SPARC T8-4 Server Service Manual

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SPARC T8-4 Server Service Manual

Part No: E80512-05

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Contents

Using This Documentation

- **Overview** – Describes how to troubleshooot and maintain the server
- **Audience** – Technicians, system administrators, and authorized service providers
- **Required knowledge** – This guide is intended for trained technicians and authorized service personnel who have been instructed on the hazards within the equipment and are qualified to remove and replace hardware

Product Documentation Library

Documentation and resources for this product and related products are available at `http://www.oracle.com/goto/t8-4/docs`.

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Identifying Components

These topics identify key components of the server, including major boards and internal system cables, as well as front and rear panel features.

Related Information

- "Detecting and Managing Faults"
- "Preparing for Service"
- "Returning the Server to Operation"

Front Panel Components
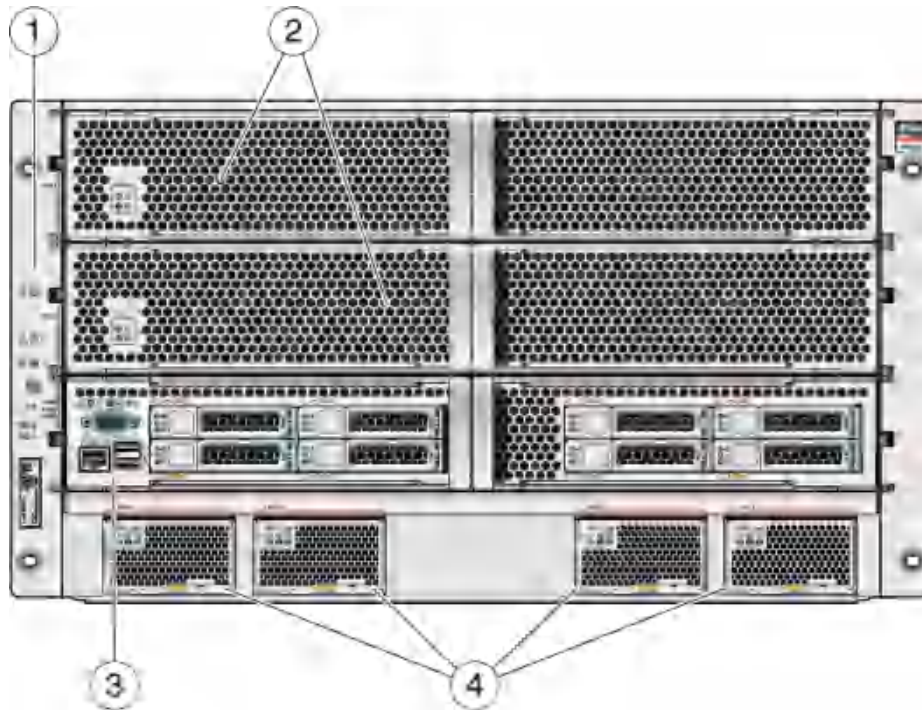
No.	Description	Links
1	Control panel	"Detecting and Managing Faults" on page 25
		"Preparing for Service" on page 43
		"Returning the Server to Operation" on page 191
2	Processor modules (slots 0 and 1) or processor filler module (slot 1 only)	"Processor Module Components" on page 18
		"Servicing Processor Modules" on page 55
3	Main module	"Main Module Components" on page 20
		"Servicing the Main Module" on page 97
4	Power supplies (4)	"Servicing Power Supplies" on page 135

Related Information

- "Rear Panel Components" on page 15
- "Chassis Subassembly Components" on page 17
- "Processor Module Components" on page 18
- "Main Module Components" on page 20
- "Supported Storage and Backup Devices" on page 21
- "Component Service Task Reference" on page 22
- "System Schematic" on page 40

Rear Panel Components
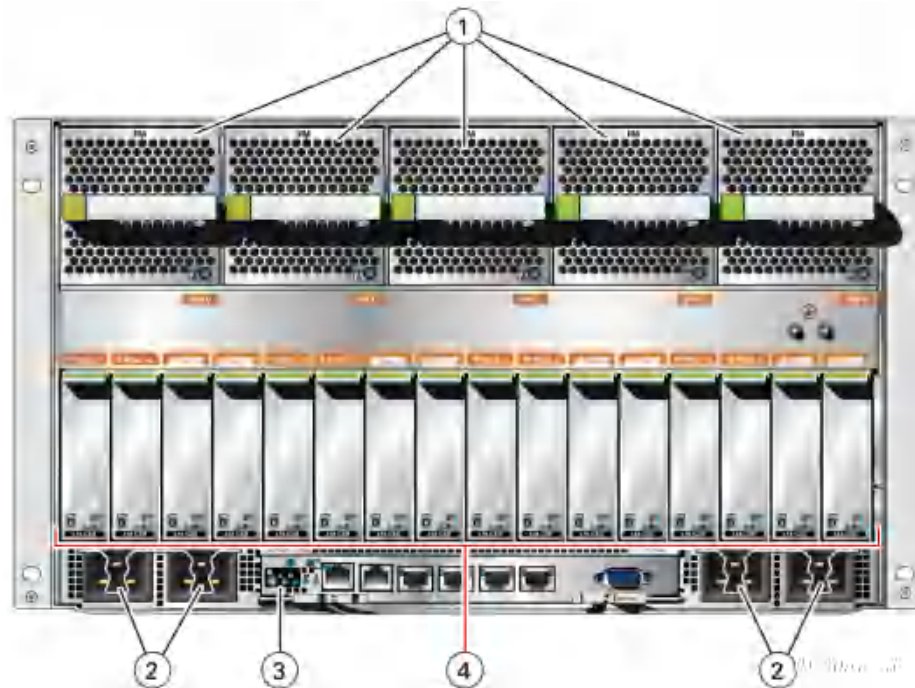
No.	Description	Links
1	Fan modules (5)	"Servicing Fan Modules" on page 145

No.	Description	Links
2	AC power connectors (4)	"Preparing for Service" on page 43
3	Rear I/O module	"Servicing the Rear I/O Module" on page 173
4	PCIe carriers (1-16, left to right)	"Servicing PCIe Cards" on page 155

These components are accessible within the rear chassis subassembly, which you can access after you have removed all the components from the rear of the server.
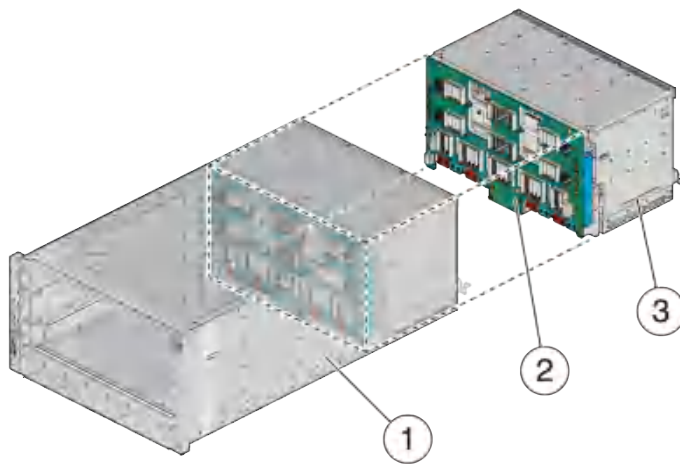
No.	Description	Links
1	Chassis	
2	Midplane assembly	"Servicing the Rear Chassis Subassembly" on page 183
3	Rear chassis subassembly	"Servicing the Rear Chassis Subassembly" on page 183

Related Information

- "Front Panel Components" on page 14
- "Chassis Subassembly Components" on page 17
- "Processor Module Components" on page 18
- "Main Module Components" on page 20
- "Supported Storage and Backup Devices" on page 21
- "Component Service Task Reference" on page 22
- "System Schematic" on page 40

Chassis Subassembly Components
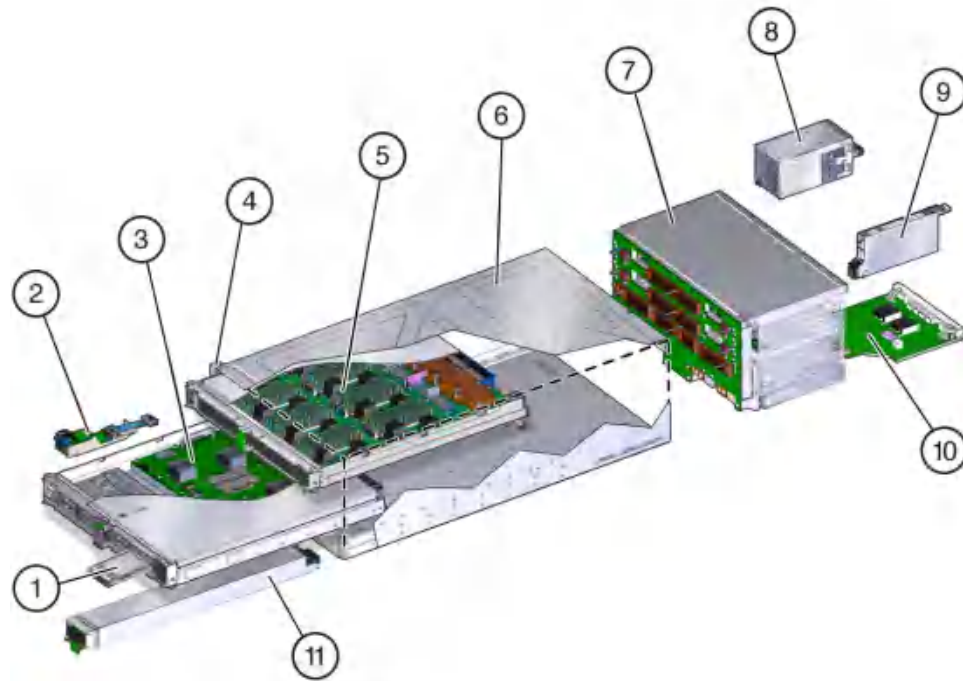
No.	Description	Links
1	Front I/O assembly	"Servicing the Main Module" on page 97
2	Main module	"Servicing the Main Module" on page 97
3	System controls and indicators	"Front Panel Controls and LEDs" on page 29
4	Processor modules (2)	"Servicing Processor Modules" on page 55
5	Chassis	
6	Rear chassis subassembly (RCSA)	"Servicing the Rear Chassis Subassembly" on page 183
7	Fan modules (5)	"Servicing Fan Modules" on page 145
8	PCIe carriers (16)	"Servicing PCIe Cards" on page 155
9	Rear I/O module	"Servicing the Rear I/O Module" on page 173
10	Power supplies (4)	"Servicing Power Supplies" on page 135
11	Hard drives (8)	"Servicing Hard Drives" on page 87

Related Information

Processor Module Components

These components are accessible within the processor module when you remove the processor module from the front of the server.

