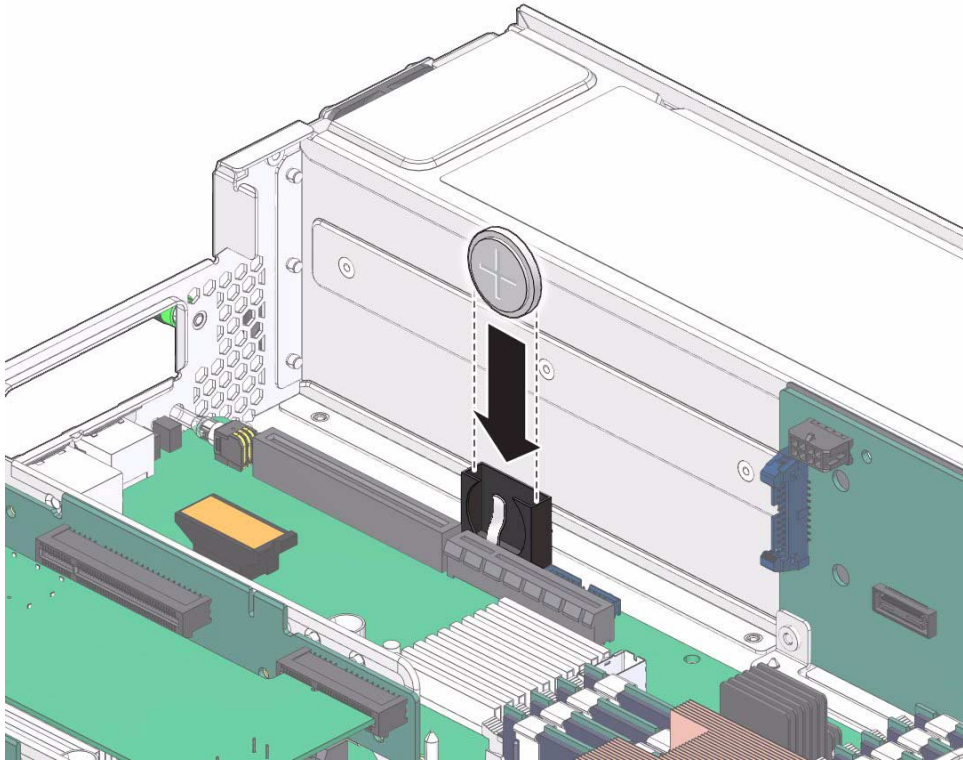
1. Consider your first steps:

- If you are replacing a battery, remove the faulty or obsolete battery first, then return to this procedure, [Step 2](#). See [“Remove the Battery” on page 223](#).
- If you are installing the battery as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the battery to the location where it installs into the chassis.

The positive (+) side of the battery is toward the center of the chassis.

3. Insert the battery into the receptacle.



4. Consider your next steps:

- If you installed the battery as part of a replacement operation, go to [Step 5](#).
- If you installed the battery as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

5. Install the right PCIe2 riser card.

See ["Install a PCIe2 Riser Card"](#) on page 184.

6. Install the PCIe2 mezzanine board.

See ["Install the PCIe2 Mezzanine Board"](#) on page 175.

7. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 255
- ["Verify the Battery"](#) on page 227

Related Information

- [“Determine if the Battery Is Faulty” on page 221](#)
- [“Remove the Battery” on page 223](#)
- [“Verify the Battery” on page 227](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Verify the Battery

After you install a battery, you can verify its functionality.

1. Reset the battery:

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

->
```

2. Verify that the battery is no longer considered faulty, then return to this procedure.

See [“Determine if the Battery Is Faulty” on page 221](#).

3. Verify the battery voltage:

```
-> show /SYS/MB/V_BAT value
/SYS/MB/V_BAT
Properties:
value = 3.120 Volts

->
```

Related Information

- [“Determine if the Battery Is Faulty” on page 221](#)
- [“Remove the Battery” on page 223](#)
- [“Install the Battery” on page 225](#)

Servicing the SP

The SP is an independent server management device providing Oracle ILOM control of the server. The SP is socketed at the left rear of the motherboard. See [“Motherboard, DIMMs, and PCI Board Locations” on page 6](#).

These topics describe service information and procedures for the SP.

- [“Determine if the SP Is Faulty” on page 229](#)
- [“Remove the SP” on page 231](#)
- [“Install the SP” on page 233](#)
- [“Verify the SP” on page 235](#)

Related Information

- [“Identifying Components” on page 1](#)
- [“Detecting and Managing Faults” on page 9](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Determine if the SP Is Faulty

You must determine if the SP is faulty before you replace it.

1. Check to see if any System Service Required LEDs are lit or flashing.
See [“Interpreting Diagnostic LEDs” on page 17](#).

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the SP is faulty.

If the SP is faulty, you will see `/SYS/MB/SP` under the Value heading. For example:

```
-> show faulty
Target                | Property                | Value
-----+-----+-----
/SP/faultmgmt/0      | fru                     | /SYS/MB/SP
.
.
.
->
```

If the SP is faulty, replace it. See [“Remove the SP” on page 231](#).

If a FRU value different from `/SYS/MB/SP` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt` shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----+-----+-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC          Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the SP is faulty, replace it. See [“Remove the SP” on page 231](#).

5. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit  
->
```

6. Within the Oracle ILOM interface, verify the presence of the SP:

```
-> show /SYS/MB/SP type  
/SYS/MB/SP  
Properties:  
    type = SP Board Module  
->
```

If the SP does not report its type, replace it. See [“Remove the SP” on page 231](#).

7. If you are unable to determine if the SP is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the SP” on page 231](#)
- [“Install the SP” on page 233](#)
- [“Verify the SP” on page 235](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove the SP

Removing the SP is a cold-service operation. You must power off the server before you remove the SP.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the SP as part of another component’s removal or installation procedure, go to [Step 2](#).

