

Netra SPARC T4-1 Server

Service Manual



Part No.: E23206-04
August 2013

Copyright © 2011, 2012, 2013, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related software documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT END USERS. Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Copyright © 2011, 2012, 2013, Oracle et/ou ses affiliés. Tous droits réservés.

Ce logiciel et la documentation qui l'accompagne sont protégés par les lois sur la propriété intellectuelle. Ils sont concédés sous licence et soumis à des restrictions d'utilisation et de divulgation. Sauf disposition de votre contrat de licence ou de la loi, vous ne pouvez pas copier, reproduire, traduire, diffuser, modifier, breveter, transmettre, distribuer, exposer, exécuter, publier ou afficher le logiciel, même partiellement, sous quelque forme et par quelque procédé que ce soit. Par ailleurs, il est interdit de procéder à toute ingénierie inverse du logiciel, de le désassembler ou de le décompiler, excepté à des fins d'interopérabilité avec des logiciels tiers ou tel que prescrit par la loi.

Les informations fournies dans ce document sont susceptibles de modification sans préavis. Par ailleurs, Oracle Corporation ne garantit pas qu'elles soient exemptes d'erreurs et vous invite, le cas échéant, à lui en faire part par écrit.

Si ce logiciel, ou la documentation qui l'accompagne, est concédé sous licence au Gouvernement des Etats-Unis, ou à toute entité qui délivre la licence de ce logiciel ou l'utilise pour le compte du Gouvernement des Etats-Unis, la notice suivante s'applique :

U.S. GOVERNMENT END USERS. Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

Ce logiciel ou matériel a été développé pour un usage général dans le cadre d'applications de gestion des informations. Ce logiciel ou matériel n'est pas conçu ni n'est destiné à être utilisé dans des applications à risque, notamment dans des applications pouvant causer des dommages corporels. Si vous utilisez ce logiciel ou matériel dans le cadre d'applications dangereuses, il est de votre responsabilité de prendre toutes les mesures de secours, de sauvegarde, de redondance et autres mesures nécessaires à son utilisation dans des conditions optimales de sécurité. Oracle Corporation et ses affiliés déclinent toute responsabilité quant aux dommages causés par l'utilisation de ce logiciel ou matériel pour ce type d'applications.

Oracle et Java sont des marques déposées d'Oracle Corporation et/ou de ses affiliés. Tout autre nom mentionné peut correspondre à des marques appartenant à d'autres propriétaires qu'Oracle.

Intel et Intel Xeon sont des marques ou des marques déposées d'Intel Corporation. Toutes les marques SPARC sont utilisées sous licence et sont des marques ou des marques déposées de SPARC International, Inc. AMD, Opteron, le logo AMD et le logo AMD Opteron sont des marques ou des marques déposées d'Advanced Micro Devices. UNIX est une marque déposée d'The Open Group.

Ce logiciel ou matériel et la documentation qui l'accompagne peuvent fournir des informations ou des liens donnant accès à des contenus, des produits et des services émanant de tiers. Oracle Corporation et ses affiliés déclinent toute responsabilité ou garantie expresse quant aux contenus, produits ou services émanant de tiers. En aucun cas, Oracle Corporation et ses affiliés ne sauraient être tenus pour responsables des pertes subies, des coûts occasionnés ou des dommages causés par l'accès à des contenus, produits ou services tiers, ou à leur utilisation.



Contents

Using This Documentation xi

Identifying Components 1

Power Supply, Hard Drive, and Fan Module Locations 2

Top Cover, Filter Tray, and DVD Tray Locations 4

Motherboard, DIMMs, and PCI Board Locations 6

Front Panel Components 7

Rear Panel Components 9

Detecting and Managing Faults 11

Diagnostics Overview 11

Diagnostics Process 13

Interpreting Diagnostic LEDs 16

Front Panel LEDs 17

Rear Panel LEDs 19

Managing Faults (Oracle ILOM) 21

Oracle ILOM Troubleshooting Overview 21

▼ Access the SP (Oracle ILOM) 23

▼ Display FRU Information (`show Command`) 25

▼ Check for Faults (`show faulty Command`) 26

▼ Check for Faults (`fmadm faulty Command`) 27

▼ Clear Faults (`clear_fault_action Property`) 28

Service-Related Oracle ILOM Commands 30

Understanding Fault Management Commands	32
No Faults Detected Example	32
Power Supply Fault Example (show faulty Command)	33
Power Supply Fault Example (fmadm faulty Command)	34
POST-Detected Fault Example (show faulty Command)	35
PSH-Detected Fault Example (show faulty Command)	36
Interpreting Log Files and System Messages	37
▼ Check the Message Buffer	37
▼ View System Message Log Files	38
Checking if Oracle VTS Is Installed	38
Oracle VTS Overview	39
▼ Check if Oracle VTS Is Installed	40
Managing Faults (POST)	40
POST Overview	41
Oracle ILOM Properties That Affect POST Behavior	42
▼ Configure POST	44
▼ Run POST With Maximum Testing	45
▼ Interpret POST Fault Messages	46
▼ Clear POST-Detected Faults	47
POST Output Reference	48
Managing Faults (PSH)	50
PSH Overview	51
PSH-Detected Fault Example	52
▼ Check for PSH-Detected Faults	53
▼ Clear PSH-Detected Faults	54
Managing Components (ASR)	56
ASR Overview	56
▼ Display System Components	57

- ▼ Disable System Components 58
- ▼ Enable System Components 59

Preparing for Service 61

Safety Information 61

Safety Symbols 62

ESD Measures 62

Antistatic Wrist Strap Use 63

Antistatic Mat 63

Tools Needed for Service 63

Filler Panels 64

▼ Find the Server Serial Number 65

▼ Locate the Server 66

Component Service Task Reference 67

Removing Power From the Server 68

▼ Prepare to Power Off the Server 69

▼ Power Off the Server (SP Command) 69

▼ Power Off the Server (Power Button - Graceful) 70

▼ Power Off the Server (Emergency Shutdown) 70

▼ Disconnect Power Cords 71

Accessing Internal Components 71

▼ Prevent ESD Damage 72

▼ Remove the Top Cover 73

Servicing the Air Filter 77

▼ Remove the Air Filter 77

▼ Install the Air Filter 79

Servicing Fan Modules 83

Fan Module LEDs 84

- ▼ Locate a Faulty Fan Module 84
- ▼ Remove a Fan Module 87
- ▼ Install a Fan Module 89
- ▼ Verify a Fan Module 90

Servicing Power Supplies 93

Power Supply LEDs 94

- ▼ Locate a Faulty Power Supply 94
- ▼ Remove a Power Supply 97
- ▼ Install a Power Supply 100
- ▼ Verify a Power Supply 102

Servicing Hard Drives 105

Hard Drive LEDs 106

- ▼ Locate a Faulty Hard Drive 107
- ▼ Remove a Hard Drive 108
- ▼ Install a Hard Drive 112
- ▼ Verify a Hard Drive 114

Servicing the Hard Drive Fan 117

- ▼ Determine if the Hard Drive Fan Is Faulty 118
- ▼ Remove the Hard Drive Fan 120
- ▼ Install the Hard Drive Fan 121
- ▼ Verify the Hard Drive Fan 123

Servicing the Hard Drive Backplane 125

- ▼ Determine if the Hard Drive Backplane Is Faulty 125
- ▼ Remove the Hard Drive Backplane 127
- ▼ Install the Hard Drive Backplane 130
- ▼ Verify the Hard Drive Backplane 132

Servicing the Power Distribution Board 133

- ▼ Determine if the Power Distribution Board Is Faulty 134
- ▼ Remove the Power Distribution Board 135
- ▼ Install the Power Distribution Board 137
- ▼ Verify the Power Distribution Board 139

Servicing the DVD Drive 141

- ▼ Determine if the DVD Drive Is Faulty 141
- ▼ Remove the DVD Drive 143
- ▼ Install the DVD Drive 145
- ▼ Verify the DVD Drive 147

Servicing the DVD Tray 149

- ▼ Remove the DVD Tray 149
- ▼ Install the DVD Tray 152

Servicing the LED Board 155

- ▼ Determine if the LED Board Is Faulty 155
- ▼ Remove the LED Board 157
- ▼ Install the LED Board 158
- ▼ Verify the LED Board 160

Servicing the Fan Board 161

- ▼ Determine if the Fan Board Is Faulty 162
- ▼ Remove the Fan Board 164
- ▼ Install the Fan Board 167
- ▼ Verify the Fan Board 170

Servicing the PCIe2 Mezzanine Board 171

- ▼ Determine if the PCIe2 Mezzanine Board Is Faulty 172
- ▼ Remove the PCIe2 Mezzanine Board 174

- ▼ Install the PCIe2 Mezzanine Board 177
- ▼ Verify the PCIe2 Mezzanine Board 179

Servicing PCIe2 Riser Cards 181

- ▼ Locate a Faulty PCIe2 Riser Card 182
- ▼ Remove a PCIe2 Riser Card 184
- ▼ Install a PCIe2 Riser Card 186
- ▼ Verify a PCIe2 Riser Card 188

Servicing PCIe2 Cards 189

- ▼ Locate a Faulty PCIe2 Card 190
- ▼ Remove a PCIe2 Card From the PCIe2 Mezzanine Board 193
- ▼ Remove a PCIe2 Card From the PCIe2 Riser Card 195
- ▼ Install a PCIe2 Card Into the PCIe2 Mezzanine Board 196
- ▼ Install a PCIe2 Card Into the PCIe2 Riser Card 198
- ▼ Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal 200
- ▼ Verify a PCIe2 Card 202

Servicing the Signal Interface Board 205

- ▼ Determine if the Signal Interface Board Is Faulty 206
- ▼ Remove the Signal Interface Board 208
- ▼ Install the Signal Interface Board 210
- ▼ Verify the Signal Interface Board 212

Servicing DIMMs 215

- DIMM Configuration 216
- DIMM LEDs 217
- ▼ Locate a Faulty DIMM 217
- ▼ Remove a DIMM 220
- ▼ Install a DIMM 221

- ▼ Verify a DIMM 223

Servicing the Battery 225

- ▼ Determine if the Battery Is Faulty 225
- ▼ Remove the Battery 227
- ▼ Install the Battery 229
- ▼ Verify the Battery 231

Servicing the SP 233

- ▼ Determine if the SP Is Faulty 234
- ▼ Remove the SP 236
- ▼ Install the SP 238
- ▼ Verify the SP 240

Servicing the ID PROM 243

- ▼ Determine if the ID PROM Is Faulty 244
- ▼ Remove the ID PROM 246
- ▼ Install the ID PROM 248
- ▼ Verify the ID PROM 249

Servicing the Motherboard 251

- ▼ Determine if the Motherboard Is Faulty 251
- ▼ Remove the Motherboard 254
- ▼ Install the Motherboard 256
- ▼ Verify the Motherboard 259

Returning the Server to Operation 261

- ▼ Install the Top Cover 261
- ▼ Connect Power Cords 263
- ▼ Power On the Server (Oracle ILOM) 263
- ▼ Power On the Server (Power Button) 264

Glossary 265

Index 271

Using This Documentation

This service manual explains how to replace parts in the Netra SPARC T4-1 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.

- “Product Notes” on page xi
- “Related Documentation” on page xii
- “Feedback” on page xii
- “Support and Accessibility” on page xii

Product Notes

For late-breaking information and known issues about this product, refer to the product notes at:

http://www.oracle.com/pls/topic/lookup?ctx=Netra_SPARCT4-1

Related Documentation

Documentation	Links
All Oracle products	http://www.oracle.com/documentation
Netra SPARC T4-1 server	http://www.oracle.com/pls/topic/lookup?ctx=Netra_SPARCT4-1
Oracle Solaris OS and other systems software	http://www.oracle.com/technetwork/indexes/documentation/index.html#sys_sw
Oracle Integrated Lights Out Manager (Oracle ILOM) 3.0	http://www.oracle.com/pls/topic/lookup?ctx=ilom30
Oracle VTS 7.0	http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0

Feedback

Provide feedback on this documentation at:

<http://www.oracle.com/goto/docfeedback>

Support and Accessibility

Description	Links
Access electronic support through My Oracle Support	http://support.oracle.com
	For hearing impaired: http://www.oracle.com/accessibility/support.html
Learn about Oracle's commitment to accessibility	http://www.oracle.com/us/corporate/accessibility/index.html

Identifying Components

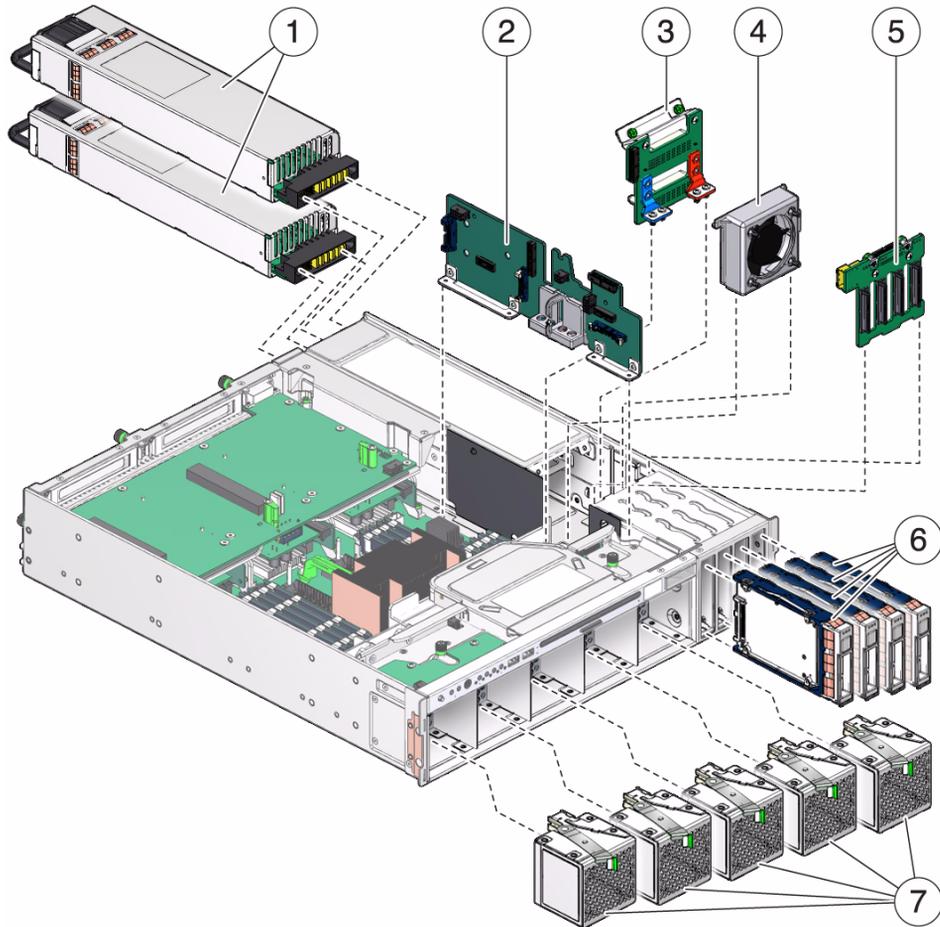
These topics identify key components of the server and provide links to the service procedures.

- [“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
- [“Front Panel Components”](#) on page 7
- [“Rear Panel Components”](#) on page 9

Related Information

- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

Power Supply, Hard Drive, and Fan Module Locations



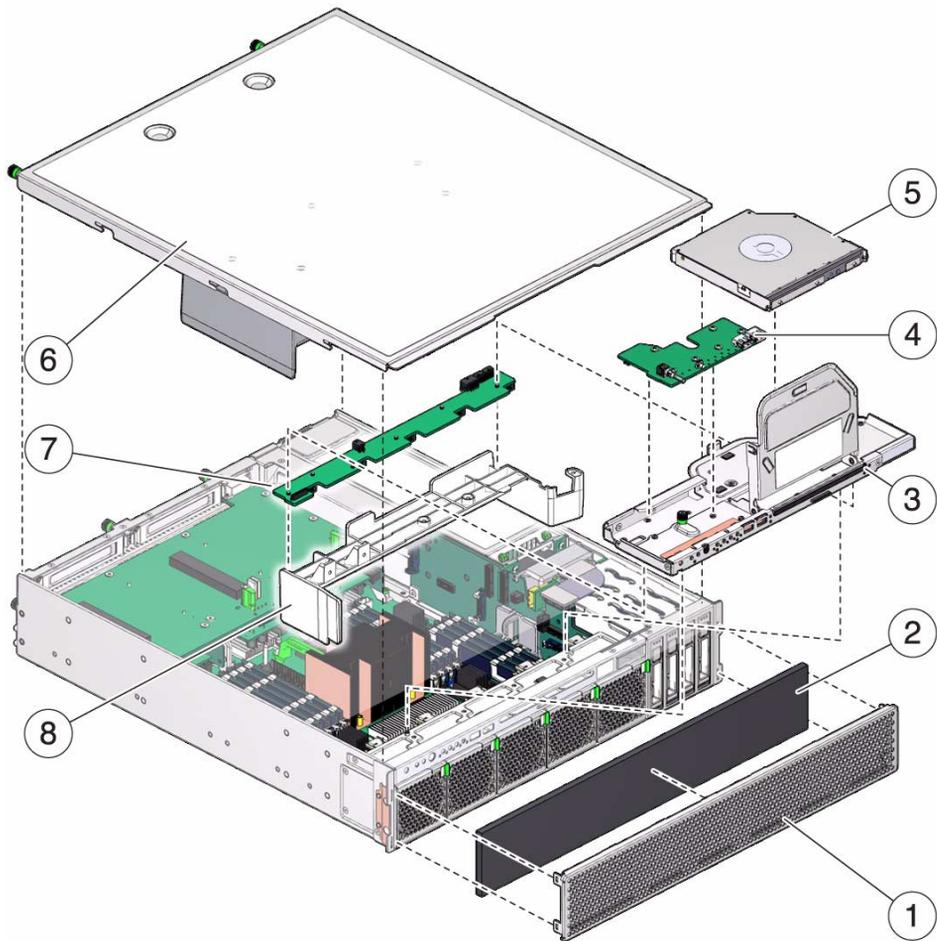
No.	Name	Service Link
1	Power supply	“Servicing Power Supplies” on page 93
2	Signal interface board	“Servicing the Signal Interface Board” on page 205
3	Power distribution board	“Servicing the Power Distribution Board” on page 133
4	Hard drive fan	“Servicing the Hard Drive Fan” on page 117

No.	Name	Service Link
5	Hard drive backplane	“Servicing the Hard Drive Backplane” on page 125
6	Hard drive	“Servicing Hard Drives” on page 105
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](#)
- [“Front Panel Components” on page 7](#)
- [“Rear Panel Components” on page 9](#)
- [“Component Service Task Reference” on page 67](#)

Top Cover, Filter Tray, and DVD Tray Locations



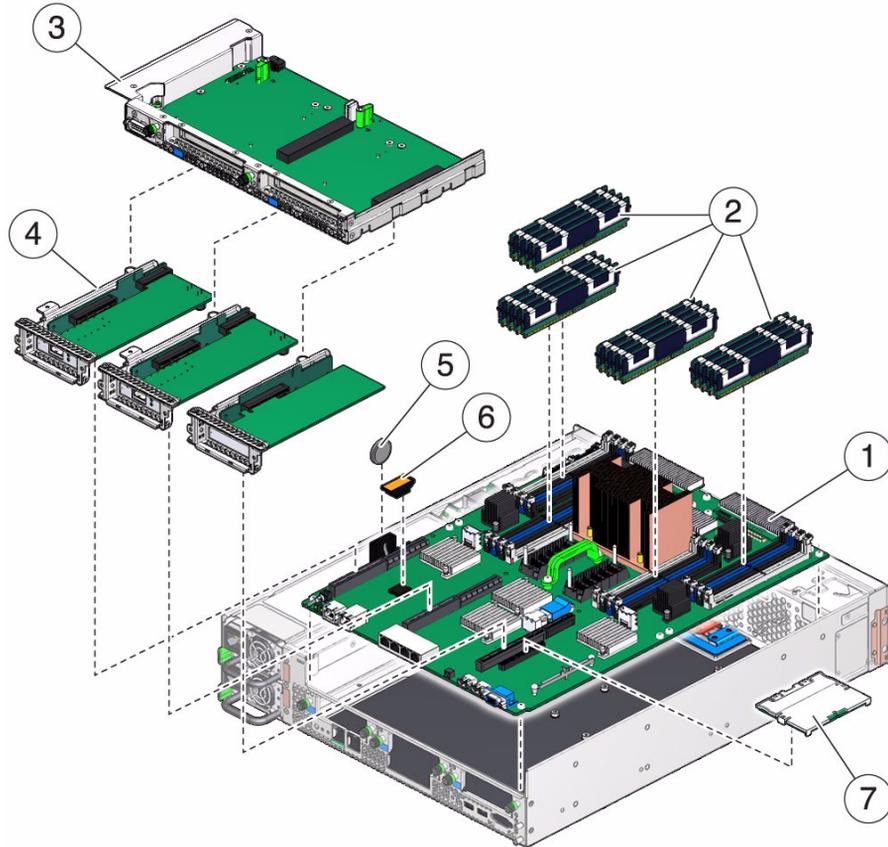
No.	Name	Service Link
1	Filter tray	"Servicing the Air Filter" on page 77
2	Air filter	"Servicing the Air Filter" on page 77
3	DVD bracket	"Servicing the DVD Tray" on page 149

No.	Name	Service Link
4	LED board	"Servicing the LED Board" on page 155
5	DVD drive	"Servicing the DVD Drive" on page 141
6	Top cover	"Remove the Top Cover" on page 73 "Install the Top Cover" on page 261
7	Fan board	"Servicing the Fan Board" on page 161
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](#)
- ["Front Panel Components" on page 7](#)
- ["Rear Panel Components" on page 9](#)
- ["Component Service Task Reference" on page 67](#)

Motherboard, DIMMs, and PCI Board Locations



No.	Name	Service Link
1	Motherboard	“Servicing the Motherboard” on page 251
2	DIMMs	“Servicing DIMMs” on page 215
3	PCIe2 mezzanine board	“Servicing the PCIe2 Mezzanine Board” on page 171
4	PCIe2 riser card	“Servicing PCIe2 Riser Cards” on page 181

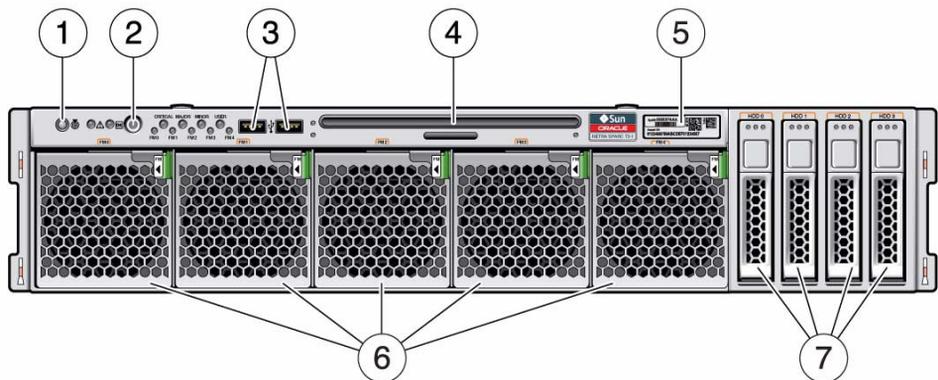
No.	Name	Service Link
5	Battery	“Servicing the Battery” on page 225
6	ID PROM	“Servicing the ID PROM” on page 243
7	SP	“Servicing the SP” on page 233

Related Information

- [“Power Supply, Hard Drive, and Fan Module Locations” on page 2](#)
- [“Top Cover, Filter Tray, and DVD Tray Locations” on page 4](#)
- [“Front Panel Components” on page 7](#)
- [“Rear Panel Components” on page 9](#)
- [“Component Service Task Reference” on page 67](#)

Front Panel Components

In this figure, the filter tray has been removed.

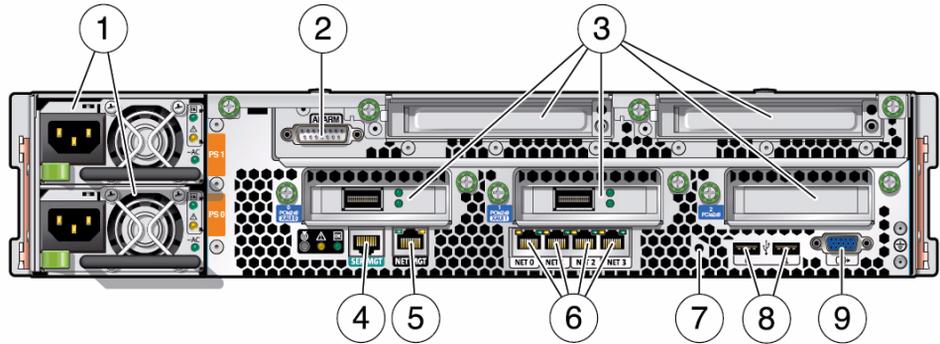


No.	Description	Links
1	Locator button	
2	Power button	“Power Off the Server (Power Button - Graceful)” on page 70 “Power On the Server (Power Button)” on page 264
3	USB 2.0 ports (USB3 - USB4, left to right)	
4	DVD drive	“Servicing the DVD Drive” on page 141
5	RFID module	
6	Fan modules (FM0 - FM4, left to right)	“Servicing Fan Modules” on page 83
7	Hard drives (HDD0 - HDD3, left to right)	“Servicing Hard Drives” on page 105

Related Information

- [“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](#)
- [“Front Panel LEDs” on page 17](#)
- [“Rear Panel Components” on page 9](#)

Rear Panel Components



No.	Description	Links
1	Power supplies (PS1 - PS0, top to bottom)	“Servicing Power Supplies” on page 93
2	Alarm port (DB-15)	“Servicing the PCIe2 Mezzanine Board” on page 171 Refer to <i>Server Installation</i> for port pin outs and signal descriptions.
3	Expansion slots 0 (left) and 1 (middle) (PCIe 2.0 x8 or XAU1) Expansion slots 2 (right), 3 and 4 (upper row) (PCIe 2.0 x8)	“Servicing the PCIe2 Mezzanine Board” on page 171 “Servicing PCIe2 Riser Cards” on page 181 “Servicing PCIe2 Cards” on page 189
4	SP SER MGT port (RJ-45)	Refer to <i>Server Installation</i> for port pin outs and signal descriptions.
5	SP NET MGT port (RJ-45)	Refer to <i>Server Installation</i> for port pin outs and signal descriptions.
6	Network 10/100/1000 ports (NET0 - NET3, left to right)	Refer to <i>Server Installation</i> for port pin outs and signal descriptions.
7	Physical Presence button access hole	
8	USB 2.0 ports (USB0 - USB1, left to right)	Refer to <i>Server Installation</i> for port pin outs and signal descriptions.
9	Video connector (HD-15)	Refer to <i>Server Installation</i> for video port pin outs and signal descriptions.

Related Information

- “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
- “Rear Panel LEDs” on page 19
- “Front Panel Components” on page 7

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 11
- [“Diagnostics Process”](#) on page 13
- [“Interpreting Diagnostic LEDs”](#) on page 16
- [“Managing Faults \(Oracle ILOM\)”](#) on page 21
- [“Understanding Fault Management Commands”](#) on page 32
- [“Interpreting Log Files and System Messages”](#) on page 37
- [“Checking if Oracle VTS Is Installed”](#) on page 38
- [“Managing Faults \(POST\)”](#) on page 40
- [“Managing Faults \(PSH\)”](#) on page 50
- [“Managing Components \(ASR\)”](#) on page 56

Related Information

- [“Identifying Components”](#) on page 1
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

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 ILOM 3.0** – 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 configurable and works with Oracle ILOM to take faulty components offline if needed.
- **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 OS 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.

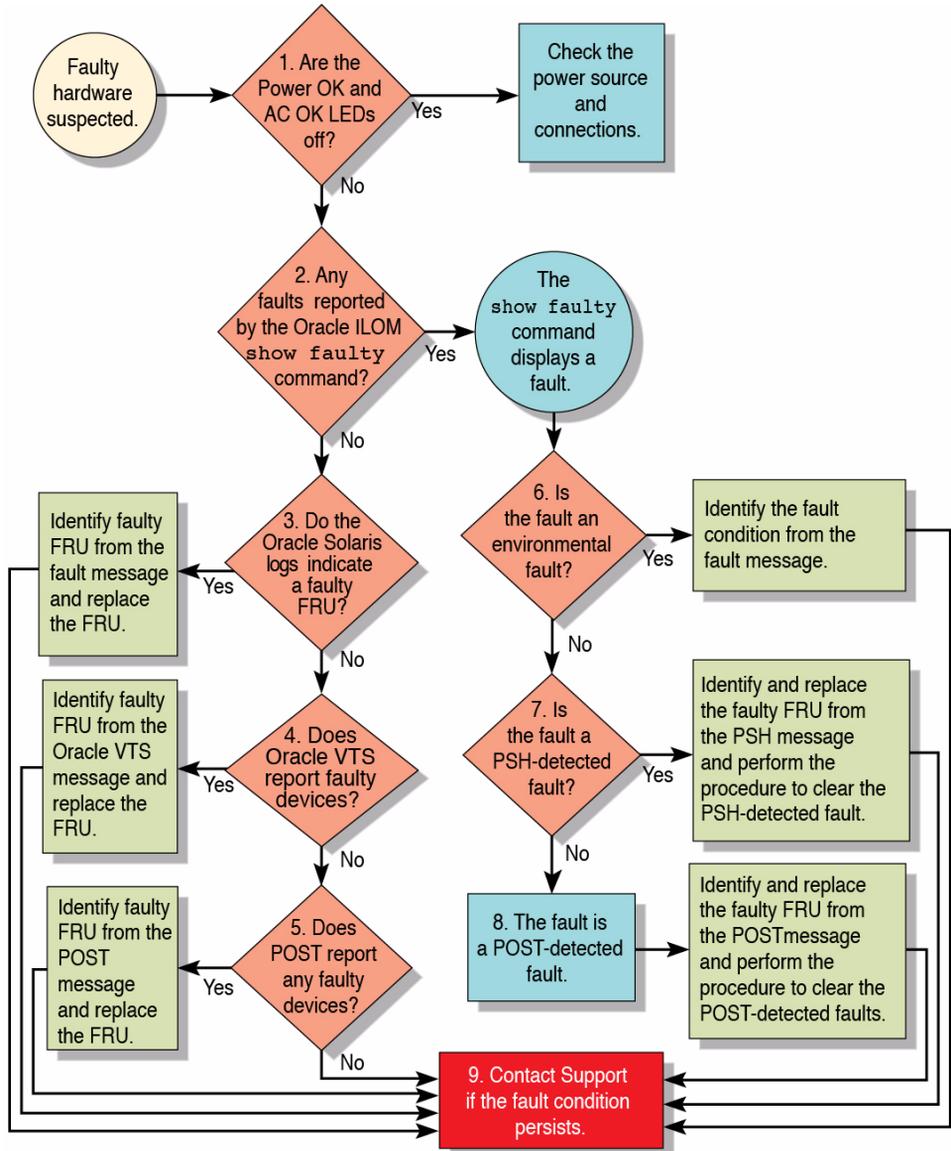
The diagnostic flowchart in [“Diagnostics Process” on page 13](#) illustrates an approach for using the server diagnostics to identify a faulty FRU. The diagnostics you use, and the order in which you use them, depend on the nature of the problem you are troubleshooting. So you might perform some actions and not others.

Related Information

- [“Diagnostics Process” on page 13](#)
- [“Interpreting Diagnostic LEDs” on page 16](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Understanding Fault Management Commands” on page 32](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Checking if Oracle VTS Is Installed” on page 38](#)
- [“Managing Faults \(POST\)” on page 40](#)
- [“Managing Faults \(PSH\)” on page 50](#)
- [“Managing Components \(ASR\)” on page 56](#)

Diagnostics Process

This flowchart illustrates the diagnostic process, using different diagnostic tools through a default sequence. See also the table that follows the flowchart.