Note - The processor modules are located beneath the heat sinks.
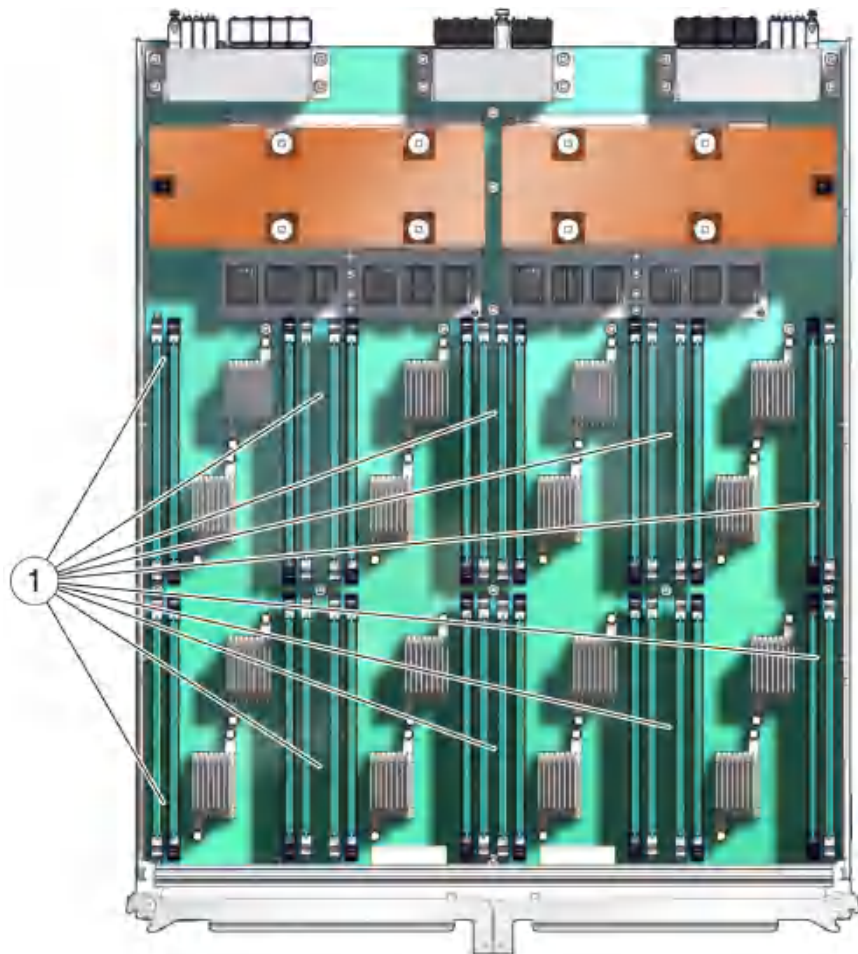
No.	Description	Link
1	DIMMs	"Servicing DIMMs" on page 69

Related Information

- "Front Panel Components" on page 14
- "Rear Panel Components" on page 15
- "Chassis Subassembly Components" on page 17
- "Main Module Components" on page 20

- "Supported Storage and Backup Devices" on page 21
- "Component Service Task Reference" on page 22
- "System Schematic" on page 40

Main Module Components

These components are accessible after you remove the main module from the front of the server.
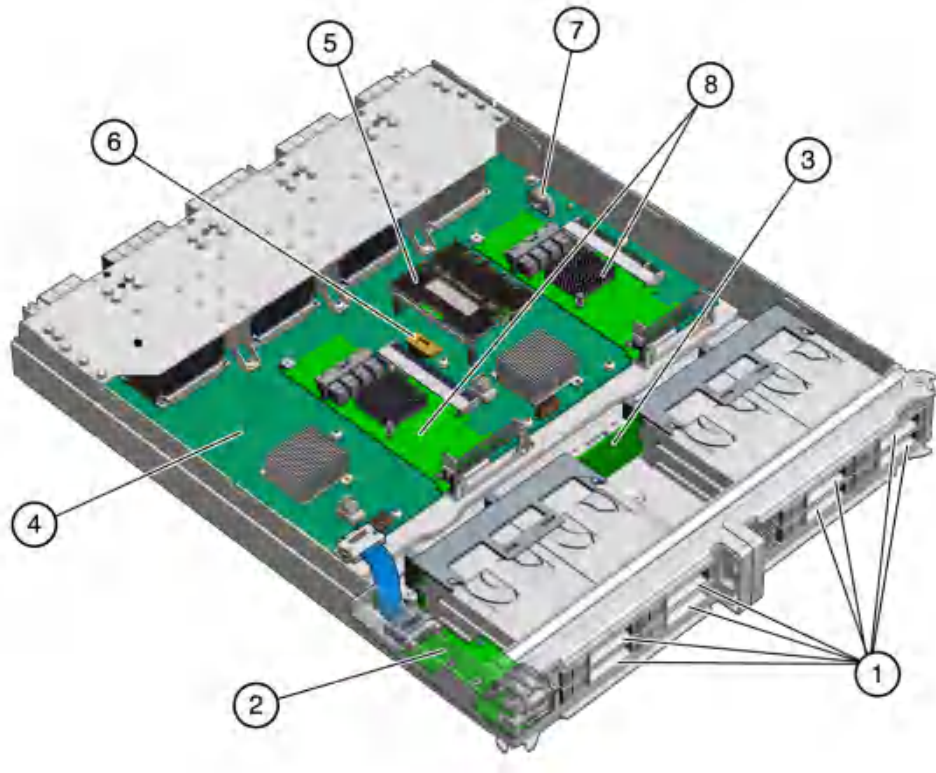
No.	Description	Links
1	Hard drives	"Servicing Hard Drives" on page 87

No.	Description	Links
2	Front I/O assembly and cables	"Servicing the Main Module" on page 97
3	Storage backplane	"Servicing the Main Module" on page 97
4	Main module motherboard	
5	SPM	"Servicing the SPM" on page 117
6	SCC PROM	"Servicing the SCC PROM" on page 125
7	Battery	"Servicing the Battery" on page 129
8	NVMe cards (optional)	"Servicing NVMe Switch Cards" on page 107

Related Information

- "Front Panel Components" on page 14
- "Rear Panel Components" on page 15
- "Chassis Subassembly Components" on page 17
- "Processor Module Components" on page 18
- "Supported Storage and Backup Devices" on page 21
- "Component Service Task Reference" on page 22
- "System Schematic" on page 40

Supported Storage and Backup Devices

The server supports the following storage devices:

- Fibre channel arrays (SATA, FC, flash, and SAS-3)
- SAS arrays (SAS-3)
- ZFS appliances (SAS-3)

The server also supports these types of tape backup and restore devices:

- TCP/IP
- Fibre channel
- SAS
- LVD SCSI

Related Information

- "Front Panel Components" on page 14

Component Service Task Reference

This table lists the names of serviceable components. It also lists the system names and task locations for the components.

Component	Max.	NAC Name	SDM Name	Link to Service Procedure
Processor module	2	`/SYS/PMx`	`/System/CPU_Modules/CPU_Module_x`	"Servicing Processor Modules" on page 55
Processor filler module	1	`/SYS/PFMx`		"Servicing Processor Modules" on page 55
DIMM	64	`/SYS/PMx/CMx/CMP/` `BOBxx/CHx/DIMM`	`/System/Memory/DIMMs/DIMM_x`	"Servicing DIMMs" on page 69
Main module	1	`/SYS/MB`	None	"Servicing the Main Module" on page 97
Disk backplane	1	`/SYS/DBP`	`SAS_BACKPLANE`	"Servicing the Main Module" on page 97
Hard drive	8	`/SYS/DBP/HDDx`	`/System/Storage/Disks/Disks_x`	"Servicing Hard Drives" on page 87
NVMe switch card (optional)	2	`/SYS/MB/PCIEx/PCIESW`	`NVMECARD`	"Servicing NVMe Switch Cards" on page 107
NVMe drive (optional)	8	`/SYS/DBP/NVMEx`	None	"Servicing Hard Drives" on page 87
SPM	1	`/SYS/MB/SPM`	`/SPM`	"Servicing the SPM" on page 117
SCC PROM	1	`/SYS/MB/SCC`	None	"Servicing the SCC PROM" on page 125
Battery	1	`/SYS/MB/BAT`	None	"Servicing the Battery" on page 129
Front I/O assembly	1	`/SYS/FIO`	None	"Servicing the Main Module" on page 97
Power supply	4	`/SYS/PSx`	`/System/Power/Power_Supplies/` `Power_Supply_x`	"Servicing Power Supplies" on page 135

Component	Max.	NAC Name	SDM Name	Link to Service Procedure
Fan module	5	`/SYS/RCSA/FANBD/FMx`	`/System/Cooling/Fans/Fan_x`	"Servicing Fan Modules" on page 145
PCIe card	16	`/SYS/RCSA/PCIEx/CAR/CAR/CARD`	`/System/PCI_Devices/Add-on/Device_x`	"Servicing PCIe Cards" on page 155
Rear IO module	1	`/SYS/RIO`	`/System/Networking/Ethernet_NICs`	"Servicing the Rear I/O Module" on page 173
Rear chassis subassembly (RCSA)	1	`/SYS/RCSA`	None	"Servicing the Rear Chassis Subassembly" on page 183

Related Information

- "Front Panel Components" on page 14
- "Rear Panel Components" on page 15
- "Chassis Subassembly Components" on page 17
- "Processor Module Components" on page 18
- "Main Module Components" on page 20
- "Supported Storage and Backup Devices" on page 21
- "System Schematic" on page 40

Detecting and Managing Faults

These topics explain how to use various diagnostic tools to monitor server status and troubleshoot faults in the server. The examples use the PSH (Predictive Self Healing) `fmadm faulty` command.

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Related Information

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Understanding Diagnostics

These topics explain the diagnostic process and tools.

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PSH Overview

The PSH feature provides problem diagnosis on the SPM and the host. Regardless of where a fault occurs, you can view and manage the fault diagnosis from the SPM or the host.

When possible, PSH initiates steps to take the component offline. PSH also logs the fault to the `syslogd` daemon and provides a fault notification with a message ID. You can use the message ID to get additional information about the problem from the Knowledge Base article database.

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

- Type
- Severity
- Description
- Automated response
- Impact
- Suggested action for system administrator

If PSH detects a faulty component, use the `fmadm faulty` command to display information about the fault. See .

Related Information

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-

Diagnostics Process

This table describes the diagnostics process.

Step	Diagnostic Action	Possible Outcome	Links
1.	Check the server for detected faults using these tools: ■ System LEDs on the front and rear panels. ■ `fmadm faulty`command from the Oracle Solaris prompt or through the Oracle ILOM fault management shell.	Determine the faulty component and replace it, or continue to advanced troubleshooting.	"Checking for Faults" on page 27
2.	Check the log files for fault information.	If system messages indicate a faulty component, replace it.	"Interpreting Log Files and System Messages" on page 35
3.	Run POST to provide additional low-level	If POST indicates a faulty component, replace it.	"Configuring POST" on page 37

Step	Diagnostic Action	Possible Outcome	Links
	diagnostic information for the server.		
4.	Contact technical support if the problem persists.	If you are unable to determine the cause of a fault, contact Oracle Support for help.	https://support.oracle.com*https://support.oracle.com*

Related Information

- "PSH Overview" on page 25
- "Checking for Faults" on page 27

Checking for Faults

Use these methods to check for faults:

- "Interpreting LEDs" on page 27
- "Log In to Oracle ILOM (Service)" on page 32
- "Check for Faults" on page 33

Interpreting LEDs

Use these steps to determine if an LED indicates that a component has failed in the server.

Steps	Description	Links
1.	Check the LEDs on the front and rear of the server.	■ "Front Panel Controls and LEDs" on page 29 ■ "Rear Panel Controls and LEDs" on page 30
2.	Check the LEDs on the individual components. **Note -** Component LEDs might not be lit even though the component is faulty. Use the	■ "Determine if the Main Module Is Faulty" on page 99

Steps	Description	Links
	instructions in these links to determine if the component has been diagnosed as being faulty.	■ "Determine Which Processor Module Is Faulty" on page 59 ■ "Identifying Faulty DIMMs" on page 74 ■ "Determine Which Hard Drive Is Faulty" on page 90 ■ "Determine Which Power Supply Is Faulty" on page 138 ■ "Determine Which Fan Module Is Faulty" on page 147 ■ "Determine Which PCIe Card Is Faulty" on page 160 ■ "Determine if the Rear I/O Module Is Faulty" on page 176

Related Information

- "Front Panel Controls and LEDs" on page 29
- "Rear Panel Controls and LEDs" on page 30

Front Panel Controls and LEDs

No.	LED	Icon or Label	Description
1	Locator LED and button (white)		You can turn on the Locator LED to identify a particular server. When lit, the LED displays as a fast blink. The blinking will time out after 15 minutes. Turn on the Locator LED by pressing the Locator button, or see "Locate the Server" on page 49.
2	System Faulit (Service Action Required) LED (amber)		The `fmadm faulty` command provides details about any faults that cause this indicator to light. See "Check for Faults" on page 33. Under some fault conditions, individual component fault LEDs are lit in addition to the Server Service Required LED.
3	Power OK LED (green)		Indicates these conditions: ■ **Off** – Server is not running in its normal state. Server power might be off. The SPM might be running. ■ **Steady on** – Server is powered on and is running in its normal operating state. No service actions are required. ■ **Fast blink** – Server is running in standby mode and can be quickly returned to full function.