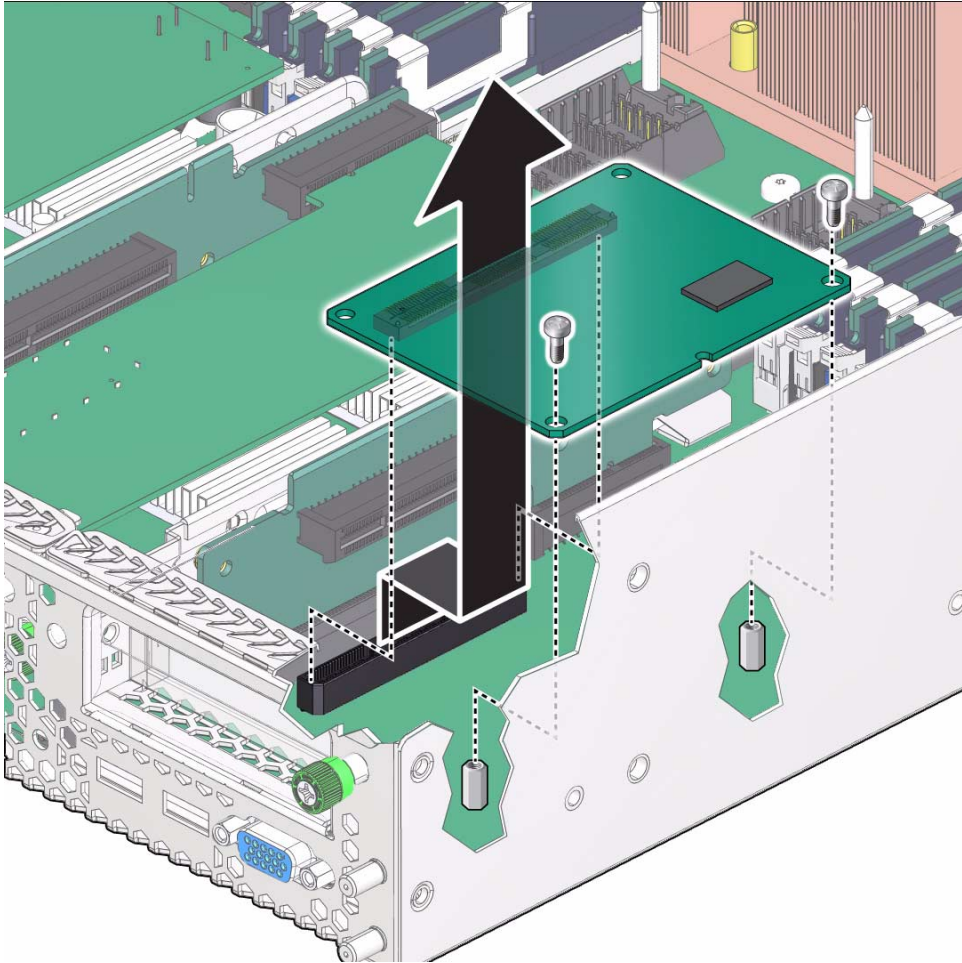
2. Remove the PCIe2 mezzanine board.

See [“Remove the PCIe2 Mezzanine Board” on page 172](#).

3. Remove the left PCIe2 riser card.

See [“Remove a PCIe2 Riser Card” on page 182](#).

4. Remove the two screws that secure the SP in place.
5. Grasp the front and rear of the SP near the PCIe2 socket and pull straight up.



6. Lift the SP out of the chassis and set the SP aside.
7. Consider your next steps:
 - If you removed the SP as part of a replacement operation, install a new SP. See [“Install the SP” on page 233](#).
 - If you removed the SP as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.

Related Information

- [“Determine if the SP Is Faulty” on page 229](#)
- [“Install the SP” on page 233](#)
- [“Verify the SP” on page 235](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Install the SP

Installing the SP is a cold-service operation. You must power off the server before installing the SP.

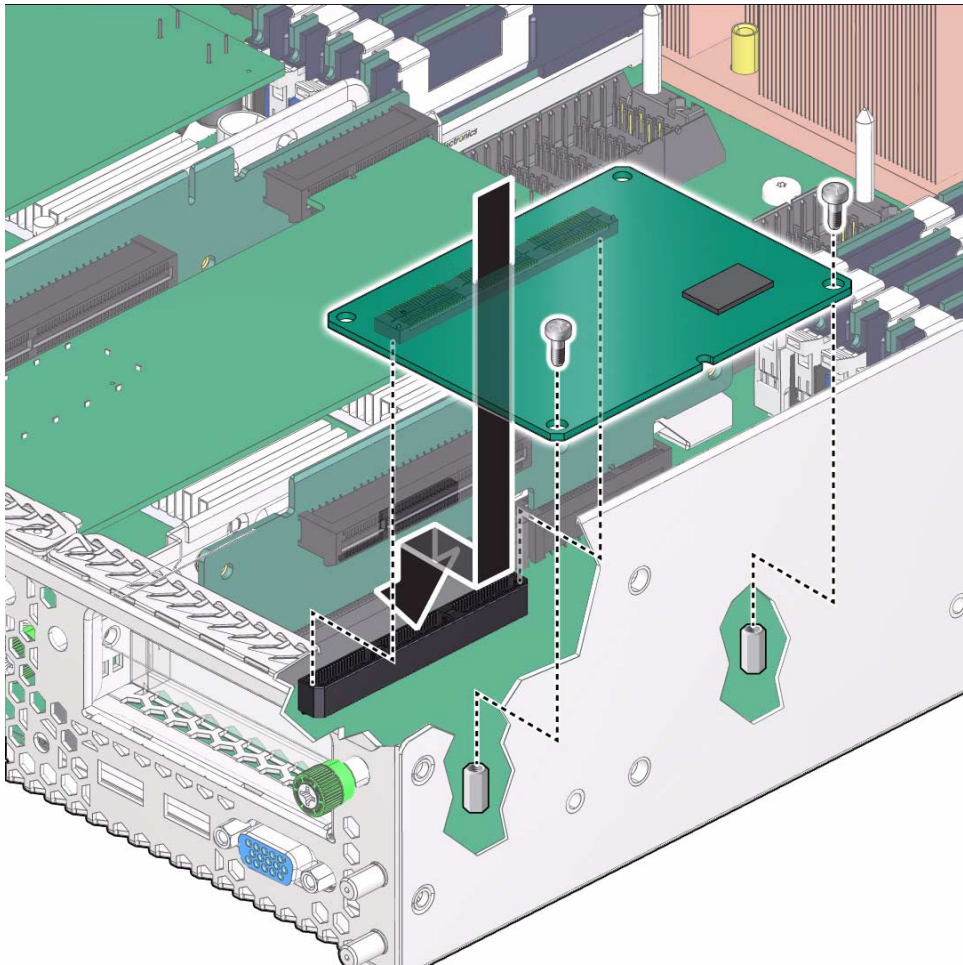
1. Consider your first steps:

- If you are replacing a SP, remove the faulty or obsolete SP first, then return to this procedure, [Step 2](#). See [“Remove the SP” on page 231](#).
- If you are installing the SP as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the SP to where it installs into the chassis.