Flowchart No.	Diagnostic Action	Possible Outcome	Additional Information
1.	Check Power OK and AC Present LEDs on the server.	If these LEDs are not on, check the power source and power connections to the server.	<ul style="list-style-type: none"> • “Interpreting Diagnostic LEDs” on page 16
2.	Run the Oracle ILOM <code>show faulty</code> command to check for faults.	<p>This command displays these kinds of faults:</p> <ul style="list-style-type: none"> • Environmental • PSH-detected • POST-detected <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 30 • “Check for Faults (show faulty Command)” on page 26
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 it. • For more diagnostic information, review the Oracle VTS report (see number 4). 	<ul style="list-style-type: none"> • “Interpreting Log Files and System Messages” on page 37
4.	Run the Oracle VTS software.	<ul style="list-style-type: none"> • If Oracle VTS reports a faulty device, replace it. • If Oracle VTS does not report a faulty device, run POST (see number 5). 	<ul style="list-style-type: none"> • “Checking if Oracle VTS Is Installed” on page 38
5.	Run POST.	POST performs basic tests of the server components and reports faulty FRUs.	<ul style="list-style-type: none"> • “Managing Faults (POST)” on page 40 • “Oracle ILOM Properties That Affect POST Behavior” on page 42
6.	Determine if the fault was detected by Oracle ILOM.	<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.</p>	<ul style="list-style-type: none"> • “Check for Faults (show faulty Command)” on page 26 • “Check for Faults (fmadm faulty Command)” on page 27

Flowchart			
Flowchart No.	Diagnostic Action	Possible Outcome	Additional Information
7.	Determine if the fault was detected by PSH.	<p>If the fault message does not begin with <i>SPT</i>, the fault was detected by PSH.</p> <p>For additional information on a reported fault, including corrective action, go to: http://support.oracle.com</p> <p>Search for the message ID contained in the fault message.</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 50 • “Clear PSH-Detected Faults” on page 54
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 this text in the fault message: <i>Forced fail 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"> • “POST-Detected Fault Example (show faulty Command)” on page 35 • “Managing Faults (POST)” on page 40 • “Clear POST-Detected Faults” on page 47
9.	Contact technical support.	<p>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 Oracle Support or go to: http://support.oracle.com</p>	

Related Information

- “Diagnostics Overview” on page 11
- “Interpreting Diagnostic LEDs” on page 16
- “Managing Faults (Oracle ILOM)” on page 21
- “Understanding Fault Management Commands” on page 32
- “Interpreting Log Files and System Messages” on page 37
- “Checking if Oracle VTS Is Installed” on page 38
- “Managing Faults (POST)” on page 40
- “Managing Faults (PSH)” on page 50
- “Managing Components (ASR)” on page 56

Interpreting Diagnostic LEDs

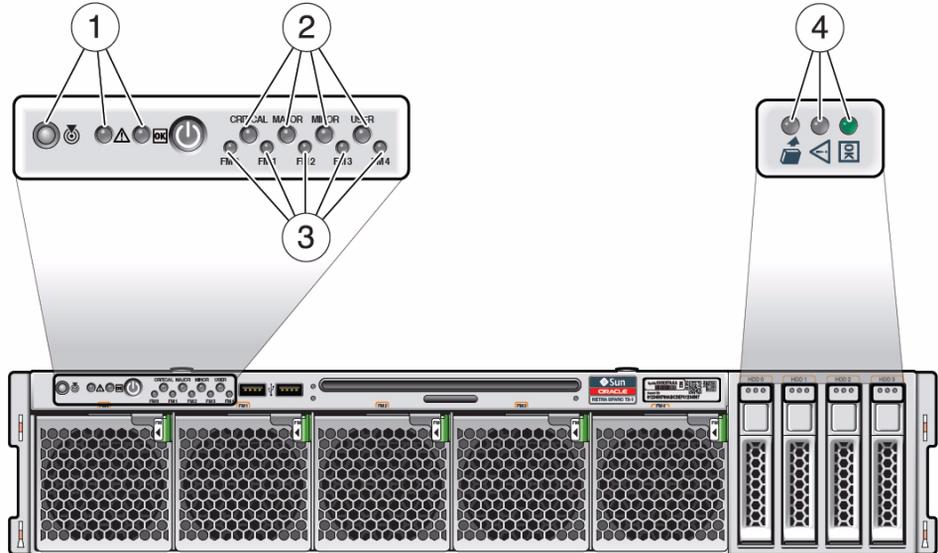
Use these diagnostic LEDs to determine if a component has failed in the server.

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

Related Information

- [“Identifying Components” on page 1](#)
- [“Diagnostics Overview” on page 11](#)
- [“Diagnostics Process” on page 13](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Understanding Fault Management Commands” on page 32](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Checking if Oracle VTS Is Installed” on page 38](#)
- [“Managing Faults \(POST\)” on page 40](#)
- [“Managing Faults \(PSH\)” on page 50](#)
- [“Managing Components \(ASR\)” on page 56](#)

Front Panel LEDs



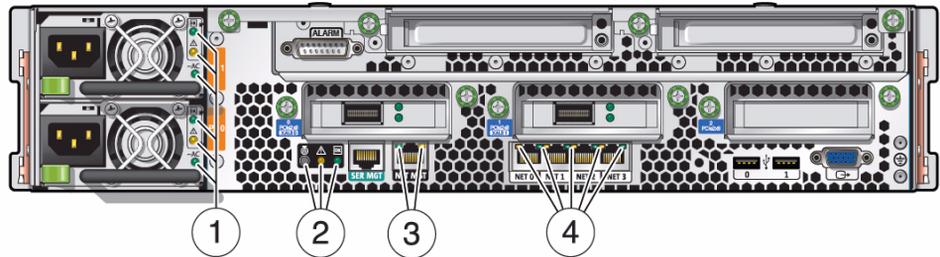
No.	LED	Description
1	Chassis Status LEDs	<p>Locator LED and button (left, white)</p> <p>The Locator LED can be turned on to identify a particular system. When on, the LED blinks rapidly. There are two methods for turning a Locator LED on:</p> <ul style="list-style-type: none"> • Typing the Oracle ILOM command <code>set /SYS/LOCATE value=Fast_Blink</code> • Pressing the Locator button <p>Service Action Required LED (center, amber)</p> <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>

No.	LED	Description
		<p>Main Power OK LED (right, green)</p> <p>Indicates these 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.
2	Alarm LEDs	<p>Critical Alarm LED (red) – Indicates a critical alarm condition.</p> <p>Major Alarm LED (red) – Indicates a major alarm condition.</p> <p>Minor Alarm LED (amber) – Indicates a minor alarm condition.</p> <p>User Alarm LED (amber) – Indicates a user alarm condition.</p>
3	Fan Status LEDs	<p>Fan module LEDs FM0 (left) to FM4 (right)</p> <p>Indicates the state of fan module FM0 to FM4:</p> <ul style="list-style-type: none"> • Green – Indicates a steady state, no service action is required. • Amber – Indicates a fault with the fan.
4	Hard Drive Status LEDs	<p>Ready to Remove LED (left, blue)</p> <p>Indicates that the drive can be removed during a hot-plug operation.</p> <p>Service Required LED (center, amber)</p> <p>Indicates that the drive has experienced a fault condition.</p> <p>OK/Activity LED (right, green)</p> <p>Indicates the drive's availability for use.</p> <ul style="list-style-type: none"> • On – Read or write activity is in progress. • Off – Drive is idle and available for use.

Related Information

- [“Front Panel Components” on page 7](#)
- [“Rear Panel LEDs” on page 19](#)

Rear Panel LEDs



No.	LED	Description
1	Power Supply Status LEDs	<p>Output Power OK LED (top, green) Indicates that output power is without fault.</p> <p>Service Action Required LED (middle, 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 <code>show faulty</code> command provides details about any faults that cause this indicator to light.</p> <p>AC or DC Input Power OK LED (bottom, green) Indicates that input power is without fault.</p>
2	Chassis Status LEDs	<p>Locator LED and button (left, 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:</p> <ul style="list-style-type: none"> • Typing the Oracle ILOM command <code>set /SYS/LOCATE value=Fast_Blink</code> • Pressing the Locator button <p>Service Action Required LED (center, amber) Indicates that service is required. POST and Oracle ILOM are two diagnostics 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.</p>

No.	LED	Description
		<p>Main Power OK LED (right, green)</p> <p>Indicates these 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.
3	Net Management LEDs	<p>Link and Activity LED (left, green)</p> <p>Indicates these conditions:</p> <ul style="list-style-type: none"> • On or blinking – A link is established. • Off – No link is established. <p>Speed LED (right, green)</p> <p>Indicates these conditions:</p> <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.
4	NET0 to NET3 Status LEDs	<p>Link and Activity LED (left, green)</p> <p>Indicates these conditions:</p> <ul style="list-style-type: none"> • On or blinking – A link is established. • Off – No link is established. <p>Speed LED (right)</p> <p>Indicates these conditions:</p> <ul style="list-style-type: none"> • Green – The link is operating as a Gigabit connection (1000 Mbps). • Amber – The link is operating as a 100-Mbps connection. • Off – The link is operating as a 10-Mbps connection or there is no link.

Related Information

- [“Rear Panel Components” on page 9](#)
- [“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 21
- [“Access the SP \(Oracle ILOM\)”](#) on page 23
- [“Display FRU Information \(show Command\)”](#) on page 25
- [“Check for Faults \(show faulty Command\)”](#) on page 26
- [“Check for Faults \(fmadm faulty Command\)”](#) on page 27
- [“Clear Faults \(clear_fault_action Property\)”](#) on page 28
- [“Service-Related Oracle ILOM Commands”](#) on page 30

Related Information

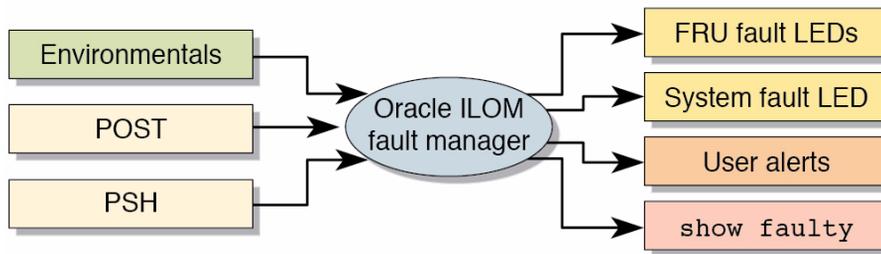
- [“Diagnostics Overview”](#) on page 11
- [“Diagnostics Process”](#) on page 13
- [“Interpreting Diagnostic LEDs”](#) on page 16
- [“Understanding Fault Management Commands”](#) on page 32
- [“Interpreting Log Files and System Messages”](#) on page 37
- [“Checking if Oracle VTS Is Installed”](#) on page 38
- [“Managing Faults \(POST\)”](#) on page 40
- [“Managing Faults \(PSH\)”](#) on page 50
- [“Managing Components \(ASR\)”](#) on page 56

Oracle ILOM Troubleshooting Overview

Oracle ILOM 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 PSH 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.

PSH 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 ILOM 3.0 documentation.

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 23
- “Display FRU Information (show Command)” on page 25
- “Check for Faults (show faulty Command)” on page 26
- “Check for Faults (fmadm faulty Command)” on page 27
- “Clear Faults (clear_fault_action Property)” on page 28
- “Service-Related Oracle ILOM Commands” on page 30

▼ 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 CLI.
- **Oracle ILOM web interface** – The Oracle ILOM web interface supports the same set of features and functions as the shell.

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 these 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 web interface.

3. Open an SSH session and connect to the SP by specifying its IP address.

The Oracle ILOM default username is `root`, and the default password is `changeme`.

```
% ssh root@xxx.xxx.xxx.xxx
...
Are you sure you want to continue connecting (yes/no) ? yes
...
Password: password (nothing displayed)

Oracle(R) Integrated Lights Out Manager

Version 3.0.12.x rxxxxx

Copyright (c) 2010 Oracle and/or its affiliates. All rights
reserved.

->
```

Note – To provide optimum server security, change the default server password.

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.

These Oracle ILOM commands are commonly used for fault management:

- `show command` – Displays information about individual FRUs. See “[Display FRU Information \(show Command\)](#)” on page 25.
- `show faulty command` – Displays environmental, POST-detected, and PSH-detected faults. See “[Check for Faults \(show faulty Command\)](#)” on page 26.

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 27.

- `clear_fault_action` **property of the set command** – Manually clears PSH-detected faults. See “[Clear Faults \(clear_fault_action Property\)](#)” on page 28.

Related Information

- “Oracle ILOM Troubleshooting Overview” on page 21
- “Display FRU Information (show Command)” on page 25
- “Check for Faults (show faulty Command)” on page 26
- “Check for Faults (fmadm faulty Command)” on page 27
- “Clear Faults (clear_fault_action Property)” on page 28
- “Service-Related Oracle ILOM Commands” on page 30

▼ Display FRU Information (show Command)

- At the Oracle ILOM prompt, type the `show` command.

In this 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 21

- “Access the SP (Oracle ILOM)” on page 23
- “Check for Faults (show faulty Command)” on page 26
- “Check for Faults (fmadm faulty Command)” on page 27
- “Clear Faults (clear_fault_action Property)” on page 28
- “Service-Related Oracle ILOM Commands” on page 30

▼ 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 Management Commands” on page 32 for examples of the kind of information the command displays for different types of faults.

- At the Oracle ILOM prompt, type 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 13
- “Oracle ILOM Troubleshooting Overview” on page 21
- “Access the SP (Oracle ILOM)” on page 23

- “Display FRU Information (show Command)” on page 25
- “Check for Faults (fmadm faulty Command)” on page 27
- “Clear Faults (clear_fault_action Property)” on page 28
- “Service-Related Oracle ILOM Commands” on page 30

▼ Check for Faults (fmadm faulty Command)

This is an example of the `fmadm faulty` command reporting on the same power supply fault as shown in the `show faulty` example. See “Check for Faults (show faulty Command)” on page 26. 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 Oracle ILOM 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, type 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 13
- “Oracle ILOM Troubleshooting Overview” on page 21
- “Access the SP (Oracle ILOM)” on page 23
- “Display FRU Information (show Command)” on page 25
- “Check for Faults (show faulty Command)” on page 26
- “Clear Faults (clear_fault_action Property)” on page 28
- “Service-Related Oracle ILOM Commands” on page 30

▼ 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. 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 54.

- **At the Oracle ILOM 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.

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 = PSO  
  fru_name = /SYS/PSO  
  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 21
- “Access the SP (Oracle ILOM)” on page 23
- “Display FRU Information (show Command)” on page 25
- “Check for Faults (show faulty Command)” on page 26
- “Check for Faults (fmadm faulty Command)” on page 27
- “Service-Related Oracle ILOM Commands” on page 30

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 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 a <code>poweron</code> .
<code>stop /SYS</code>	Powers off the host server.
<code>start /SYS</code>	Powers on the host server.

Oracle ILOM Command	Description
set /SYS/PSUx prepare_to_remove_action=true	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.
reset /SYS	Generates a hardware reset on the host server.
reset /SP	Reboots the SP.
set /SYS keyswitch_state= <i>value</i> normal standby diag locked	Sets the virtual keyswitch.
set /SYS/LOCATE value= <i>value</i> [Fast_blink Off]	Turns the Locator LED on or off.
show faulty	Displays current system faults. See “Check for Faults (show faulty Command)” on page 26 .
show /SYS keyswitch_state	Displays the status of the virtual keyswitch.
show /SYS/LOCATE	Displays the current state of the Locator LED as either on or off.
show /SP/logs/event/list	Displays the history of all events logged in the SP event buffers (in RAM or the persistent buffers).
show /HOST	Displays information about the operating state of the host system, the system serial number, and whether the hardware is providing service.

Related Information

- [“Oracle ILOM Troubleshooting Overview” on page 21](#)
- [“Access the SP \(Oracle ILOM\)” on page 23](#)
- [“Display FRU Information \(show Command\)” on page 25](#)
- [“Check for Faults \(show faulty Command\)” on page 26](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 27](#)
- [“Clear Faults \(clear_fault_action Property\)” on page 28](#)

Understanding Fault Management Commands

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

- “No Faults Detected Example” on page 32
- “Power Supply Fault Example (show faulty Command)” on page 33
- “Power Supply Fault Example (fmadm faulty Command)” on page 34
- “POST-Detected Fault Example (show faulty Command)” on page 35
- “PSH-Detected Fault Example (show faulty Command)” on page 36

Related Information

- “Diagnostics Overview” on page 11
- “Diagnostics Process” on page 13
- “Interpreting Diagnostic LEDs” on page 16
- “Managing Faults (Oracle ILOM)” on page 21
- “Interpreting Log Files and System Messages” on page 37
- “Checking if Oracle VTS Is Installed” on page 38
- “Managing Faults (POST)” on page 40
- “Managing Faults (PSH)” on page 50
- “Managing Components (ASR)” on page 56

No Faults Detected Example

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

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

Related Information

- [“Power Supply Fault Example \(show faulty Command\)” on page 33](#)
- [“Power Supply Fault Example \(fmadm faulty Command\)” on page 34](#)
- [“POST-Detected Fault Example \(show faulty Command\)” on page 35](#)
- [“PSH-Detected Fault Example \(show faulty Command\)” on page 36](#)
- [“Service-Related Oracle ILOM Commands” on page 30](#)

Power Supply Fault Example (show faulty Command)

This 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

- [“No Faults Detected Example” on page 32](#)

- “Power Supply Fault Example (fmadm faulty Command)” on page 34
- “POST-Detected Fault Example (show faulty Command)” on page 35
- “PSH-Detected Fault Example (show faulty Command)” on page 36
- “Service-Related Oracle ILOM Commands” on page 30

Power Supply Fault Example (fmadm faulty Command)

This is an example of the `fmadm faulty` command reporting on the same power supply fault as shown in the `show faulty` example. See “Power Supply Fault Example (show faulty Command)” on page 33. 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.

```
-> 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

- “No Faults Detected Example” on page 32
- “Power Supply Fault Example (show faulty Command)” on page 33
- “POST-Detected Fault Example (show faulty Command)” on page 35
- “PSH-Detected Fault Example (show faulty Command)” on page 36
- “Service-Related Oracle ILOM Commands” on page 30

POST-Detected Fault Example (show faulty Command)

This 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

- “No Faults Detected Example” on page 32
- “Power Supply Fault Example (show faulty Command)” on page 33
- “Power Supply Fault Example (fmadm faulty Command)” on page 34
- “PSH-Detected Fault Example (show faulty Command)” on page 36
- “Service-Related Oracle ILOM Commands” on page 30

PSH-Detected Fault Example (show faulty Command)

This is an example of the `show faulty` command displaying a fault that was detected by PSH. 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

- [“No Faults Detected Example” on page 32](#)
- [“Power Supply Fault Example \(show faulty Command\)” on page 33](#)
- [“Power Supply Fault Example \(fmadm faulty Command\)” on page 34](#)
- [“POST-Detected Fault Example \(show faulty Command\)” on page 35](#)
- [“Service-Related Oracle ILOM Commands” on page 30](#)

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 drive faults are usually captured by the Oracle Solaris message files.

- [“Check the Message Buffer” on page 37](#)
- [“View System Message Log Files” on page 38](#)

Related Information

- [“Diagnostics Overview” on page 11](#)
- [“Diagnostics Process” on page 13](#)
- [“Interpreting Diagnostic LEDs” on page 16](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Understanding Fault Management Commands” on page 32](#)
- [“Checking if Oracle VTS Is Installed” on page 38](#)
- [“Managing Faults \(POST\)” on page 40](#)
- [“Managing Faults \(PSH\)” on page 50](#)
- [“Managing Components \(ASR\)” on page 56](#)

▼ 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 37](#)

Checking if Oracle VTS Is Installed

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](#)
- [“Check if Oracle VTS Is Installed” on page 40](#)

Related Information

- “Diagnostics Overview” on page 11
- “Diagnostics Process” on page 13
- “Interpreting Diagnostic LEDs” on page 16
- “Managing Faults (Oracle ILOM)” on page 21
- “Understanding Fault Management Commands” on page 32
- “Interpreting Log Files and System Messages” on page 37
- “Managing Faults (POST)” on page 40
- “Managing Faults (PSH)” on page 50
- “Managing Components (ASR)” on page 56

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 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 web browser, a terminal interface, or a CLI.

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
- [“Check if Oracle VTS Is Installed” on page 40](#)

▼ Check if Oracle VTS Is Installed

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

```
# pkginfo -l SUNvts SUNwvtsr SUNwvtsts 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 install the software before you can use it. You can obtain the Oracle VTS software from these 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 44](#)
- [“Run POST With Maximum Testing” on page 45](#)
- [“Interpret POST Fault Messages” on page 46](#)
- [“Clear POST-Detected Faults” on page 47](#)
- [“POST Output Reference” on page 48](#)

Related Information

- [“Diagnostics Overview” on page 11](#)
- [“Diagnostics Process” on page 13](#)
- [“Interpreting Diagnostic LEDs” on page 16](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Understanding Fault Management Commands” on page 32](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Checking if Oracle VTS Is Installed” on page 38](#)
- [“Managing Faults \(PSH\)” on page 50](#)
- [“Managing Components \(ASR\)” on page 56](#)

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 a 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 44](#)
- [“Run POST With Maximum Testing” on page 45](#)
- [“Interpret POST Fault Messages” on page 46](#)
- [“Clear POST-Detected Faults” on page 47](#)
- [“POST Output Reference” on page 48](#)

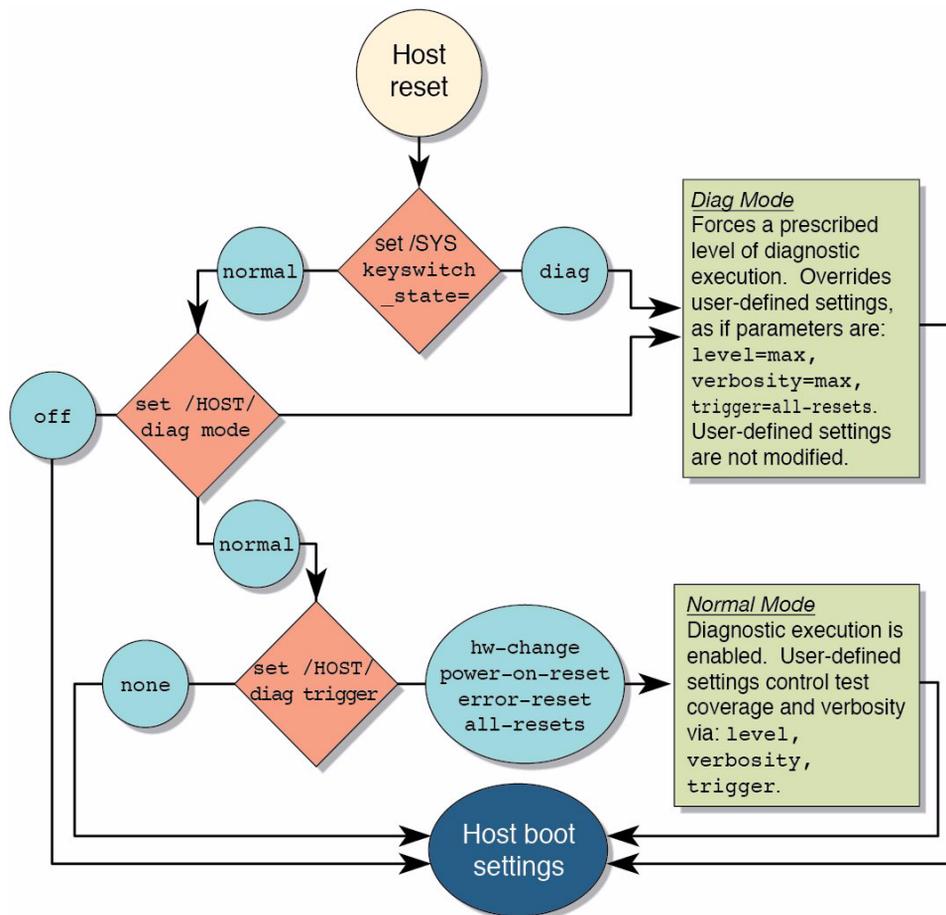
Oracle ILOM Properties That Affect POST Behavior

These Oracle ILOM properties determine how POST performs its operations. See also the flowchart that follows the table.

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: <code>level=max</code> , <code>verbosity=max</code> , <code>trigger=all-reset</code>
	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 <code>diag level</code> value.
	service	Runs POST with preset values for <code>diag level</code> and <code>diag verbosity</code> .
/HOST/diag level	max	If <code>mode = normal</code> , runs all the minimum tests plus extensive processor and memory tests.
	min	If <code>mode = normal</code> , runs the 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	Runs POST only 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.

Parameter	Values	Description
	max	POST displays all test and informational messages, and some debugging messages.
	debug	POST displays extensive debugging output on the system console, including the devices being tested and the debug output of each test.
	none	No POST output is displayed.



Related Information

- [“POST Overview” on page 41](#)
- [“Configure POST” on page 44](#)
- [“Run POST With Maximum Testing” on page 45](#)

- “Interpret POST Fault Messages” on page 46
- “Clear POST-Detected Faults” on page 47
- “POST Output Reference” on page 48

▼ Configure POST

1. Access the Oracle ILOM prompt.

See “Access the SP (Oracle ILOM)” on page 23.

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

This 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.

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

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

```
-> 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 45](#)
- [“Interpret POST Fault Messages” on page 46](#)
- [“Clear POST-Detected Faults” on page 47](#)
- [“POST Output Reference” on page 48](#)

▼ Run POST With Maximum Testing

1. Access the Oracle ILOM prompt:

See [“Access the SP \(Oracle ILOM\)” on page 23](#).

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. This 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 46.

Related Information

- “POST Overview” on page 41
- “Oracle ILOM Properties That Affect POST Behavior” on page 42
- “Configure POST” on page 44
- “Interpret POST Fault Messages” on page 46
- “Clear POST-Detected Faults” on page 47
- “POST Output Reference” on page 48

▼ Interpret POST Fault Messages

1. Run POST.

See “Run POST With Maximum Testing” on page 45.

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

See “POST Output Reference” on page 48.

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

See “Check for Faults (show faulty Command)” on page 26.

Related Information

- “POST Overview” on page 41
- “Oracle ILOM Properties That Affect POST Behavior” on page 42
- “Configure POST” on page 44
- “Run POST With Maximum Testing” on page 45
- “Clear POST-Detected Faults” on page 47
- “POST Output Reference” on page 48

▼ 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 56](#).

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. Replace the faulty FRU.

2. At the Oracle ILOM prompt, type 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. For 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)

3. Take one of these actions based on the 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 [Step 4](#).

4. 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 2](#).

```
-> 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.

5. Reset the server.

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

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

```
-> 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 44](#)
- [“Run POST With Maximum Testing” on page 45](#)
- [“Interpret POST Fault Messages” on page 46](#)
- [“POST Output Reference” on page 48](#)

POST Output Reference

POST error messages use this 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 this syntax:

```
WARNING: message
```

Informational messages use this syntax:

```
INFO: message
```

In this 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 44](#)
- [“Run POST With Maximum Testing” on page 45](#)
- [“Interpret POST Fault Messages” on page 46](#)
- [“Clear POST-Detected Faults” on page 47](#)

Managing Faults (PSH)

These topics describe PSH and how to use it.

- [“PSH Overview” on page 51](#)
- [“PSH-Detected Fault Example” on page 52](#)
- [“Check for PSH-Detected Faults” on page 53](#)
- [“Clear PSH-Detected Faults” on page 54](#)

Related Information

- “Diagnostics Overview” on page 11
- “Diagnostics Process” on page 13
- “Interpreting Diagnostic LEDs” on page 16
- “Managing Faults (Oracle ILOM)” on page 21
- “Understanding Fault Management Commands” on page 32
- “Interpreting Log Files and System Messages” on page 37
- “Checking if Oracle VTS Is Installed” on page 38
- “Managing Faults (POST)” on page 40
- “Managing Components (ASR)” on page 56

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 these server components:

- CPU
- Memory
- I/O subsystem

The PSH console message provides this information about each detected fault:

- Type
- Severity
- Description
- Automated response
- Impact

- Suggested action for a system administrator

If PSH 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 52
- “Check for PSH-Detected Faults” on page 53
- “Clear PSH-Detected Faults” on page 54

PSH-Detected Fault Example

When a PSH fault is detected, an Oracle Solaris console message similar to this 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 51
- “Check for PSH-Detected Faults” on page 53
- “Clear PSH-Detected Faults” on page 54

▼ 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=0000000000000000000000
                    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 these details:

- Date and time of the fault (Aug 13 11:48:33).
- EVENT-ID, which is unique for every fault (21a8b59e-89ff-692a-c4bc-f4c5cccca8c8).
- MSG-ID, 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.
 - a. Obtain the MSGID from console output or from the Oracle ILOM `show faulty` command.
 - b. Go to:
 - <http://support.oracle.com>
 - Search for the message ID in the Knowledge Base.
 3. Follow the suggested actions to repair the fault.

Related Information

- “PSH Overview” on page 51
- “PSH-Detected Fault Example” on page 52
- “Clear PSH-Detected Faults” on page 54

▼ 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, 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 this 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 51](#)
- [“PSH-Detected Fault Example” on page 52](#)
- [“Check for PSH-Detected Faults” on page 53](#)

Managing Components (ASR)

These topics explain the role played by ASR and how to manage the components that ASR controls.

- [“ASR Overview” on page 56](#)
- [“Display System Components” on page 57](#)
- [“Disable System Components” on page 58](#)
- [“Enable System Components” on page 59](#)

Related Information

- [“Diagnostics Overview” on page 11](#)
- [“Diagnostics Process” on page 13](#)
- [“Interpreting Diagnostic LEDs” on page 16](#)
- [“Managing Faults \(Oracle ILOM\)” on page 21](#)
- [“Understanding Fault Management Commands” on page 32](#)
- [“Interpreting Log Files and System Messages” on page 37](#)
- [“Checking if Oracle VTS Is Installed” on page 38](#)
- [“Managing Faults \(POST\)” on page 40](#)
- [“Managing Faults \(PSH\)” on page 50](#)

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 these components:

- CPU strands
- Memory DIMMs
- I/O subsystem

The database that contains the list of disabled components is 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.

These ASR commands enable you to view, 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 57](#)
- [“Disable System Components” on page 58](#)
- [“Enable System Components” on page 59](#)

▼ Display System Components

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

- **At the Oracle ILOM prompt, type `show components`.**

In this example, PCI-EM3 is shown as disabled.

```

-> show components
-----+-----+-----
Target          | Property          | Value
-----+-----+-----
/SYS/MB/REM0/   | component_state   | Enabled
SASHBA0 |          |
/SYS/MB/REM1/   | component_state   | Enabled
SASHBA1 |          |
/SYS/MB/VIDEO   | component_state   | Enabled
/SYS/MB/PCI-    | component_state   | Enabled

```

```

SWITCH0 |
<...>
/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 56](#)
- [“Disable System Components” on page 58](#)
- [“Enable System Components” on page 59](#)

▼ 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 Oracle ILOM 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 56](#)

- “Display System Components” on page 57
- “Enable System Components” on page 59

▼ Enable System Components

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

1. **At the Oracle ILOM 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 56
- “Display System Components” on page 57
- “Disable System Components” on page 58

Preparing for Service

These topics describe how to prepare the server for servicing.