No.	LED	Icon or Label	Description
			■ **Slow blink** – A normal but transitory activity is taking place. Slow blinking might indicate that server diagnostics are running or that the server is booting.
4	Power button		The recessed Power button toggles the server on or off. See "Power Off the Server (Power Button – Graceful Shutdown)" on page 52.
5	System Overtemp LED(amber)		Indicates these conditions: ■ **Off** – Indicates a steady state, no service action is required. ■ **Steady on** – Indicates that a temperature failure event has been acknowledged and a service action is required.
6	Fan Module Fault LED(amber)	Rear FM	Indicates these conditions: ■ **Off** – Indicates a steady state, no service action is required. ■ **Steady on** – Indicates that a fan module failure event has been acknowledged and a service action is required on at least one of the fan modules.
7	PCIe Card Fault LED(amber)	Rear PCIe	Indicates these conditions: ■ **Off** – Indicates a steady state, no service action is required. ■ **Steady on** – Indicates that a failure event has been acknowledged and a service action is required on at least one of the PCIe cards.

Rear Panel Controls and LEDs

No.	LED	Icon or Label	Description
1	AC 0 (left) and AC 1 (right) power LED		Indicates these conditions: ■ **Off** – No power is applied to the server. ■ **Green** – Power is applied to the server.
2	Net MGT port link LED		Indicates these conditions: ■ **Off** – No link is established. ■ **On or blinking** – A link is established.
3	Net MGT port speed LED		Indicates these conditions: ■ **Off** – The link is operating as a 10-Mbps connection. ■ **On or blinking** – The link is operating as a 100-Mbps connection.
4	Network port link LED		Indicates these conditions: ■ **Off** – No link is established. ■ **Blinking** – A link is established.
5	Network port speed LED		Indicates these conditions: ■ **Off** – The link is operating as a 10-Mbps connection or there is no link. ■ **Amber on** – The link is operating as a 100-Mbps connection. ■ **Green on** – The link is operating as a Gigabit connection (1000 Mbps).
6	AC 2 (left) and AC 3 (right) power LEDs		Indicates these conditions: ■ **Off** – No power is applied to the server. ■ **Green** – Power is applied to the server.
7	Locator LED and button (white)		Turn on the Locator LED by pressing the Locator button, or see "Locate the Server" on page 49. When lit, the LED blinks rapidly.
8	System Fault (Service Action Required) LED (amber)		The `fmadm faulty` command provides details about any faults that cause this indicator to light. See "Check for Faults" on page 33. Under some fault conditions, individual component fault LEDs are lit in addition to the Service Required LED.
9	Power OK LED (green)		Indicates these conditions: ■ **Off** – Server is not running in its normal state. Server power might be off. The SP might be running. ■ **Steady on** – Server is powered on and is running in its normal operating state. No service actions are required. ■ **Slow blink** – A normal but transitory activity is taking place. Slow blinking might indicate that server diagnostics are running or that the server is booting. ■ **Standby blink** – Server is running in standby mode and can be quickly returned to full function.
10	SP LED	SP OK	Indicates these conditions:

No.	LED	Icon or Label	Description
			■ **Off** – AC power might not have been connected to the power supplies, or an SPM error has occurred and service is required.
			■ **Steady on** – SP is running in its normal operating state. No service actions are required.
			■ **Slow Blink** – SP is initializing the Oracle ILOM firmware.
11	Overtemp LED(amber)		Indicates these conditions:
			■ **Off** – Indicates a steady state, no service action is required.
			■ **Steady on** – Indicates that a temperature failure event has been acknowledged and a service action is required.

▼ Log In to Oracle ILOM (Service)

1. At the terminal prompt, type:

```
ssh root@IP-address
Password: password

Oracle (R) Integrated Lights Out Manager
Version 4.0.x rXXXXX
Copyright (c) 2017, Oracle and/or its affiliates. All rights
reserved.
->
```

Note - To enable first-time login and access to Oracle ILOM, a default Administrator account and its password are provided with the system. To build a secure environment, you must change the default password (`changeme`) for the default Administrator account (`root`) after your initial login to Oracle ILOM. If this default Administrator account has since been changed, contact your system administrator for an Oracle ILOM user account with Administrator privileges.

2. Enable the Oracle ILOM 3.0 legacy name spaces.

```
-> set /SP/cli legacy_targets=enabled
```

Note - In Oracle ILOM 3.1, the name spaces for `/SYS` and `/STORAGE` were replaced with `/System`. You can still use the 3.0 legacy names in commands at any time, but to expose the legacy names in the output, you must enable them. This manual uses the legacy names in the command examples and shows the names in the output examples. For more information about the new name spaces, see the Oracle ILOM documentation.

Related Information

▼ Check for Faults

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

1. Log in to Oracle ILOM.

2. Check for PSH-diagnosed faults.

This example shows how to check for faults through the Oracle ILOM fault management shell.

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

faultmgmtsp> fmadm faulty
------------------ ------------------------------------ ------------- -------
Time               UUID                                 msgid        Severity
------------------ ------------------------------------ ------------- -------
2014-08-27/19:46:26 4ec16c8d-5cdb-c6ca-c949-e24d3637ef27 PCIEX-8000-8R Major

Problem Status   : solved
Diag Engine      : [unknown]
System
  Manufacturer   : Oracle Corporation
  Name           : SPARC T8-4
  Part_Number    : 12345678+11+1
  Serial_Number  : 1238BDC0DF

----------------------------------------
Suspect 1 of 1
  Fault class  : fault.io.pciex.device-interr-corr
  Certainty    : 100%
  Affects      : hc:///chassis=0/motherboard=0/cpuboard=0/chip=0/hostbridge=0/
                 pciexrc=0
 Status        : faulted but still in service
  FRU
    Status       : faulty
    Location     : /SYS/PM0
```

```
      Manufacturer      : Oracle Corporation
      Name              : TLA,PN,NRM,M7 1.2
      Part_Number       : 7061001
      Revision          : 01
      Serial_Number     : 465769T+12445102WR
      Chassis
         Manufacturer   : Oracle Corporation
         Name           : SPARC T8-4
         Part_Number    : 12345678+13+2
         Serial_Number  : 1248DC140


Description : A fault has been diagnosed by the Host Operation System.

Response    : The service required LED on the chassis and on the affected
              FRU may be illuminated.

Impact      : No SPM impact

Action      : Refer to the associated reference document at
              https://support.oracle.com/msg/PCIEX-8000-8R for the latest
              service procedures and policies regarding this diagnosis.
faultmgmtsp>
```

In this example, a fault is displayed that includes these details:

- **Date and time of the fault (`2012-08-27/19:46:26`).**

- **UUID (`4e16c8d-5cdb-c6ca-c949-e24d3637ef27`), which is unique to each fault.**

- **Message identifier (`PCIEX-8000-8R`), which can be used to obtain additional fault information from Knowledge Base articles.**

3. **Consider your next step:**

   - **If you are checking for faults while adding a second processor module, and no faults were detected, return to "Server Upgrade Process" on page 56.**

   - **If a fault is detected, proceed to Step 4.**

4. **Use the message ID to obtain more information about this type of fault.**

   a. **Obtain the message ID from console output.**

   b. **Go to `https://support.oracle.com`, and search on the message ID in the Knowledge tab.**

5.   Follow the suggested actions to repair the fault.

6.   If necessary, clear the fault manually.

See .

Related Information

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Interpreting Log Files and System Messages

With the 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 PSH does not indicate the source of a fault, check the message buffer and log files for notifications for faults. Drive faults are usually captured by the Oracle Solaris message files.

These topics explain how to view the log files and system messages.

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-
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▼ 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 Log Files (Oracle Solaris)

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. To view all logged messages, type:

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

Related Information

- ■ "Check the Message Buffer" on page 35
- ■ "View Log Files (Oracle ILOM)" on page 36

▼ View Log Files (Oracle ILOM)

1. View the event log.

```
-> show /SP/logs/event/list
```

2. View the audit log.

```
-> show /SP/logs/audit/list
```

Related Information

- ■ "Check the Message Buffer" on page 35
- ■ "View Log Files (Oracle Solaris)" on page 36

Configuring POST

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

- "POST Overview" on page 37
- "Configure POST" on page 37

POST Overview

POST is a group of PROM-based tests that run when the server is powered on or when it is reset. POST checks the basic integrity of the critical hardware components in the server.

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 described in "Configure POST" on page 37.

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

Related Information

- "Configure POST" on page 37

▼ Configure POST

1. **Log in to Oracle ILOM.**

   See "Log In to Oracle ILOM (Service)" on page 32.

2. **Set `/HOST/diag` to the value that corresponds to the POST configuration you want to run.**

   This example sets the `/HOST/diag` `default_level` to `min`, which configures POST to run according to other parameter values.

```
-> set /HOST/diag default_level=min
Set default_level to min
```

For possible values for the default_level parameter, type:

```
-> help /HOST/diag

/HOST/diag : Manage Host Power On Self Test Diagnostics

Targets:

Properties:
default_level : Diag level in the default cause (no error or hw change)
default_level : Possible values = off, min, max
default_level : User role required for set = r

default_verbosity : Diag verbosity in the default cause (no error or hw change)
default_verbosity : Possible values = none, min, normal, max
default_verbosity : User role required for set = r

error_level : Diag level when running after an error reset
error_level : Possible values = off, min, max
error_level : User role required for set = r

error_verbosity : Diag verbosity when running after an error reset
error_verbosity : Possible values = none, min, normal, max
error_verbosity : User role required for set = r

hw_change_level : Diag level when running after a hw change
hw_change_level : Possible values = off, min, max
hw_change_level : User role required for set = r

hw_change_verbosity : Diag verbosity when running after a hw change
hw_change_verbosity : Possible values = none, min, normal, max
hw_change_verbosity : User role required for set = r

->
```

Note - When the verbosity value is set to *none*, the console may not display any POST test status for extended periods of time on certain configurations.

3. **(Optional) Set /HOST/diag to determine the diagnostic level after an error reset and after a hardware change.**

   To set error_level, to max, and to set hw_change_level to max, type:

```
-> set /HOST/diag error_level=max
-> set /HOST/diag hw_change_level=max
```

Refer to the section on setting the SPARC host keyswitch state in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x* for a description of parameters and values.

4. **View the current values for settings.**

Example:

```
-> show /HOST/diag
/HOST/diag
   Targets:

   Properties:
        error_reset_level = max
        error_reset_verbosity = normal
        hw_change_level = max
        hw_change_verbosity = normal
        level = min
        mode = normal
        power_on_level = max
        power_on_verbosity = normal
        trigger = hw_change error-reset
        verbosity = normal

   Commands:
        cd
        set
        show
->
```

Related Information

-

▼ Clear a Fault Manually

When PSH detects faults, the faults are logged and displayed on the console. In most cases, after the fault is repaired, the corrected state is detected by the server, and the fault condition is repaired automatically. However, this repair should be verified. 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.**

See .

2. **At the host prompt, determine whether the replaced FRU still shows a faulty state.**
See .

- **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 PSH command:

```
faultmgmtsp> fmadm acquit UUID
```

4. **Verify the fault is cleared.**
Run the show disabled command to see if any components are still listed as faulty. If there are disabled components, repair the faults manually and continue to the next step to reset the server.