The connector on the bottom of the SP aligns to the connector left of the left PCIe2 socket.

3. Press the right side of the SP down firmly into the connector.



4. Install the two screws that secure the SP in place.

5. Consider your next steps:

- If you installed the SP as part of a replacement operation, go to [Step 6](#).
- If you installed the SP as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

6. Install the left PCIe2 riser card.

See ["Install a PCIe2 Riser Card"](#) on page 184.

7. Install the PCIe2 mezzanine board.

See ["Install the PCIe2 Mezzanine Board"](#) on page 175.

8. Finish the installation procedure.

See:

- [“Returning the Server to Operation” on page 255](#)
- [“Verify the SP” on page 235](#)

Related Information

- [“Determine if the SP Is Faulty” on page 229](#)
- [“Remove the SP” on page 231](#)
- [“Verify the SP” on page 235](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Verify the SP

After you install a SP, you can verify its functionality.

1. Reset the SP:

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

->
```

2. Verify that the SP is no longer considered faulty, then return to this procedure.

See [“Determine if the SP Is Faulty” on page 229](#).

3. Verify the presence of the SP:

```
-> show /SYS/MB/SP type
/SYS/MB/SP
Properties:
    type = SP Board Module

->
```

Related Information

- [“Determine if the SP Is Faulty” on page 229](#)
- [“Remove the SP” on page 231](#)

- “Install the SP” on page 233

Servicing the ID PROM

The ID PROM is a nonvolatile memory device that stores basic boot and network configuration information. The ID PROM is socketed at the right rear of the motherboard. See [“Motherboard, DIMMs, and PCI Board Locations”](#) on page 6.

These topics describe service information and procedures for the ID PROM.

- [“Determine if the ID PROM Is Faulty”](#) on page 237
- [“Remove the ID PROM”](#) on page 239
- [“Install the ID PROM”](#) on page 241
- [“Verify the ID PROM”](#) on page 242

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the ID PROM Is Faulty

You must determine if the ID PROM is faulty before you replace it.

1. Check to see if any System Service Required LEDs are lit or flashing.
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the ID PROM is faulty.

If the ID PROM is faulty, you will see `/SYS/MB/SCC` under the Value heading.
For example:

```
-> show faulty
Target                | Property                | Value
-----+-----+-----
/SP/faultmgmt/0      | fru                     | /SYS/MB/SCC
.
.
.
->
```

If the ID PROM is faulty, replace it. See [“Remove the ID PROM” on page 239](#).

If a FRU value different from `/SYS/MB/SCC` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt shell`:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```

4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----+-----+-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC          Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the ID PROM is faulty, replace it. See [“Remove the ID PROM” on page 239](#).

5. Exit the Oracle ILOM faultmgmt shell:

```
faultmgmtsp> exit  
->
```

6. Within the Oracle ILOM interface, verify the presence of the ID PROM:

```
-> show /SP/network macaddress  
/SP/network  
Properties:  
    macaddress = 00:21:28:A6:1A:23  
-> show /SP/clock datetime  
/SP/clock  
Properties:  
    datetime = Wed Jan 12 03:50:33 2011  
->
```

If the ID PROM does not report its MAC address or time, replace it. See [“Remove the ID PROM” on page 239](#).

7. If you are unable to determine if the ID PROM is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the ID PROM” on page 239](#)
- [“Install the ID PROM” on page 241](#)
- [“Verify the ID PROM” on page 242](#)
- [“Detecting and Managing Faults” on page 9](#)

▼ Remove the ID PROM

Removing the ID PROM is a cold-service operation. You must power off the server before you remove the ID PROM.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the ID PROM as part of another component’s removal or installation procedure, go to [Step 2](#).

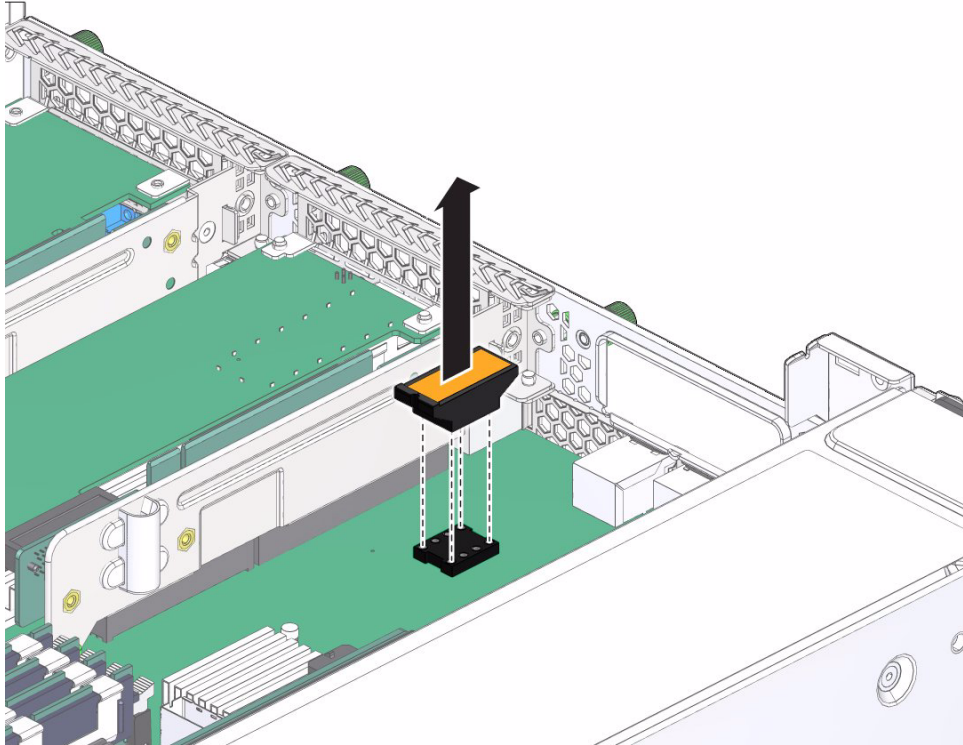
2. Remove the PCIe2 mezzanine board.

See [“Remove the PCIe2 Mezzanine Board” on page 172.](#)

3. Remove the right PCIe2 riser card.

See [“Remove a PCIe2 Riser Card” on page 182.](#)

4. Grasp the front and rear of the ID PROM and pull straight up.



5. Lift the ID PROM out of the chassis and set the ID PROM aside.

6. Consider your next steps:

- If you removed the ID PROM as part of a replacement operation, install a new ID PROM. See [“Install the ID PROM” on page 241.](#)
- If you removed the ID PROM as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.

Related Information

- [“Determine if the ID PROM Is Faulty” on page 237](#)
- [“Install the ID PROM” on page 241](#)

- [“Verify the ID PROM” on page 242](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Install the ID PROM

Installing the ID PROM is a cold-service operation. You must power off the server before installing the ID PROM.

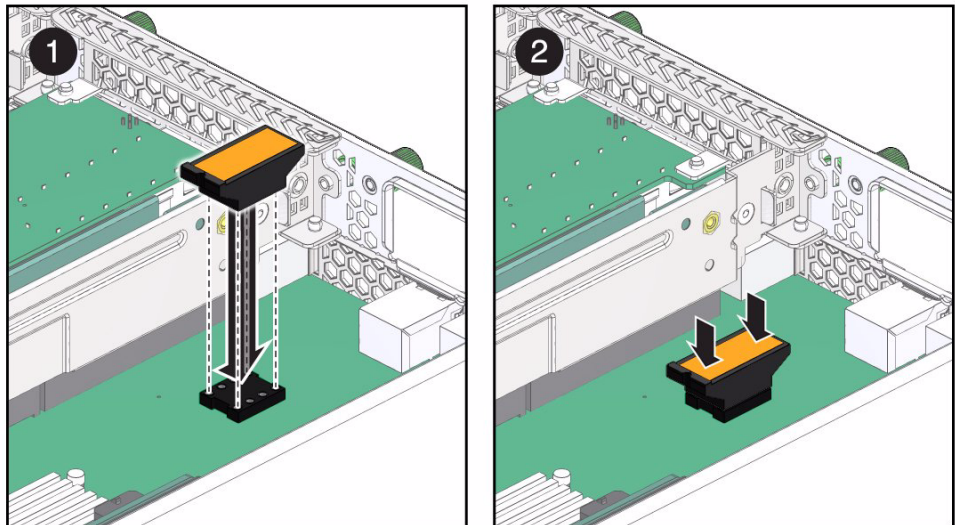
1. Consider your first steps:

- If you are replacing a ID PROM, remove the faulty or obsolete ID PROM first, then return to this procedure, [Step 2](#). See [“Remove the ID PROM” on page 239](#).
- If you are installing the ID PROM as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the ID PROM to the location where it installs into the chassis.

The key on the underside of the ID PROM lines up with the notch at the rear of the socket.

3. Press the center of the ID PROM straight into the socket.



4. Consider your next steps:

- If you installed the ID PROM as part of a replacement operation, go to [Step 5](#).

- If you installed the ID PROM as part of another component's removal or installation procedure, return to that procedure. See ["Component FRU Names and Service Links"](#) on page 67 for assistance.

5. Install the right PCIe2 riser card.

See ["Install a PCIe2 Riser Card"](#) on page 184.

6. Install the PCIe2 mezzanine board.

See ["Install the PCIe2 Mezzanine Board"](#) on page 175.

7. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 255
- ["Verify the ID PROM"](#) on page 242

Related Information

- ["Determine if the ID PROM Is Faulty"](#) on page 237
- ["Remove the ID PROM"](#) on page 239
- ["Verify the ID PROM"](#) on page 242
- ["Preparing for Service"](#) on page 63
- ["Returning the Server to Operation"](#) on page 255

▼ Verify the ID PROM

After you install a ID PROM, you can verify its functionality.

1. Reset the ID PROM:

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

->
```

2. Verify that the ID PROM is no longer considered faulty, then return to this procedure.

See ["Determine if the ID PROM Is Faulty"](#) on page 237.

3. Verify the presence of the ID PROM:

```
-> show /SP/network macaddress
/SP/network
Properties:
    macaddress = 00:21:28:A6:1A:23
-> show /SP/clock datetime
/SP/clock
Properties:
    datetime = Wed Jan 12 03:50:33 2011
->
```

Related Information

- [“Determine if the ID PROM Is Faulty” on page 237](#)
- [“Remove the ID PROM” on page 239](#)
- [“Install the ID PROM” on page 241](#)

Servicing the Motherboard

The motherboard is the main hardware component of the server. The motherboard is located at the bottom of the chassis. See [“Motherboard, DIMMs, and PCI Board Locations”](#) on page 6.

These topics describe service information and procedures for the motherboard.

- [“Determine if the Motherboard Is Faulty”](#) on page 245
- [“Remove the Motherboard”](#) on page 248
- [“Install the Motherboard”](#) on page 250
- [“Verify the Motherboard”](#) on page 253

Related Information

- [“Identifying Components”](#) on page 1
- [“Detecting and Managing Faults”](#) on page 9
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Determine if the Motherboard Is Faulty

You must determine if the motherboard is faulty before you replace it.

1. Check to see if any System Service Required LEDs are lit or flashing.
See [“Interpreting Diagnostic LEDs”](#) on page 17.

2. Within the Oracle ILOM interface, type the `show faulty` command to verify that the motherboard is faulty.

If the motherboard is faulty, you will see `/SYS/MB` under the Value heading. For example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB
.		
.		
.		
->		

If the motherboard is faulty, replace it. See [“Remove the Motherboard” on page 248](#).

If a FRU value different from `/SYS/MB` is displayed, see [“Component FRU Names and Service Links” on page 67](#) to identify which component is faulty.