Step	Description	Link
1.	Review safety and handling information.	“Safety Information” on page 61
2.	Gather the tools for service.	“Tools Needed for Service” on page 63
3.	Consider filler panel options.	“Filler Panels” on page 64
4.	Find the server serial number.	“Find the Server Serial Number” on page 65
5.	Identify the server to be serviced.	“Locate the Server” on page 66
6.	Locate the component service information.	“Component Service Task Reference” on page 67
7.	For cold-service operations, shut down the OS and move the server out of the rack.	“Removing Power From the Server” on page 68
8.	Gain access to internal components.	“Accessing Internal Components” on page 71

Related Information

- [“Identifying Components” on page 1](#)
- [“Detecting and Managing Faults” on page 11](#)
- [“Returning the Server to Operation” on page 261](#)

Safety Information

For your protection, observe these 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 T4-1 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 these 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

ESD-sensitive devices, such as PCI cards, 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. These 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)

Related Information

- [“Tools Needed for Service” on page 63](#)
- [“Filler Panels” on page 64](#)
- [“Find the Server Serial Number” on page 65](#)
- [“Locate the Server” on page 66](#)
- [“Component Service Task Reference” on page 67](#)
- [“Removing Power From the Server” on page 68](#)
- [“Accessing Internal Components” on page 71](#)

Tools Needed for Service

You need these 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

- [“Safety Information” on page 61](#)
 - [“Tools Needed for Service” on page 63](#)
 - [“Filler Panels” on page 64](#)
 - [“Find the Server Serial Number” on page 65](#)
 - [“Locate the Server” on page 66](#)
 - [“Component Service Task Reference” on page 67](#)
 - [“Removing Power From the Server” on page 68](#)
 - [“Accessing Internal Components” on page 71](#)
-

Filler Panels

Each server is shipped with replacement filler panels for hard drives and PCI cards. 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 functional component to ensure proper airflow through the system. If you remove a filler panel and continue to operate your system with an empty 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

- [“Safety Information” on page 61](#)
- [“Tools Needed for Service” on page 63](#)
- [“Find the Server Serial Number” on page 65](#)
- [“Locate the Server” on page 66](#)
- [“Component Service Task Reference” on page 67](#)
- [“Removing Power From the Server” on page 68](#)
- [“Accessing Internal Components” on page 71](#)

▼ Find the Server 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 61](#)
- [“Tools Needed for Service” on page 63](#)

- “Filler Panels” on page 64
- “Locate the Server” on page 66
- “Component Service Task Reference” on page 67
- “Removing Power From the Server” on page 68
- “Accessing Internal Components” on page 71

▼ 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 61
- “Tools Needed for Service” on page 63
- “Filler Panels” on page 64
- “Find the Server Serial Number” on page 65
- “Component Service Task Reference” on page 67
- “Removing Power From the Server” on page 68
- “Accessing Internal Components” on page 71

Component Service Task Reference

This 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	<code>/SYS/MB/BAT</code>	“Servicing the Battery” on page 225
DIMM	<code>/SYS/MB/CMP0/BOBx/CHy/Dz</code>	“Servicing DIMMs” on page 215
DVD bracket		“Servicing the DVD Tray” on page 149
DVD drive		“Servicing the DVD Drive” on page 141
Fan board	<code>/SYS/FANBD</code>	“Servicing the Fan Board” on page 161
Fan module	<code>/SYS/FANBD/FMx</code>	“Servicing Fan Modules” on page 83
LED board		“Servicing the LED Board” on page 155
Hard drive	<code>/SYS/HDDx</code>	“Servicing Hard Drives” on page 105
Hard drive backplane	<code>/SYS/SASBP</code>	“Servicing the Hard Drive Backplane” on page 125
Hard drive fan	<code>/SYS/FANBD/FM5</code>	“Servicing the Hard Drive Fan” on page 117
Motherboard	<code>/SYS/MB</code>	“Servicing the Motherboard” on page 251
ID PROM	<code>/SYS/MB/SCC</code>	“Servicing the ID PROM” on page 243
PCIe2 card	<code>/SYS/MB/PCI_MEZZ/PCIEx/card_type</code> <code>/SYS/MB/RISERy/card_type</code>	“Servicing PCIe2 Cards” on page 189
PCIe2 mezzanine board	<code>/SYS/MB/PCI_MEZZ</code>	“Servicing the PCIe2 Mezzanine Board” on page 171
PCIe2 riser card	<code>/SYS/MB/RISERx</code>	“Servicing PCIe2 Riser Cards” on page 181
Power distribution board		“Servicing the Power Distribution Board” on page 133
Power supply	<code>/SYS/PSx</code>	“Servicing Power Supplies” on page 93
SP	<code>/SYS/MB/SP</code>	“Servicing the SP” on page 233
Signal interface board	<code>/SYS/SIB</code>	“Servicing the Signal Interface Board” on page 205

Related Information

- [“Safety Information” on page 61](#)
- [“Tools Needed for Service” on page 63](#)
- [“Filler Panels” on page 64](#)
- [“Find the Server Serial Number” on page 65](#)
- [“Locate the Server” on page 66](#)
- [“Removing Power From the Server” on page 68](#)
- [“Accessing Internal Components” on page 71](#)

Removing Power From the Server

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

Step	Description	Link
1.	Prepare the server for powering off.	“Prepare to Power Off the Server” on page 69
2.	Power off the server by one of three methods.	“Power Off the Server (SP Command)” on page 69 “Power Off the Server (Power Button - Graceful)” on page 70 “Power Off the Server (Emergency Shutdown)” on page 70
3.	Disconnect the power cords.	“Disconnect Power Cords” on page 71

Related Information

- [“Safety Information” on page 61](#)
- [“Tools Needed for Service” on page 63](#)
- [“Filler Panels” on page 64](#)
- [“Find the Server Serial Number” on page 65](#)
- [“Locate the Server” on page 66](#)
- [“Component Service Task Reference” on page 67](#)
- [“Accessing Internal Components” on page 71](#)

▼ 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 69](#)
- [“Power Off the Server \(Power Button - Graceful\)” on page 70](#)
- [“Power Off the Server \(Emergency Shutdown\)” on page 70](#)

Related Information

- [“Power Off the Server \(SP Command\)” on page 69](#)
- [“Power Off the Server \(Power Button - Graceful\)” on page 70](#)
- [“Power Off the Server \(Emergency Shutdown\)” on page 70](#)
- [“Disconnect Power Cords” 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 Oracle ILOM prompt by typing the # . (Hash Period) key sequence.**

3. **At the Oracle ILOM 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 70.](#)) 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 70](#)
- [“Power Off the Server \(Emergency Shutdown\)” on page 70](#)
- [“Disconnect Power Cords” 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. See [“Front Panel Components” on page 7.](#)

- **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 69](#)
- [“Power Off the Server \(Emergency Shutdown\)” on page 70](#)
- [“Disconnect Power Cords” 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.

See [“Front Panel Components” on page 7.](#)

- **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 69
- “Power Off the Server (Power Button - Graceful)” on page 70
- “Disconnect Power Cords” on page 71

▼ Disconnect Power Cords

1. Power off the server.

See:

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

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 69
- “Power Off the Server (Power Button - Graceful)” on page 70
- “Power Off the Server (Emergency Shutdown)” on page 70

Accessing Internal Components

These topics provide procedures and guidelines when accessing internal components.

Step	Description	Link
1.	Take antistatic precautions now.	“Prevent ESD Damage” on page 72
2.	Move the server out of the rack and gain access to the internal components.	“Remove the Top Cover” on page 73

Related Information

- [“Safety Information” on page 61](#)
- [“Tools Needed for Service” on page 63](#)
- [“Filler Panels” on page 64](#)
- [“Find the Server Serial Number” on page 65](#)
- [“Locate the Server” on page 66](#)
- [“Component Service Task Reference” on page 67](#)
- [“Removing Power From the Server” on page 68](#)

▼ Prevent ESD Damage

Many components housed within the chassis can be damaged by electrostatic discharge. To protect these components from damage, perform these steps before opening the chassis for service. See [“Safety Information” on page 61](#).

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 61](#)
- [“Remove the Top Cover” on page 73](#)

▼ Remove the Top Cover

1. Shut down the server.

See “Removing Power From the Server” on page 68.

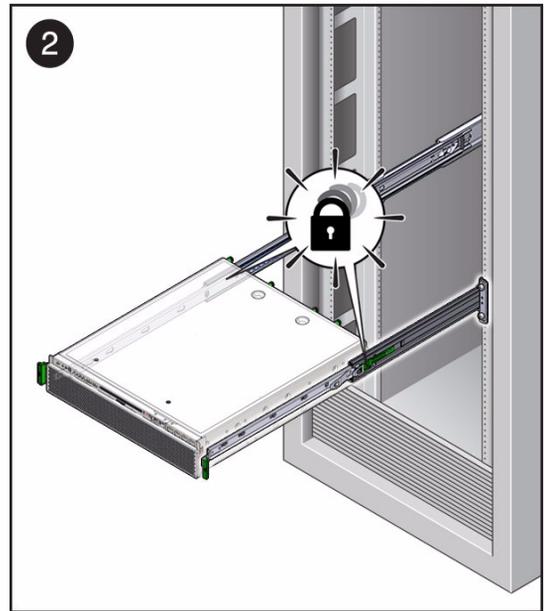
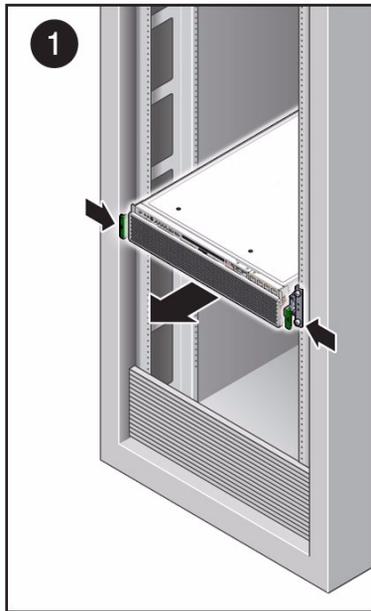
2. Remove the power cords from the server.

See “Remove a Power Supply” on page 97.

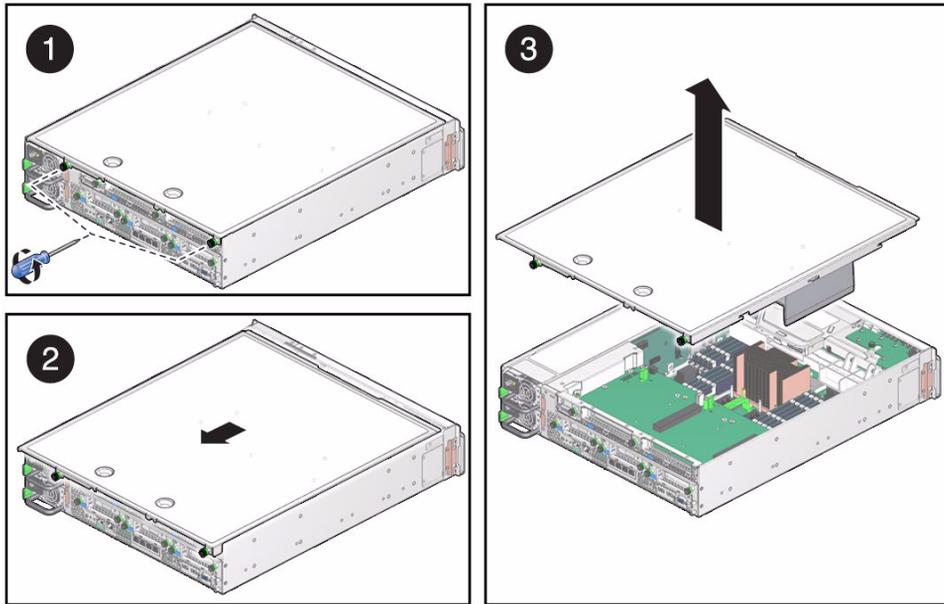
3. Disconnect all cables from the rear of the server.

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 225
- “Servicing DIMMs” on page 215
- “Servicing the DVD Tray” on page 149
- “Servicing the DVD Drive” on page 141
- “Servicing the Fan Board” on page 161
- “Servicing the LED Board” on page 155
- “Servicing the Hard Drive Backplane” on page 125
- “Servicing the Hard Drive Fan” on page 117
- “Servicing the Motherboard” on page 251
- “Servicing the ID PROM” on page 243
- “Servicing PCIe2 Cards” on page 189
- “Servicing the PCIe2 Mezzanine Board” on page 171
- “Servicing PCIe2 Riser Cards” on page 181
- “Servicing the Power Distribution Board” on page 133
- “Servicing the SP” on page 233
- “Servicing the Signal Interface Board” on page 205

Related Information

- “Safety Information” on page 61

- “Prevent ESD Damage” on page 72
- “Install the Top Cover” on page 261

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.

Description	Links
Replace the faulty air filter.	“Remove the Air Filter” on page 77 “Install the Air Filter” on page 79
Remove the filter tray as part of another component’s service operation.	“Remove the Air Filter” on page 77
Install the filter tray as part of another component’s service operation.	“Install the Air Filter” on page 79

Related Information

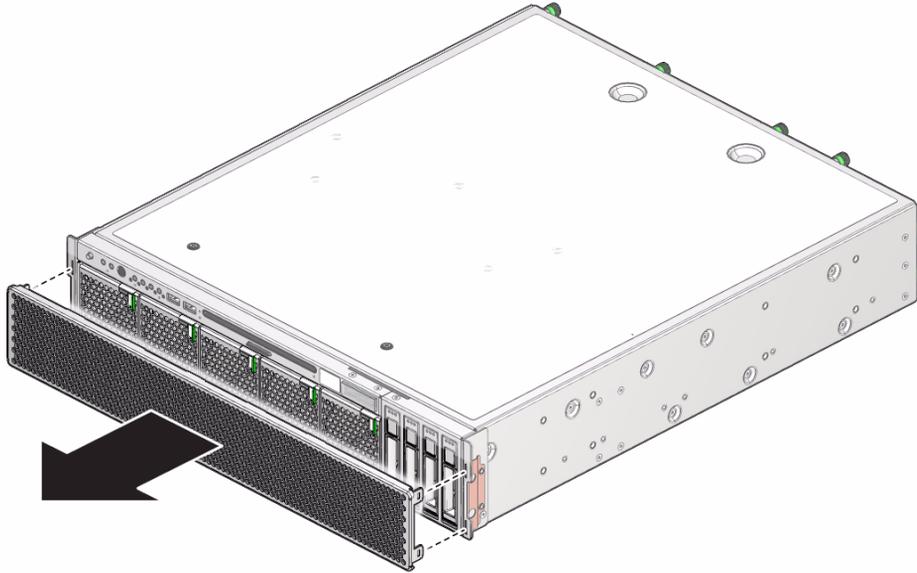
- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 61.
 - 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:

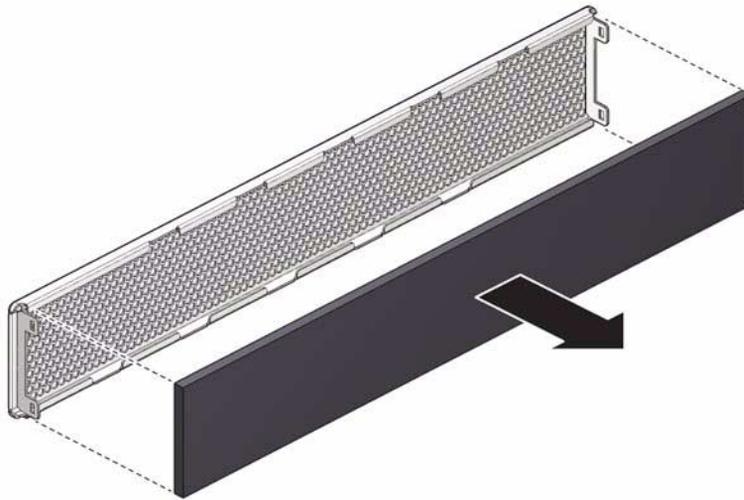
- If you removed the filter tray as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) on page 67 for assistance.
- If you removed the filter tray to service the air filter, go to [Step 4](#).

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.

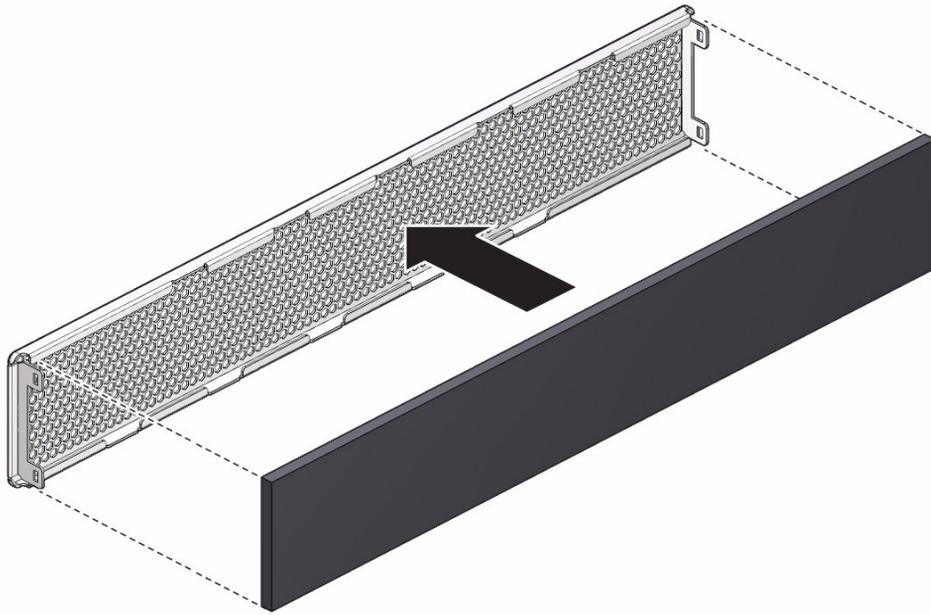
Related Information

- [“Install the Air Filter”](#) on page 79
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

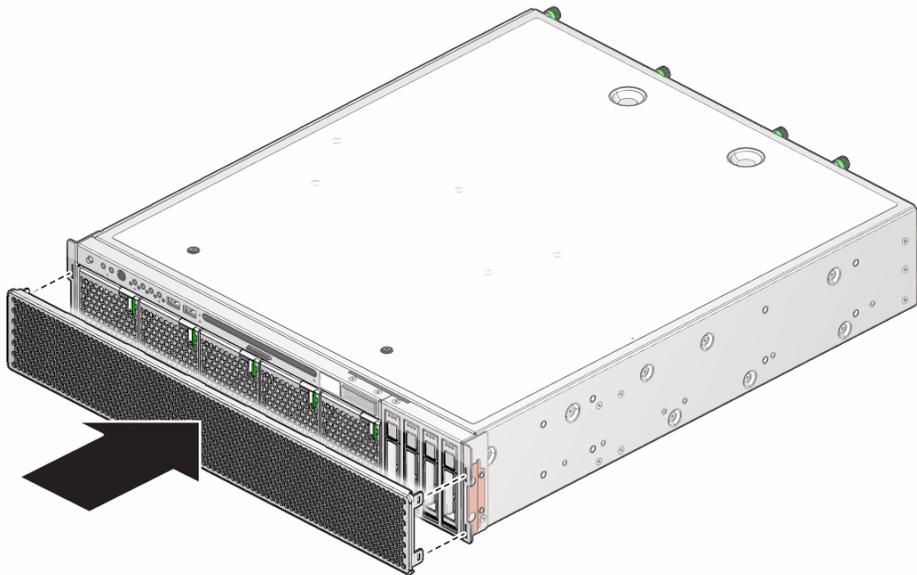
▼ Install the Air Filter

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 Service Task Reference" 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 61](#)
- ["Returning the Server to Operation" on page 261](#)

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.

Description	Links
Replace a faulty fan module.	“Locate a Faulty Fan Module” on page 84 “Fan Module LEDs” on page 84 “Remove a Fan Module” on page 87 “Install a Fan Module” on page 89 “Verify a Fan Module” on page 90
Remove a fan module as part of another component’s service operation.	“Remove a Fan Module” on page 87
Install a fan module as part of another component’s service operation.	“Install a Fan Module” on page 89
Identify a faulty fan module.	“Fan Module LEDs” on page 84 “Locate a Faulty Fan Module” on page 84 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

Fan Module LEDs

The status of each fan module is represented by a bi-color LED. The LEDs are located on the upper left frame of the front panel.

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

Related Information

- [“Front Panel LEDs” on page 17](#)
- [“Locate a Faulty Fan Module” on page 84](#)
- [“Remove a Fan Module” on page 87](#)
- [“Install a Fan Module” on page 89](#)
- [“Verify a Fan Module” on page 90](#)

▼ 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 16](#).
- 2. Visually inspect the fan module to see if any of its status LEDs are lit or flashing.**
See [“Fan Module LEDs” on page 84](#).
- 3. If the fan module is faulty, replace it.**
See [“Remove a Fan Module” on page 87](#).

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 87](#).

If a FRU value different from `/SYS/FANBD/FMx` is displayed, see [“Component Service Task Reference” 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 87](#).

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 87](#).

9. If you are unable to identify the faulty fan module, seek further information.

See [“Detecting and Managing Faults” on page 11](#).

Related Information

- [“Fan Module LEDs” on page 84](#)
- [“Remove a Fan Module” on page 87](#)

- [“Install a Fan Module”](#) on page 89
- [“Verify a Fan Module”](#) on page 90
- [“Detecting and Managing Faults”](#) on page 11

▼ 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 61.
- If you are removing the fan module as part of another component’s removal or installation procedure, go to [Step 2](#).

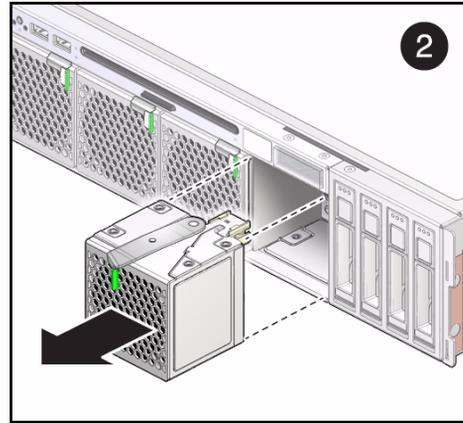
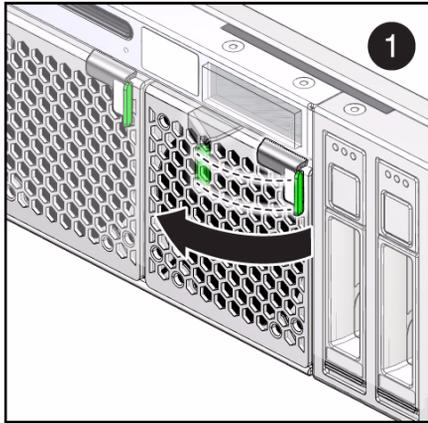
2. Remove the filter tray.

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 89.
 - If you removed the fan module as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) 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 261.

Related Information

- [“Fan Module LEDs”](#) on page 84
- [“Locate a Faulty Fan Module”](#) on page 84
- [“Install a Fan Module”](#) on page 89
- [“Verify a Fan Module”](#) on page 90
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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.

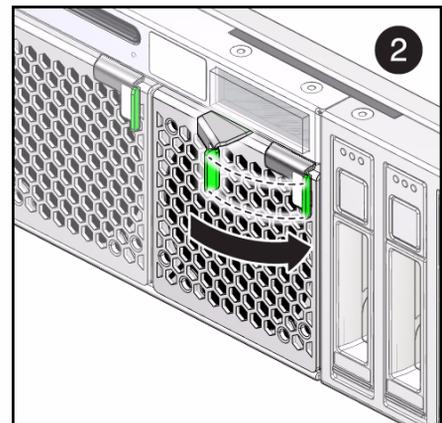
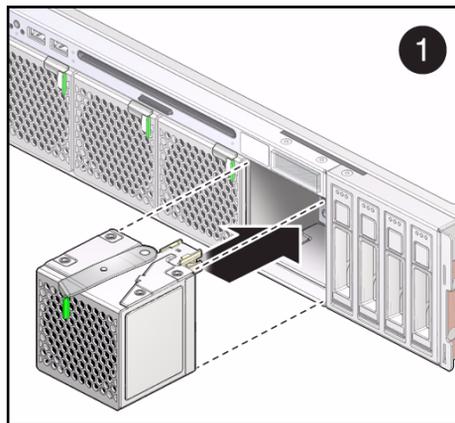
1. Consider your first steps:

- 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 87](#).
- If you are installing a new or additional fan module, see these topics in order:
 - [“Remove the Air Filter” on page 77](#)
 - [“Preparing for Service” on page 61](#).
- 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 Service Task Reference"](#) 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 261
- ["Verify a Fan Module"](#) on page 90

Related Information

- ["Fan Module LEDs"](#) on page 84
- ["Locate a Faulty Fan Module"](#) on page 84
- ["Remove a Fan Module"](#) on page 87
- ["Verify a Fan Module"](#) on page 90
- ["Preparing for Service"](#) on page 61
- ["Returning the Server to Operation"](#) on page 261

▼ 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 84](#)
- [“Locate a Faulty Fan Module” on page 84](#)
- [“Remove a Fan Module” on page 87](#)
- [“Install a Fan Module” on page 89](#)

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.

Description	Links
Replace a faulty power supply.	“Locate a Faulty Power Supply” on page 94 “Power Supply LEDs” on page 94 “Remove a Power Supply” on page 97 “Install a Power Supply” on page 100 “Verify a Power Supply” on page 102
Remove the power supplies as part of another component’s service operation.	“Remove a Power Supply” on page 97
Install the power supplies as part of another component’s service operation.	“Install a Power Supply” on page 100
Identify a faulty power supply.	“Power Supply LEDs” on page 94 “Locate a Faulty Power Supply” on page 94 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components” on page 1](#)
- [“Component Service Task Reference” on page 67](#)
- [“Detecting and Managing Faults” on page 11](#)
- [“Preparing for Service” on page 61](#)
- [“Returning the Server to Operation” on page 261](#)

Power Supply LEDs

The status of each power supply is represented by the same three LEDs. The LEDs are located to the right of the fan of each power supply.

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

- [“Rear Panel LEDs” on page 19](#)
- [“Locate a Faulty Power Supply” on page 94](#)
- [“Remove a Power Supply” on page 97](#)
- [“Install a Power Supply” on page 100](#)
- [“Verify a Power Supply” on page 102](#)

▼ 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 16](#).
2. **Visually inspect the power supply to see if any of its status LEDs are lit or flashing.**
See [“Power Supply LEDs” on page 94](#).
If the power supply is faulty, replace it. See [“Remove a Power Supply” on page 97](#).

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 97](#).

If a FRU value different from `/SYS/PSx` is displayed, see [“Component Service Task Reference” 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 97.

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 97.

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

See [“Detecting and Managing Faults”](#) on page 11.

Related Information

- [“Power Supply LEDs”](#) on page 94
- [“Remove a Power Supply”](#) on page 97
- [“Install a Power Supply”](#) on page 100
- [“Verify a Power Supply”](#) on page 102

- [“Detecting and Managing Faults”](#) on page 11

▼ 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.

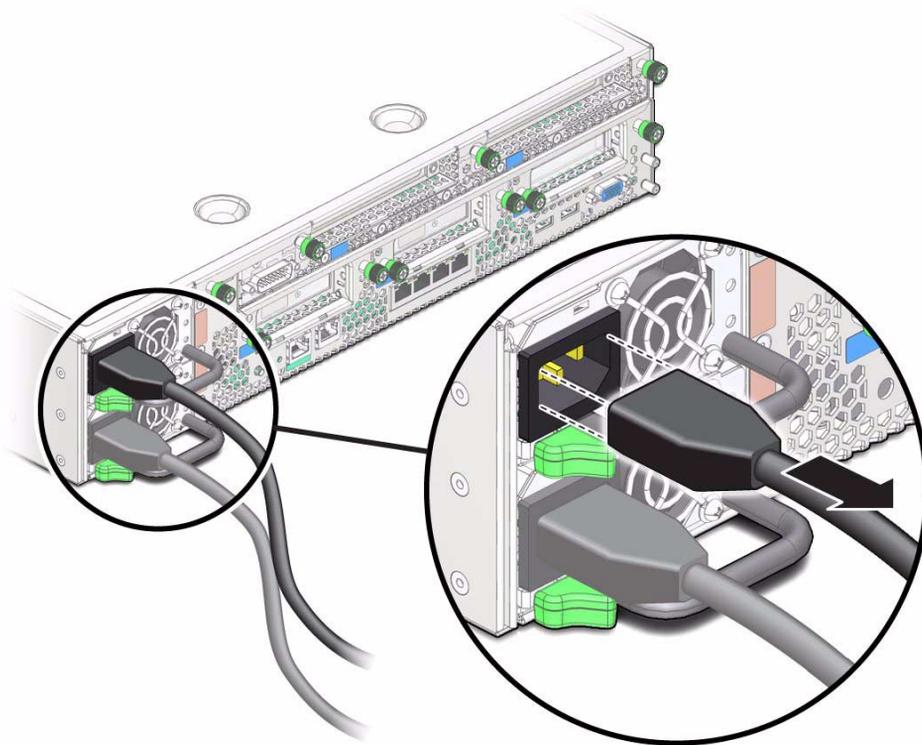
1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service”](#) on page 61.
- If you are removing the power supply as part of another component’s removal or installation procedure, go to [Step 2](#).

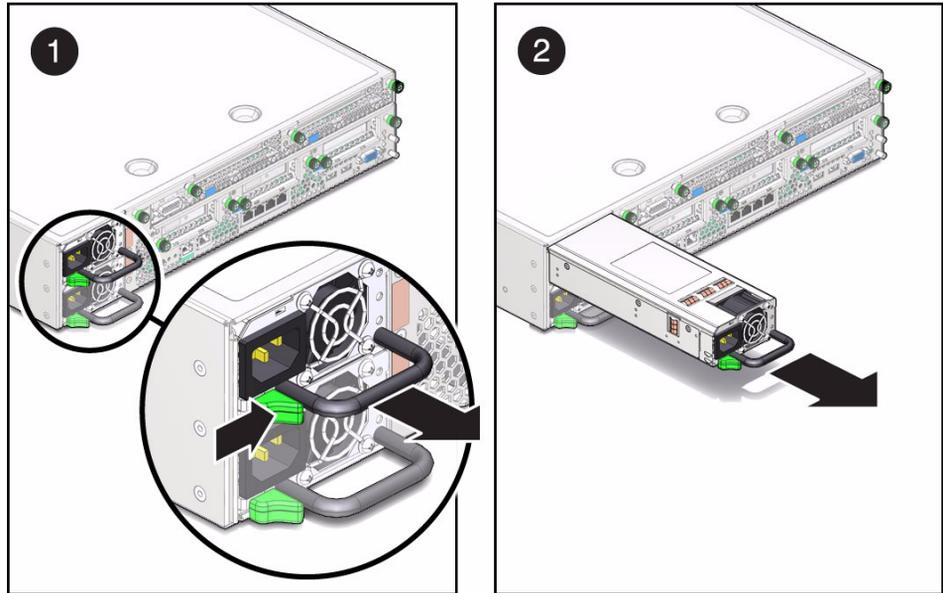
2. Determine which power supply to remove.

See [“Locate a Faulty Power Supply”](#) on page 94.

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 100](#).
 - If you removed the power supply as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference” 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 261](#).

Related Information

- [“Power Supply LEDs” on page 94](#)
- [“Locate a Faulty Power Supply” on page 94](#)
- [“Install a Power Supply” on page 100](#)
- [“Verify a Power Supply” on page 102](#)

- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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.

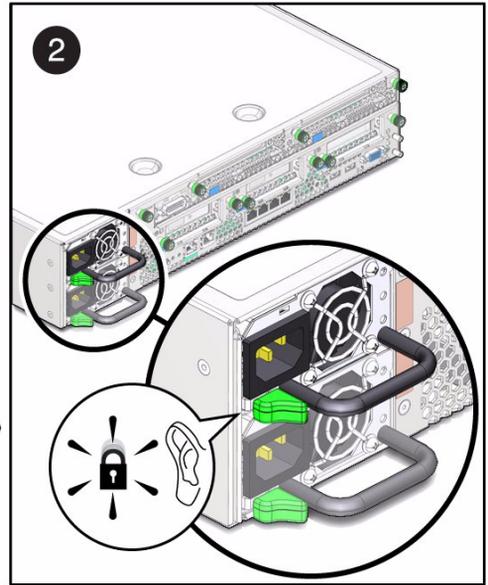
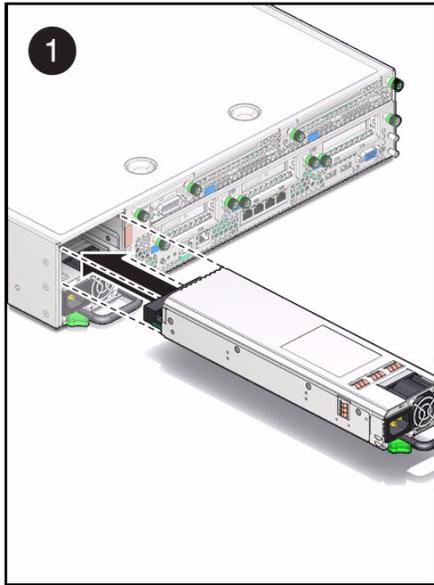
1. Consider your first steps:

- 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 97.
- If you are installing a new or an additional power supply, see “[Preparing for Service](#)” on page 61.
- If you are installing the power supply as part of another component’s removal or installation procedure, go to [Step 2](#).

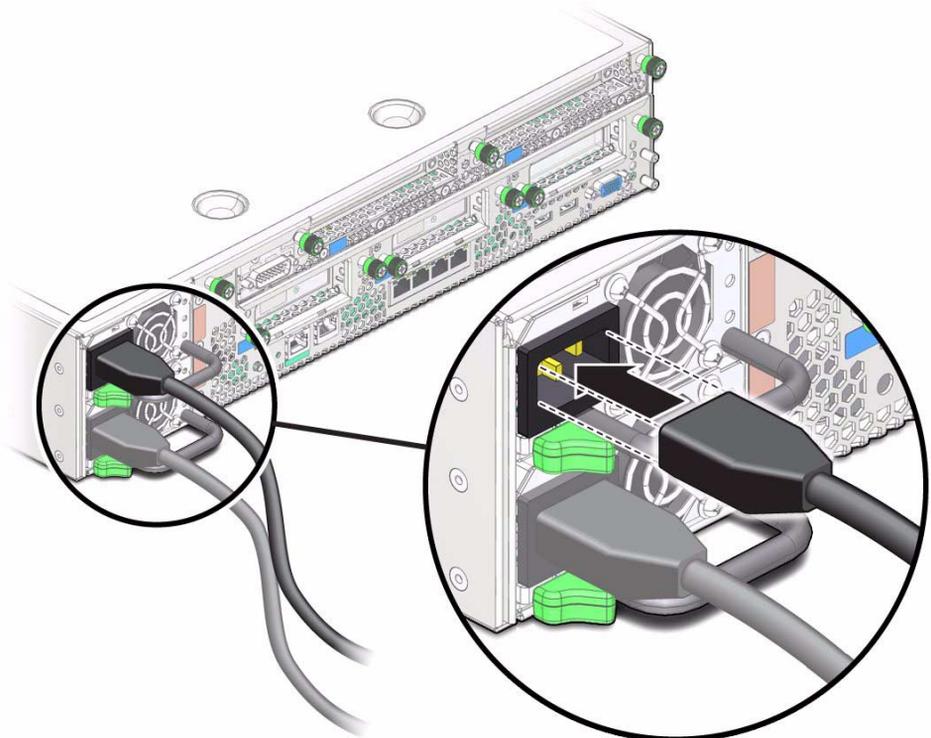
2. Align the power supply to the location where it installs into the chassis.