```
faultmgmtsp> show disabled
```

5. **If required, reset the server.**

```
faultmgmtsp> exit
-> reset /System
Are you sure you want to reset /System? y
Resetting /System ...
```

Related Information

-
-

System Schematic

This schematic shows the connections between and among specific components and device slots. You can use this schematic to determine optimum locations for any optional cards or other peripherals based on system configuration and intended use.
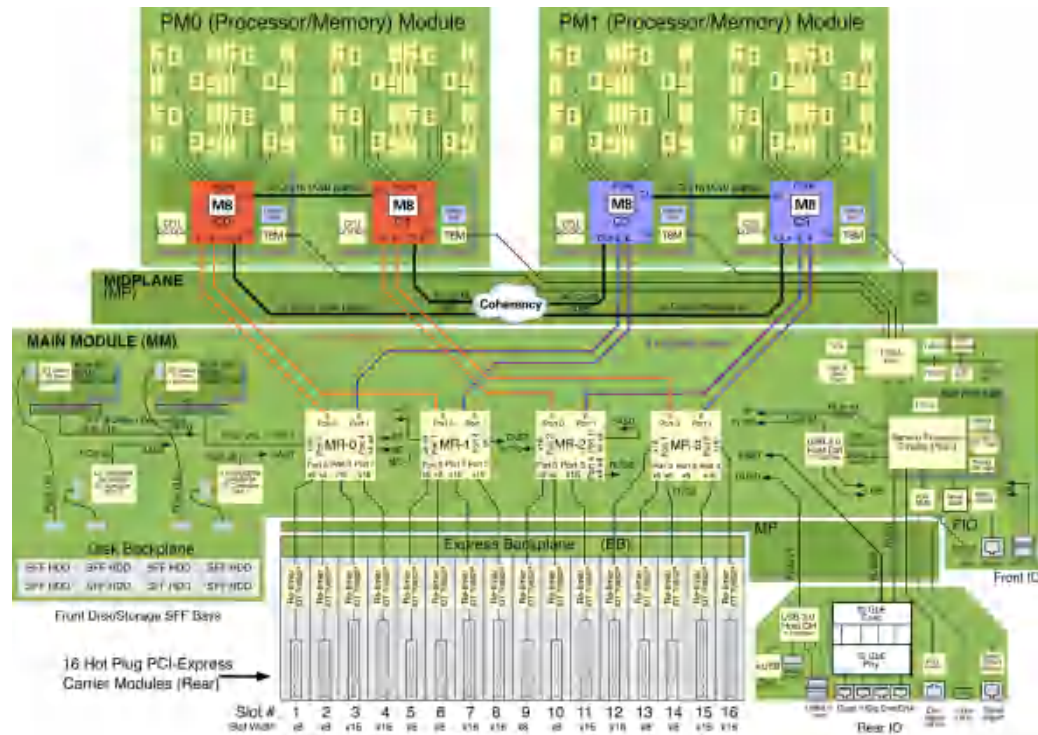
Related Information

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 43
2.	Gather the tools needed for service.	"Tools Needed for Service" on page 45
3.	Consider filler options.	"Component Fillers" on page 46
4.	Find the server serial number.	"Find the Server Serial Number" on page 47
5.	Identify the server to be serviced.	"Locate the Server" on page 49
6.	Locate the component service information.	"Component Service Task Reference" on page 22
7.	For cold-service operations, shut down the OS.	"Removing Power From the Server" on page 50
8.	Gain access to service components.	"Chassis Subassembly Components" on page 17

Safety Information

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

- Follow all cautions and instructions marked on the equipment and described in the documentation shipped with your server.
- Follow all cautions and instructions marked on the equipment and described in the *SPARC T8-4 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 ESD safety practices as described in this section.

This topic includes the following sections:

- "Safety Symbols" on page 44
- "ESD Precautions" on page 44
- "Antistatic Wrist Strap" on page 44

-

Safety Symbols

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

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

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

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

ESD Precautions

ESD-sensitive devices, such as the PCIe 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

Wear an antistatic wrist strap and use an antistatic mat when handling components such as hard drive assemblies, circuit boards, or PCIe cards. 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.

Related Information

-
-
-
-
-
-
-

Tools Needed for Service

You will need the following tools for most service operations:

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

Related Information

-
-
-
-
-
-
-

■ "Removing Power From the Server" on page 50

Component Fillers

Depending on configuration, each server is shipped with replacement fillers for hard drives and processor modules. A filler is an empty metal or plastic component that does not contain any functioning system hardware or cable connectors.

The fillers 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 sytem. If you remove a filler 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 for a server component, refer to the topic in this document about servicing that component.

Related Information

■ "Safety Information" on page 43
■ "Tools Needed for Service" on page 45
■ "Component Service Categories" on page 46
■ "Find the Server Serial Number" on page 47
■ "Locate the Server" on page 49
■ "Prevent ESD Damage" on page 49
■ "Removing Power From the Server" on page 50

Component Service Categories

Replaceable components fall into these categories:

■ **Hot-serviceable by the customer** – Hot-serviceable components can be removed while the server is running. Hot-swappable components do not require any preparation prior to servicing. Hot-pluggable components do require preparation prior to servicing.
■ **Cold-serviceable by the customer or exclusively by authorized service personnel** – Cold-serviceable components require that the server is shut down. In addition, some service procedures require that the power cables be disconnected between the power supplies and the power source.

The following table identifies the server components that are replaceable.

Component	Power Status for Removal	Authorized Service Personnel Only	Remove and Replace Instructions
Processor module	Off		"Servicing Processor Modules" on page 55
DIMM	Off		"Servicing DIMMs" on page 69
Hard drive	Off or On		"Servicing Hard Drives" on page 87
Main module[†]	Off	X	"Servicing the Main Module" on page 97
NVMe switch card	Off		"Servicing NVMe Switch Cards" on page 107
Storage backplane[*]	Off	X	"Servicing the Main Module" on page 97
SPM[*]	Off	X	"Servicing the SPM" on page 117
SCC PROM[*]	Off	X	"Servicing the SCC PROM" on page 125
System battery[*]	Off	X	"Servicing the Battery" on page 129
Front I/O assembly[*]	Off	X	"Servicing the Main Module" on page 97
Power supply	Off or On		"Servicing Power Supplies" on page 135
Fan module	Off or On		"Servicing Fan Modules" on page 145
PCIe card	Off or On		"Servicing PCIe Cards" on page 155
Rear I/O module[*]	Off	X	"Servicing the Rear I/O Module" on page 173
Rear chassis subassembly[*]	Off	X	"Servicing the Rear Chassis Subassembly" on page 183

[†]You must disconnect the ower cords before accessing this component..

Related Information

- "Safety Information" on page 43
- "Tools Needed for Service" on page 45
- "Component Fillers" on page 46
- "Find the Server Serial Number" on page 47
- "Locate the Server" on page 49
- "Prevent ESD Damage" on page 49
- "Removing Power From the Server" on page 50

▼ Find the Server Serial Number

If you require technical support for your server, you will be asked to provide the server's serial number.

● **Use one of the following options to find the serial number.**

■ **Locate the manufacturing sticker on the front of the server or on the sticker on the side of the server.**

■ **At the Oracle ILOM prompt, type**

```
-> show /SYS

/SYS
   Targets:
        MB
        MB_ENV
        RIO
        PM0
        PM1
        FM0
...
   Properties:
        type = Host System
        ipmi_name = /SYS
        keyswitch_state = Normal
        product_name = T5-4
        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

- "Removing Power From the Server" on page 50

▼ Locate the Server

You can use the Locator LEDs to identify a particular server.

1. **At the Oracle ILOM prompt, 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 it off using one of the following methods.**

   - **Press the Locator button.**

   - **At the Oracle ILOM prompt, type:**

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

   Related Information

   - "Safety Information" on page 43
   - "Tools Needed for Service" on page 45
   - "Component Fillers" on page 46
   - "Component Service Categories" on page 46
   - "Find the Server Serial Number" on page 47
   - "Prevent ESD Damage" on page 49
   - "Removing Power From the Server" on page 50

▼ Prevent ESD Damage

Many components contained in the processor modules and main module can be damaged by ESD. To protect these components from damage, perform the following steps before opening these modules for service.

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. The following items can be used as an antistatic mat:

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

2. **Attach an antistatic wrist strap.**

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

Related Information

- "Safety Information" on page 43
- "Servicing Processor Modules" on page 55
- "Servicing DIMMs" on page 69
- "Servicing the Main Module" on page 97
- "Servicing the SPM" on page 117
- "Servicing the SCC PROM" on page 125
- "Servicing the Battery" on page 129
- "Servicing PCIe Cards" on page 155
- "Servicing the Rear I/O Module" on page 173
- "Servicing the Rear Chassis Subassembly" on page 183

Removing Power From the Server

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

- "Prepare to Power Off the Server" on page 51
- "Power Off the Server (Oracle ILOM)" on page 51
- "Power Off the Server (Power Button – Graceful Shutdown)" on page 52
- "Power Off the Server (Power Button – Emergency Shutdown)" on page 52
- "Disconnect Power Cords" on page 53
- "Prevent ESD Damage" on page 49

▼ Prepare to Power 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 (Oracle ILOM)" on page 51
- "Power Off the Server (Power Button – Graceful Shutdown)" on page 52
- "Power Off the Server (Power Button – Emergency Shutdown)" on page 52

Related Information

- "Prepare to Power Off the Server" on page 51
- "Disconnect Power Cords" on page 53

▼ Power Off the Server (Oracle ILOM)

You can use the SPM 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.

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:

```
-> stop /System
Stopping /System
```

4. **If you are powering off the server in order to add a second processor module, return to "Server Upgrade Process" on page 56.**

    Related Information

    - "Prepare to Power Off the Server" on page 51
    - "Power Off the Server (Power Button – Graceful Shutdown)" on page 52
    - "Power Off the Server (Power Button – Emergency Shutdown)" on page 52

▼ Power Off the Server (Power Button – Graceful Shutdown)

This procedure places the server in the power standby mode.

1. **Press and release the recessed Power button.**
    The Power OK LED blinks rapidly.

2. **If you are powering off the server in order to add a second processor module, return to "Server Upgrade Process" on page 56.**

    Related Information

    - "Power Off the Server (Oracle ILOM)" on page 51
    - "Power Off the Server (Power Button – Emergency Shutdown)" on page 52

▼ Power Off the Server (Power Button – Emergency Shutdown)

⚠ **Caution -** All applications and files are closed abruptly without saving changes. File system corruption might occur.

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

Related Information

- "Power Off the Server (Oracle ILOM)" on page 51
- "Power Off the Server (Power Button – Graceful Shutdown)" on page 52

▼ Disconnect Power Cords

You must disconnect the power cords before accessing the following components:

- Main module
- Storage backplanes
- SPM
- SCC PROM
- Battery
- Front I/O assembly
- Rear I/O module
- Rear chassis subassembly

1. **Power off the server.**

   See:

   - "Power Off the Server (Oracle ILOM)" on page 51
   - "Power Off the Server (Power Button – Graceful Shutdown)" on page 52
   - "Power Off the Server (Power Button – Emergency Shutdown)" on page 52

2. **Disconnect all power cords from the server.**

   Caution - Because standby power is always present in the system, you must unplug the power cords before accessing certain components.

Related Information

- "Safety Information" on page 43
- "Tools Needed for Service" on page 45
- "Component Fillers" on page 46
- "Component Service Categories" on page 46
- "Find the Server Serial Number" on page 47
- "Locate the Server" on page 49

■ "Prevent ESD Damage" on page 49

Attachment of Devices During Service

During service procedures, you might have to connect devices to the server.

■ For OS support, connect an Ethernet cable to the one of the Ethernet connectors (NET 0, NET 1, NET 2, or NET 3).

■ If you plan to interact with the system console directly, you can connect additional external devices, such as a mouse and keyboard, to the server's USB connectors, and connect a monitor to the rear DB-15 video connector. For more details on connecting to the video port, refer to "Connecting Cables" in *SPARC T8-4 Server Installation Guide*.