3. Start the Oracle ILOM `faultmgmt` shell:

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
faultmgmtsp>
```


4. Identify the faulty component.

For example:

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid                Severity
-----
2010-08-11/14:54:23 59654226-50d3-cdc6-9f09-e591f39792ca SPT-8000-LC         Critical

Fault class : fault.chassis.power.volt-fail

Description : A Power Supply voltage level has exceeded acceptable limits.
.
.
.
faultmgmtsp>
```

Check the `Fault class` and `Description` fields for more information.

If the motherboard is faulty, replace it. See [“Remove the Motherboard” on page 248](#).

5. Exit the Oracle ILOM `faultmgmt` shell:

```
faultmgmtsp> exit
->
```

6. Within the Oracle ILOM interface, verify the presence of the motherboard:

```
-> show /SYS/MB type
/SYS/MB
Properties:
    type = Motherboard
->
```

If the motherboard does not report its presence, replace it. See [“Remove the Motherboard” on page 248](#).

7. If you are unable to determine if the motherboard is faulty, seek further information.

See [“Detecting and Managing Faults” on page 9](#).

Related Information

- [“Remove the Motherboard” on page 248](#)
- [“Install the Motherboard” on page 250](#)

- [“Verify the Motherboard” on page 253](#)
 - [“Detecting and Managing Faults” on page 9](#)
-

▼ Remove the Motherboard

Removing the motherboard is a cold-service operation. You must power off the server before you remove the motherboard.

1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 63](#).
- If you are removing the motherboard as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Remove all fans.

See [“Remove a Fan Module” on page 86](#).

3. Remove the hard drive fan.

See [“Remove the Hard Drive Fan” on page 118](#).

4. Remove the DVD tray.

See [“Remove the DVD Tray” on page 147](#).

5. Remove the signal interface board.

See [“Remove the Signal Interface Board” on page 204](#).

6. Remove the PCIe2 mezzanine board.

See [“Remove the PCIe2 Mezzanine Board” on page 172](#).

7. Remove the PCIe2 riser cards.

See [“Remove a PCIe2 Riser Card” on page 182](#).

8. Remove all cables from the motherboard.

9. Remove the DIMMs.

See [“Remove a DIMM” on page 215](#).

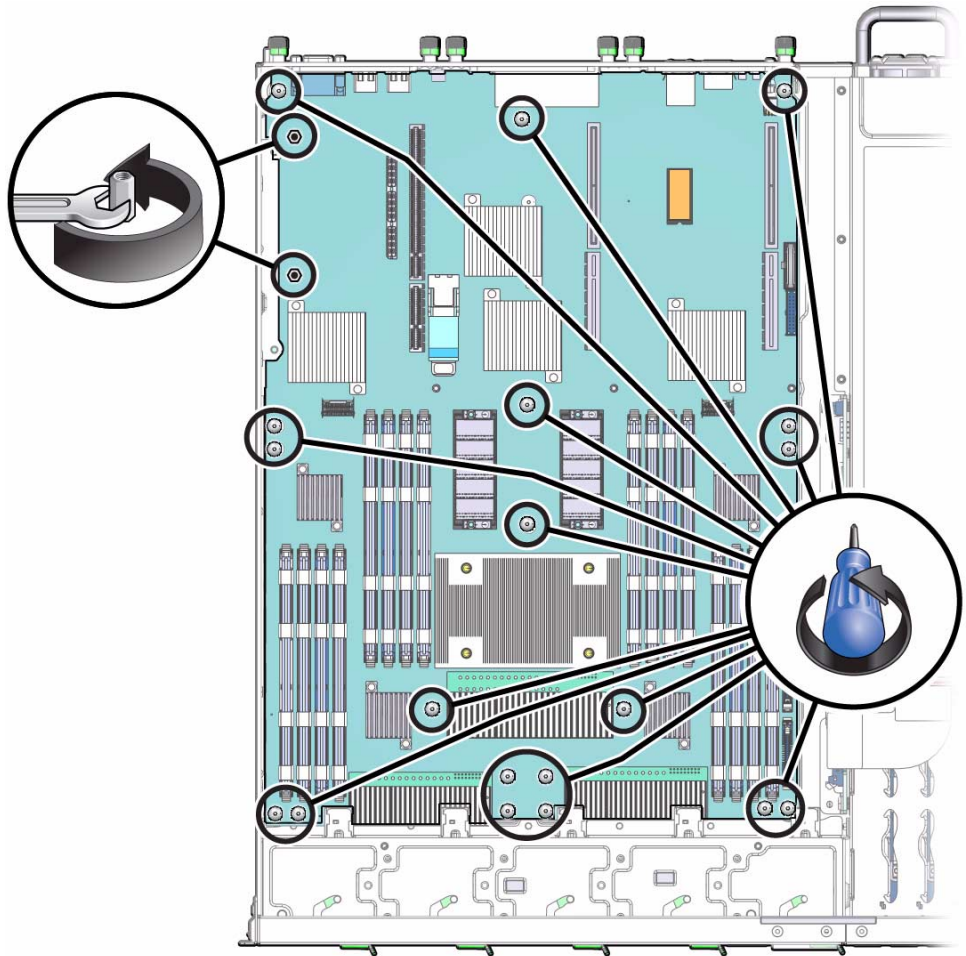
10. Remove the SP.

See [“Remove the SP” on page 231](#).

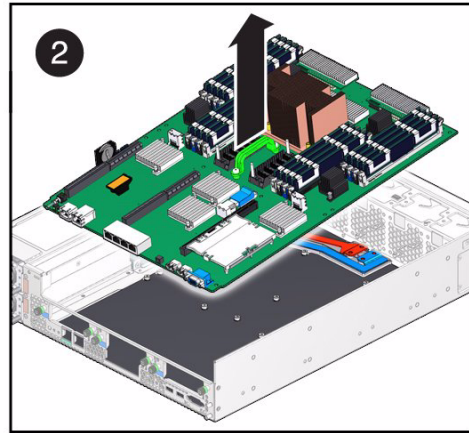
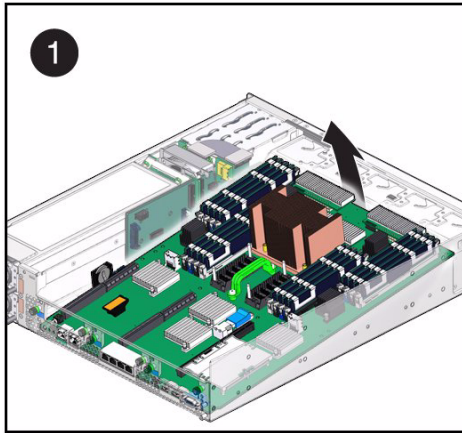
11. Remove the ID PROM.