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 Service Task Reference"](#) on page 67 for assistance.

6. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 261
- ["Verify a Power Supply"](#) on page 102

Related Information

- ["Power Supply LEDs"](#) on page 94
- ["Locate a Faulty Power Supply"](#) on page 94
- ["Remove a Power Supply"](#) on page 97
- ["Verify a Power Supply"](#) on page 102
- ["Preparing for Service"](#) on page 61
- ["Returning the Server to Operation"](#) on page 261

▼ 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 94.

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 94](#)
- [“Locate a Faulty Power Supply” on page 94](#)
- [“Remove a Power Supply” on page 97](#)
- [“Install a Power Supply” on page 100](#)

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.

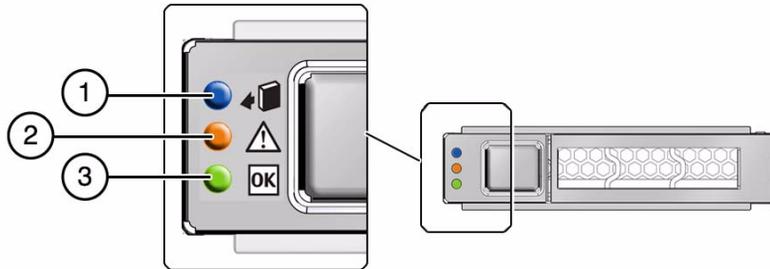
Description	Links
Replace a faulty hard drive.	“Locate a Faulty Hard Drive” on page 107 “Hard Drive LEDs” on page 106 “Remove a Hard Drive” on page 108 “Install a Hard Drive” on page 112 “Verify a Hard Drive” on page 114
Remove the hard drives as part of another component’s service operation.	“Remove a Hard Drive” on page 108
Install the hard drives as part of another component’s service operation.	“Install a Hard Drive” on page 112
Add an additional hard drive.	“Install a Hard Drive” on page 112 “Verify a Hard Drive” on page 114
Remove an existing hard drive.	“Remove a Hard Drive” on page 108
Identify a faulty hard drive.	“Hard Drive LEDs” on page 106 “Locate a Faulty Hard Drive” on page 107 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

Hard Drive LEDs

The status of each drive is represented by the same three LEDs. The LEDs are located above the release button of each hard drive.



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

- [“Front Panel LEDs” on page 17](#)
- [“Locate a Faulty Hard Drive” on page 107](#)
- [“Remove a Hard Drive” on page 108](#)
- [“Install a Hard Drive” on page 112](#)
- [“Verify a Hard Drive” on page 114](#)

▼ 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 16](#).
2. **Visually inspect the hard drive to see if any of its status LEDs are lit or flashing.**
See [“Hard Drive LEDs” on page 106](#).
If the hard drive is faulty, replace it. See [“Remove a Hard Drive” on page 108](#).
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 108](#).

If a FRU value different from `/SYS/HDDx` is displayed, see [“Component Service Task Reference” 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 108.

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 11.

Related Information

- [“Hard Drive LEDs”](#) on page 106
- [“Remove a Hard Drive”](#) on page 108
- [“Install a Hard Drive”](#) on page 112
- [“Verify a Hard Drive”](#) on page 114
- [“Detecting and Managing Faults”](#) on page 11

▼ 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 61](#).
 - 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 107](#).
4. **Determine if you need to shut down the OS to replace the drive, and perform one of these actions:**
 - If the drive cannot be taken offline without shutting down the OS, follow instructions in [“Power Off the Server \(SP Command\)” on page 69](#) 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.

For 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
c4	scsi-sas	connected	configured	unknown
c3::w500cca00a772bd1,0	disk-path	connected	configured	unknown
c4::w500cca00a59b0a9,0	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.

For example:

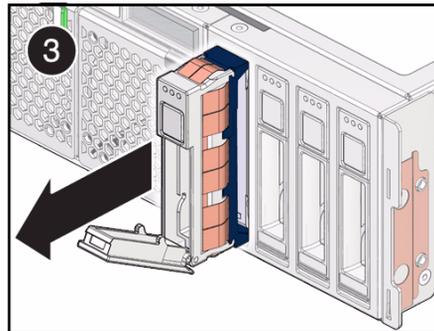
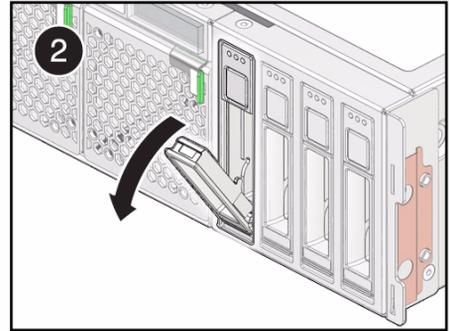
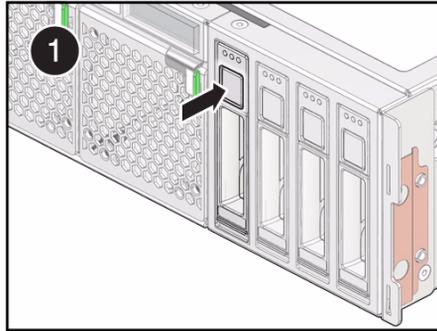
```
# cfgadm -c unconfigure c2::w500cca00a76d1f5,0
```

Replace `c2::w500cca00a76d1f5,0` with the drive name that applies to your situation.

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

See "Hard Drive LEDs" on page 106.

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 112.
 - If you removed the hard drive as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) 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 112.
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 261.

Related Information

- [“Hard Drive LEDs”](#) on page 106
- [“Locate a Faulty Hard Drive”](#) on page 107
- [“Install a Hard Drive”](#) on page 112
- [“Verify a Hard Drive”](#) on page 114
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ Install a Hard Drive

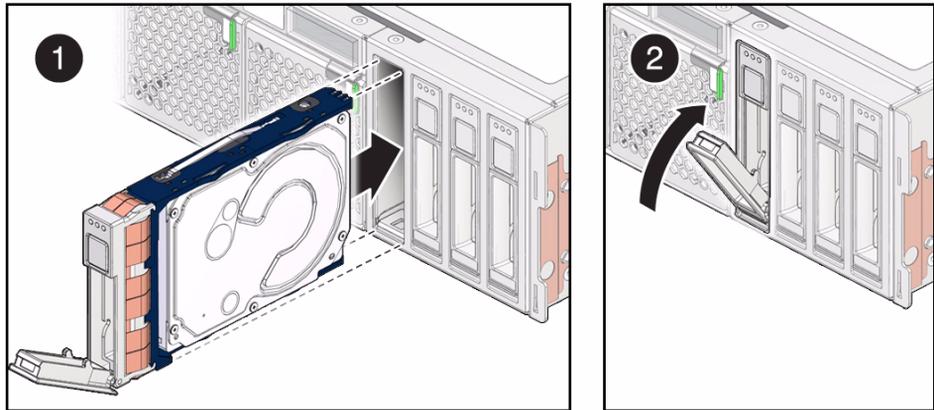
Installing the hard drive is a hot-plug operation. You do not need to power off the server before installing the hard drive.

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 108.
- If you are installing a new or an additional hard drive, see these topics in order:
 - [“Remove the Air Filter”](#) on page 77
 - [“Preparing for Service”](#) on page 61
- 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 Service Task Reference](#)" 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 261
 - "[Verify a Hard Drive](#)" on page 114

Related Information

- "[Hard Drive LEDs](#)" on page 106
- "[Locate a Faulty Hard Drive](#)" on page 107
- "[Remove a Hard Drive](#)" on page 108
- "[Verify a Hard Drive](#)" on page 114
- "[Preparing for Service](#)" on page 61

- [“Returning the Server to Operation” on page 261](#)

▼ 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 107](#).
- 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. For 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

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

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

For 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 106](#).

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. For 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
c4	scsi-sas	connected	configured	unknown
c3::w500cca00a772bd1,0	disk-path	connected	configured	unknown
c4::w500cca00a59b0a9,0	disk-path	connected	configured	unknown
.				
.				
.				

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

- If the previous steps did not verify the drive, see [“Diagnostics Process” on page 13](#).

- 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 106](#)
- [“Locate a Faulty Hard Drive” on page 107](#)
- [“Remove a Hard Drive” on page 108](#)
- [“Install a Hard Drive” on page 112](#)
- Oracle Solaris OS documentation
- Oracle VTS documentation

Servicing the Hard Drive Fan

The hard drive fan supplements 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.

Description	Links
Replace the faulty hard drive fan.	“Determine if the Hard Drive Fan Is Faulty” on page 118 “Remove the Hard Drive Fan” on page 120 “Install the Hard Drive Fan” on page 121 “Verify the Hard Drive Fan” on page 123
Remove the hard drive fan as part of another component’s service operation.	“Remove the Hard Drive Fan” on page 120
Install the hard drive fan as part of another component’s service operation.	“Install the Hard Drive Fan” on page 121
Determine whether the hard drive fan is faulty.	“Determine if the Hard Drive Fan Is Faulty” on page 118 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 120.

If a FRU value different from `/SYS/FANBD/FM5` is displayed, see [“Component Service Task Reference”](#) 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 120](#).

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 120](#).

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

See [“Detecting and Managing Faults” on page 11](#).

Related Information

- [“Remove the Hard Drive Fan” on page 120](#)
- [“Install the Hard Drive Fan” on page 121](#)

- “Verify the Hard Drive Fan” on page 123
- “Detecting and Managing Faults” on page 11

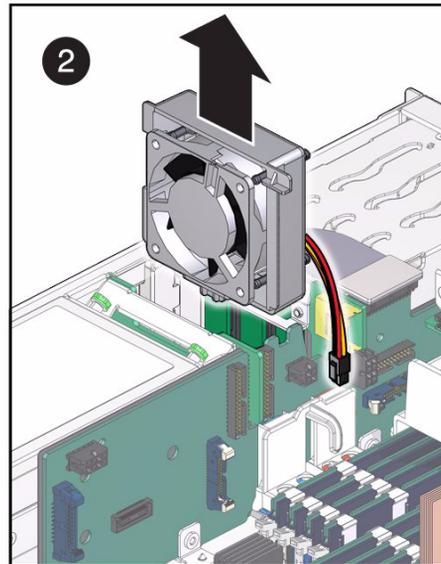
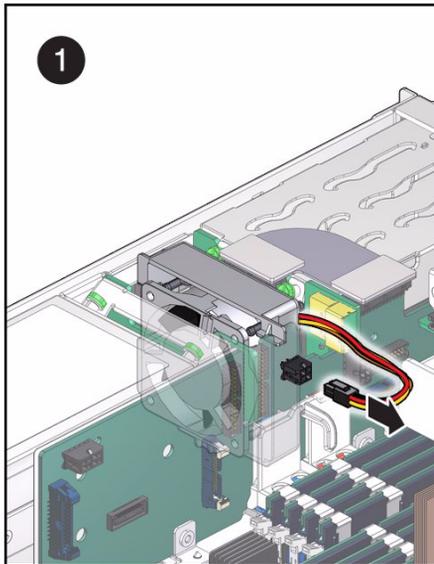
▼ Remove the Hard Drive Fan

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 61.
- 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 121.

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

Related Information

- ["Determine if the Hard Drive Fan Is Faulty"](#) on page 118
- ["Install the Hard Drive Fan"](#) on page 121
- ["Verify the Hard Drive Fan"](#) on page 123
- ["Preparing for Service"](#) on page 61
- ["Returning the Server to Operation"](#) on page 261

▼ 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.

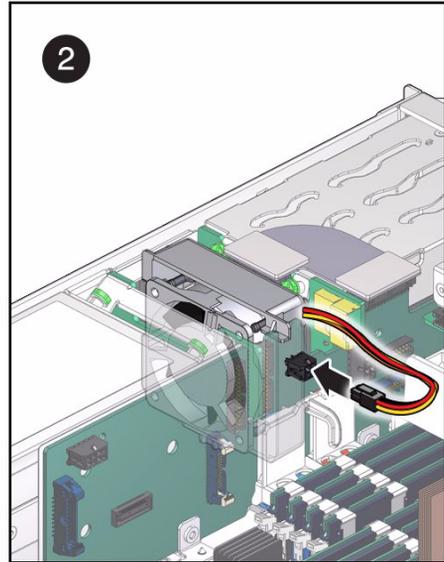
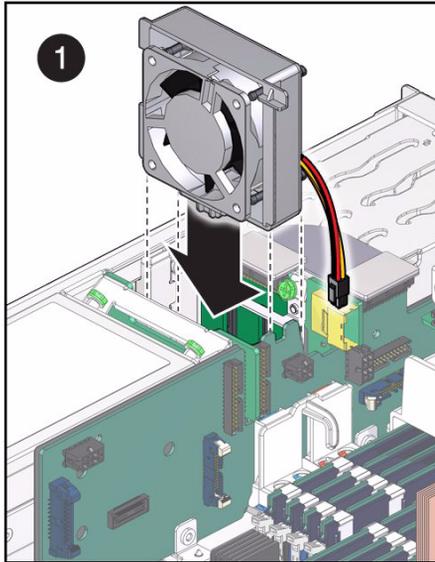
1. Consider your first steps:

- 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 120.
- 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 Service Task Reference"](#) on page 67 for assistance.

6. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 261
- ["Verify the Hard Drive Fan"](#) on page 123

Related Information

- ["Determine if the Hard Drive Fan Is Faulty"](#) on page 118
- ["Remove the Hard Drive Fan"](#) on page 120
- ["Verify the Hard Drive Fan"](#) on page 123
- ["Preparing for Service"](#) on page 61
- ["Returning the Server to Operation"](#) on page 261

▼ 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 118.

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 118
- “Remove the Hard Drive Fan” on page 120
- “Install the Hard Drive Fan” on page 121

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.

Description	Links
Replace the faulty hard drive backplane.	“Determine if the Hard Drive Backplane Is Faulty” on page 125 “Remove the Hard Drive Backplane” on page 127 “Install the Hard Drive Backplane” on page 130 “Verify the Hard Drive Backplane” on page 132
Determine whether the hard drive backplane is faulty.	“Determine if the Hard Drive Backplane Is Faulty” on page 125 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 127.

If a FRU value different from `/SYS/SASBP` is displayed, see [“Component Service Task Reference”](#) 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 127.

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 11.

Related Information

- [“Remove the Hard Drive Backplane”](#) on page 127
- [“Install the Hard Drive Backplane”](#) on page 130
- [“Verify the Hard Drive Backplane”](#) on page 132
- [“Detecting and Managing Faults”](#) on page 11

▼ 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 61.
- If you are removing the hard drive backplane as part of another component’s removal or installation procedure, go to [Step 2](#).

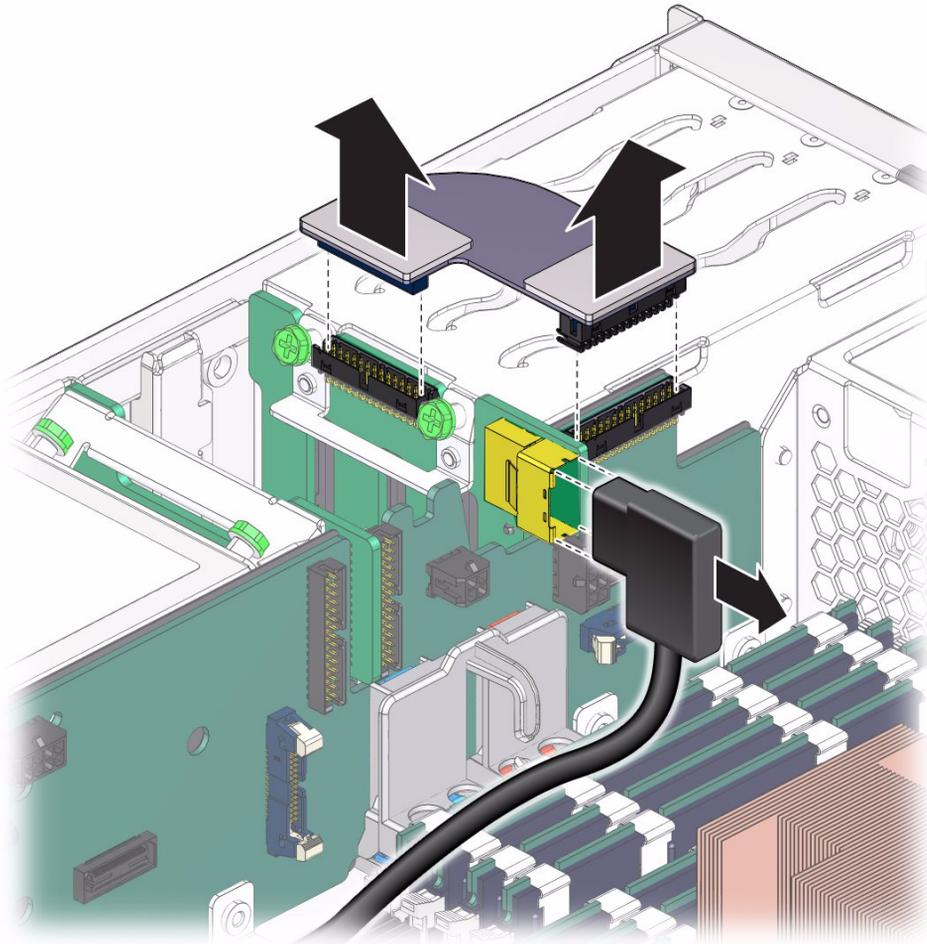
2. Remove all of the hard drives.

See [“Remove a Hard Drive”](#) on page 108.

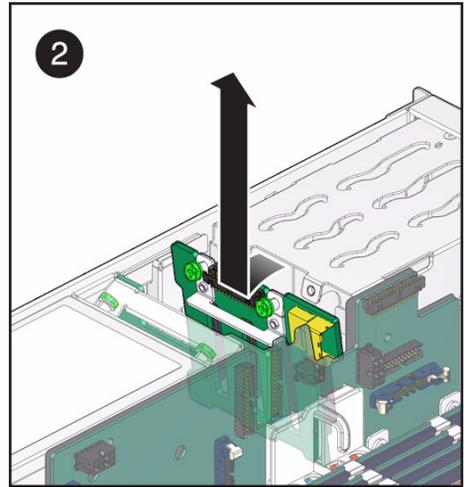
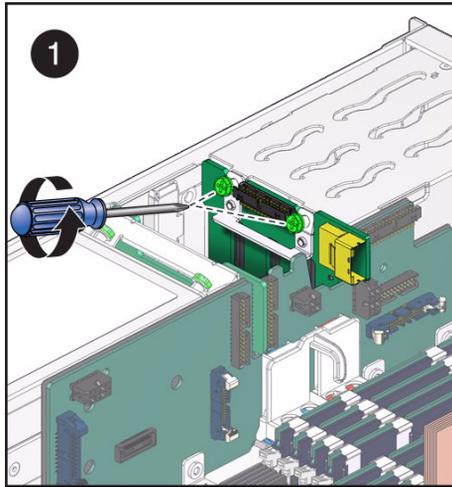
3. Remove the hard drive fan.

See [“Remove the Hard Drive Fan”](#) on page 120.

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 130.
 - If you removed the hard drive backplane as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) on page 67 for assistance.

Related Information

- [“Determine if the Hard Drive Backplane Is Faulty”](#) on page 125
- [“Install the Hard Drive Backplane”](#) on page 130
- [“Verify the Hard Drive Backplane”](#) on page 132
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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.

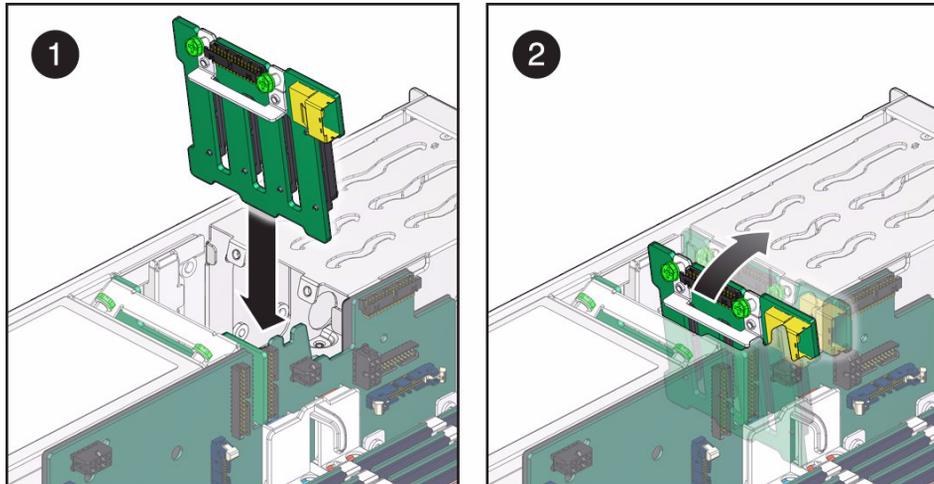
1. Consider your first steps:

- 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 127.
- 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.

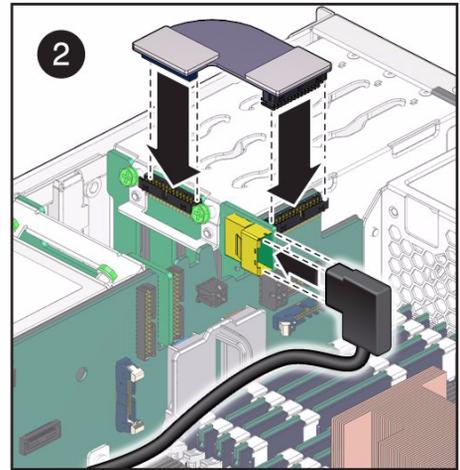
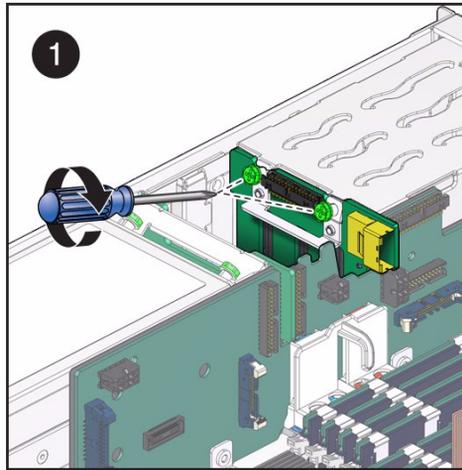
3. Tilt the hard drive backplane slightly backwards and lower it into the chassis (pane 1).



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 Service Task Reference"](#) on page 67 for assistance.
10. **Install the hard drive fan.**

See ["Install the Hard Drive Fan"](#) on page 121.
11. **Install the hard drives.**

See ["Install a Hard Drive"](#) on page 112.
12. **Finish the installation procedure.**

See:

 - ["Returning the Server to Operation"](#) on page 261
 - ["Verify the Hard Drive Backplane"](#) on page 132

Related Information

- ["Determine if the Hard Drive Backplane Is Faulty"](#) on page 125
- ["Remove the Hard Drive Backplane"](#) on page 127
- ["Verify the Hard Drive Backplane"](#) on page 132
- ["Preparing for Service"](#) on page 61

- [“Returning the Server to Operation”](#) on page 261

▼ 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 125.

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 125
- [“Remove the Hard Drive Backplane”](#) on page 127
- [“Install the Hard Drive Backplane”](#) on page 130

Servicing the Power Distribution Board

The power distribution board 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.

Description	Links
Replace the faulty power distribution board.	“Determine if the Power Distribution Board Is Faulty” on page 134 “Remove the Power Distribution Board” on page 135 “Install the Power Distribution Board” on page 137 “Verify the Power Distribution Board” on page 139
Determine whether the power distribution board is faulty.	“Determine if the Power Distribution Board Is Faulty” on page 134 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.
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 135.

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 135.

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 11.

Related Information

- [“Remove the Power Distribution Board”](#) on page 135
- [“Install the Power Distribution Board”](#) on page 137
- [“Verify the Power Distribution Board”](#) on page 139
- [“Detecting and Managing Faults”](#) on page 11

▼ 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.

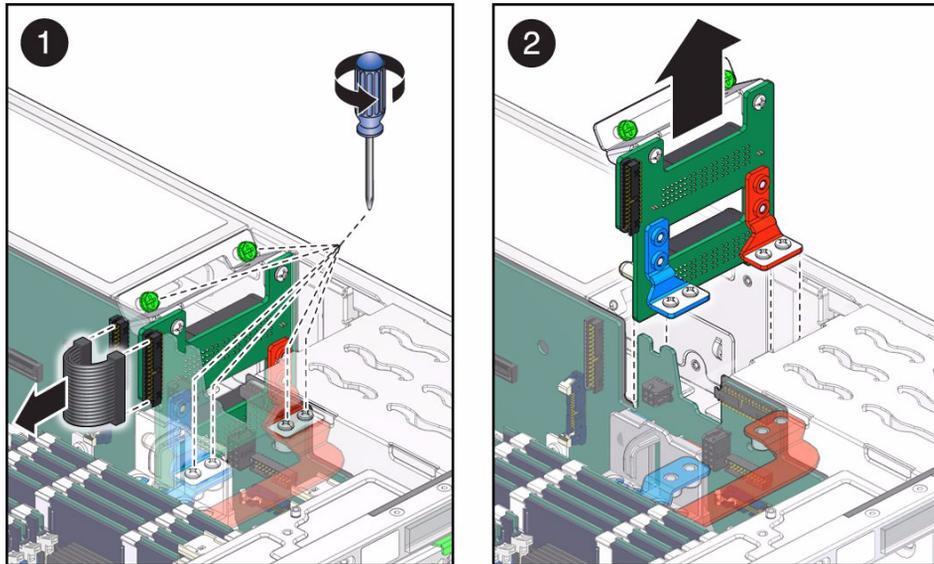
1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service”](#) on page 61.
- 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 97.

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 137.
- If you removed the power distribution board as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) on page 67 for assistance.

Related Information

- “Determine if the Power Distribution Board Is Faulty” on page 134
- “Install the Power Distribution Board” on page 137
- “Verify the Power Distribution Board” on page 139
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ Install the Power Distribution Board

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

1. Consider your first steps:

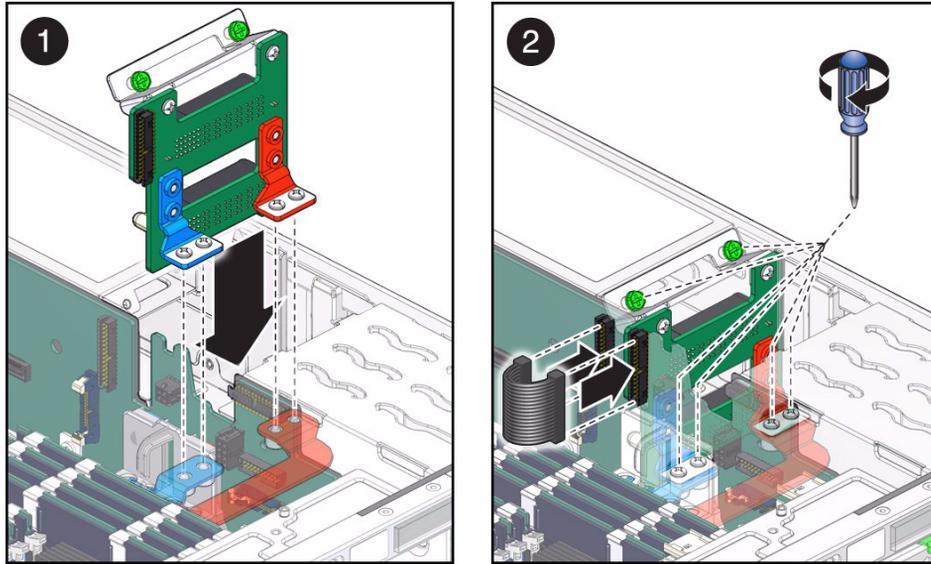
- If you are replacing a power distribution board, remove the faulty or obsolete power distribution board first, then return to this procedure, [Step 2](#). See [“Remove the Power Distribution Board” on page 135](#).
- If you are installing the power distribution board as part of another component’s 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 Service Task Reference"](#) on page 67 for assistance.
7. Install the power supplies.
See ["Install a Power Supply"](#) on page 100.
8. Finish the installation procedure.
See:
 - ["Returning the Server to Operation"](#) on page 261
 - ["Verify the Power Distribution Board"](#) on page 139

Related Information

- “Determine if the Power Distribution Board Is Faulty” on page 134
- “Remove the Power Distribution Board” on page 135
- “Verify the Power Distribution Board” on page 139
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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 134
- “Remove the Power Distribution Board” on page 135
- “Install the Power Distribution Board” on page 137

Servicing the DVD Drive

The DVD drive is an SATA 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.

Description	Links
Replace the faulty DVD drive.	“Determine if the DVD Drive Is Faulty” on page 141 “Remove the DVD Drive” on page 143 “Install the DVD Drive” on page 145 “Verify the DVD Drive” on page 147
Determine whether the DVD drive is faulty.	“Determine if the DVD Drive Is Faulty” on page 141 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Servicing the DVD Tray”](#) on page 149
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 143.

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 143.

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 143.

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 11.

Related Information

- [“Remove the DVD Drive”](#) on page 143
- [“Install the DVD Drive”](#) on page 145
- [“Verify the DVD Drive”](#) on page 147
- [“Detecting and Managing Faults”](#) on page 11

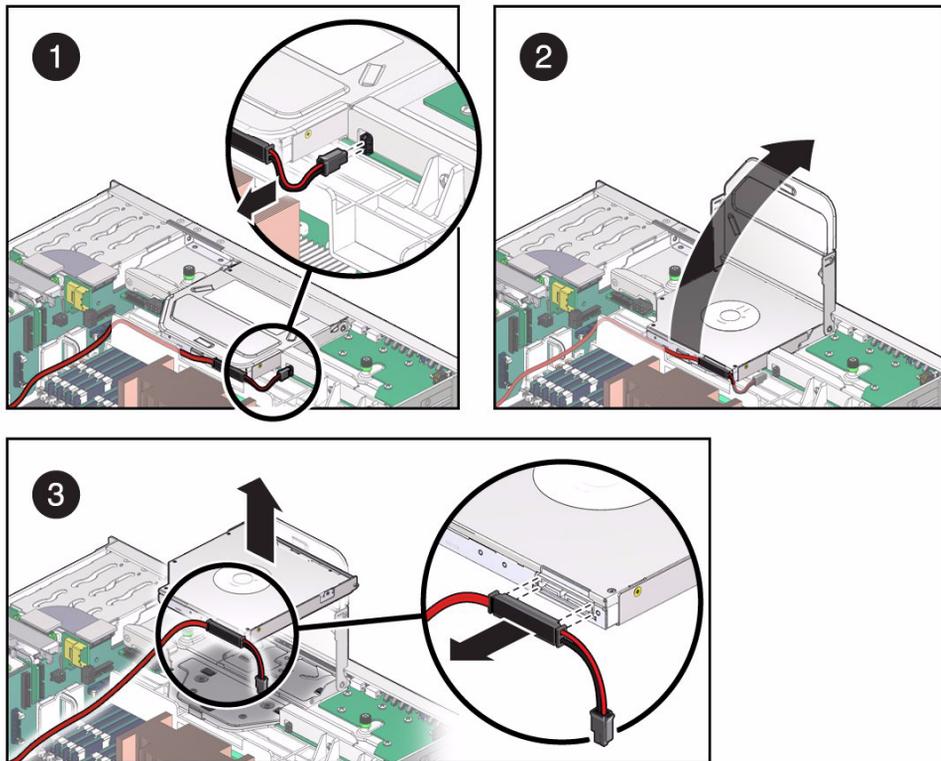
▼ Remove the DVD Drive

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 61.
- 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 145.
 - If you removed the DVD drive as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) on page 67 for assistance.