■ If you plan to connect to the Oracle ILOM software over the network, connect an Ethernet cable to the Ethernet port labeled NET MGT.

Note - The SP uses the NET MGT (out-of-band) port by default. You can configure the SP to share one of the sever's four Ethernet ports instead. The SP uses only the configured Ethernet port.

■ If you plan to access the Oracle ILOM CLI through the management port, connect a serial null modem cable to the RJ-45 serial port labeled SER MGT.

■ The USB connectors on the front panel support USB 2.0. The USB connectors on the rear panel support USB 3.0.

Related Information

■ "Front Panel Components" on page 14
■ "Rear Panel Components" on page 15
■ "Detecting and Managing Faults" on page 25
■ "Connecting Cables" in *SPARC T8-4 Server Installation Guide*

Servicing Processor Modules

This topic describes how to service processor modules, and how to upgrade the server from a single processor module configuration to a dual processor module configuration.

⚠ **Caution -** You must disconnect the power cords before servicing this component. See "Disconnect Power Cords" on page 53.

Description	Links
Replace a processor module.	■ "Determine Which Processor Module Is Faulty" on page 59 ■ "Preparing for Service" on page 43 ■ "Remove a Processor Module or Processor Filler Module" on page 60 ■ "Install a Processor Module or Processor Filler Module" on page 63 ■ "Verify a Processor Module" on page 67
Learn the process for upgrading the server from a single processor module configuration to a two processor module configuration.	"Server Upgrade Process" on page 56
Remove the processor module as part of another component's service operation.	"Remove a Processor Module or Processor Filler Module" on page 60
Install the processor module as part of another component's service operation.	"Install a Processor Module or Processor Filler Module" on page 63

Related Information

- "Identifying Components" on page 13
- "Processor Module Components" on page 18
- "Detecting and Managing Faults" on page 25
- "Preparing for Service" on page 43
- "Component Service Categories" on page 46
- "Servicing DIMMs" on page 69
- "Returning the Server to Operation" on page 191

Server Upgrade Process

The SPARC T8-4 server supports two processor module configurations:

- **Fully-populated** — Two processor modules
- **Half-populated** — One processor module and one processor filler module

Processor modules are cold-service components that can be replaced only by qualified service personnel. For the location of the processor modules, see .

 Caution - These service procedures require that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

This table contains the steps for upgrading the server to a fully-populated configuration.

Step	Description	Link
1.	Remove the upgrade components from their packaging, and place them on an antistatic mat.	
2.	Remove the covers from the new processor module.	"Remove a Processor Module or Processor Filler Module" on page 60
3.	Verify that you have the correct DIMMs for your server. All of the DIMMs must be either 32 or 64 GB, and they must match the size and capacity of the DIMMs already installed in the cpu node.	"Understanding DIMM Configurations" on page 69
4.	Install the DIMMs.	"Install a DIMM" on page 81
5.	Check the server for faults. If any fault is present, you must correct the fault and clear it from the server before you can continue with the upgrade.	"Check for Faults" on page 33
6.	Shut down the server.	"Removing Power From the Server" on page 50
7.	Remove the processor filler module from Slot 1.	"Remove a Processor Module or Processor Filler Module" on page 60
8.	Install the new processor module in Slot 1.	"Install a Processor Module or Processor Filler Module" on page 63
9.	Return the server to operation.	"Returning the Server to Operation" on page 191
10.	Verify the installation. If any fault is present, you must correct the fault and clear it from the server.	"Verify a Processor Module" on page 67
11.	Review the root complex changes.	"Understanding PCIe Root Complex Connections" on page 155
12.	Review the PCIe card load balancing changes. Even though the load balancing guidelines change with the u;pgrade, you do not need to move any existing PCIe cards.	"PCIe Card Configuration" on page 158

Related Information

Processor Module Configuration

Processor modules are accessed from the front of the server. In Oracle ILOM, the processor modules are numbered PM0 and PM1, starting with the lower slot.

No.	Description
1	Processor Module 1 (PM1) or processor filler module
2	Processor Module 0 (PM0)

Note - All CPU modules should have the same DIMMs configurations, either all fully populated or all half populated. See "Understanding DIMM Configurations" on page 69.

Processor Module LEDs
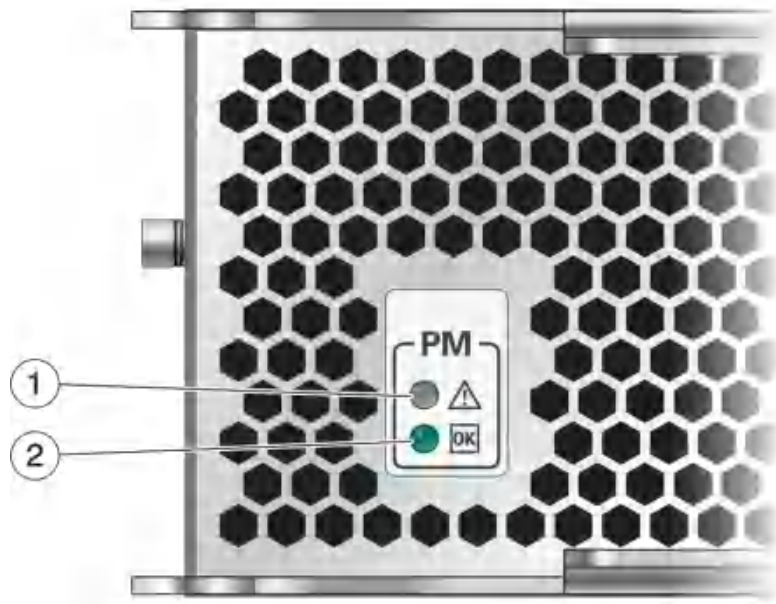
No.	LED	Icon	Description
1	Service Required (amber)		Indicates that the processor module has experienced a fault condition.

No.	LED	Icon	Description
2	OK (green)		Indicates if the processor module is available for use. ■ On – The server is running and the processor module is functioning correctly. ■ Off – The server is powered down and the processor module is in standby mode.

Related Information

- "Processor Module Components" on page 18
- "Server Upgrade Process" on page 56
- "Determine Which Processor Module Is Faulty" on page 59
- "Remove a Processor Module or Processor Filler Module" on page 60
- "Install a Processor Module or Processor Filler Module" on page 63
- "Verify a Processor Module" on page 67

▼ Determine Which Processor Module Is Faulty

The following LEDs are lit when a processor module fault is detected:

- Front and rear System Fault (Service Required) LEDs
- Service Required LED on the faulty processor module

1. Determine if the Service Required LEDs are illuminated on the front panel or the rear I/O module.

See "Interpreting LEDs" on page 27.

2. From the front of the server, check the processor module LEDs to identify which processor module needs to be replaced.

See "Processor Module LEDs" on page 58. The amber Service Required LED is lit on the processor module that needs to be replaced.

3. Remove the faulty processor module.

See "Remove a Processor Module or Processor Filler Module" on page 60.

Related Information

- "Processor Module Components" on page 18

- "Processor Module LEDs" on page 58
- "Remove a Processor Module or Processor Filler Module" on page 60
- "Install a Processor Module or Processor Filler Module" on page 63
- "Verify a Processor Module" on page 67

▼ Remove a Processor Module or Processor Filler Module

Processor modules and processor filler modules are cold-service components that can be replaced only after you power off the system. Processor modules can be replaced only by qualified service personnel. For the location of the modules, see "Processor Module Configuration" on page 57.

Caution - You must disconnect the power cords before servicing this component. See "Disconnect Power Cords" on page 53.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

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

   See "Preparing for Service" on page 43.

2. **Ensure that the server is powered off.**

   See "Removing Power From the Server" on page 50.

3. **Disconnect the power cords.**

   See "Disconnect Power Cords" on page 53.

4. **Locate the processor module in the server that you want to remove.**

   - **If you are replacing a faulty processor module, see "Determine Which Processor Module Is Faulty" on page 59 to locate a faulty processor module.**

   - **If you are adding a processor module, remove the processor filler module in slot 1.**

5. **Press the two extraction levers in toward the server and pull the extraction levers out to disengage the processor module or processor filler module from the server.**
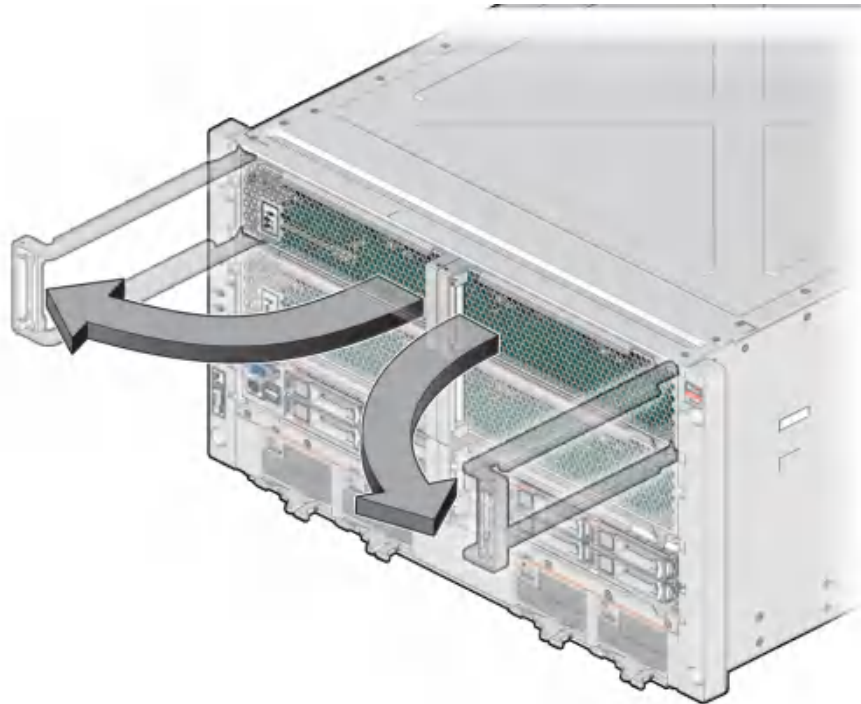
6. **Pull the processor module or processor filler module halfway out of the server, and close the levers.**

This action protects the levers from damage while the module is outside the server.
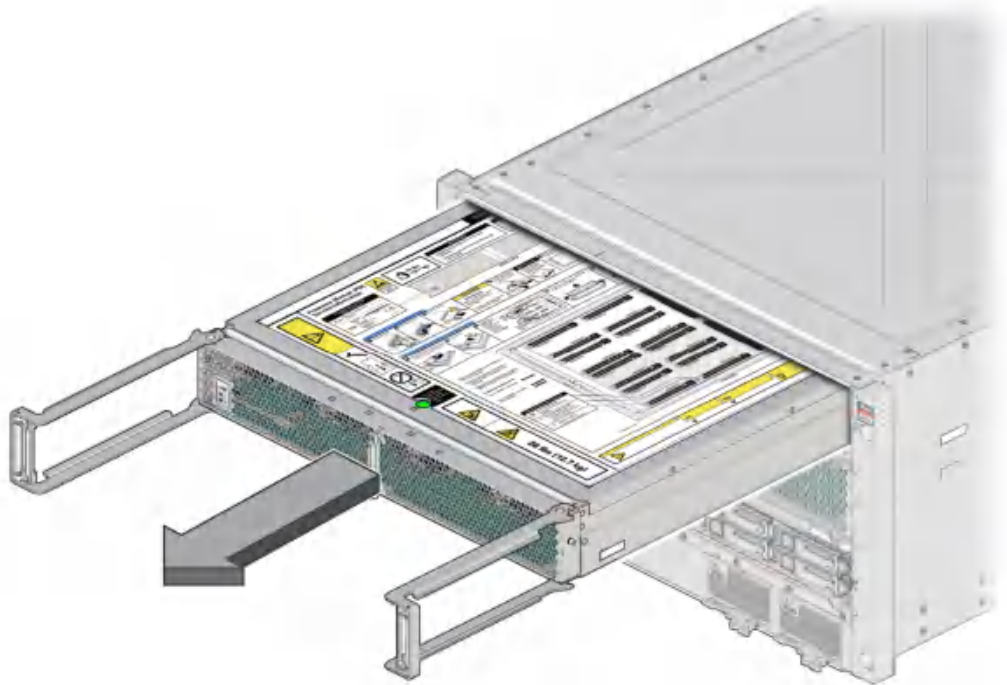
7. **The processor module is heavy. Use two hands to completely remove the processor module (or processor filler module) and place the module on an antistatic mat.**

    Caution - Do not touch the connectors at the rear of the module.