See [“Remove the ID PROM” on page 239](#).

12. Remove the 15 screws and 2 standoffs securing the motherboard to the chassis.



13. Lift the front edge of the motherboard up and off of the standoffs (pane 1).



14. Lift the entire motherboard out of the chassis and set the motherboard aside (pane 2).

15. Consider your next steps:

- If you removed the motherboard as part of a replacement operation, install a new motherboard. See [“Install the Motherboard” on page 250](#).
- If you removed the motherboard as part of another component’s removal or installation procedure, return to that procedure. See [“Component FRU Names and Service Links” on page 67](#) for assistance.

Related Information

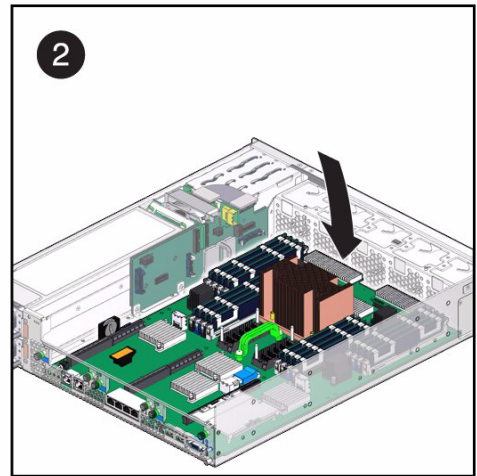
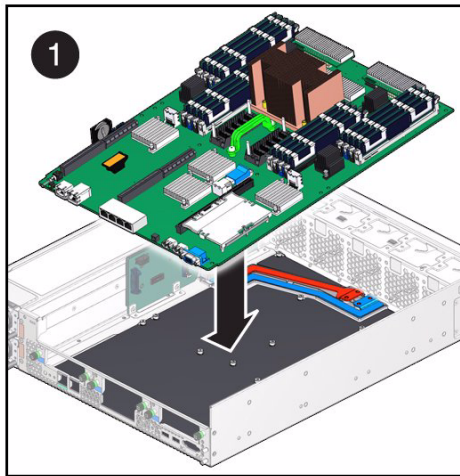
- [“Determine if the Motherboard Is Faulty” on page 245](#)
- [“Install the Motherboard” on page 250](#)
- [“Verify the Motherboard” on page 253](#)
- [“Preparing for Service” on page 63](#)
- [“Returning the Server to Operation” on page 255](#)

▼ Install the Motherboard

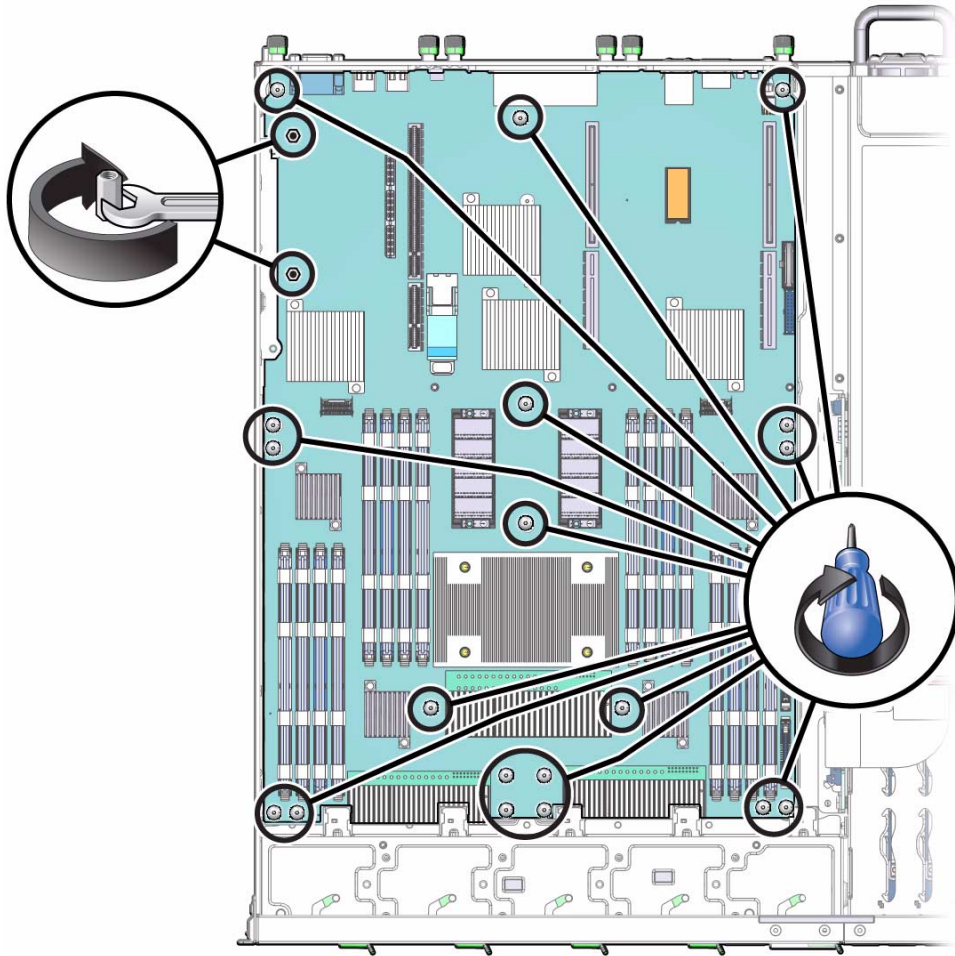
Installing the motherboard is a cold-service operation. You must power off the server before installing the motherboard.

1. Consider your first steps:

- If you are replacing a motherboard, remove the faulty or obsolete motherboard first, then return to this procedure, [Step 2](#). See [“Remove the Motherboard” on page 248](#).
 - If you are installing the motherboard as part of another component’s removal or installation procedure, go to [Step 2](#).
2. **Align the motherboard to the location where it installs into the chassis.**
The components point up, and the connectors are at the rear of the chassis.
 3. **Insert the rear of the motherboard into the rear panel of the chassis (pane 1).**



4. **Pivot the motherboard down and onto the standoffs (pane 2).**
5. **Align the holes in the motherboard to the ridges of the standoffs.**
6. **Install the 15 screws and 2 standoffs into the motherboard.**



Do not tighten the screws at this time.