Related Information

- [“Determine if the DVD Drive Is Faulty”](#) on page 141
- [“Install the DVD Drive”](#) on page 145
- [“Verify the DVD Drive”](#) on page 147
- [“Preparing for Service”](#) on page 61

- [“Returning the Server to Operation”](#) on page 261

▼ Install the DVD Drive

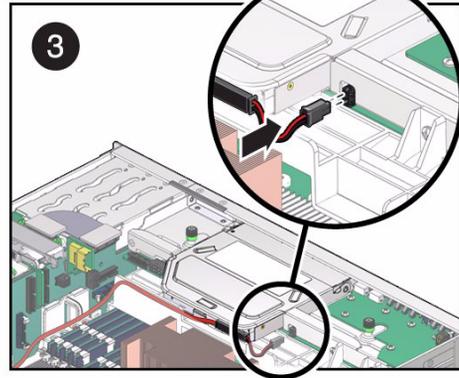
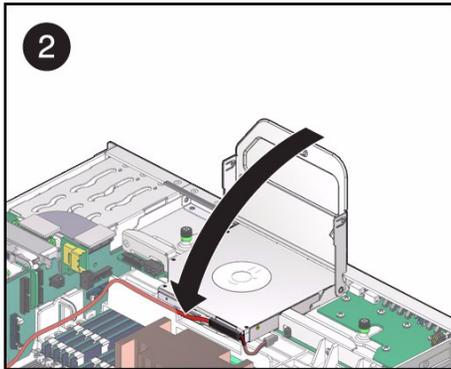
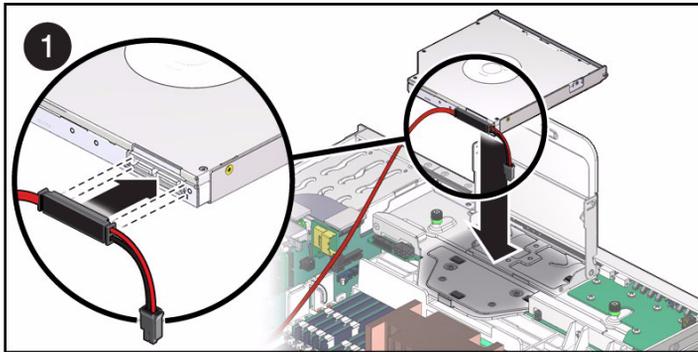
Installing the DVD drive is a cold-service operation. You must power off the server before installing the DVD drive.

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 143.
- 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 Service Task Reference](#)" on [page 67](#) for assistance.
10. **Finish the installation procedure.**
See:

- “Returning the Server to Operation” on page 261
- “Verify the DVD Drive” on page 147

Related Information

- “Determine if the DVD Drive Is Faulty” on page 141
- “Remove the DVD Drive” on page 143
- “Verify the DVD Drive” on page 147
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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 141
- “Remove the DVD Drive” on page 143
- “Install the DVD Drive” on page 145

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.

Description	Links
Remove the DVD tray as part of another component’s service operation.	“Remove the DVD Tray” on page 149
Install the DVD tray as part of another component’s service operation.	“Install the DVD Tray” on page 152

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Servicing the DVD Drive”](#) on page 141
- [“Servicing the LED Board”](#) on page 155
- [“Servicing the Fan Board”](#) on page 161
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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.

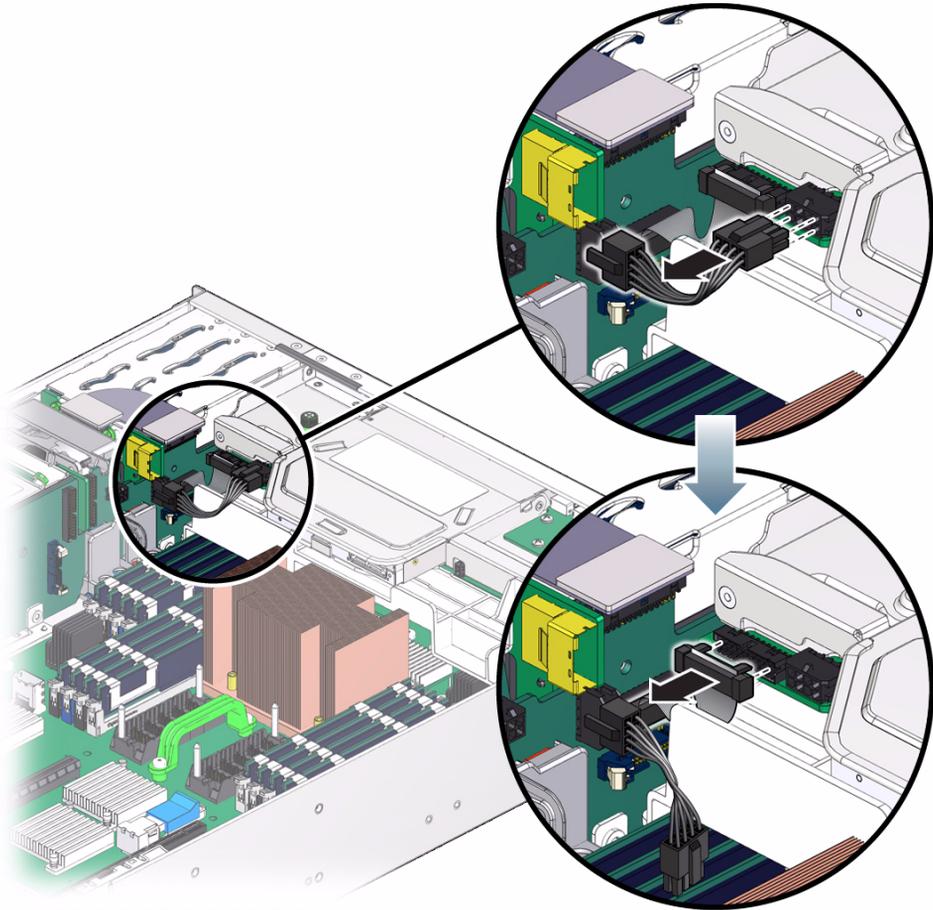
1. **Consider your first step:**

- If you have not prepared for service, do so now. See [“Preparing for Service”](#) on page 61.
- If you are removing the DVD tray as part of another component’s removal or installation procedure, go to [Step 2](#).

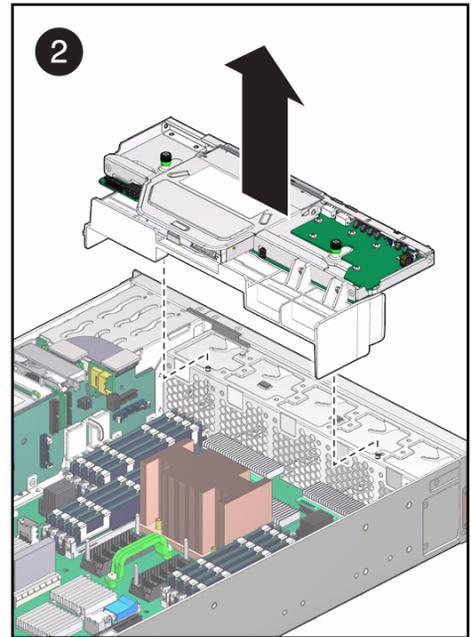
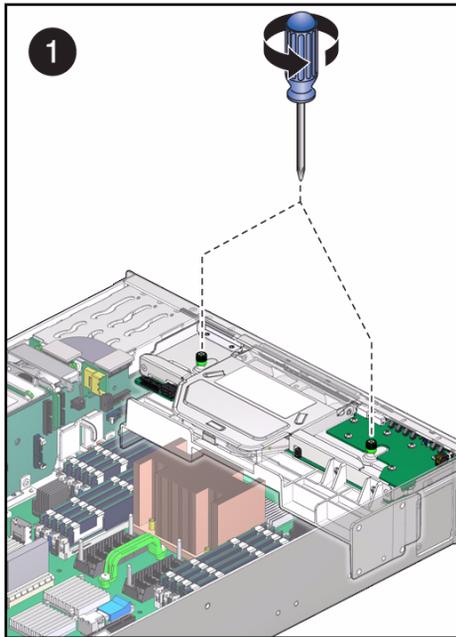
2. Remove the DVD drive.

See [“Remove the DVD Drive”](#) on page 143.

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 152.
- If you removed the DVD tray as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) on page 67 for assistance.

Related Information

- [“Install the DVD Tray”](#) on page 152
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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.

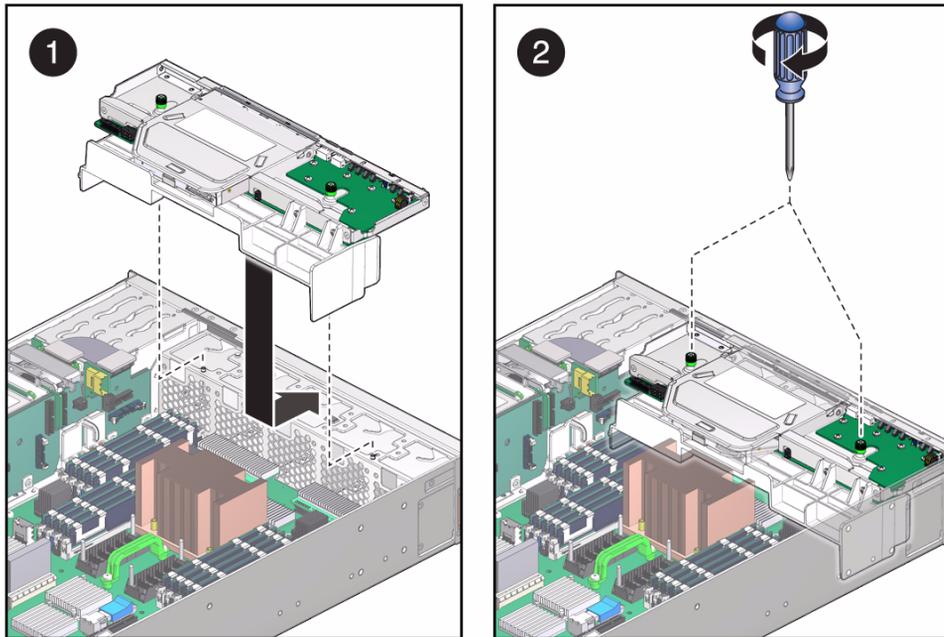
1. Consider your first steps:

- 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 149.
- 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.

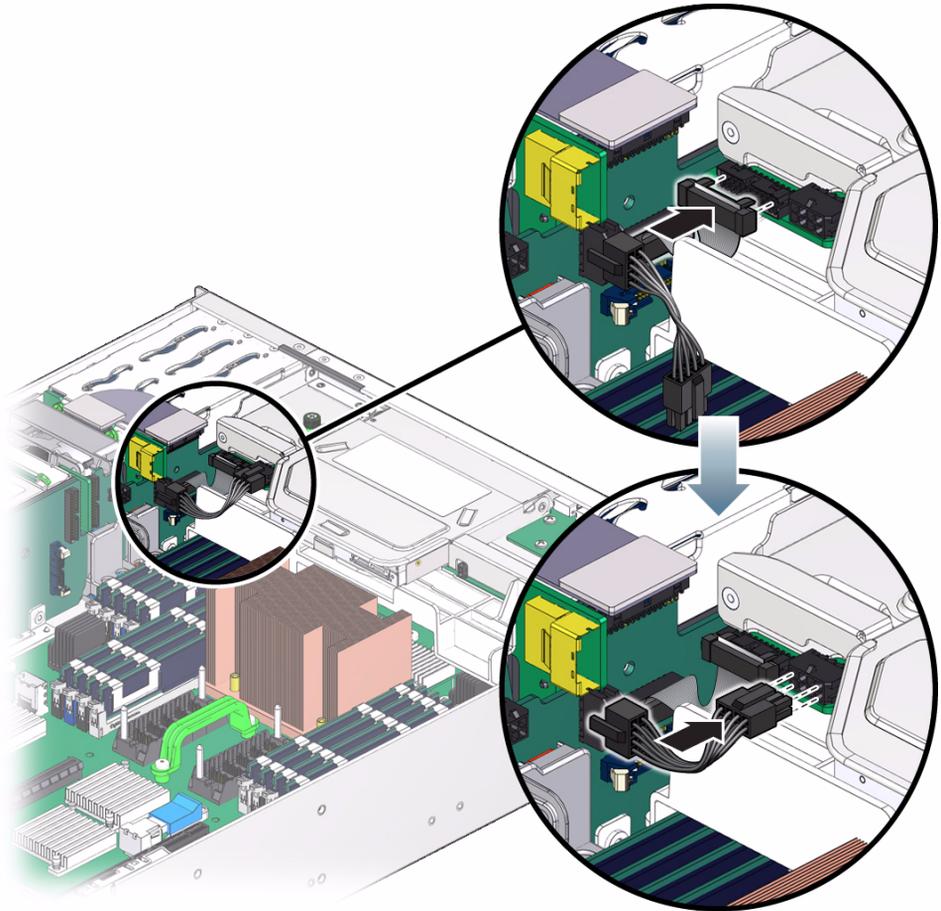
The DVD tray has the LED board to the front left top.

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 Service Task Reference"](#) on page 67 for assistance.

7. Install the DVD drive.

See ["Install the DVD Drive"](#) on page 145.

8. Finish the installation procedure.

See ["Returning the Server to Operation"](#) on page 261.

Related Information

- ["Remove the DVD Tray"](#) on page 149

- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

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.

Description	Links
Replace the faulty LED board.	“Determine if the LED Board Is Faulty” on page 155 “Remove the LED Board” on page 157 “Install the LED Board” on page 158 “Verify the LED Board” on page 160
Determine whether the LED board is faulty.	“Determine if the LED Board Is Faulty” on page 155 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Servicing the DVD Tray”](#) on page 149
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 157](#).

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 157](#).

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 157](#).

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 11.

Related Information

- [“Remove the LED Board”](#) on page 157
- [“Install the LED Board”](#) on page 158
- [“Verify the LED Board”](#) on page 160
- [“Detecting and Managing Faults”](#) on page 11

▼ 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 61.
- If you are removing the LED board as part of another component’s removal or installation procedure, go to [Step 2](#).

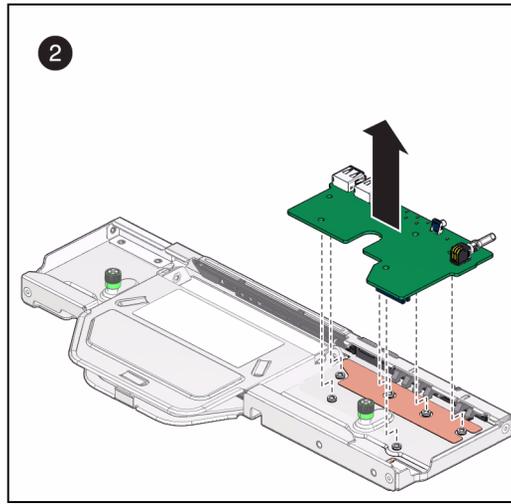
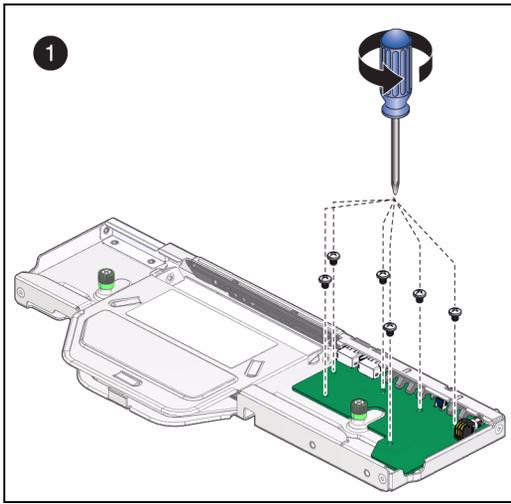
2. Remove the DVD tray.

See [“Remove the DVD Tray”](#) on page 149.

3. Remove the fan board.

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

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 158.
 - If you removed the LED board as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) on page 67 for assistance.

Related Information

- [“Determine if the LED Board Is Faulty”](#) on page 155
- [“Install the LED Board”](#) on page 158
- [“Verify the LED Board”](#) on page 160
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ Install the LED Board

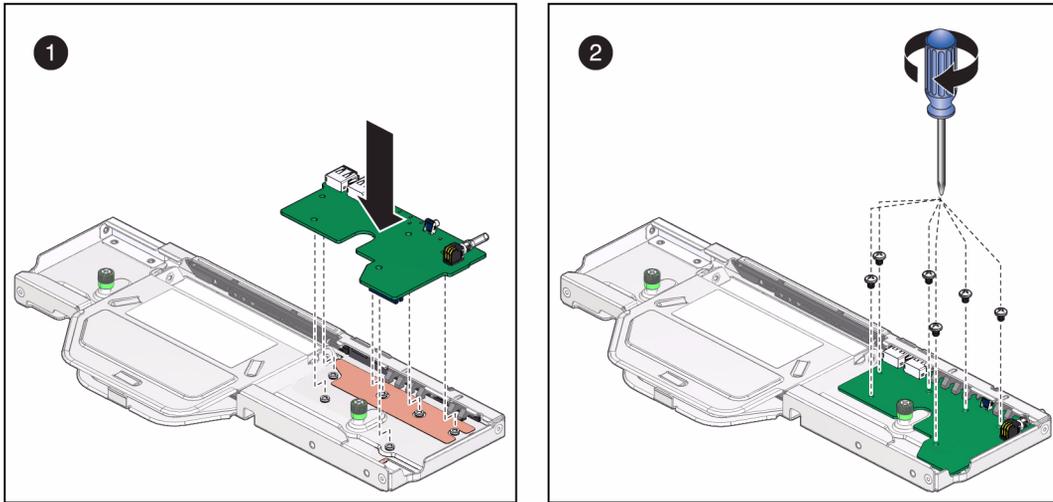
Installing the LED board is a cold-service operation. You must power off the server before installing the LED board.

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 157.
- 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 Service Task Reference”](#) on page 67 for assistance.

5. Install the fan board.

See [“Install the Fan Board”](#) on page 167.

6. Install the DVD tray.

See [“Install the DVD Tray”](#) on page 152.

7. Finish the installation procedure.

See:

- [“Returning the Server to Operation”](#) on page 261

- “Verify the LED Board” on page 160

Related Information

- “Determine if the LED Board Is Faulty” on page 155
- “Remove the LED Board” on page 157
- “Verify the LED Board” on page 160
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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 155
- “Remove the LED Board” on page 157
- “Install the LED Board” on page 158

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.

Description	Links
Replace the faulty fan board.	“Determine if the Fan Board Is Faulty” on page 162 “Remove the Fan Board” on page 164 “Install the Fan Board” on page 167 “Verify the Fan Board” on page 170
Remove the fan board as part of another component’s service operation.	“Remove the Fan Board” on page 164
Install the fan board as part of another component’s service operation.	“Install the Fan Board” on page 167
Determine whether the fan board is faulty.	“Determine if the Fan Board Is Faulty” on page 162 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Servicing the DVD Tray”](#) on page 149
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 164.

If a FRU value different from `/SYS/FANBD` is displayed, see [“Component Service Task Reference”](#) 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 164](#).

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 164](#).

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

See [“Detecting and Managing Faults” on page 11](#).

Related Information

- [“Remove the Fan Board” on page 164](#)
- [“Install the Fan Board” on page 167](#)
- [“Verify the Fan Board” on page 170](#)
- [“Detecting and Managing Faults” on page 11](#)

▼ 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.

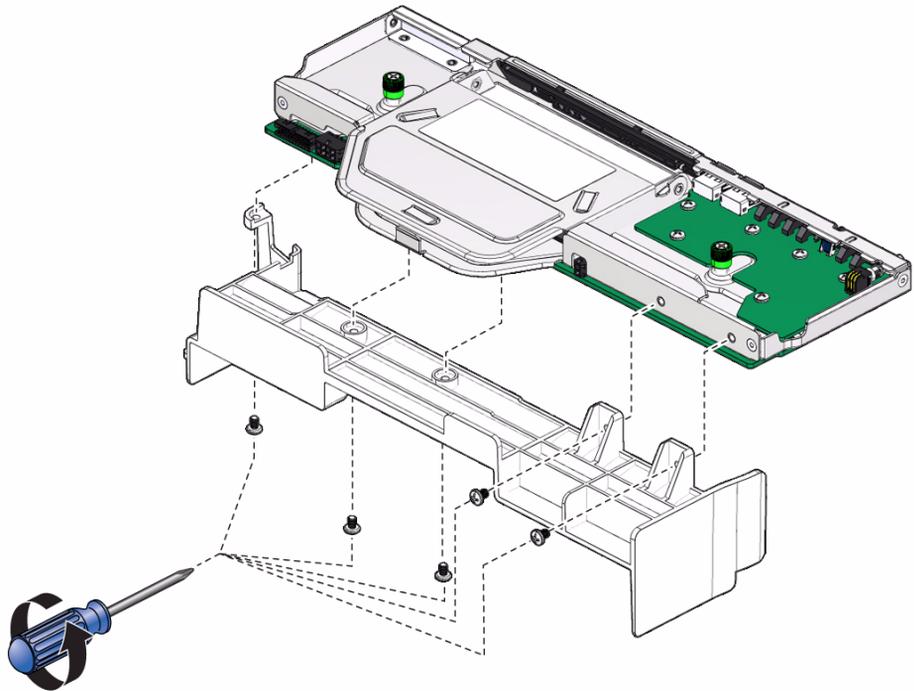
1. Consider your first step:

- If you have not prepared for service, do so now. See [“Preparing for Service” on page 61](#).
- 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.

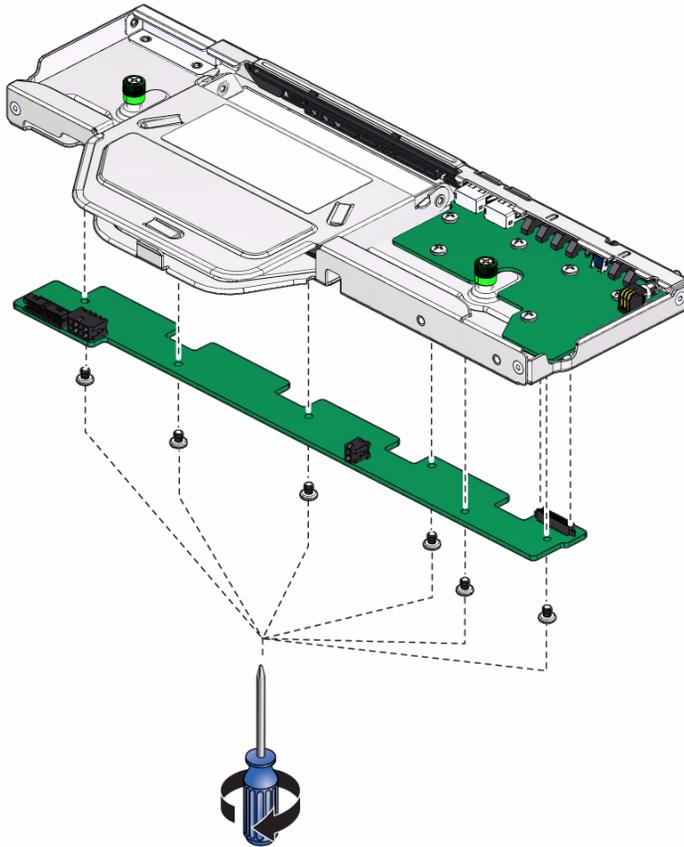
See [“Remove the DVD Tray” on page 149](#).

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 167](#).
- If you removed the fan board as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference” on page 67](#) for assistance.

Related Information

- [“Determine if the Fan Board Is Faulty” on page 162](#)
- [“Install the Fan Board” on page 167](#)
- [“Verify the Fan Board” on page 170](#)
- [“Preparing for Service” on page 61](#)
- [“Returning the Server to Operation” on page 261](#)

▼ 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:

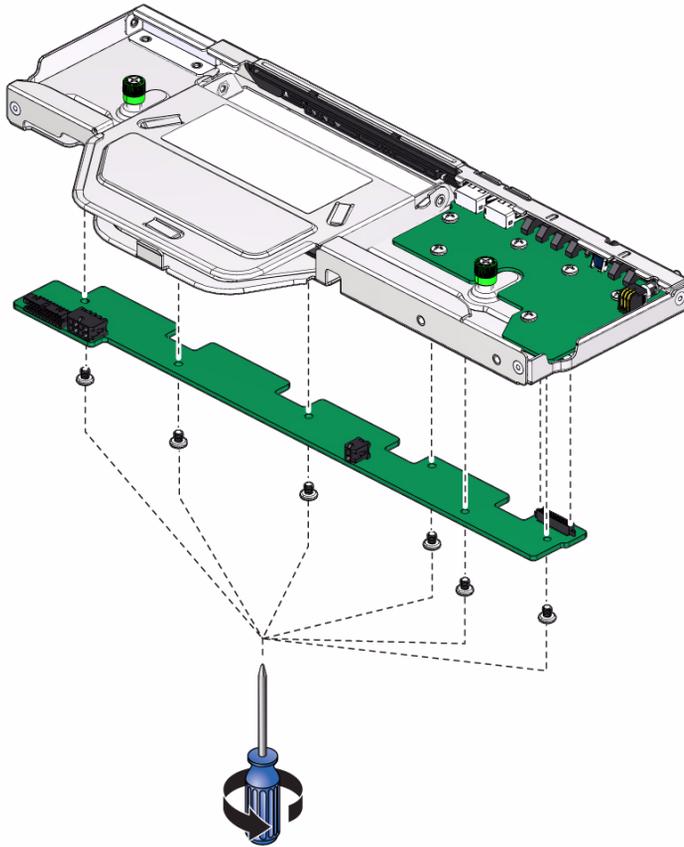
- If you are replacing a fan board, remove the faulty or obsolete fan board first, then return to this procedure, [Step 2](#). See [“Remove the Fan Board” on page 164](#).
- If you are installing the fan board as part of another component’s removal or installation procedure, go to [Step 2](#).

2. Align the fan board to the location where it installs onto the DVD tray.

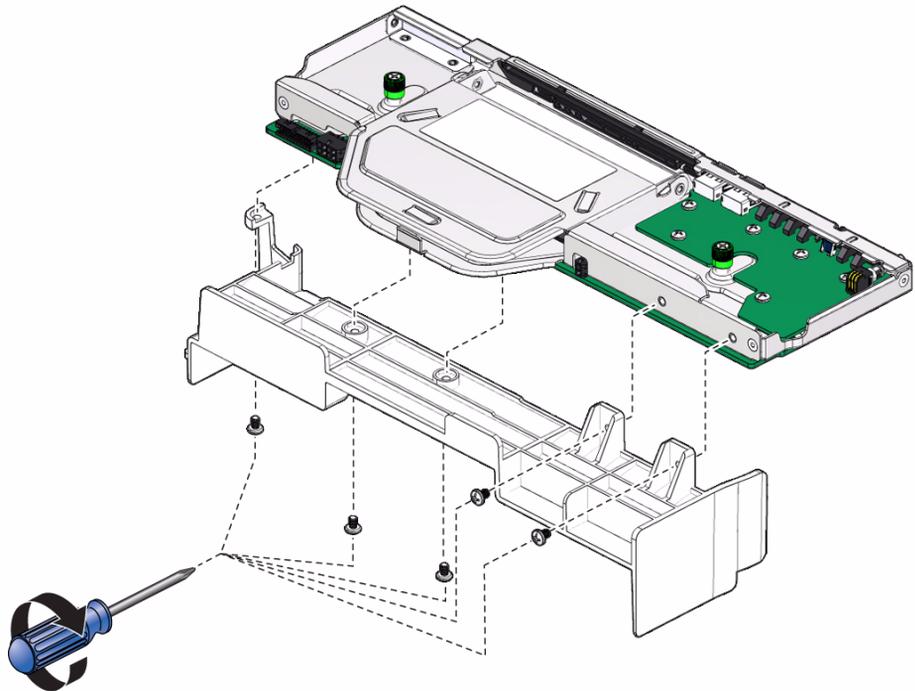
The power and signal connectors fit into the cut-outs of the DVD tray.

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 Service Task Reference"](#) on page 67 for assistance.

6. Install the DVD tray.

See ["Install the DVD Tray"](#) on page 152.

7. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 261
- ["Verify the Fan Board"](#) on page 170

Related Information

- ["Determine if the Fan Board Is Faulty"](#) on page 162
- ["Remove the Fan Board"](#) on page 164
- ["Verify the Fan Board"](#) on page 170
- ["Preparing for Service"](#) on page 61
- ["Returning the Server to Operation"](#) on page 261

▼ 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 162.

3. 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).

Related Information

- “Determine if the Fan Board Is Faulty” on page 162
- “Remove the Fan Board” on page 164
- “Install the Fan Board” on page 167

Servicing the PCIe2 Mezzanine Board

The PCIe2 mezzanine board hosts 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.

Description	Links
Replace the faulty PCIe2 mezzanine board.	“Determine if the PCIe2 Mezzanine Board Is Faulty” on page 172 “Remove the PCIe2 Mezzanine Board” on page 174 “Install the PCIe2 Mezzanine Board” on page 177 “Verify the PCIe2 Mezzanine Board” on page 179
Remove the PCIe2 mezzanine board as part of another component’s service operation.	“Remove the PCIe2 Mezzanine Board” on page 174
Install the PCIe2 mezzanine board as part of another component’s service operation.	“Install the PCIe2 Mezzanine Board” on page 177
Determine whether the PCIe2 mezzanine board is faulty.	“Determine if the PCIe2 Mezzanine Board Is Faulty” on page 172 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Servicing PCIe2 Riser Cards”](#) on page 181
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 174.

If a FRU value different from `/SYS/MB/PCI_MEZZ` is displayed, see [“Component Service Task Reference”](#) 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 174.

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 174.

7. If you are unable to determine if the PCIe2 mezzanine board is faulty, seek further information.

See [“Detecting and Managing Faults”](#) on page 11.

Related Information

- [“Remove the PCIe2 Mezzanine Board”](#) on page 174

- “Install the PCIe2 Mezzanine Board” on page 177
- “Verify the PCIe2 Mezzanine Board” on page 179
- “Detecting and Managing Faults” on page 11

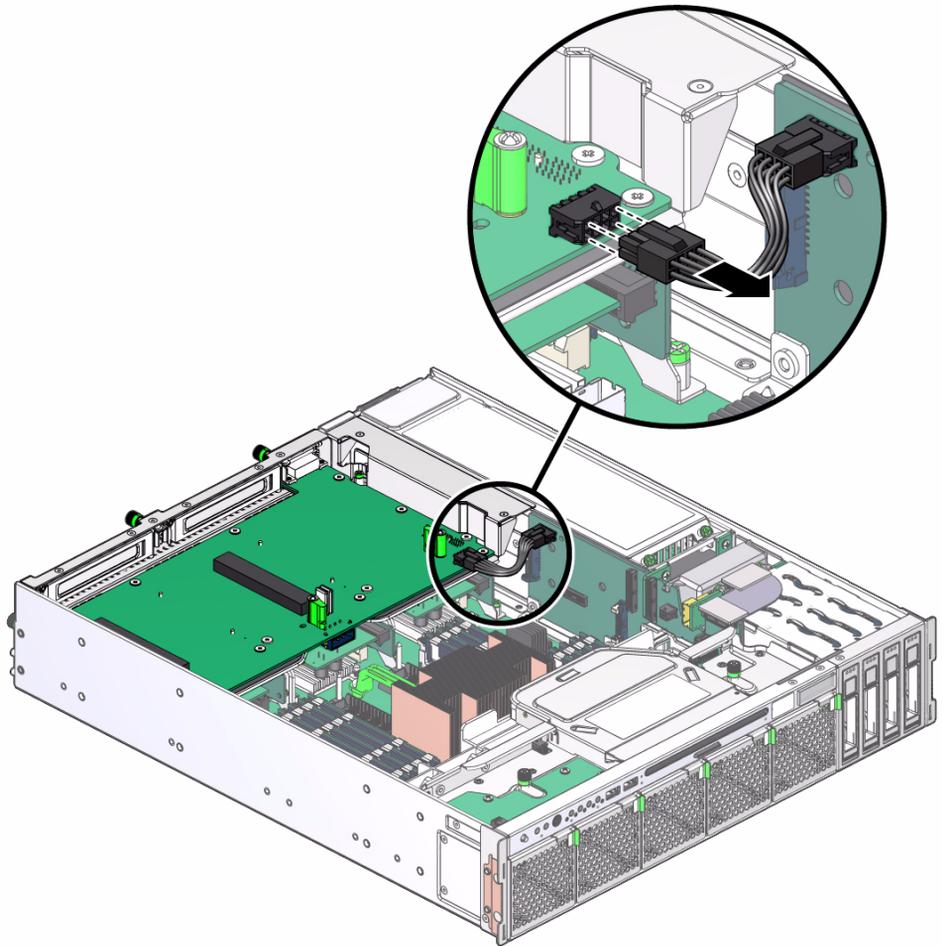
▼ Remove the PCIe2 Mezzanine Board

Removing the PCIe2 mezzanine board is a cold-service operation. You must power off the server before you remove the PCIe2 mezzanine board.