8. **Determine your next step.**

    ■   **If you are replacing or installing DIMMs within the processor module, see "Servicing DIMMs" on page 69.**

    ■   **If you are replacing a faulty processor module, populate and install the replacement processor module:**

a. **Remove all of the DIMMs from the faulty processor module, and set them in a safe place.**

See "Remove a DIMM" on page 78.

b. **Install the DIMMs into the new processor module.**

See "Install a DIMM" on page 81.

c. **Install the processor module.**

See "Install a Processor Module or Processor Filler Module" on page 63.

- **If you have removed a processor filler module as part of a server upgrade, return to "Server Upgrade Process" on page 56.**

- **If you have removed a processor module or processor filler module to prepare the server for installation, return to "Preparing for Installation" in *SPARC T8-4 Server Installation Guide* .**

Related Information

- "Processor Module Components" on page 18
- "Processor Module LEDs" on page 58
- "Server Upgrade Process" on page 56
- "Determine Which Processor Module Is Faulty" on page 59
- "Servicing DIMMs" on page 69
- "Install a Processor Module or Processor Filler Module" on page 63
- "Verify a Processor Module" on page 67

▼ Install a Processor Module or Processor Filler Module

Processor modules are cold-service components that can be replaced only by qualified service personnel. For the location of the processor modules, see "Front Panel Components" on page 14.

Caution - You must disconnect the power cords before servicing this component. See "Disconnect Power Cords" on page 53.

> ⚡ **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Ensure the power cords are disconnected.**

   See "Disconnect Power Cords" on page 53.

2. **Determine your next step.**

   - **If you are installing a processor module after replacing or installing DIMMs, go to Step 3.**

   - **If you are installing a new processor module to replace a faulty one, install all of the DIMMs that you removed from the faulty processor module into the replacement module. See "Install a DIMM" on page 81.**

3. **Open the latches on the processor module or processor filler module, and insert the module into the empty processor module slot in the server.**

> **Note -** A processor filler module can only be installed in slot 1.
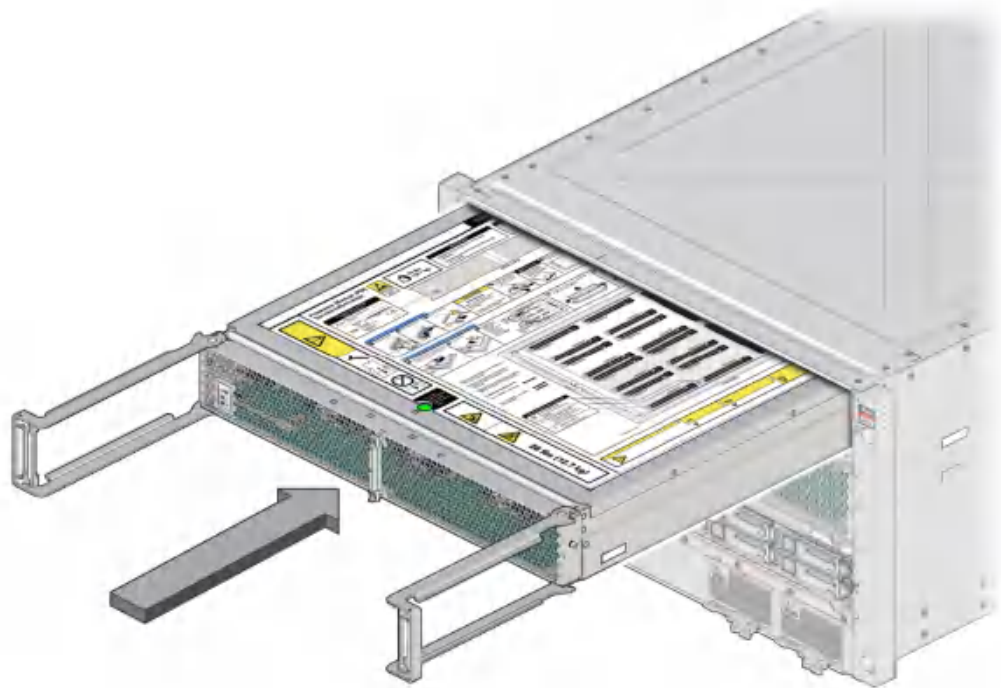
4. **Bring the levers together toward the center of the module and press the levers firmly against the module to fully seat the module back into the server.**

The levels should click into place when the module is fully seated in the server.
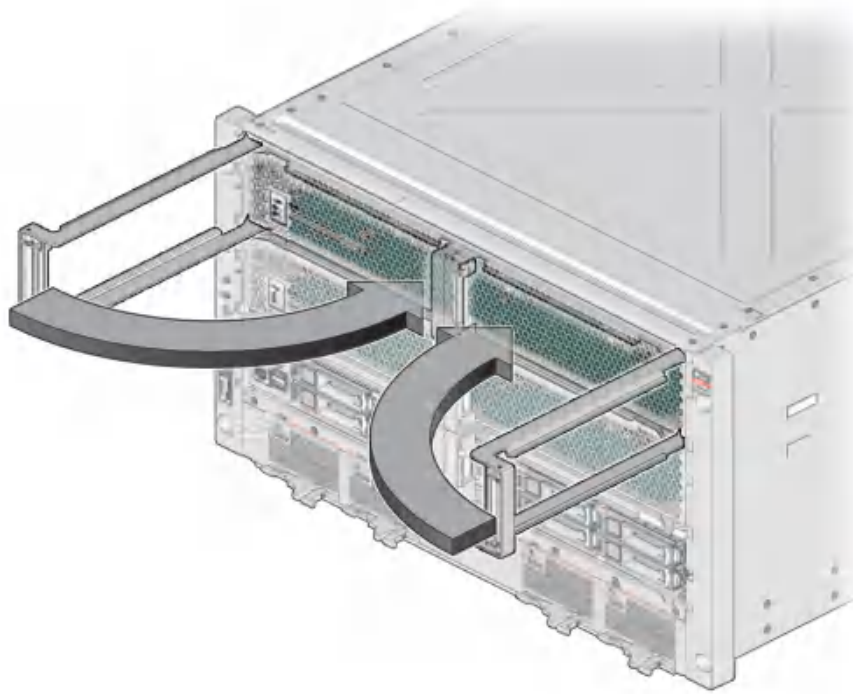
5. **Power on the server.**

    See "Returning the Server to Operation" on page 191.

6. **Verify the processor module functionality.**

    See "Verify a Processor Module" on page 67.

7. **If you are adding a second processor module to the server, return to "Server Upgrade Process" on page 56.**

    ### Related Information

    ■ "Processor Module Components" on page 18
    ■ "Server Upgrade Process" on page 56
    ■ "Processor Module LEDs" on page 58

- "Determine Which Processor Module Is Faulty" on page 59
- "Remove a Processor Module or Processor Filler Module" on page 60
- "Servicing DIMMs" on page 69
- "Verify a Processor Module" on page 67

▼ Verify a Processor Module

1. **Use the Oracle ILOM fault management shell to determine if the new processor module is shown as enabled or disabled.**

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

   faultmgmtsp> fmadm faulty
   ```

   a. **If the output from the fmadm faulty command shows the replacement processor module as enabled, go to Step 2.**

   b. **If the output from the fmadm faulty command shows the replacement processor as disabled, go to "Detecting and Managing Faults" on page 25 to clear the PSH-detected fault from the server.**

2. **Verify that the OK LED is lit on the processor module and that the Fault LED is not lit.**

   See "Processor Module LEDs" on page 58.

3. **Verify that the front and rear Service Required LEDs are not lit.**

   See "Front Panel Controls and LEDs" on page 29 and "Rear Panel Controls and LEDs" on page 30.

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

   - **If the previous steps did not clear the fault, see "Diagnostics Process" on page 26.**

   - **If Step 2 and Step 3 indicate that no faults have been detected, then the processor module has been replaced successfully. No further action is required.**

■ **If you are verifying the server after adding a second processor module, return to "Server Upgrade Process" on page 56.**

Related Information

- "Processor Module Components" on page 18
- "Processor Module LEDs" on page 58
- "Determine Which Processor Module Is Faulty" on page 59
- "Remove a Processor Module or Processor Filler Module" on page 60
- "Install a Processor Module or Processor Filler Module" on page 63

Servicing DIMMs

Up to 32 DIMMs can be installed in each processor module, for a total of 64 DIMMs in the server.

DIMMs are cold-service components that can be replaced by customers. For the location of the DIMMs, see "Processor Module Components" on page 18.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

Description	Links
Understand how to replace DIMMs	■ "Understanding DIMM Configurations" on page 69
	■ "Identifying DIMMs" on page 71
Locate a faulty DIMM	■ "Determine Which DIMM Is Faulty (PSH)" on page 74
	■ "Determine Which DIMM Is Faulty (DIMM Fault LEDs)" on page 76
	■ "DIMM Configuration Errors" on page 72
Replace a DIMM	■ "Remove a DIMM" on page 78
	■ "Install a DIMM" on page 81
	■ "Verify a DIMM" on page 84

Understanding DIMM Configurations

These topics describe DIMM configurations:

- "Supported Memory Configurations" on page 70
- "Identifying DIMMs" on page 71
- "DIMM Configuration Errors" on page 72

Supported Memory Configurations

The server supports 16-Gbyte, 32-Gbyte, and 64-Gbyte DIMMs, with up to 4096 Gbytes in a server fully configured with two processor modules.

Each processor module can be either half populated (16 DIMMs) or fully populated (32 DIMMs).

Consider these population rules when installing, upgrading, or replacing DIMMs in a processor module:

- In half-populated configurations, 16 DIMMs must be installed in all `CH0` slots.

  These slots have black ejector levers.
- In fully-populated configurations (32 DIMMs), DIMMs must be installed in all slots (`CH0` and `CH1`)

Note - The DIMM sparing feature is available only in fully-populated servers.

- All DIMMs associated with each `CMx` must be identical (same size, same rank classification).
- Mixed configurations are supported (DIMMs associated with `CM0` with one size, and DIMMs associated with `CM1` with a different size) *as long as all DIMMs in the server have a supported rank classification*. For example, 32 Gbyte 4Rx4 DIMMs associated with `PM0/CM0`, and 64 Gbyte 4Rx4 DIMMs associated with `PM0/CM1`.

To identify DIMM architecture, see "Identifying DIMMs" on page 71.

Related Information

Identifying DIMMs

Each DIMM is affixed with an identifying label. The first four characters on the label describe the DIMM memory capacity; the second four characters describe the rank classification.
Use these labels to identify the DIMMs installed in the server, to verify that any replacement DIMMs are compatible, or to confirm that upgrade DIMMs may be installed in a supported configuration.

As of System Firmware version 9.10.3, the following DIMM configurations are supported.

DIMM Capacity	DRAM Density	Rank Classification	Label
16 Gbyte	4 Gbit	Dual-rank x4	2Rx4
32 Gbyte	4 Gbit	Quad-rank x4	4Rx4
32 Gbyte	8 Gbit	Dual-rank x4	2Rx4
64 Gbyte	8 Gbit	Quad-rank x4	4Rx4
128 Gbyte	16 Gbit	Quad-rank x4	2S2Rx4

Related Information

- "Understanding DIMM Configurations" on page 69
- "DIMM FRU Names" on page 73
- "DIMM Configuration Errors" on page 72

DIMM Configuration Errors

When the server boots, system firmware checks the memory configuration against the rules described in "Understanding DIMM Configurations" on page 69. If any violations of these rules are detected, the following general error message is displayed.