7. Tighten the screws, working from the center of the motherboard to the outer periphery.

Securely tighten the bus bar screws.

8. Install the ID PROM.

See [“Install the ID PROM” on page 241.](#)

9. Install the SP.

See [“Install the SP” on page 233.](#)

10. Install the DIMMs.

See [“Install a DIMM” on page 217.](#)

11. **Install all cables to the motherboard.**
12. **Install the PCIe2 riser cards.**
See [“Install a PCIe2 Riser Card”](#) on page 184.
13. **Install the PCIe2 mezzanine board.**
See [“Install the PCIe2 Mezzanine Board”](#) on page 175.
14. **Install the signal interface board.**
See [“Install the Signal Interface Board”](#) on page 206.
15. **Install the DVD tray.**
See [“Install the DVD Tray”](#) on page 150.
16. **Install the hard drive fan.**
See [“Install the Hard Drive Fan”](#) on page 119.
17. **Install the fans.**
See [“Install a Fan Module”](#) on page 88.
18. **Finish the installation procedure.**
See:
 - [“Returning the Server to Operation”](#) on page 255
 - [“Verify the Motherboard”](#) on page 253

Related Information

- [“Determine if the Motherboard Is Faulty”](#) on page 245
- [“Remove the Motherboard”](#) on page 248
- [“Verify the Motherboard”](#) on page 253
- [“Preparing for Service”](#) on page 63
- [“Returning the Server to Operation”](#) on page 255

▼ Verify the Motherboard

After you install a motherboard, you can verify its functionality.

1. Reset the motherboard:

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

->
```

2. Verify that the motherboard is no longer considered faulty, then return to this procedure.

See [“Determine if the Motherboard Is Faulty”](#) on page 245.

3. Verify the presence of the motherboard:

```
-> show /SYS/MB type
/SYS/MB
  Properties:
    type = Motherboard

->
```

Related Information

- [“Determine if the Motherboard Is Faulty”](#) on page 245
- [“Remove the Motherboard”](#) on page 248
- [“Install the Motherboard”](#) on page 250

Returning the Server to Operation

These topics explain how to return the Netra SPARC T3-1 server from Oracle to operation after you perform service procedures.

- [“Install the Top Cover” on page 255](#)
- [“Connect Power Cords to the Server” on page 257](#)
- [“Power On the Server \(Oracle ILOM\)” on page 257](#)
- [“Power On the Server \(Power Button\)” on page 258](#)

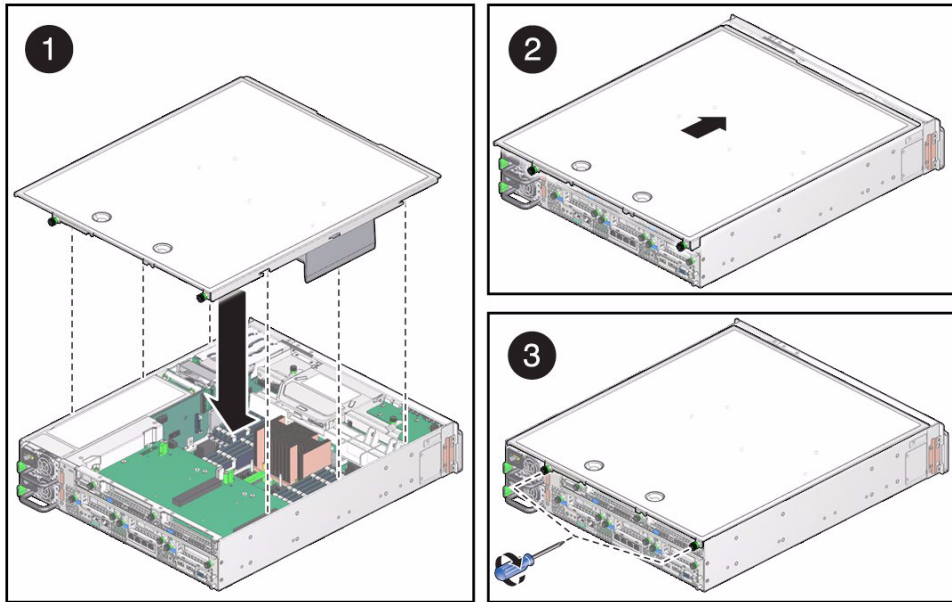
Related Information

- [“Identifying Components” on page 1](#)
- [“Detecting and Managing Faults” on page 9](#)
- [“Preparing for Service” on page 63](#)

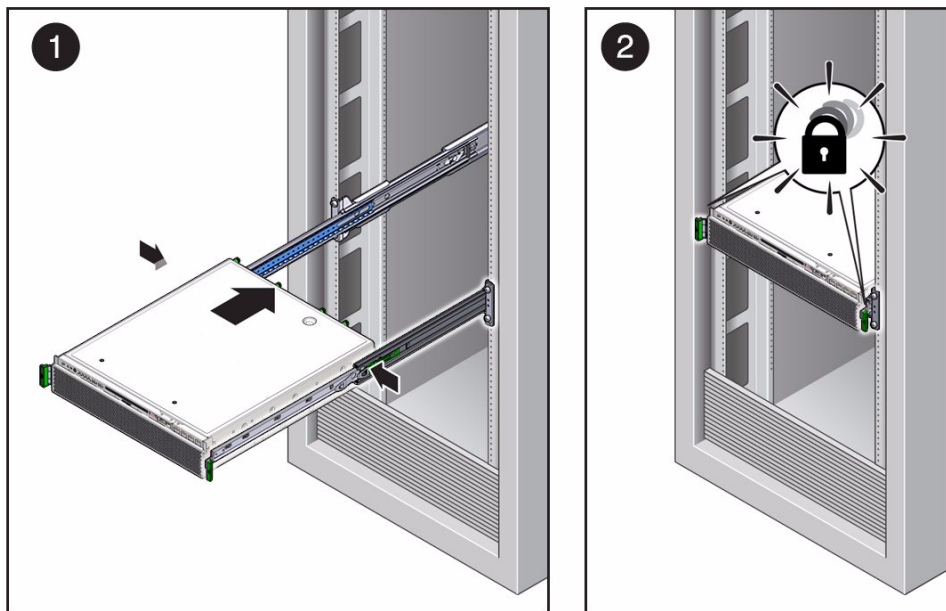
▼ Install the Top Cover

Perform this task when you have previously removed the top cover.

1. **Fit the top cover over the chassis and slide the cover into place.**



2. Secure the top cover with the two captive screws.
3. Release the slide rail latches and guide the server back into the rack until the rails click into position.



4. **Reconnect all cables to the rear of the server.**

5. **Connect the power cords to the server.**

See [“Connect Power Cords to the Server”](#) on page 257.

6. **Power on the server.**

See [“Power On the Server \(Oracle ILOM\)”](#) on page 257 or [“Power On the Server \(Power Button\)”](#) on page 258.

Related Information

- [“Remove the Top Cover”](#) on page 73
- [“Connect Power Cords to the Server”](#) on page 257
- [“Power On the Server \(Oracle ILOM\)”](#) on page 257
- [“Power On the Server \(Power Button\)”](#) on page 258

▼ Connect Power Cords to the Server

- **Reconnect the power cords to the power supplies.**

Note – As soon as the power cords are connected, standby power is applied. Depending on how the firmware is configured, the system might boot at this time.

Related Information

- [“Install the Top Cover”](#) on page 255
- [“Power On the Server \(Oracle ILOM\)”](#) on page 257
- [“Power On the Server \(Power Button\)”](#) on page 258

▼ Power On the Server (Oracle ILOM)

- **At the SP prompt, type:**