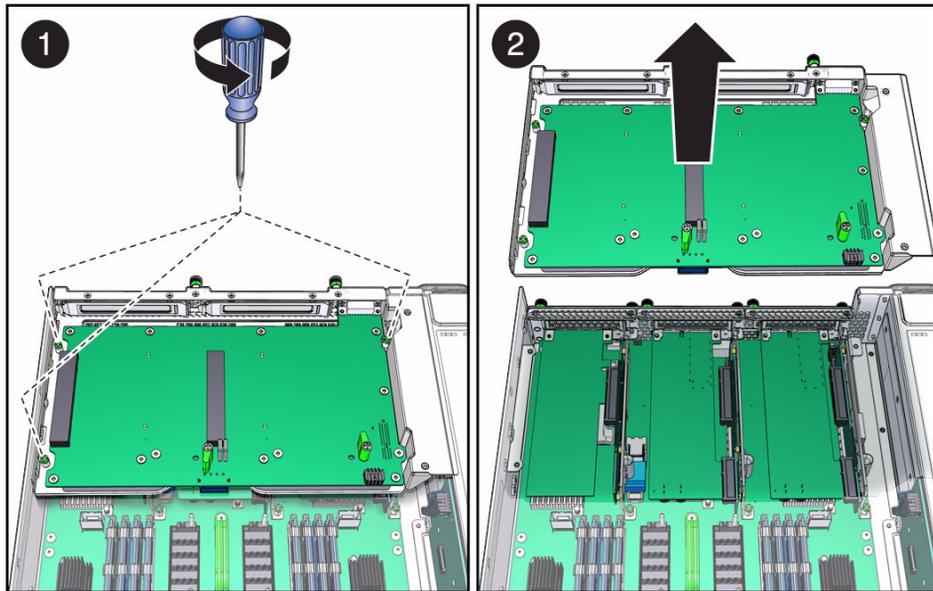
1. Consider your first step:

- If you have not prepared for service, do so now. See “[Preparing for Service](#)” on page 61.
- 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 193.
 - Install a new PCIe2 mezzanine board. See “Install the PCIe2 Mezzanine Board” on page 177.
- If you removed the PCIe2 mezzanine board as part of another component’s removal or installation procedure, return to that procedure. See “Component Service Task Reference” on page 67 for assistance.

Related Information

- “Determine if the PCIe2 Mezzanine Board Is Faulty” on page 172
- “Install the PCIe2 Mezzanine Board” on page 177
- “Verify the PCIe2 Mezzanine Board” on page 179
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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 174.
- If you are installing the PCIe2 mezzanine board as part of another component’s removal or installation procedure, go to [Step 3](#).

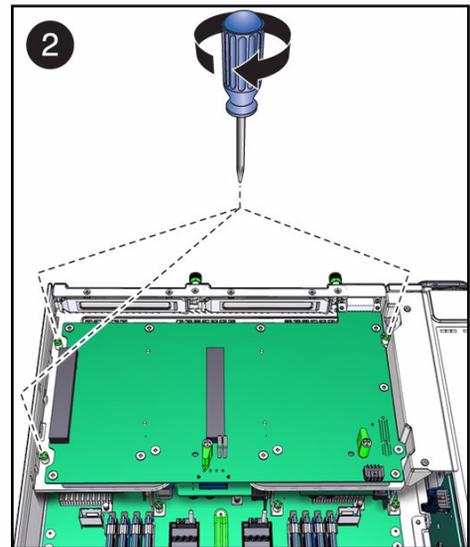
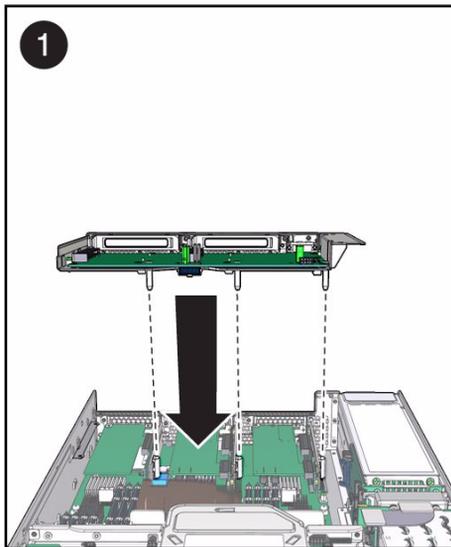
2. If the PCIe2 cards were previously removed, install them.

See [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 196.

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.

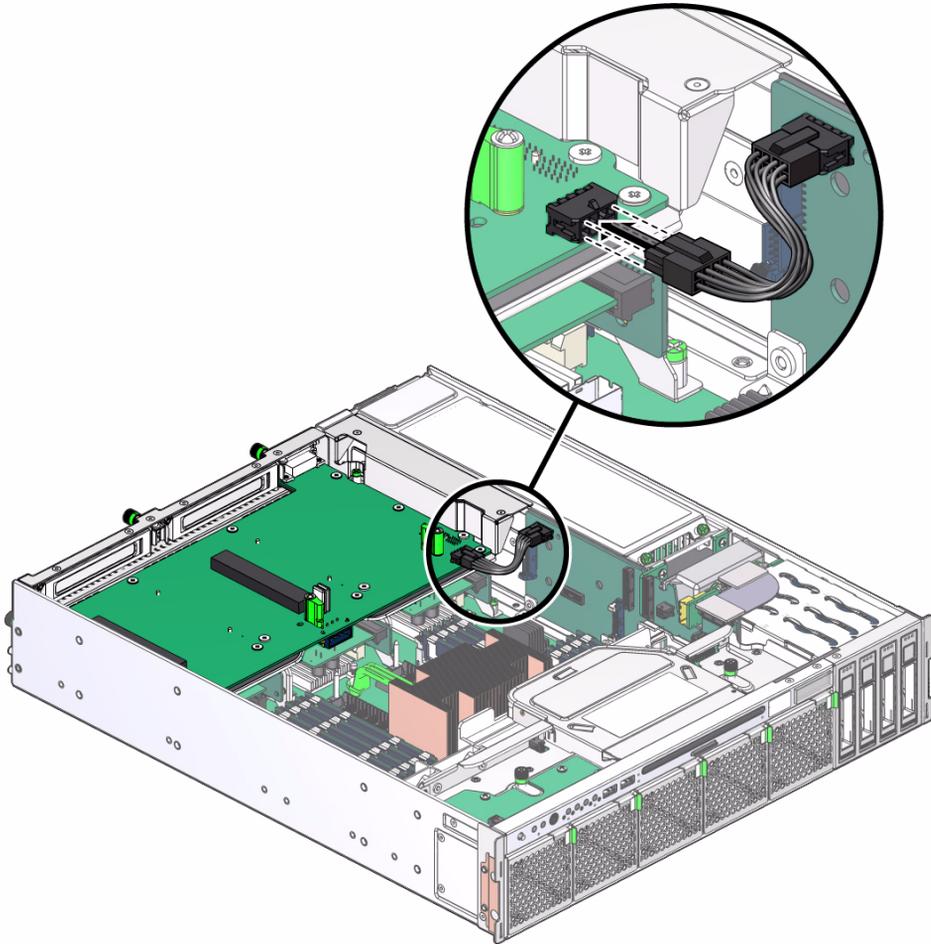
4. Lower the PCIe2 mezzanine board onto the PCIe2 riser cards and press the board securely in place (pane 1).



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 Service Task Reference](#)" on page 67 for assistance.

8. Finish the installation procedure.

See:

- "[Returning the Server to Operation](#)" on page 261
- "[Verify the PCIe2 Mezzanine Board](#)" on page 179

Related Information

- “Determine if the PCIe2 Mezzanine Board Is Faulty” on page 172
- “Remove the PCIe2 Mezzanine Board” on page 174
- “Verify the PCIe2 Mezzanine Board” on page 179
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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 172.