```
Please refer to the service documentation for supported memory
configurations.
```

In some cases, the server boots in a degraded state, and a message such as the following is displayed:

```
WARNING: Running with a nonstandard DIMM configuration. Refer to service document for
 details.
```

In other cases, the configuration error is fatal, and the following message is displayed:

```
Fatal configuration error - forcing power-down
```

In addition to these general memory configuration errors, one or more rule-specific messages is displayed, indicating the type of configuration error detected. To identify the DIMMs affected, use the fmadm faulty command as described in "Check for Faults" on page 33.

Related Information

- "Check for Faults" on page 33
- "Clear a Fault Manually" on page 39
- "Understanding DIMM Configurations" on page 69
- "DIMM FRU Names" on page 73
- "Identifying DIMMs" on page 71

DIMM FRU Names

The following figure illustrates the DIMM addresses on a processor module, with the front of the processor module oriented toward the left:
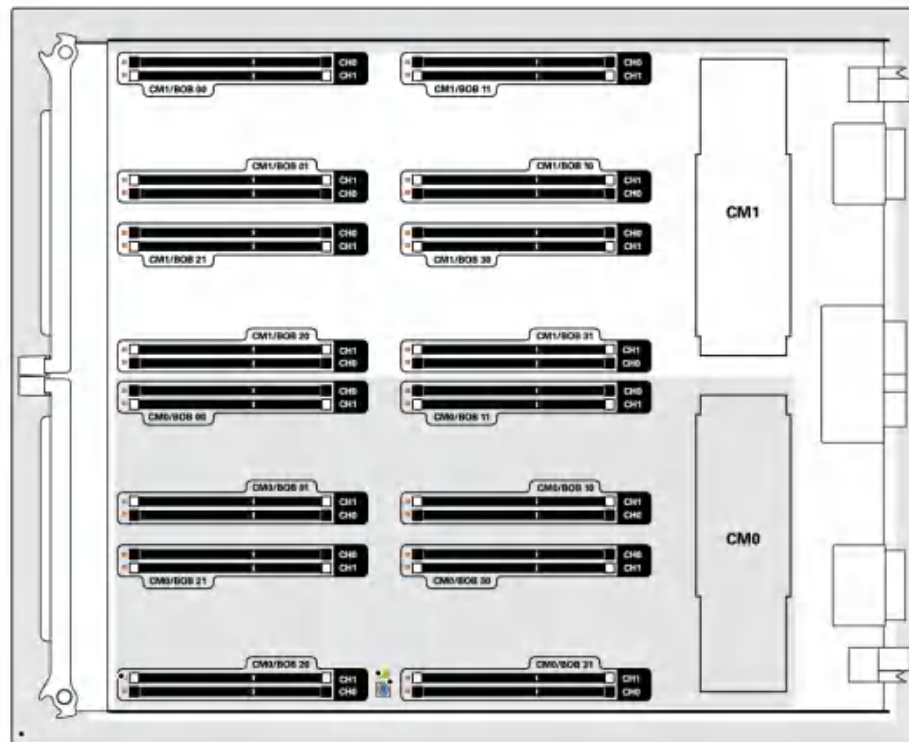
DIMM NAC names are based both on the location of the DIMM slot on the processor module, and in which slot the processor module is installed. For example, the full NAC name for the DIMM installed in the front-left corner on a processor module installed at PM0 is:

`/SYS/PM0/CM1/CMP/BOB00/CH0/DIMM`

Related Information

- "Servicing Processor Modules" on page 55

Identifying Faulty DIMMs

You can identify faulty DIMMs using the following methods:

▼ Determine Which DIMM Is Faulty (Oracle ILOM)

● **If you suspect that the server has a memory problem, run the Oracle ILOM `show faulty` command.**
This command lists memory faults and identifies the DIMM modules associated with the fault.

Related Information

▼ Determine Which DIMM Is Faulty (PSH)

The Oracle Fault Management tool `fmadm faulty` displays current server faults, including DIMM failures.

1. **Start the Fault Management Shell:**

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

2. **Type:**

```
faultmgmtsp> fmadm faulty
------------------ ----------------------------------- -------------- ------
 Time              UUID                                msgid          Severity
```

```
------------------ ------------------------------------- -------------- ------
2014-08-18/21:04:40 7040d859-5b03-4a58-8dfd-e3a80875d62f SPSUN4V-8000-EJ Critical
Problem Status   : solved
Diag Engine      : fdd 1.0
System
   Manufacturer  : Oracle Corporation
   Name          : SPARC T8-4
   Part_Number   : 7021179
   Serial_Number : 1201CTHC01
System Component
   Manufacturer  : Oracle Corporation
   Name          : SPARC T8-4
   Part_Number   : 7021179
   Serial_Number : 1201CTHC01
----------------------------------------
Suspect 1 of 1
   Fault class  : fault.memory.dimm-ue
   Certainty    : 100%
   Affects      : /SYS/PM0/CM1/CMP/BOB10/CH0/DIMM
   Status       : faulted but still in service
 FRU
      Status            : faulty
      Location          : /SYS/PM0/CM1/CMP/BOB10/CH0/DIMM
      Manufacturer      : Samsung
      Name              : 16384MB DDR4 SDRAM DIMM
      Part_Number       : 07042208,M393B1K70DH0-YK0
      Revision          : 04
      Serial_Number     : 00CE0212153367DD4B
      Chassis
         Manufacturer   : Oracle Corporation
         Name           : SPARC T8-4
         Part_Number    : 7021179
         Serial_Number  : 1201CTHC01
Description : Uncorrectable errors have occurred while accessing memory.
Response    : An attempt will be made to remove the affected memory from
              service.  Host HW may restart.
Impact      : Total system memory capacity has been reduced and some
              applications  may have been terminated.
Action      : Use 'fmadm faulty' to provide a more detailed view of this
              event. Please refer to the associated reference document at
              http://support.oracle.com/msg/SPSUN4V-8000-EJ for the latest
              service procedures and policies regarding this diagnosis.
```

Related Information

- "Determine Which DIMM Is Faulty (Oracle ILOM)" on page 74
- "Determine Which DIMM Is Faulty (DIMM Fault LEDs)" on page 76

▼ Determine Which DIMM Is Faulty (DIMM Fault LEDs)

DIMMs are cold-service components that can be replaced by customers. For the location of the DIMMs, see "Processor Module Components" on page 18.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Consider your first steps.**

   ■ **Familiarize yourself with DIMM configuration rules.**

      See "Understanding DIMM Configurations" on page 69

   ■ **Prepare the system for service.**

      See "Preparing for Service" on page 43.

   ■ **Remove the processor module containing the faulty DIMM. Place the processor module on an ESD-protect work surface. Remove the processor module cover.**

      See "Remove a Processor Module or Processor Filler Module" on page 60.

2. Locate the DIMM Fault Remind button on the processor module.
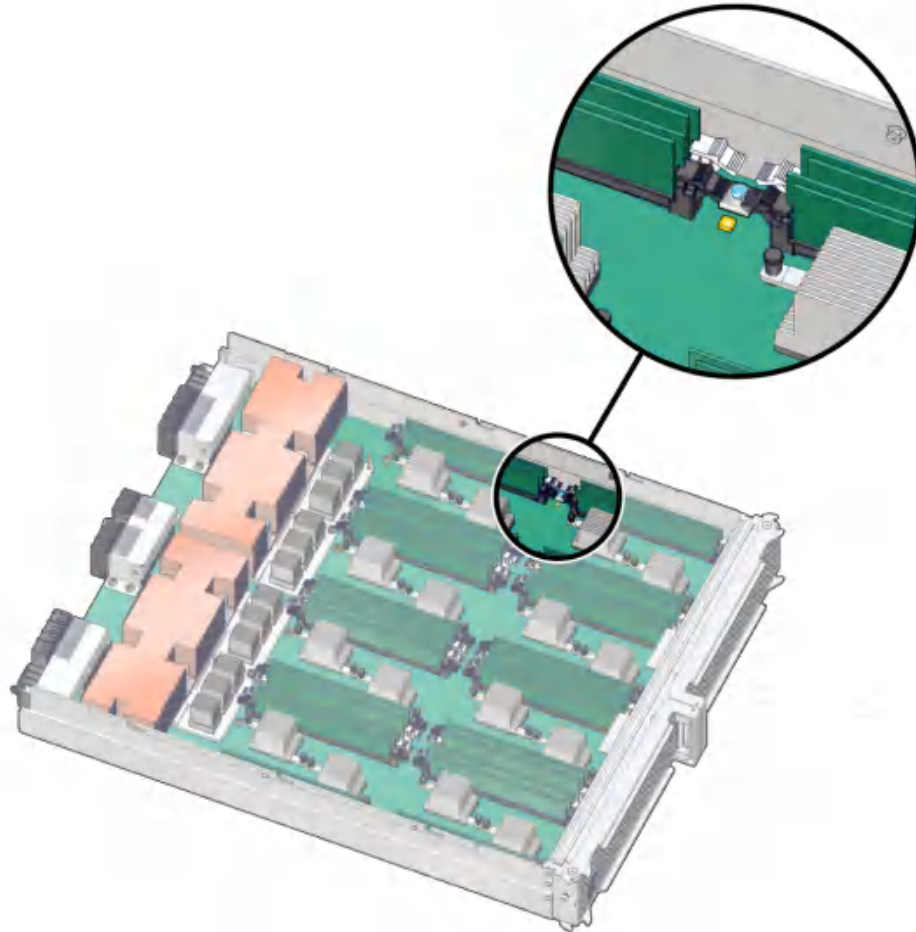
3. Verify that the Memory Riser Power LED next to the button is illuminated.

An illuminated Memory Riser Power LED indicates that there is power available to illuminate any Memory DIMM Fault LEDs once you have pressed the DIMM Fault Remind button.

4. Press the DIMM Fault Remind button on the processor module.

This will cause the Memory DIMM Fault LEDs associated with any faulty DIMMs to illuminate for a few minutes.

5. **Note the address of the DIMM next to any illuminated Memory DIMM Fault LED.**

6. **Ensure that all other DIMMs are seated correctly in their slots.**

    ### Related Information

    ■ "Determine Which DIMM Is Faulty (Oracle ILOM)" on page 74
    ■ "Determine Which DIMM Is Faulty (PSH)" on page 74

▼ Remove a DIMM

DIMMs are cold-service components that can be replaced by customers. For the location of the DIMMs, see "Processor Module Components" on page 18.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Consider your first steps.**

    ■ **Familiarize yourself with DIMM population rules.**

       See "Understanding DIMM Configurations" on page 69

    ■ **Prepare the system for service.**

       See "Preparing for Service" on page 43.

    ■ **Remove the processor module. Place the processor module on an ESD-protect work surface.**

       See "Remove a Processor Module or Processor Filler Module" on page 60.

2. **Remove the cover from the processor module.**

Press the green button near the front edge of the cover and slide the cover back and up off the main module.
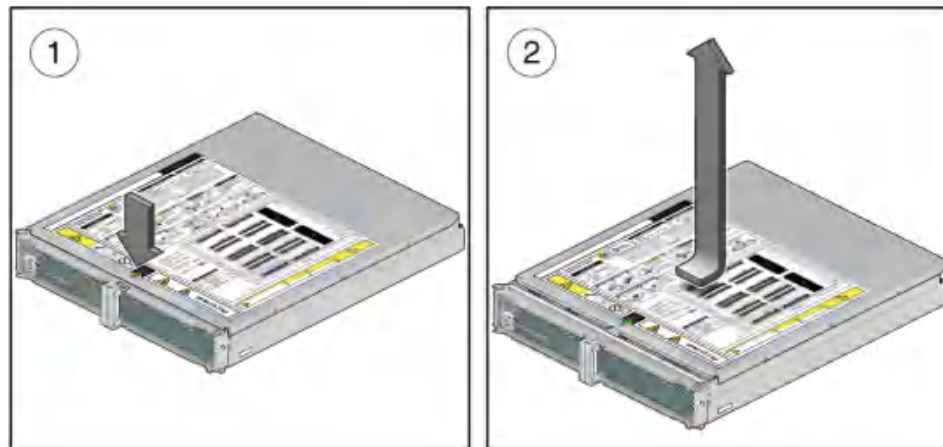
3. **Locate the DIMMs that need to be replaced.**

    See "Determine Which DIMM Is Faulty (DIMM Fault LEDs)" on page 76.

4. **Push down on the ejector tabs on each side of the DIMM until the DIMM is released.**

Caution - DIMMs and heat sinks on the motherboard might be hot.
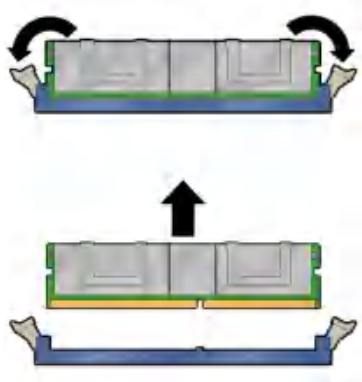
5.   **Grasp the top corners of the faulty DIMM and lift it out of its slot.**

6.   **Place the DIMM on an antistatic mat.**

7.   **Repeat Step 4 through Step 6 for any other DIMMs you intend to remove.**

8.   **Determine your next step:**

   ■   **If you are installing replacement DIMMs at this time, go to "Install a DIMM" on page 81.**

   ■   **If you are not installing replacement DIMMs at this time, go to Step 9.**

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

     See:

     ■   Install the processor module.

         See "Install a Processor Module or Processor Filler Module" on page 63.

     ■   Power on the server.

         See "Power On the Server (Oracle ILOM)" on page 192.

     ■   Verify DIMM functionality.

         See "Verify a DIMM" on page 84.

Related Information

- "Understanding DIMM Configurations" on page 69
- "Understanding DIMM Configurations" on page 69
- "Determine Which DIMM Is Faulty (DIMM Fault LEDs)" on page 76
- "Determine Which DIMM Is Faulty (PSH)" on page 74
- "Install a DIMM" on page 81
- "Verify a DIMM" on page 84

▼ Install a DIMM

DIMMs are cold-service components that can be replaced by customers. For the location of the DIMMs, see "Processor Module Components" on page 18.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Consider your first steps.**

   - **Familiarize yourself with DIMM population rules.**

     See "Understanding DIMM Configurations" on page 69

   - **Prepare the system for service.**

     See "Preparing for Service" on page 43.

   - **Remove the processor module. Place the processor module on an ESD-protect work surface.**

     See "Remove a Processor Module or Processor Filler Module" on page 60.

2. **Consider your next steps.**

   - **If you are replacing a faulty DIMM, ensure that you have removed the faulty DIMM.**

     See "Identifying Faulty DIMMs" on page 74.

     See "Remove a DIMM" on page 78.

   - **If you are adding DIMMs to a half-populated processor module:**

Ensure you have the correct DIMMs for your server. See "Identifying DIMMs" on page 71.

■ **If you are populating a new processor module:**

Ensure you have the correct DIMMs for your server. See "Understanding DIMM Configurations" on page 69.

3. **Unpack the replacement DIMMs and place them on an antistatic mat.**

4. **Ensure that the ejector tabs on the connector that will receive the DIMM are in the open position.**

5. **Align the DIMM notch with the key in the connector.**

> ⚠ **Caution -** Ensure that the orientation is correct. The DIMM might be damaged if the orientation is reversed.
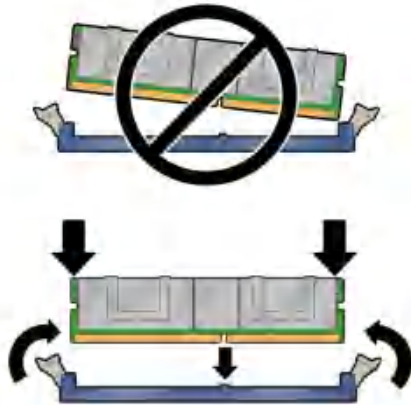
6. **Push the DIMM into the connector until the ejector tabs lock the DIMM in place.**

If the DIMM does not easily seat into the connector, check the DIMM's orientation.

7. **Repeat Step 4 through Step 6 until all new DIMMs are installed.**

8. **Place the cover onto the processor module and slide the cover forward until the latch clicks into place.**
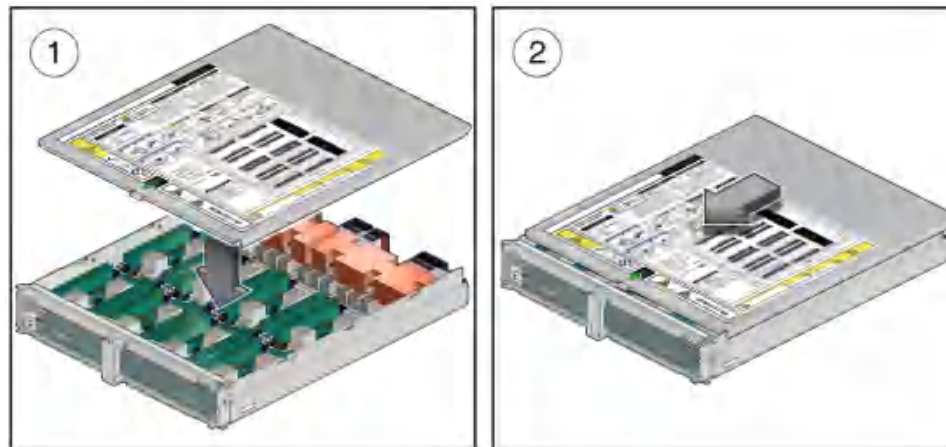
9. **Consider your next steps.**

   ■ **If you are adding a second processor module to the server, return to "Server Upgrade Process" on page 56.**

   ■ **If you are replacing a processor module after installing replacement DIMMs, proceed to Step 10.**

10. **Finish the installation procedure.**

    See:

    ■ Install the processor module.

      See "Install a Processor Module or Processor Filler Module" on page 63.

    ■ Return the server to operation.

      See "Returning the Server to Operation" on page 191.

    ■ Verify DIMM functionality.

      See "Verify a DIMM" on page 84.

    ## Related Information

    ■ "Understanding DIMM Configurations" on page 69

- "Understanding DIMM Configurations" on page 69
- "Identifying DIMMs" on page 71
- "Remove a DIMM" on page 78
- "Verify a DIMM" on page 84
- "DIMM Configuration Errors" on page 72

▼ Verify a DIMM

1. Use the `show faulty` command to determine how to clear the fault.

- If `show faulty` indicates a POST-detected fault, go to **Broken Link (Target ID: GOZPJ)**.
- If `show faulty` output displays a UUID, which indicates a host-detected fault, skip **Broken Link (Target ID: GOZPJ)** and go directly to **Broken Link (Target ID: GOZQE)**.

2. Use the `set` command to enable the DIMM that was disabled by POST.

In most cases, replacement of a faulty DIMM is detected when the SPM is power cycled. In those cases, the fault is automatically cleared from the server. If `show faulty` still displays the fault, the `set` command clears it.