```
-> start /SYS
```

Related Information

- [“Install the Top Cover” on page 255](#)
- [“Connect Power Cords to the Server” on page 257](#)
- [“Power On the Server \(Power Button\)” on page 258](#)

▼ **Power On the Server (Power Button)**

- **Momentarily press and release the Power button on the front panel.**

See [“Front Components and LEDs” on page 14](#) for the location of the Power button.

Related Information

- [“Install the Top Cover” on page 255](#)
- [“Connect Power Cords to the Server” on page 257](#)
- [“Power On the Server \(Oracle ILOM\)” on page 257](#)

Glossary

A

- ACPI** Advanced configuration and power interface.
- ASR** Automatic system recovery.
- AWG** American wire gauge.

B

- BIOS** Basic input/output system.
- BMC** Baseboard management controller.

C

- CLI** Command-line interface.
- CMA** Cable management arm, used to route and secure cables extending from the rear of the system.
- CTS** Clear To Send.

D

DB-15	15-pin D-subminiature connector.
DDR3	Double-data rate three.
DHCP	Dynamic Host Configuration Protocol.
DIMM	Dual in-line memory module.
DR	Dual-rank DIMM.

E

ECC	Error correction code.
EMI	Electromagnetic interference.
ESD	Electrostatic discharge.

F

G

GRUB	GNU grand unified bootloader. An open source boot loader.
-------------	---

H

HBA	Host bus adapter.
------------	-------------------

I

IME	Integrated mirror enhanced array.
IPMI	Intelligent platform management interface.
IS	Integrated striping array.

K

KVM	Keyboard, video, mouse. Refers to using a switch to enable sharing of one keyboard, one display, and one mouse with more than one computer.
------------	---

L

LED	Light- emitting diode.
------------	------------------------

M

MAC or MAC address	Media access controller address.
---------------------------	----------------------------------

N

NEBS	Network Equipment-Building Standards. Defined standards for equipment to be installed in a telecommunications central office. Telecordia maintains these standards and tests equipment for NEBS certification.
NET MGT	Network management port. After connecting a network cable to this NET MGT port, you can configure the system Oracle ILOM SP through this port.
NIC	Network interface card.
NTP	Network Time Protocol.

NVRAM Nonvolatile random access memory.

O

OBP OpenBoot Prom.

Oracle ILOM Oracle Integrated Lights Out Manager. Oracle ILOM firmware is preinstalled on a variety of Oracle systems. Oracle ILOM enables you to remotely manage your Oracle servers regardless of the state of the host system.

Oracle VTS Oracle Validation Test Suite. Oracle VTS software is an Oracle hardware validation test based on the Solaris Operating System. The suite's multiple hardware diagnostic tests verify the functionality of most hardware controllers and devices for SPARC and x86 architecture based systems. Oracle VTS 7.0 is the first version of this software and supersedes the SunVTS suites.

OSP Outside plant

OS Operating system.

OVM Oracle VM Server for SPARC.

P

PCIe2 Peripheral Component Interconnect Express 2.0. Refers to cards or slots that support the PCI Express 2.0 specification.

PDB Power distribution board.

POST Power-on self-test.

PSH Predictive self-healing.

PSU Power supply unit.

PXE Preboot execution environment.

Q

QSFP Quad small form-factor pluggable.

R

RAID Redundant array of independent disks.

RAS Reliability, availability, and serviceability.

RIS Remote installation services.

RPM Rotations per minute.

RTS Request To Send.

S

SAS Serial-attached SCSI.

SATA Serial advanced technology attachment.

SCC System configuration card.

SCSI Small computer system interface.

SER MGT Serial management port. The default port for system management, especially during the initial system configuration.

SFF Small form factor.

S.M.A.R.T. Self-monitoring, analysis, and reporting technology.

SP Service processor.

SR DIMM Single-rank DIMM.

SSD Solid-state drive.

SSH Secure shell.

STP Shielded twisted pair.

SunVTS Sun Validation Test Suite. SunVTS software runs through version 6.x. The SunVTS software is superseded by the Oracle VTS 7.0 software.

T

TCG Trusted Computing Group.

TPM Trusted platform module. For more information, refer to the Microsoft Windows Trusted Platform Module Management documentation.

U

UI User interface.

UUID Universal unique identifier.

USB Universal serial bus.

US NEC United States National Electrical Code. A United States standard for the installation of electrical wiring and equipment.

V

VAC Volts of alternating current.

VDC Volts of direct (continuous) current.

VGA Video graphics array.

VT-d Virtualization technology for directed I/O.

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