3. Verify that the PCIe2 cards installed in the PCIe2 mezzanine board are enabled.

```
-> show /SYS/MB/PCI_MEZZ/PCIE $x$  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 172
- “Remove the PCIe2 Mezzanine Board” on page 174
- “Install the PCIe2 Mezzanine Board” on page 177

Servicing PCIe2 Riser Cards

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.

Description	Links
Replace a faulty PCIe2 riser card.	“Locate a Faulty PCIe2 Riser Card” on page 182 “Remove a PCIe2 Riser Card” on page 184 “Install a PCIe2 Riser Card” on page 186 “Verify a PCIe2 Riser Card” on page 188
Remove the PCIe2 riser cards as part of another component’s service operation.	“Remove a PCIe2 Riser Card” on page 184
Install the PCIe2 riser cards as part of another component’s service operation.	“Install a PCIe2 Riser Card” on page 186
Identify a faulty PCIe2 riser card.	“Locate a Faulty PCIe2 Riser Card” on page 182 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 184.

If a FRU value different from `/SYS/MB/RISERx` is displayed, see [“Component Service Task Reference”](#) 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 184](#).

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 184](#).

7. If you are unable to identify the faulty PCIe2 riser card, seek further information.

See [“Detecting and Managing Faults” on page 11](#).

Related Information

- [“Remove a PCIe2 Riser Card” on page 184](#)

- [“Install a PCIe2 Riser Card”](#) on page 186
- [“Verify a PCIe2 Riser Card”](#) on page 188
- [“Detecting and Managing Faults”](#) on page 11

▼ 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 61.
- 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.

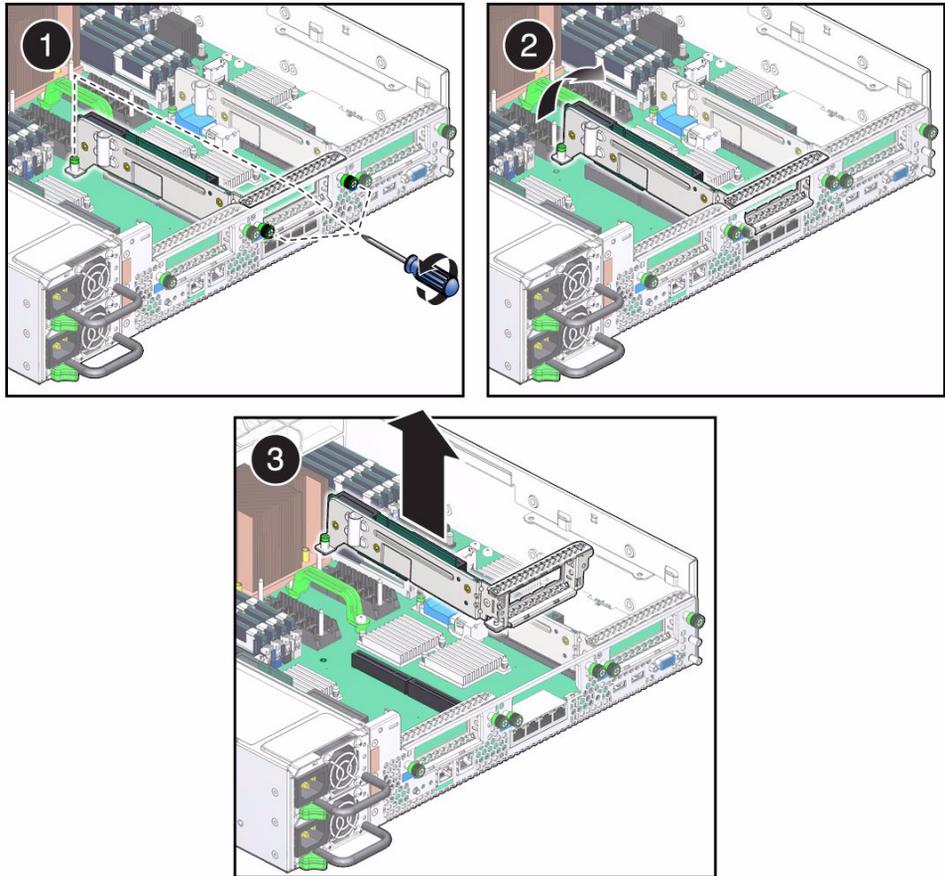
See [“Remove the PCIe2 Mezzanine Board”](#) on page 174.

3. Determine which PCIe2 riser card to remove.

See [“Locate a Faulty PCIe2 Riser Card”](#) on page 182.

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 195.
 - Install a new PCIe2 riser card. See [“Install a PCIe2 Riser Card”](#) on page 186.
 - If you removed the PCIe2 riser card as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) on page 67 for assistance.

Related Information

- [“Locate a Faulty PCIe2 Riser Card”](#) on page 182

- “Install a PCIe2 Riser Card” on page 186
- “Verify a PCIe2 Riser Card” on page 188
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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:

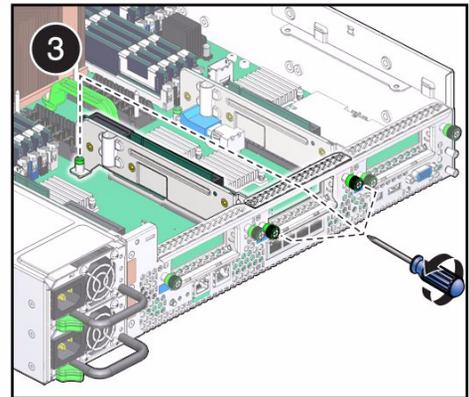
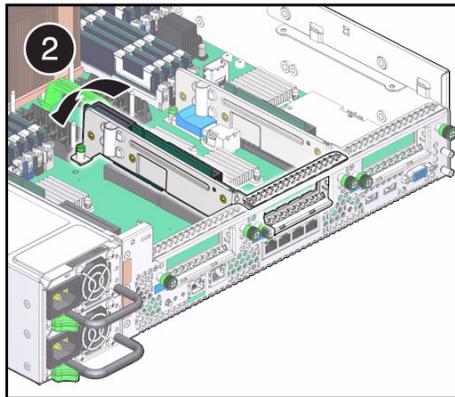
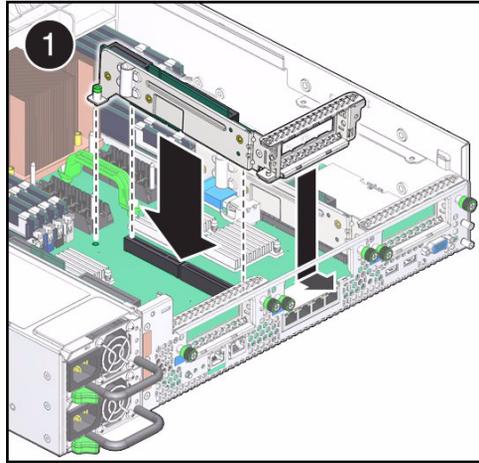
- If you are replacing a PCIe2 riser card, remove the faulty or obsolete PCIe2 riser card first, then return to this procedure, [Step 2](#). See “[Remove a PCIe2 Riser Card](#)” on page 184.
- If you are installing the PCIe2 riser card as part of another component’s removal or installation procedure, 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 198.

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 Service Task Reference"](#) on page 67 for assistance.
7. Finish the installation procedure.
See:
 - ["Returning the Server to Operation"](#) on page 261
 - ["Verify a PCIe2 Riser Card"](#) on page 188

Related Information

- “Locate a Faulty PCIe2 Riser Card” on page 182
- “Remove a PCIe2 Riser Card” on page 184
- “Verify a PCIe2 Riser Card” on page 188
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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/RISERx 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 182.

3. Verify that 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).

Related Information

- “Locate a Faulty PCIe2 Riser Card” on page 182
- “Remove a PCIe2 Riser Card” on page 184
- “Install a PCIe2 Riser Card” on page 186

Servicing PCIe2 Cards

PCIe2 cards are industry-standard form factor peripheral components. PCIe2 cards 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.

Description	Links
Replace a faulty PCIe2 card.	“Locate a Faulty PCIe2 Card” on page 190 “Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 193 “Remove a PCIe2 Card From the PCIe2 Riser Card” on page 195 “Install a PCIe2 Card Into the PCIe2 Mezzanine Board” on page 196 “Install a PCIe2 Card Into the PCIe2 Riser Card” on page 198 “Verify a PCIe2 Card” on page 202
Remove the PCIe2 cards as part of another component’s service operation.	“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 193 “Remove a PCIe2 Card From the PCIe2 Riser Card” on page 195
Install the PCIe2 cards as part of another component’s service operation.	“Install a PCIe2 Card Into the PCIe2 Mezzanine Board” on page 196 “Install a PCIe2 Card Into the PCIe2 Riser Card” on page 198
Add an additional PCIe2 card. If installing a Sun Storage 6 Gb SAS PCIe RAID HBA, Internal card, you must also install a special SAS cable.	“Install a PCIe2 Card Into the PCIe2 Mezzanine Board” on page 196 “Install a PCIe2 Card Into the PCIe2 Riser Card” on page 198 “Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal” on page 200 “Verify a PCIe2 Card” on page 202

Description	Links
Remove an existing PCIe2 card.	“Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 193 “Remove a PCIe2 Card From the PCIe2 Riser Card” on page 195
Identify the faulty PCIe2 card.	“Locate a Faulty PCIe2 Card” on page 190 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components” on page 1](#)
- [“Component Service Task Reference” on page 67](#)
- [“Servicing PCIe2 Riser Cards” on page 181](#)
- [“Servicing the PCIe2 Mezzanine Board” on page 171](#)
- [“Detecting and Managing Faults” on page 11](#)
- [“Preparing for Service” on page 61](#)
- [“Returning the Server to Operation” on page 261](#)

▼ 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 16](#).
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 193](#) or [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 195](#).

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 193](#) or [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 195](#).

If a FRU value different from `/SYS/MB/PCI_MEZZ/PCIEx/card_type` or `/SYS/MB/RISERY/card_type` is displayed, see [“Component Service Task Reference” 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 193 or [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 195.

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/PCIE*
/SYS/MB/PCI_MEZZ/PCIE4
Targets:
XAUI0
.
.
.
-> show -d targets /SYS/MB/RISER*
/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 193 or [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 195.

8. **If you are unable to identify the faulty PCIe2 card, seek further information.**
See [“Detecting and Managing Faults”](#) on page 11.

Related Information

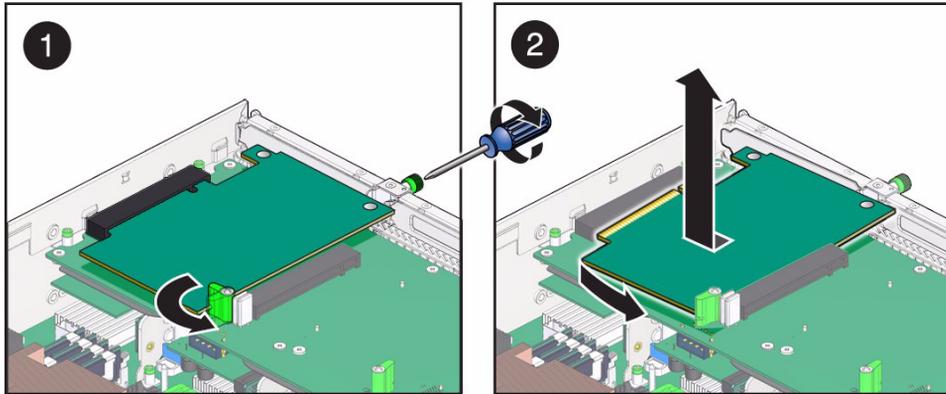
- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board”](#) on page 193
- [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 195
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 196
- [“Install a PCIe2 Card Into the PCIe2 Riser Card”](#) on page 198
- [“Verify a PCIe2 Card”](#) on page 202
- [“Detecting and Managing Faults”](#) on page 11

▼ 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 190.
 - 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 195.
2. **Consider your next step:**
 - If you have not prepared for service, do so now. See [“Preparing for Service”](#) on page 61.
 - 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 196.
 - If you removed the PCIe2 card as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) 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 261.

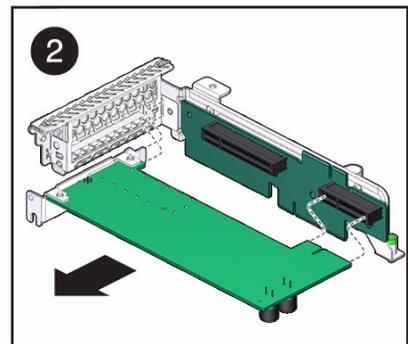
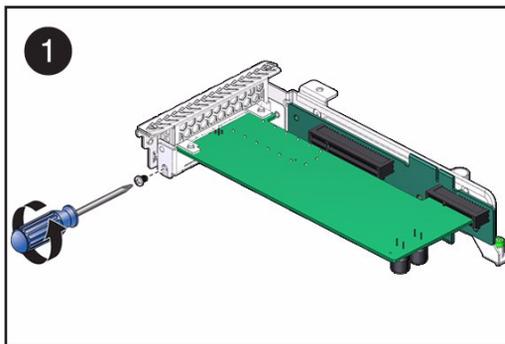
Related Information

- [“Locate a Faulty PCIe2 Card”](#) on page 190
- [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 195
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 196
- [“Install a PCIe2 Card Into the PCIe2 Riser Card”](#) on page 198
- [“Verify a PCIe2 Card”](#) on page 202
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 190.
 - 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 193.
 - 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 200 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 61.
 - 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 184.
- 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 198.
- If you removed the PCIe2 card as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) on page 67 for assistance.
- If you are not replacing the PCIe2 card, go to [Step 8](#).

8. Install the PCIe2 riser card.

See [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 196.

9. Finish the removal procedure.

See [“Returning the Server to Operation”](#) on page 261.

Related Information

- [“Locate a Faulty PCIe2 Card”](#) on page 190
- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board”](#) on page 193
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 196
- [“Install a PCIe2 Card Into the PCIe2 Riser Card”](#) on page 198
- [“Verify a PCIe2 Card”](#) on page 202
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ Install a PCIe2 Card Into the PCIe2 Mezzanine Board

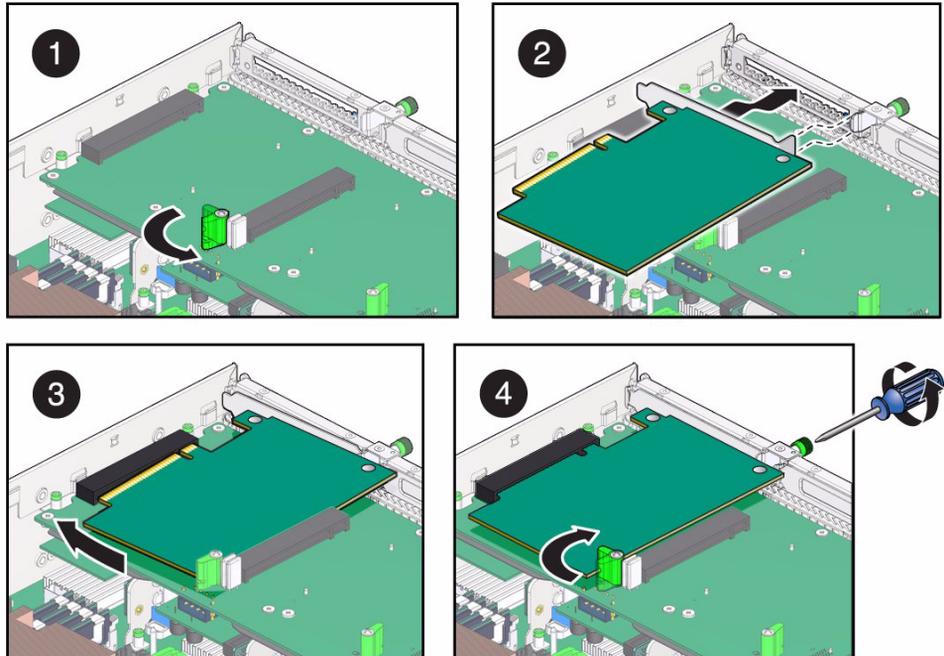
Installing the PCIe2 card is a cold-service operation. You must power off the server before installing the PCIe2 card.

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 196.
- If you are installing a new or an additional PCIe2 card, see [“Preparing for Service”](#) on page 61.

- 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 Service Task Reference](#)" 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 261
- [“Verify a PCIe2 Card”](#) on page 202

Related Information

- [“Locate a Faulty PCIe2 Card”](#) on page 190
- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board”](#) on page 193
- [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 195
- [“Install a PCIe2 Card Into the PCIe2 Riser Card”](#) on page 198
- [“Verify a PCIe2 Card”](#) on page 202
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 195.
- If you are installing a new or an additional PCIe2 card, see these topics in order:
 - [“Preparing for Service”](#) on page 61.
 - Remove the PCIe2 riser card. See [“Remove a PCIe2 Riser Card”](#) on page 184.
 - 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 200.
- 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.

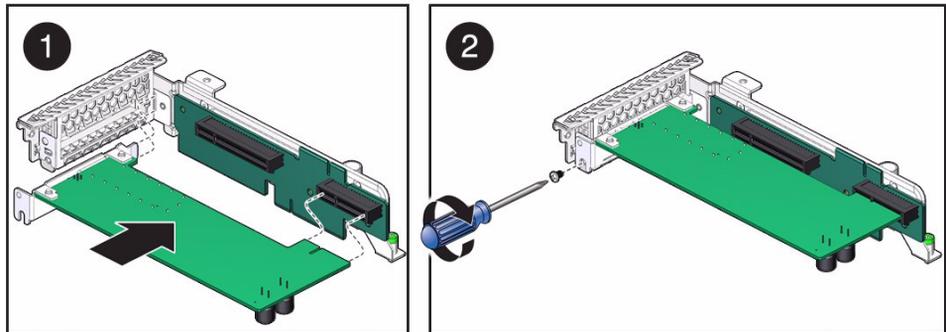


Caution – Verify the PCI card you are installing matches the slot. The PCIe 0 and PCI 1 slots are different than the PCIe 2 slot.

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 200 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 edge connector aligns with a connector on the riser card.

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 Service Task Reference”](#) 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 200.
- 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 186.

9. Finish the installation procedure.

See:

- “Returning the Server to Operation” on page 261
- “Verify a PCIe2 Card” on page 202

Related Information

- “Locate a Faulty PCIe2 Card” on page 190
- “Remove a PCIe2 Card From the PCIe2 Mezzanine Board” on page 193
- “Remove a PCIe2 Card From the PCIe2 Riser Card” on page 195
- “Install a PCIe2 Card Into the PCIe2 Mezzanine Board” on page 196
- “Install SAS Cable for Sun Storage 6 Gb SAS PCIe RAID HBA, Internal” on page 200
- “Verify a PCIe2 Card” on page 202
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261
- *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.

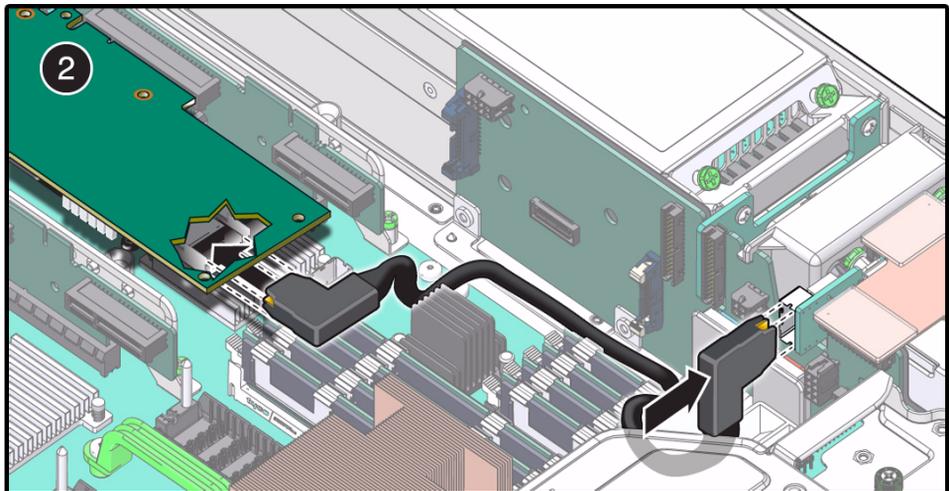
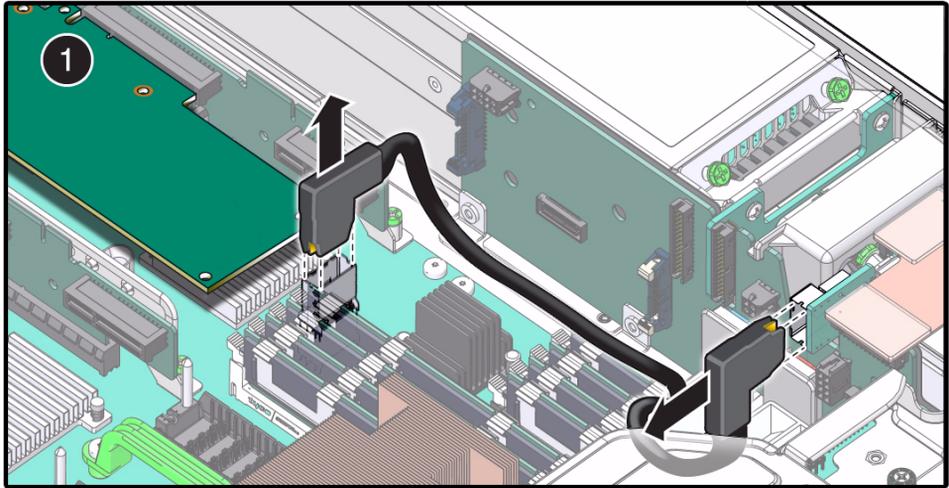
1. Install the card in PCIe slot 0.

See “Install a PCIe2 Card Into the PCIe2 Riser Card” on page 198.

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 261](#)
- [“Verify a PCIe2 Card” on page 202](#)

Related Information

- [“Remove a PCIe2 Card From the PCIe2 Riser Card” on page 195](#)
- [“Install a PCIe2 Card Into the PCIe2 Riser Card” on page 198](#)
- [“Verify a PCIe2 Card” on page 202](#)
- [“Preparing for Service” on page 61](#)

- “Returning the Server to Operation” on page 261
- *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 190.
- 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 190
- [“Remove a PCIe2 Card From the PCIe2 Mezzanine Board”](#) on page 193
- [“Remove a PCIe2 Card From the PCIe2 Riser Card”](#) on page 195
- [“Install a PCIe2 Card Into the PCIe2 Mezzanine Board”](#) on page 196
- [“Install a PCIe2 Card Into the PCIe2 Riser Card”](#) on page 198

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.

Description	Links
Replace the faulty signal interface board.	“Determine if the Signal Interface Board Is Faulty” on page 206 “Remove the Signal Interface Board” on page 208 “Install the Signal Interface Board” on page 210 “Verify the Signal Interface Board” on page 212
Remove the signal interface board as part of another component’s service operation.	“Remove the Signal Interface Board” on page 208
Install the signal interface board as part of another component’s service operation.	“Install the Signal Interface Board” on page 210
Determine whether the signal interface board is faulty.	“Determine if the Signal Interface Board Is Faulty” on page 206 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Servicing Fan Modules”](#) on page 83
- [“Servicing the Hard Drive Fan”](#) on page 117
- [“Servicing the DVD Tray”](#) on page 149
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 208.

If a FRU value different from `/SYS/SIB` is displayed, see [“Component Service Task Reference”](#) 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 208](#).

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 208](#).

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

See [“Detecting and Managing Faults” on page 11](#).

Related Information

- [“Remove the Signal Interface Board” on page 208](#)
- [“Install the Signal Interface Board” on page 210](#)

- [“Verify the Signal Interface Board”](#) on page 212
 - [“Detecting and Managing Faults”](#) on page 11
-

▼ 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 61.
- 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 87.

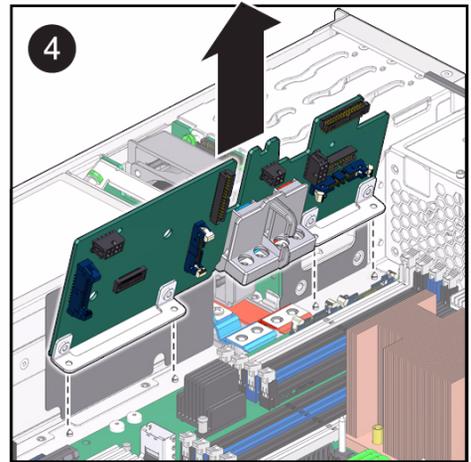
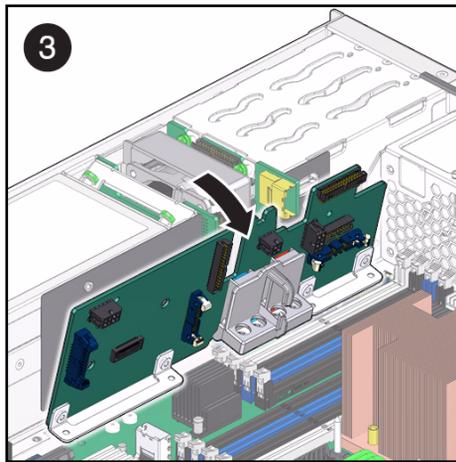
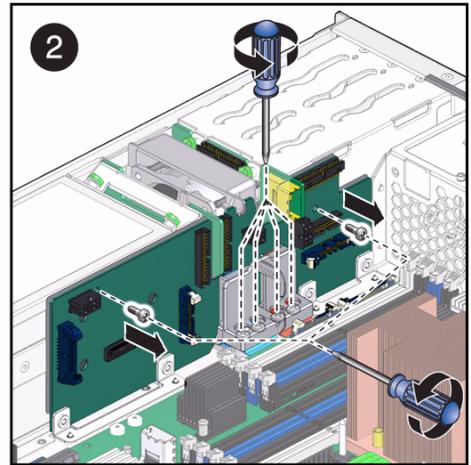
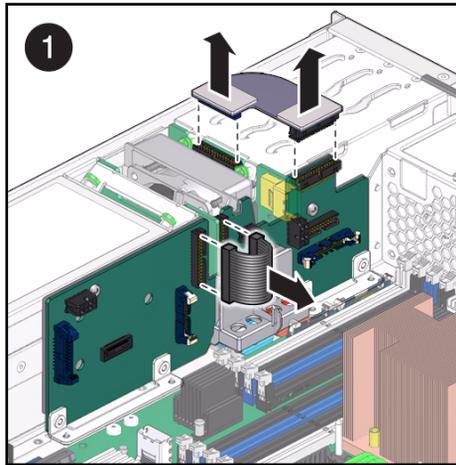
3. Remove the hard drive fan.

See [“Remove the Hard Drive Fan”](#) on page 120.

4. Remove the DVD tray.

See [“Remove the DVD Tray”](#) on page 149.

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 210.

- If you removed the signal interface board as part of another component's removal or installation procedure, return to that procedure. See ["Component Service Task Reference"](#) on page 67 for assistance.

Related Information

- ["Determine if the Signal Interface Board Is Faulty"](#) on page 206
- ["Install the Signal Interface Board"](#) on page 210
- ["Verify the Signal Interface Board"](#) on page 212
- ["Preparing for Service"](#) on page 61
- ["Returning the Server to Operation"](#) on page 261

▼ 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.

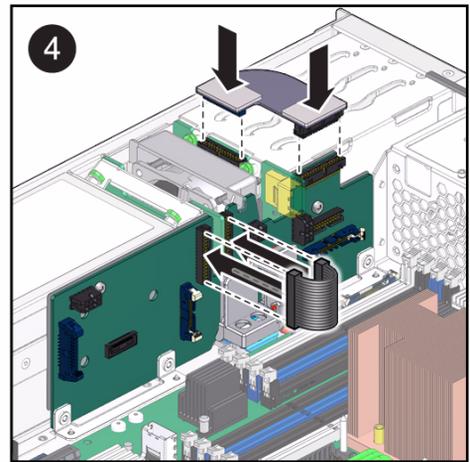
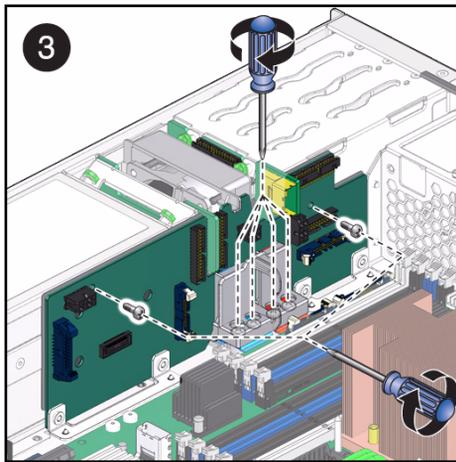
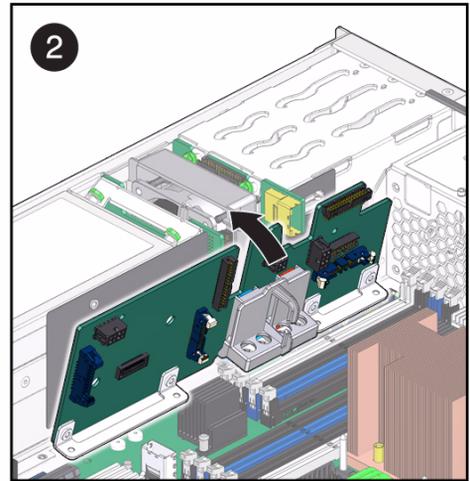
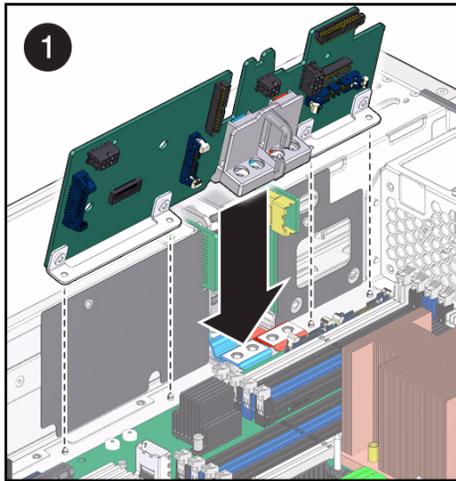
1. Consider your first steps:

- 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 208.
- 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 Service Task Reference"](#) on page 67 for assistance.

8. Install the DVD tray.

See ["Install the DVD Tray"](#) on page 152.

9. Install the hard drive fan.

See ["Install the Hard Drive Fan"](#) on page 121.

10. Install the right most fan.

See ["Install a Fan Module"](#) on page 89.

11. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 261
- ["Verify the Signal Interface Board"](#) on page 212

Related Information

- ["Determine if the Signal Interface Board Is Faulty"](#) on page 206
- ["Remove the Signal Interface Board"](#) on page 208
- ["Verify the Signal Interface Board"](#) on page 212
- ["Preparing for Service"](#) on page 61
- ["Returning the Server to Operation"](#) on page 261

▼ 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 206.

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 206
- “Remove the Signal Interface Board” on page 208
- “Install the Signal Interface Board” on page 210

Servicing DIMMs

DIMMs are random access memory devices. 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.

Description	Links
Replace a faulty DIMM.	“DIMM Configuration” on page 216 “Locate a Faulty DIMM” on page 217 “DIMM LEDs” on page 217 “Remove a DIMM” on page 220 “Install a DIMM” on page 221 “Verify a DIMM” on page 223
Remove the DIMMs as part of another component’s service operation.	“Remove a DIMM” on page 220
Install the DIMMs as part of another component’s service operation.	“Install a DIMM” on page 221
Add an additional DIMM.	“DIMM Configuration” on page 216 “Install a DIMM” on page 221 “Verify a DIMM” on page 223
Remove an existing DIMM.	“Remove a DIMM” on page 220
Identify a faulty DIMM.	“DIMM LEDs” on page 217 “Locate a Faulty DIMM” on page 217 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

DIMM Configuration

You must follow these rules when configuring DIMMs into the server.

- Only 4 GB, 8 GB, and 16 GB DIMM capacities are supported.
- All DIMMs of the same branch must be of the same part number.
- All DIMMs must be of the same capacity and rank.
 - 16 GB dual-rank (2R×4) DIMMs can not be mixed with the 16 GB quad-rank (4R×4) DIMMs.
 - The 16 GB dual-rank (2R×4) DIMMs require system firmware version 8.2.1.b or newer.
- 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.

Populate	Slot Color	Motherboard Labels	Oracle ILOM Target	Total Capacity 4 GB DIMMs	Total Capacity 8 GB DIMMs	Total Capacity 16 GB DIMMs
First	Blue	J1001	/SYS/MB/CMP0/BOB0/CH1/D0	4 x 4 GB = 16 GB	4 x 8 GB = 32 GB	4 x 16 GB = 64 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	8 x 16 GB = 128 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	16 x 16 GB = 256 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 217](#)
- [“Locate a Faulty DIMM” on page 217](#)

- [“Remove a DIMM” on page 220](#)
- [“Install a DIMM” on page 221](#)
- [“Verify a DIMM” on page 223](#)

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. See [“Motherboard, DIMMs, and PCI Board Locations” on page 6](#).

Related Information

- [“DIMM Configuration” on page 216](#)
- [“Locate a Faulty DIMM” on page 217](#)
- [“Remove a DIMM” on page 220](#)
- [“Install a DIMM” on page 221](#)
- [“Verify a DIMM” on page 223](#)
- [“Motherboard, DIMMs, and PCI Board Locations” on page 6](#)

▼ 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 16](#).

2. Visually inspect the DIMM to see if any of its status LEDs are lit or flashing.

See “DIMM LEDs” on page 217.

If the DIMM is faulty, replace it. See “Remove a DIMM” on page 220.

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 220.

If a FRU value different from `/SYS/MB/CMP0/BOBx/CHy/Dz` is displayed, see “Component Service Task Reference” 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 220](#).

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 220](#).

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

See [“Detecting and Managing Faults” on page 11](#).

Related Information

- [“DIMM Configuration” on page 216](#)

- “DIMM LEDs” on page 217
- “Remove a DIMM” on page 220
- “Install a DIMM” on page 221
- “Verify a DIMM” on page 223
- “Detecting and Managing Faults” on page 11

▼ 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 217.

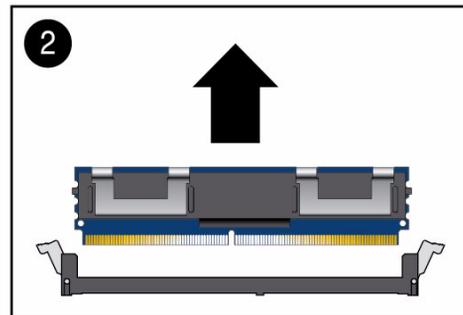
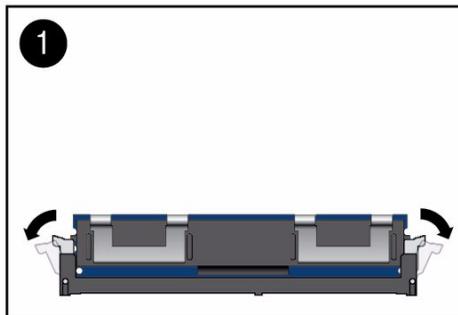
2. Consider your next step:

- If you have not prepared for service, do so now. See “Preparing for Service” on page 61.
- 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 149.

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 221.
- If you removed the DIMM as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) 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 152.

10. Finish the removal procedure.

See [“Returning the Server to Operation”](#) on page 261.

Related Information

- [“DIMM Configuration”](#) on page 216
- [“DIMM LEDs”](#) on page 217
- [“Locate a Faulty DIMM”](#) on page 217
- [“Install a DIMM”](#) on page 221
- [“Verify a DIMM”](#) on page 223
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ Install a DIMM

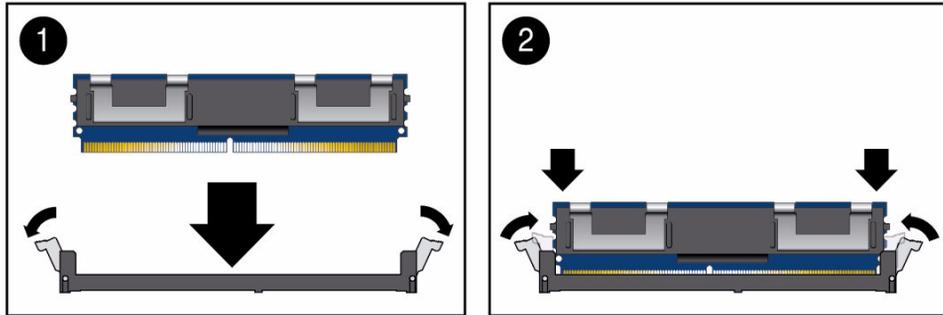
Installing a DIMM is a cold-service operation. You must power off the server before installing a DIMM.

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 220.
- If you are installing a new or an additional DIMM, see these topics in order:
 - [“Preparing for Service”](#) on page 61.
 - (Optional) Remove the DVD tray. See [“Remove the DVD Tray”](#) on page 149.

- 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 Service Task Reference” 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 152](#).

8. Finish the installation procedure.

See:

- [“Returning the Server to Operation” on page 261](#)
- [“Verify a DIMM” on page 223](#)

Related Information

- [“DIMM Configuration” on page 216](#)
- [“DIMM LEDs” on page 217](#)
- [“Locate a Faulty DIMM” on page 217](#)
- [“Remove a DIMM” on page 220](#)

- “Verify a DIMM” on page 223
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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 217](#).
- 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 216](#)
- [“DIMM LEDs” on page 217](#)
- [“Locate a Faulty DIMM” on page 217](#)

- “Remove a DIMM” on page 220
- “Install a DIMM” on page 221

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.

Description	Links
Replace the faulty battery.	“Determine if the Battery Is Faulty” on page 225 “Remove the Battery” on page 227 “Install the Battery” on page 229 “Verify the Battery” on page 231
Determine whether the battery is faulty.	“Determine if the Battery Is Faulty” on page 225 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 227](#).

If a FRU value different from `/SYS/MB/BAT` is displayed, see [“Component Service Task Reference” 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 227](#).

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 227](#).

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

See [“Detecting and Managing Faults” on page 11](#).

Related Information

- [“Remove the Battery” on page 227](#)
- [“Install the Battery” on page 229](#)
- [“Verify the Battery” on page 231](#)
- [“Detecting and Managing Faults” on page 11](#)

▼ 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 61](#).
- If you are removing the battery as part of another component’s removal or installation procedure, go to [Step 2](#).

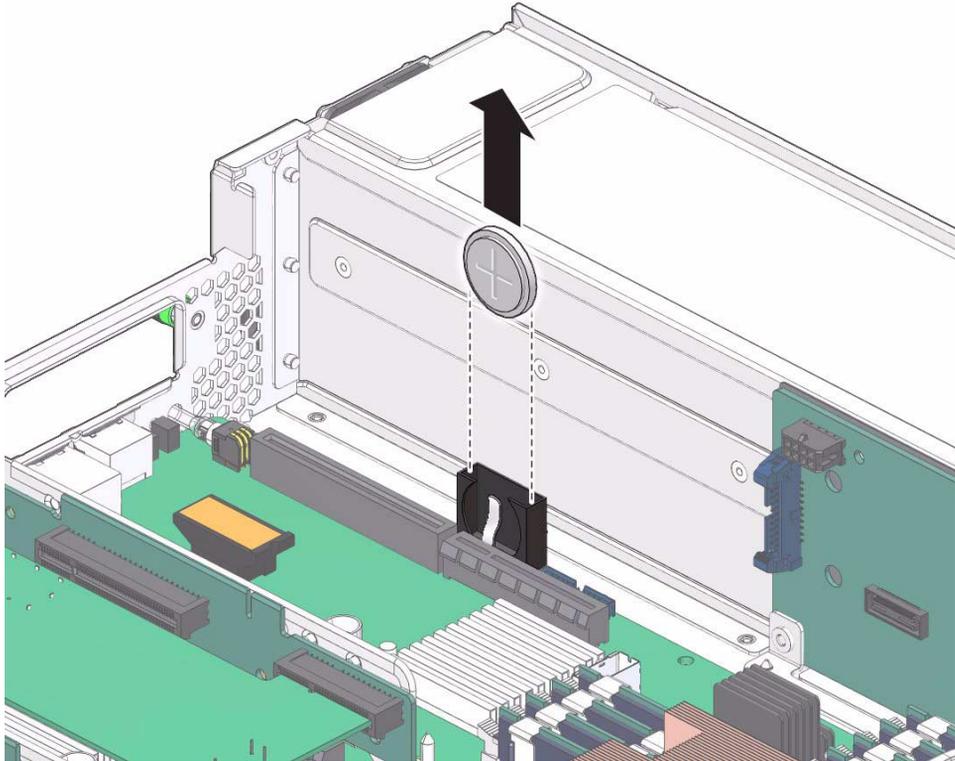
2. Remove the PCIe2 mezzanine board.

See [“Remove the PCIe2 Mezzanine Board” on page 174](#).

3. Remove the right PCIe2 riser card.

See [“Remove a PCIe2 Riser Card”](#) on page 184.

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 229.
- If you removed the battery as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference”](#) on page 67 for assistance.

Related Information

- [“Determine if the Battery Is Faulty”](#) on page 225
- [“Install the Battery”](#) on page 229
- [“Verify the Battery”](#) on page 231
- [“Preparing for Service”](#) on page 61

- [“Returning the Server to Operation”](#) on page 261

▼ Install the Battery

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

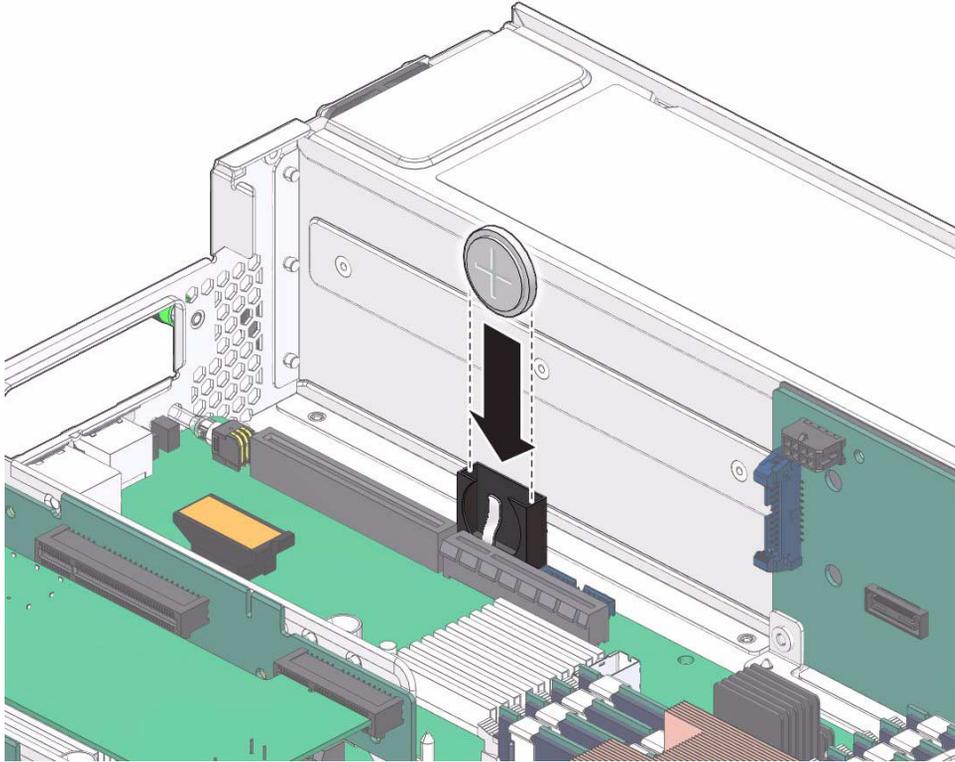
1. Consider your first steps:

- 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 227.
- 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 Service Task Reference"](#) on page 67 for assistance.

5. Install the right PCIe2 riser card.

See ["Install a PCIe2 Riser Card"](#) on page 186.

6. Install the PCIe2 mezzanine board.

See ["Install the PCIe2 Mezzanine Board"](#) on page 177.

7. Finish the installation procedure.

See:

- ["Returning the Server to Operation"](#) on page 261
- ["Verify the Battery"](#) on page 231

Related Information

- [“Determine if the Battery Is Faulty” on page 225](#)
- [“Remove the Battery” on page 227](#)
- [“Verify the Battery” on page 231](#)
- [“Preparing for Service” on page 61](#)
- [“Returning the Server to Operation” on page 261](#)

▼ 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 225](#).

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 225](#)
- [“Remove the Battery” on page 227](#)
- [“Install the Battery” on page 229](#)

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.

Description	Links
Replace the faulty SP.	“Determine if the SP Is Faulty” on page 234 “Remove the SP” on page 236 “Install the SP” on page 238 “Verify the SP” on page 240
Remove the SP as part of another component’s service operation.	“Remove the SP” on page 236
Install the SP as part of another component’s service operation.	“Install the SP” on page 238
Determine whether the SP is faulty.	“Determine if the SP Is Faulty” on page 234 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 236.

If a FRU value different from `/SYS/MB/SP` is displayed, see [“Component Service Task Reference”](#) 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 236.

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 236.

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

See [“Detecting and Managing Faults”](#) on page 11.

Related Information

- [“Remove the SP”](#) on page 236
- [“Install the SP”](#) on page 238
- [“Verify the SP”](#) on page 240
- [“Detecting and Managing Faults”](#) on page 11

▼ 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 61](#).
- 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.

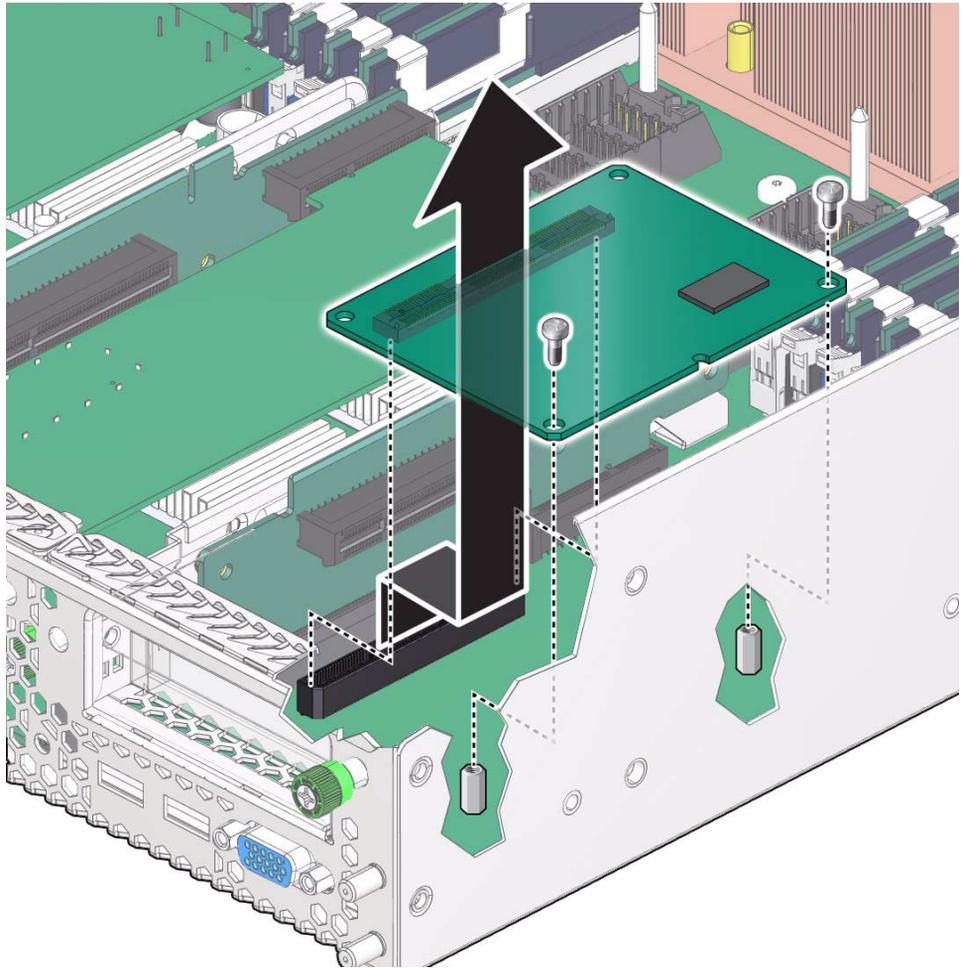
See [“Remove the PCIe2 Mezzanine Board” on page 174](#).

3. Remove the left PCIe2 riser card.

See [“Remove a PCIe2 Riser Card” on page 184](#).

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 238](#).
- If you removed the SP as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference” on page 67](#) for assistance.

Related Information

- [“Determine if the SP Is Faulty” on page 234](#)
- [“Install the SP” on page 238](#)
- [“Verify the SP” on page 240](#)

- “Preparing for Service” on page 61
 - “Returning the Server to Operation” on page 261
-

▼ Install the SP

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

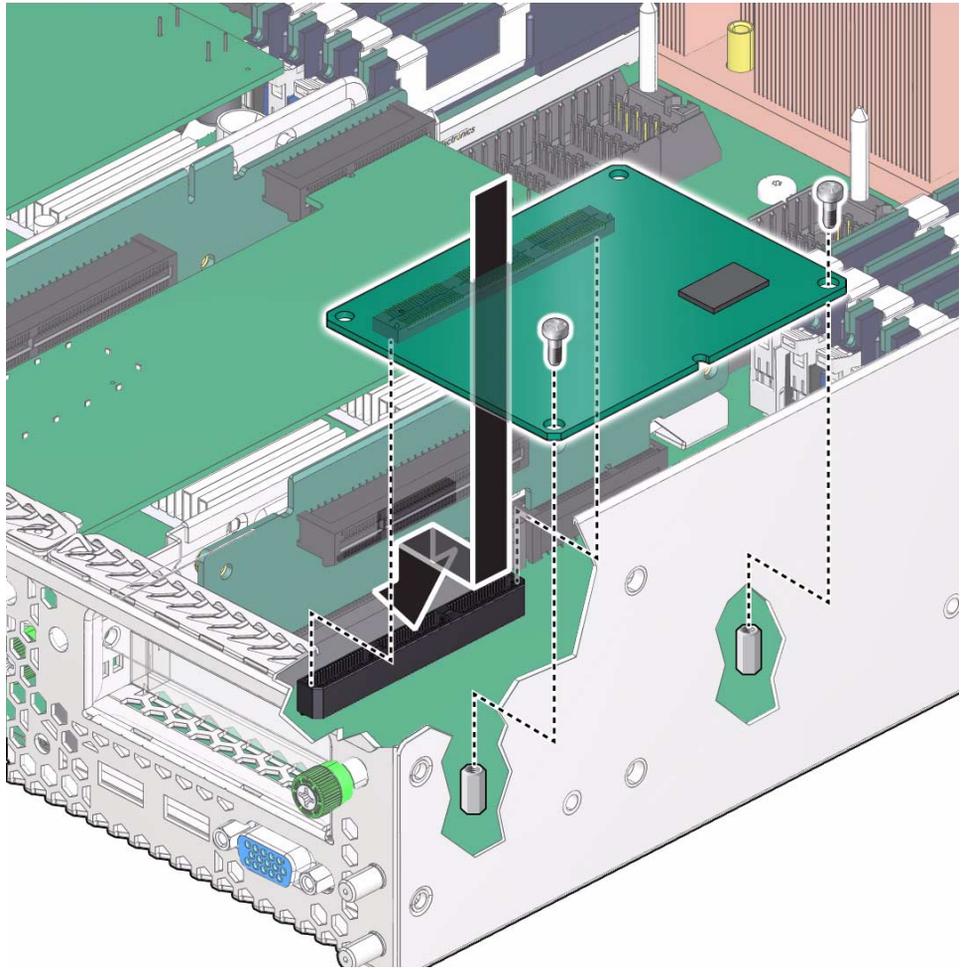
1. Consider your first steps:

- 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 236.
- 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 Service Task Reference"](#) on [page 67](#) for assistance.
6. **Install the left PCIe2 riser card.**

See ["Install a PCIe2 Riser Card"](#) on [page 186](#).
7. **Install the PCIe2 mezzanine board.**

See ["Install the PCIe2 Mezzanine Board"](#) on [page 177](#).

8. Finish the installation procedure.

See:

- “Returning the Server to Operation” on page 261
- “Verify the SP” on page 240

Related Information

- “Determine if the SP Is Faulty” on page 234
- “Remove the SP” on page 236
- “Verify the SP” on page 240
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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 234.

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 234
- “Remove the SP” on page 236

- “Install the SP” on page 238

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.

Description	Links
Replace the faulty ID PROM.	“Determine if the ID PROM Is Faulty” on page 244 “Remove the ID PROM” on page 246 “Install the ID PROM” on page 248 “Verify the ID PROM” on page 249
Remove the ID PROM as part of another component’s service operation.	“Remove the ID PROM” on page 246
Install the ID PROM as part of another component’s service operation.	“Install the ID PROM” on page 248
Determine whether the ID PROM is faulty.	“Determine if the ID PROM Is Faulty” on page 244 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 246.

If a FRU value different from `/SYS/MB/SCC` is displayed, see [“Component Service Task Reference”](#) 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 246](#).

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 246](#).

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

See [“Detecting and Managing Faults” on page 11](#).

Related Information

- [“Remove the ID PROM” on page 246](#)
- [“Install the ID PROM” on page 248](#)
- [“Verify the ID PROM” on page 249](#)
- [“Detecting and Managing Faults” on page 11](#)

▼ 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 61](#).
- If you are removing the ID PROM as part of another component’s removal or installation procedure, go to [Step 2](#).

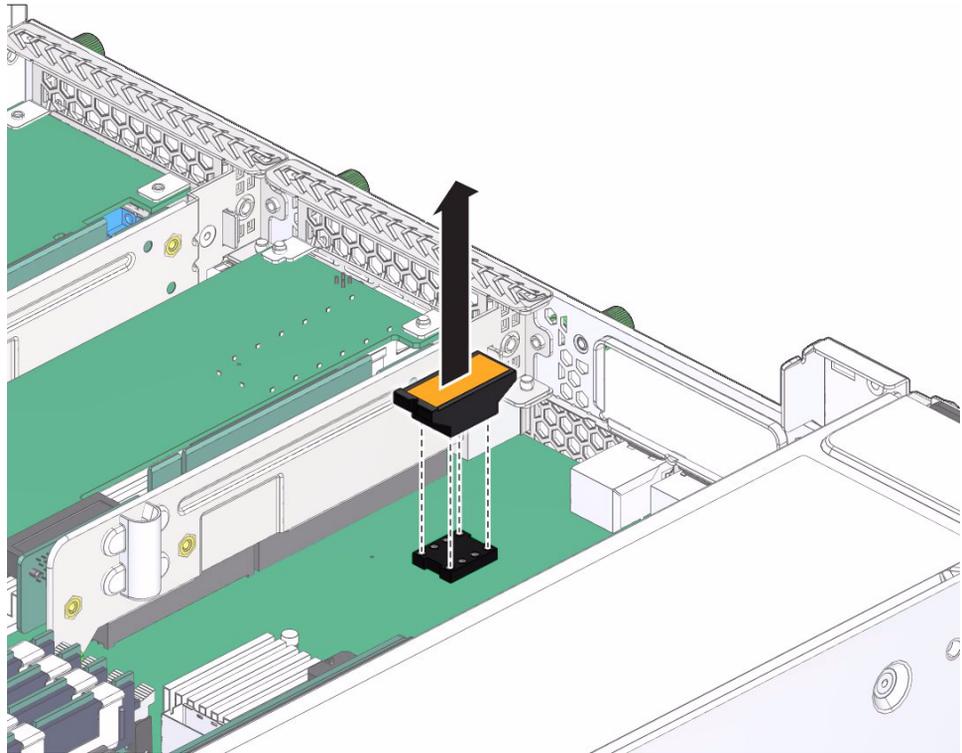
2. Remove the PCIe2 mezzanine board.

See [“Remove the PCIe2 Mezzanine Board” on page 174](#).

3. Remove the right PCIe2 riser card.

See [“Remove a PCIe2 Riser Card” on page 184](#).

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 248](#).
- If you removed the ID PROM as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference” on page 67](#) for assistance.

Related Information

- [“Determine if the ID PROM Is Faulty” on page 244](#)
- [“Install the ID PROM” on page 248](#)
- [“Verify the ID PROM” on page 249](#)
- [“Preparing for Service” on page 61](#)
- [“Returning the Server to Operation” on page 261](#)

▼ Install the ID PROM

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

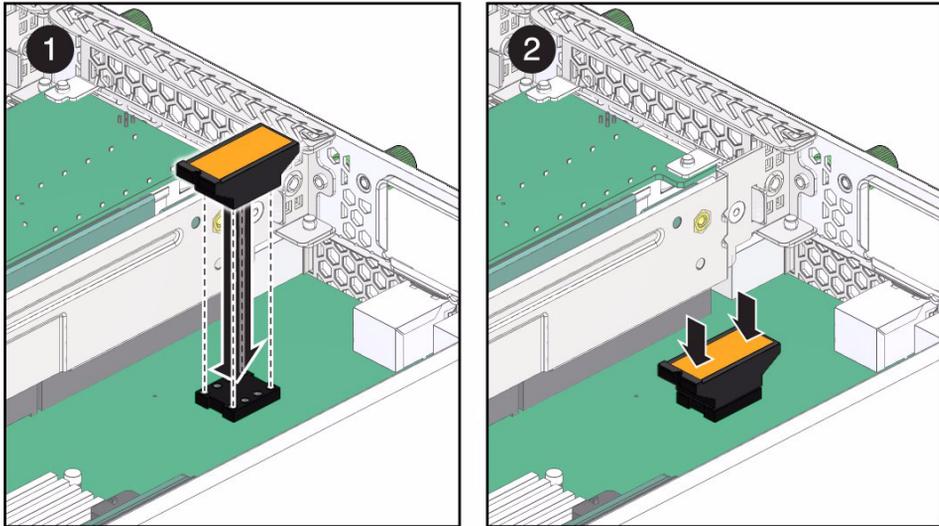
1. Consider your first steps:

- 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 246.
- 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 Service Task Reference”](#) on page 67 for assistance.

5. Install the right PCIe2 riser card.

See [“Install a PCIe2 Riser Card”](#) on page 186.

6. Install the PCIe2 mezzanine board.

See “Install the PCIe2 Mezzanine Board” on page 177.

7. Finish the installation procedure.

See:

- “Returning the Server to Operation” on page 261
- “Verify the ID PROM” on page 249

Related Information

- “Determine if the ID PROM Is Faulty” on page 244
- “Remove the ID PROM” on page 246
- “Verify the ID PROM” on page 249
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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 244.

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 244](#)
- [“Remove the ID PROM” on page 246](#)
- [“Install the ID PROM” on page 248](#)

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.

Description	Links
Replace the faulty motherboard.	“Determine if the Motherboard Is Faulty” on page 251 “Remove the Motherboard” on page 254 “Install the Motherboard” on page 256 “Verify the Motherboard” on page 259
Determine whether the motherboard is faulty.	“Determine if the Motherboard Is Faulty” on page 251 “Detecting and Managing Faults” on page 11

Related Information

- [“Identifying Components”](#) on page 1
- [“Component Service Task Reference”](#) on page 67
- [“Detecting and Managing Faults”](#) on page 11
- [“Preparing for Service”](#) on page 61
- [“Returning the Server to Operation”](#) on page 261

▼ 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 16.

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 254](#).

If a FRU value different from `/SYS/MB` is displayed, see [“Component Service Task Reference” 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 254](#).

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 254](#).

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

See [“Detecting and Managing Faults” on page 11](#).

Related Information

- [“Remove the Motherboard” on page 254](#)
- [“Install the Motherboard” on page 256](#)

- “Verify the Motherboard” on page 259
- “Detecting and Managing Faults” on page 11

▼ 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 61.
- 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 87.

3. Remove the hard drive fan.

See “Remove the Hard Drive Fan” on page 120.

4. Remove the DVD tray.

See “Remove the DVD Tray” on page 149.

5. Remove the signal interface board.

See “Remove the Signal Interface Board” on page 208.

6. Remove the PCIe2 mezzanine board.

See “Remove the PCIe2 Mezzanine Board” on page 174.

7. Remove the PCIe2 riser cards.

See “Remove a PCIe2 Riser Card” on page 184.

8. Remove all cables from the motherboard.

9. Remove the DIMMs.

See “Remove a DIMM” on page 220.

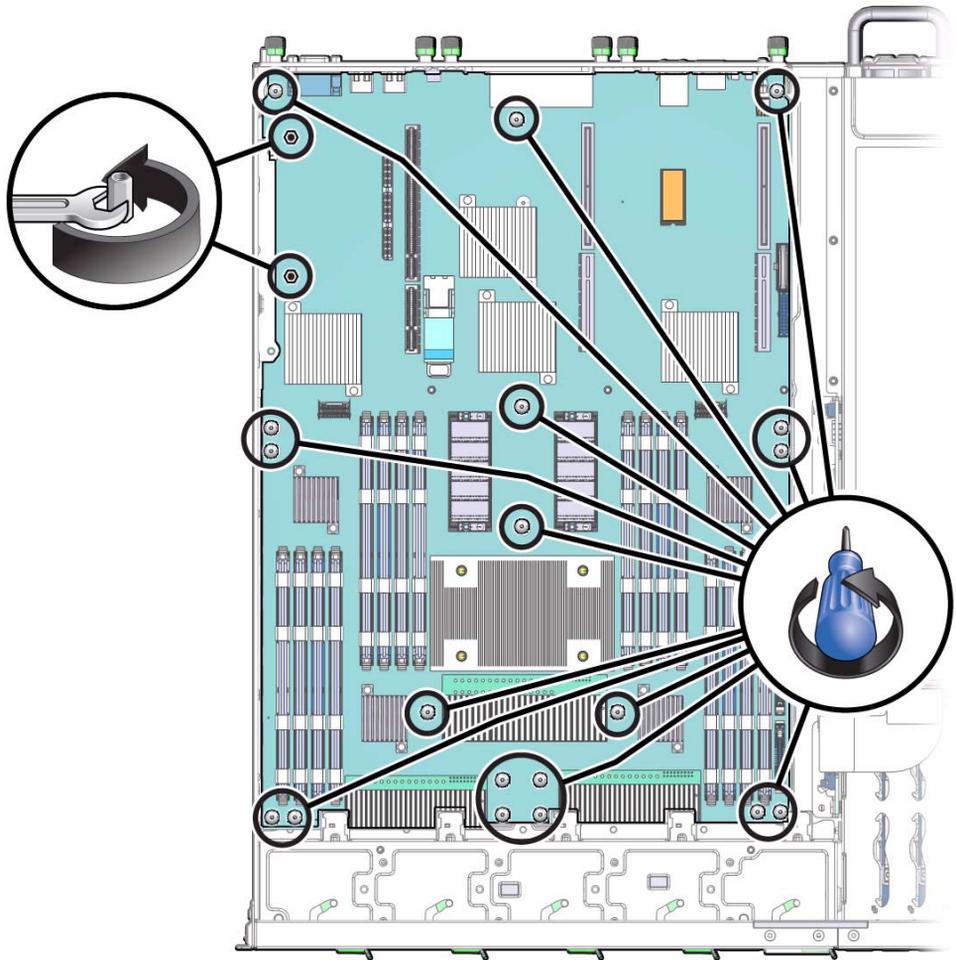
10. Remove the SP.

See “Remove the SP” on page 236.

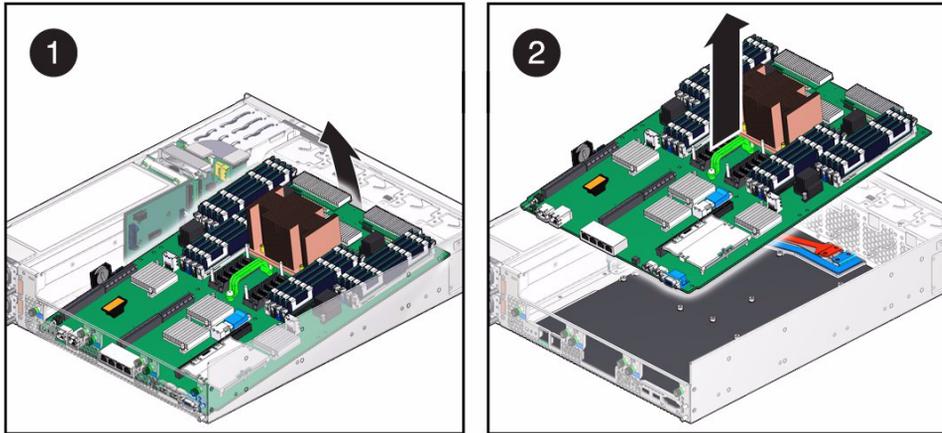
11. Remove the ID PROM.

See “Remove the ID PROM” on page 246.

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 256](#).
- If you removed the motherboard as part of another component’s removal or installation procedure, return to that procedure. See [“Component Service Task Reference” on page 67](#) for assistance.

Related Information

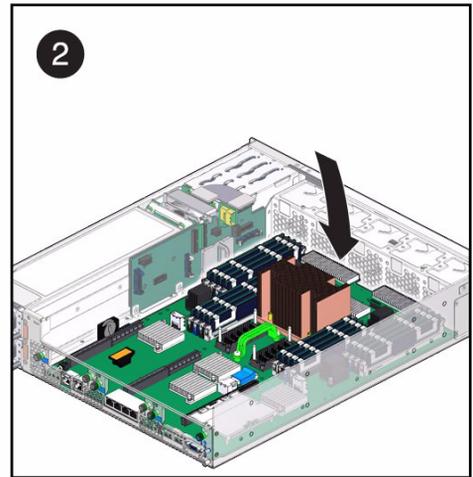
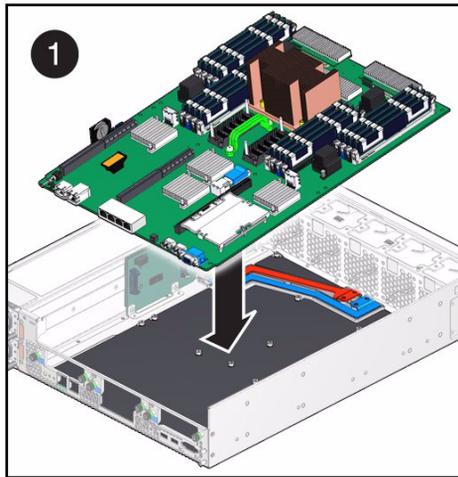
- [“Determine if the Motherboard Is Faulty” on page 251](#)
- [“Install the Motherboard” on page 256](#)
- [“Verify the Motherboard” on page 259](#)
- [“Preparing for Service” on page 61](#)
- [“Returning the Server to Operation” on page 261](#)

▼ Install the Motherboard

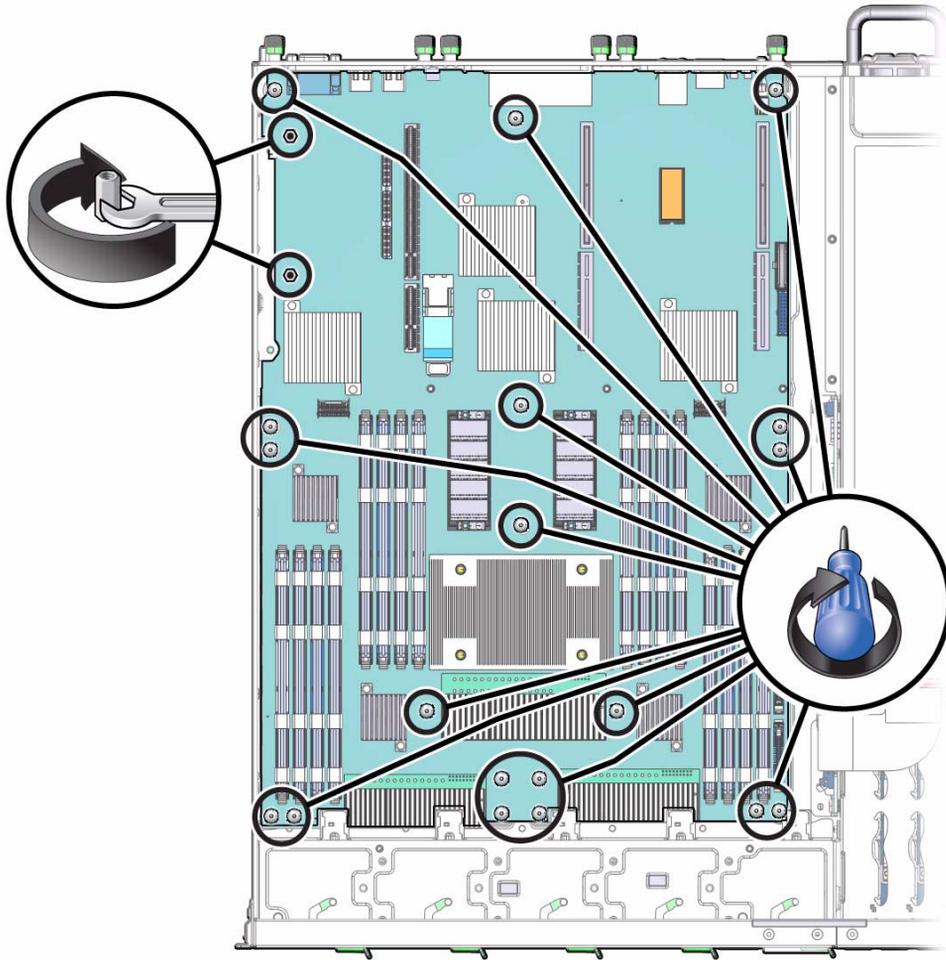
Installing the motherboard is a cold-service operation. You must power off the server before installing the motherboard.

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 254](#).
 - 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 248.

9. Install the SP.

See [“Install the SP”](#) on page 238.

10. Install the DIMMs.

See [“Install a DIMM”](#) on page 221.

11. **Install all cables to the motherboard.**
12. **Install the PCIe2 riser cards.**
See “Install a PCIe2 Riser Card” on page 186.
13. **Install the PCIe2 mezzanine board.**
See “Install the PCIe2 Mezzanine Board” on page 177.
14. **Install the signal interface board.**
See “Install the Signal Interface Board” on page 210.
15. **Install the DVD tray.**
See “Install the DVD Tray” on page 152.
16. **Install the hard drive fan.**
See “Install the Hard Drive Fan” on page 121.
17. **Install the fans.**
See “Install a Fan Module” on page 89.
18. **Finish the installation procedure.**
See:
 - “Returning the Server to Operation” on page 261
 - “Verify the Motherboard” on page 259

Related Information

- “Determine if the Motherboard Is Faulty” on page 251
- “Remove the Motherboard” on page 254
- “Verify the Motherboard” on page 259
- “Preparing for Service” on page 61
- “Returning the Server to Operation” on page 261

▼ 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 251.

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 251
- [“Remove the Motherboard”](#) on page 254
- [“Install the Motherboard”](#) on page 256

Returning the Server to Operation

These topics explain how to return the Netra SPARC T4-1 server from Oracle to operation after you perform service procedures.

Step	Description	Link
1.	Install the top cover and move the server back into the rack.	“Install the Top Cover” on page 261
2.	Connect power cords to the server.	“Connect Power Cords” on page 263
3.	Power on the server by one of two methods.	“Power On the Server (Oracle ILOM)” on page 263 “Power On the Server (Power Button)” on page 264

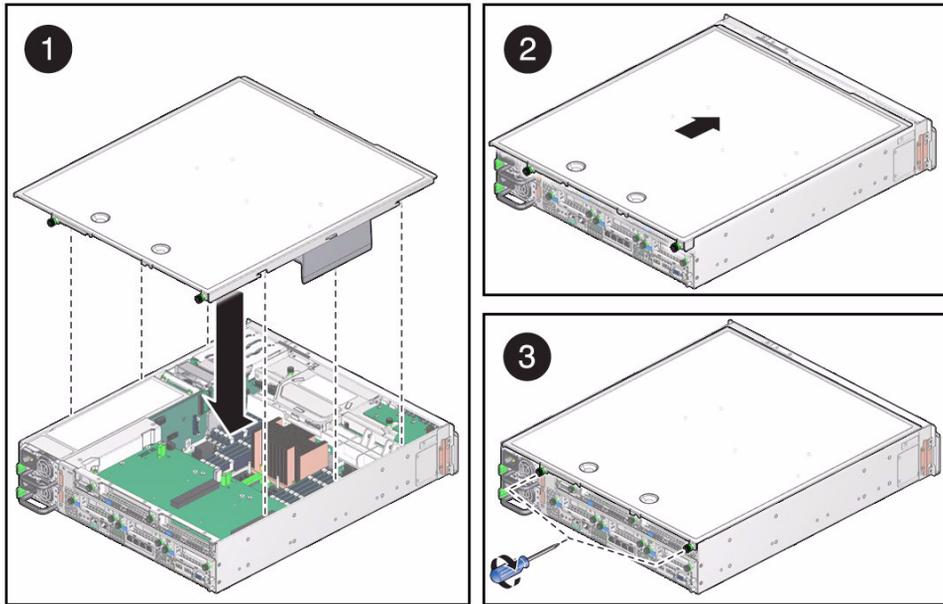
Related Information

- [“Identifying Components” on page 1](#)
- [“Component Service Task Reference” on page 67](#)
- [“Detecting and Managing Faults” on page 11](#)
- [“Preparing for Service” on page 61](#)

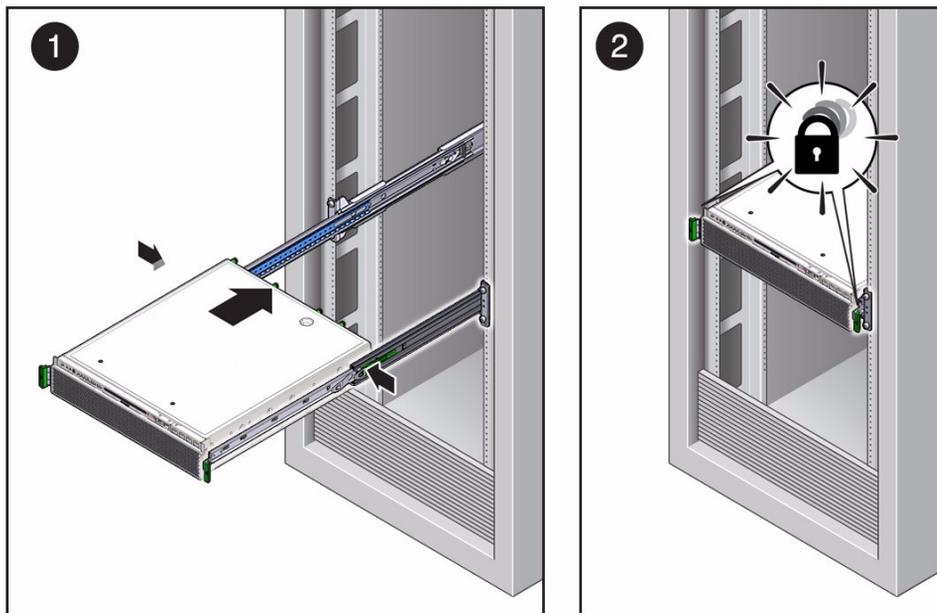
▼ Install the Top Cover

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” on page 263.

6. **Power on the server.**

See “Power On the Server (Oracle ILOM)” on page 263 or “Power On the Server (Power Button)” on page 264.

Related Information

- “Remove the Top Cover” on page 73
- “Connect Power Cords” on page 263
- “Power On the Server (Oracle ILOM)” on page 263
- “Power On the Server (Power Button)” on page 264

▼ Connect Power Cords

- **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 261
- “Power On the Server (Oracle ILOM)” on page 263
- “Power On the Server (Power Button)” on page 264

▼ Power On the Server (Oracle ILOM)

- **At the SP prompt, type.**

```
-> start /SYS
```

Related Information

- [“Install the Top Cover” on page 261](#)
- [“Connect Power Cords” on page 263](#)
- [“Power On the Server \(Power Button\)” on page 264](#)

▼ Power On the Server (Power Button)

- **Momentarily press and release the Power button on the front panel.**
See [“Front Panel Components” on page 7](#) for the location of the Power button.

Related Information

- [“Install the Top Cover” on page 261](#)
- [“Connect Power Cords” on page 263](#)
- [“Power On the Server \(Oracle ILOM\)” on page 263](#)

Glossary

A

- ANSI SIS** American National Standards Institute Status Indicator Standard.
- ASF** Alert standard format (Netra products only).
- ASR** Automatic system recovery.
- AWG** American wire gauge.

B

- blade** Generic term for server modules and storage modules. See *server module* and *storage module*.
- blade server** Server module. See *server module*.
- BMC** Baseboard management controller.
- BOB** Memory buffer on board.

C

- chassis** For servers, refers to the server enclosure. For server modules, refers to the modular system enclosure.
- CMA** Cable management arm.

CMM Chassis monitoring module. The CMM is the service processor in the modular system. Oracle ILOM runs on the CMM, providing lights out management of the components in the modular system chassis. See *Modular system and Oracle ILOM*.

CMM Oracle ILOM Oracle ILOM that runs on the CMM. See *Oracle ILOM*.

D

DHCP Dynamic Host Configuration Protocol.

disk module or disk blade Interchangeable terms for storage module. See *storage module*.

DTE Data terminal equipment.

E

EIA Electronics Industries Alliance.

ESD Electrostatic discharge.

F

FEM Fabric expansion module. FEMs enable server modules to use the 10GbE connections provided by certain NEMs. See *NEM*.

FRU Field-replaceable unit.

H

HBA Host bus adapter.

host The part of the server or server module with the CPU and other hardware that runs the Oracle Solaris OS and other applications. The term *host* is used to distinguish the primary computer from the SP. See *SP*.

I

- ID PROM** Chip that contains system information for the server or server module.
- IP** Internet Protocol.

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

- LwA** Sound power level.

M

- MAC** Machine access code.
- MAC address** Media access controller address.
- Modular system** The rackmountable chassis that holds server modules, storage modules, NEMs, and PCI EMs. The modular system provides Oracle ILOM through its CMM.
- MSGID** Message identifier.

N

- name space** Top-level Oracle ILOM CMM target.
- NEBS** Network Equipment-Building System (Netra products only).

NEM	Network express module. NEMs provide 10/100/1000 Mbps Ethernet, 10GbE Ethernet ports, and SAS connectivity to storage modules.
NET MGT	Network management port. An Ethernet port on the server SP, the server module SP, and the CMM.
NIC	Network interface card or controller.
NMI	Nonmaskable interrupt.

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 Solaris OS	Oracle Solaris operating system.

P

PCI	Peripheral component interconnect.
PCI EM	PCIe ExpressModule. Modular components that are based on the PCI Express industry-standard form factor and offer I/O features such as Gigabit Ethernet and Fibre Channel.
POST	Power-on self-test.
PROM	Programmable read-only memory.
PSH	Predictive self healing.

Q

QSFP	Quad small form-factor pluggable.
-------------	-----------------------------------

R

REM RAID expansion module. Sometimes referred to as an HBA. See *HBA*. Supports the creation of RAID volumes on drives.

S

SAS Serial attached SCSI.

SCC System configuration chip.

SER MGT Serial management port. A serial port on the server SP, the server module SP, and the CMM.

server module Modular component that provides the main compute resources (CPU and memory) in a modular system. Server modules might also have onboard storage and connectors that hold REMs and FEMs.

SP Service processor. In the server or server module, the SP is a card with its own OS. The SP processes Oracle ILOM commands providing lights out management control of the host. See *host*.

SSD Solid-state drive.

SSH Secure shell.

storage module Modular component that provides computing storage to the server modules.

T

TIA Telecommunications Industry Association (Netra products only).

Tma Maximum ambient temperature.

U

UCP Universal connector port.

UI	User interface.
UL	Underwriters Laboratory Inc.
U.S. NEC	United States National Electrical Code.
UTC	Coordinated Universal Time.
UUID	Universal unique identifier.

W

WWN	World wide name. A unique number that identifies a SAS target.
------------	--

Index

A

- accessing
 - internal components, 71
 - SP, 23
- adding
 - DIMM, 221
 - fan module, 89
 - hard drive, 112
 - PCIe2 card
 - to PCIe2 mezzanine board, 196
 - to PCIe2 riser card, 198
- air filter
 - installing, 79
 - location, 4
 - removing, 77
 - servicing, 77
- ASR
 - blacklist, 47, 56
 - components
 - disabling, 58
 - displaying, 57
 - enabling, 59
 - managing, 56
 - overview, 56
- asrkeys (system components), 57

B

- battery
 - determining faulty, 225
 - installing, 229
 - location, 6
 - removing, 227
 - resetting, 231
 - servicing, 225
 - verifying, 231

C

- cfgadm command, 114
- checking
 - message buffer, 37
- clear_fault_action property, 28
- clearing
 - faults, 28
 - POST faults, 47
 - PSH-detected faults, 54
- components
 - accessing, 71
 - disabled by POST, 56
 - displaying, 57
 - front, 7
 - identifying, 1
 - rear, 9
 - replaceable, 2, 4, 6
- configuring
 - DIMM, 216
 - hard drive, 114
 - POST, 44
- connecting
 - power cords, 263

D

- detecting faults, 11
- determining faulty
 - battery, 225
 - DVD drive, 141
 - fan board, 162
 - hard drive backplane, 125
 - hard drive fan, 118
 - ID PROM, 244
 - LED board, 155
 - motherboard, 251
 - PCIe2 mezzanine board, 172
 - power distribution board, 134

- signal interface board, 206
- SP, 234
- diagnostics
 - flowchart, 13
 - overview, 11
 - process, 13
- DIMM
 - adding, 221
 - configuration, 216
 - installing, 221
 - locating faulty, 217
 - locations, 6
 - removing, 220
 - resetting, 223
 - servicing, 215
 - status LEDs, 217
 - verifying, 223
- disconnecting
 - power cords, 71
- displaying
 - chassis serial number, 65
 - faults, 26, 27
 - FRU information, 25
- dmesg command, 37
- DVD drive
 - determining faulty, 141
 - installing, 145
 - location, 4
 - removing, 143
 - resetting, 147
 - servicing, 141
 - verifying, 147
- DVD tray
 - installing, 152
 - location, 4
 - removing, 149
 - servicing, 149
- E**
- emergency shutdown, 70
- environmental faults, 26
- ESD
 - antistatic
 - mat, 63
 - wrist strap, 63
 - measures, 62
 - preventing, 72

- example fault
 - fmadm faulty command, 34
 - none, 32
 - POST-detected, 35
 - PSH-detected, 36
 - show faulty command, 33

F

- fan board
 - determining faulty, 162
 - installing, 167
 - location, 4
 - removing, 164
 - resetting, 170
 - servicing, 161
 - verifying, 170
- fan module
 - adding, 89
 - installing, 89
 - locating faulty, 84
 - locations, 2
 - removing, 87
 - resetting, 90
 - servicing, 83
 - status LEDs, 84
 - verifying, 90
- faults
 - clearing, 28, 47
 - detecting, 11
 - displaying, 26, 27
 - example, 32
 - fmadm faulty command, 34
 - none, 32
 - POST-detected, 35
 - PSH-detected, 36
 - show faulty command, 33
 - managing, 11, 21
 - POST messages, 46
 - PSH-detected
 - checking, 53
 - clearing, 54
 - example, 52
- faulty
 - battery, 225
 - DIMM, 217
 - DVD drive, 141
 - fan board, 162
 - fan module, 84

- hard drive, 107
- hard drive backplane, 125
- hard drive fan, 118
- ID PROM, 244
- LED board, 155
- motherboard, 251
- PCIe2 card, 190
- PCIe2 mezzanine board, 172
- PCIe2 riser card, 182
- power distribution board, 134
- power supply, 94
- signal interface board, 206
- SP, 234
- filler panels, 64
- filter tray
 - installing, 79
 - location, 4
 - removing, 77
- flowchart
 - diagnostic, 13
 - POST, 42
- fmadm *faulty* command, 27
- fmadm *repair* command, 54
- fmdump command, 53
- front panel components (Service), 7
- FRU
 - illustration, 2, 4, 6
 - information, 25
 - service procedures, 67
 - values, 67

G

- graceful shutdown, 69, 70

H

- hard drive
 - adding, 112
 - configuring, 114
 - installing, 112
 - locating faulty, 107
 - locations, 2
 - removing, 108
 - resetting, 114
 - servicing, 105
 - status LEDs, 106
 - verifying, 114
- hard drive backplane

- determining faulty, 125
- installing, 130
- location, 2
- removing, 127
- resetting, 132
- servicing, 125
- verifying, 132
- hard drive fan
 - determining faulty, 118
 - installing, 121
 - location, 2
 - removing, 120
 - resetting, 123
 - servicing, 117
 - verifying, 123

I

ID PROM

- determining faulty, 244
- installing, 248
- location, 6
- removing, 246
- resetting, 249
- servicing, 243
- verifying, 249

- identifying components, 1

installation

- verifying Oracle VTS, 38

installing

- air filter, 79
- battery, 229
- DIMM, 221
- DVD drive, 145
- DVD tray, 152
- fan board, 167
- fan module, 89
- filter tray, 79
- hard drive, 112
- hard drive backplane, 130
- hard drive fan, 121
- ID PROM, 248
- LED board, 158
- motherboard, 256
- PCIe2 card
 - into PCIe2 mezzanine board, 196
 - into PCIe2 riser card, 198
- PCIe2 mezzanine board, 177
- PCIe2 riser card, 186

- power distribution board, 137
- power supply, 100
- SAS cable, 200
- signal interface board, 210
- SP, 238
- top cover, 261

interpreting

- log files, 37
- POST fault messages, 46

K

keyswitch states

- diag, 41
- normal, 42

L

LED board

- determining faulty, 155
- installing, 158
- location, 4
- removing, 157
- resetting, 160
- servicing, 155
- verifying, 160

LEDs

- DIMM status, 217
- fan module status, 84
- front panel, 17
- hard drive status, 106
- interpreting, 16
- Locator, 66
- power supply status, 94
- rear module, 19

locating faulty

- DIMM, 217
- fan module, 84
- hard drive, 107
- PCIe2 card, 190
- PCIe2 riser card, 182
- power supply, 94

locating the server (Service), 66

Locator LED location, 66

log files, 37

- interpreting, 37
- viewing, 38

login, 23

M

managing

- components of ASR, 56
- faults, 11
 - through Oracle ILOM, 21

message buffer

- checking, 37

message identifier, 53

motherboard

- determining faulty, 251
- installing, 256
- location, 6
- removing, 254
- resetting, 259
- servicing, 251
- verifying, 259

N

NET MGT port, 23

O

Oracle ILOM

- accounts, 23
- browser interface, 23
- CLI interface, 23
- commands for service, 30
- default password, 23
- fault manager, 21
- managing faults, 21
- properties affecting POST, 42
- troubleshooting overview, 21

Oracle Solaris

- files and commands, 37
- PSH, 50

Oracle VTS

- overview, 39
- packages, 40
- test types, 39
- verifying installation, 38, 40

overview

- ASR, 56
- diagnostics, 11
- Oracle ILOM troubleshooting, 21
- POST, 41
- PSH, 51

P

password for Oracle ILOM, 23

PCIe2 card

adding

to PCIe2 mezzanine board, 196

to PCIe2 riser card, 198

installing

into PCIe2 mezzanine board, 196

into PCIe2 riser card, 198

locating faulty, 190

locations, 6

removing

from PCIe2 mezzanine board, 193

from PCIe2 riser card, 195

resetting, 202

servicing, 189

verifying, 202

PCIe2 mezzanine board

determining faulty, 172

installing, 177

location, 6

removing, 174

resetting, 179

servicing, 171

verifying, 179

PCIe2 riser card

installing, 186

locating faulty, 182

locations, 6

removing, 184

resetting, 188

servicing, 181

verifying, 188

POST, 40

clearing faults, 47

components disabled, 56

configuring, 44

flowchart, 42

interpreting fault messages, 46

maximum testing, 45

Oracle ILOM properties effect, 42

output, 48

overview, 41

running, 40, 45

POST-detected faults, 26

power button

power off, 70

power on, 264

power cords

connecting, 263

disconnecting, 71

power distribution board

determining faulty, 134

installing, 137

location, 2

removing, 135

resetting, 139

servicing, 133

verifying, 139

power supply

installing, 100

locating faulty, 94

locations, 2

removing, 97

resetting, 102

servicing, 93

status LEDs, 94

verifying, 102

powering off the server

emergency shutdown, 70

power button, 70

preparing, 69

SP, 69

powering on the server

power button, 264

SP, 263

preparing

for service, 61

to power off the server, 69

PSH

detected faults, 26

checking, 53

example, 52

knowledge article web site, 53

managing faults, 50

overview, 51

R

rear panel components (Service), 9

removing

air filter, 77

battery, 227

DIMM, 220

DVD drive, 143

DVD tray, 149

fan board, 164

- fan module, 87
- filter tray, 77
- hard drive, 108
- hard drive backplane, 127
- hard drive fan, 120
- ID PROM, 246
- LED board, 157
- motherboard, 254
- PCIe2 card
 - from PCIe2 mezzanine board, 193
 - from PCIe2 riser card, 195
- PCIe2 mezzanine board, 174
- PCIe2 riser card, 184
- power distribution board, 135
- power from the server, 68
- power supply, 97
- signal interface board, 208
- SP, 236
- top cover, 73

replaceable components, 2, 4, 6

resetting

- battery, 231
- DIMM, 223
- DVD drive, 147
- fan board, 170
- fan module, 90
- hard drive, 114
- hard drive backplane, 132
- hard drive fan, 123
- ID PROM, 249
- LED board, 160
- motherboard, 259
- PCIe2 card, 202
- PCIe2 mezzanine board, 179
- PCIe2 riser card, 188
- power distribution board, 139
- power supply, 102
- signal interface board, 212
- SP, 240

returning the server to operation, 261

running

- POST, 40, 45

S

safety

- information, 61
- symbols, 62

SAS cable

- installing, 200

SER MGT port

- accessing, 23

server

- locating, 66

service

- preparing, 61
- procedures, 67

servicing

- air filter, 77
- battery, 225
- DIMM, 215
- DVD drive, 141
- DVD tray, 149
- fan board, 161
- fan module, 83
- hard drive, 105
- hard drive backplane, 125
- hard drive fan, 117
- ID PROM, 243
- LED board, 155
- motherboard, 251
- PCIe2 card, 189
- PCIe2 mezzanine board, 171
- PCIe2 riser card, 181
- power distribution board, 133
- power supply, 93
- signal interface board, 205
- SP, 233

setting keyswitch

- diag state, 45
- normal state, 44

show command, 25

show components command, 57

show faulty command, 26

shutting down

- power button, 70
- SP, 69

signal interface board

- determining faulty, 206
- installing, 210
- location, 2
- removing, 208
- resetting, 212
- servicing, 205
- verifying, 212

SP

- accessing, 23
- determining faulty, 234
- installing, 238
- location, 6
- powering on, 263
- removing, 236
- resetting, 240
- servicing, 233
- verifying, 240

start /SYS command, 263

stop /SYS command, 69

symbols in documentation, 62

system message log files

- viewing, 38

T

tools

- for service, 63

top cover

- installing, 261
- location, 4
- removing, 73

troubleshooting, 13

U

UUID value, 34

V

verifying

- battery, 231
- DIMM, 223
- DVD drive, 147
- fan board, 170
- fan module, 90
- hard drive, 114
- hard drive backplane, 132
- hard drive fan, 123
- ID PROM, 249
- LED board, 160
- motherboard, 259
- Oracle VTS installation, 40
- PCIe2 card, 202
- PCIe2 mezzanine board, 179
- PCIe2 riser card, 188
- power distribution board, 139
- power supply, 102
- signal interface board, 212

- SP, 240

viewing

- log files/var/adm/messages file, 38
- system message log files, 38