```
-> set /SYS/MB/CM0/CMP/MR0/BOB1/CH0/DIMM clear_fault_action=true
Are you sure you want to clear /SYS/MB/CM0/CMP/MR0/BOB1/CH0/DIMM (y/n)? y
Set 'clear_fault_action' to 'true'
```

3. For a host-detected fault, perform the following steps to verify the new DIMM.

a. Set the virtual keyswitch to `diag` so that POST runs in Service mode.

```
-> set /HOST keyswitch_state=Diag
Set 'keyswitch_state' to 'Diag'
```

b. Stop the host.

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

c. Check if the host has been powered off.

Allow approximately one minute before performing this step. Type the `show /HOST` command. When the host is powered off, the console displays `status=Powered Off`.

d. Start the host.

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

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

Watch the POST output for possible fault messages. The following output indicates that POST did not detect any faults:

```
-> start /HOST/console
...
0:0:0>INFO:
0:0:0>    POST Passed all devices.
0:0:0>POST:    Return to VBSC.
0:0:0>Master set ACK for vbsc runpost command and spin...
```

Note - The server might boot automatically at this point. If so, go to step f. If the server remains at the OpenBoot prompt (ok) go to the next step.

f. If the server remains at the OpenBoot prompt, type boot.

g. Return the virtual keyswitch to Normal mode.

```
-> set /HOST keyswitch_state=Normal
Set 'keyswitch_state' to 'Normal'
```

h. Switch to the system console and type:

```
# fmadm faulty
```

If any faults are reported, refer to the diagnostics instructions described in "Detecting and Managing Faults" on page 25.

4. Switch to the Oracle ILOM command shell.

5. Run the show faulty command.

```
-> show faulty
Target              | Property                | Value
--------------------+-------------------------+------------------------------
/SP/faultmgmt/0     | fru                     | /SYS/PM0/CM0/CMP/BOB10/D0
/SP/faultmgmt/0     | timestamp               | Dec 14 22:43:59
/SP/faultmgmt/0/    | sunw-msg-id             | SUN4V-8000-DX
faults/0            |                         |
/SP/faultmgmt/0/    | uuid                    | 3aa7c854-9667-e176-efe5-e487e520
```

```
faults/0               |                        | 7a8a
/SP/faultmgmt/0/       | timestamp              | Dec 14 22:43:59
faults/0               |                        |
```

If the show faulty command reports a fault with a UUID, go on to Step 6. If show faulty does *not* report a fault with a UUID, you are done with the verification process.

6. **Switch to the system console and use the `fmadm repair` command with the UUID.**

Use the same UUID that was displayed from the output of the Oracle ILOM show faulty command. For example:

 # fmadm repair 3aa7c854-9667-e176-efe5-e487e520

Related Information

- "Understanding DIMM Configurations" on page 69
- "Understanding DIMM Configurations" on page 69
- "DIMM Configuration Errors" on page 72
- "Determine Which DIMM Is Faulty (DIMM Fault LEDs)" on page 76
- "Determine Which DIMM Is Faulty (PSH)" on page 74
- "Remove a DIMM" on page 78
- "Install a DIMM" on page 81

Servicing Hard Drives

Hard drives are hot-service components that can be replaced by customers. For the location of the hard drives, see "Hard Drive Configuration" on page 87.

![caution icon] **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

These topics describe service procedures for the hard drives in the server.

- "Hard Drive Configuration" on page 87
- "Hard Drive Configuration" on page 87
- "Hard Drive LEDs" on page 89
- "Determine Which Hard Drive Is Faulty" on page 90
- "Remove a Hard Drive" on page 90
- "Install a Hard Drive" on page 93
- "Verify a Hard Drive" on page 94

Hard Drive Configuration

You can install a mix of hard drives and solid state drives. The server requires at least one hard drive to be installed and operational.
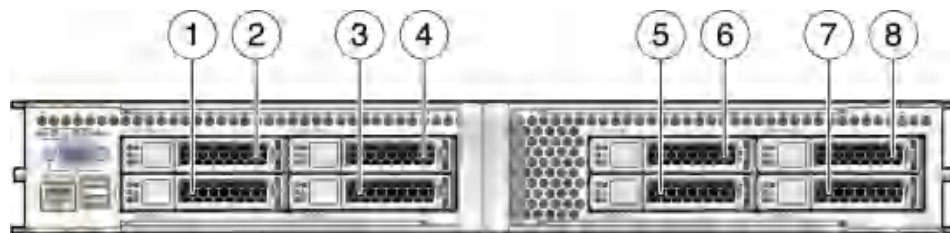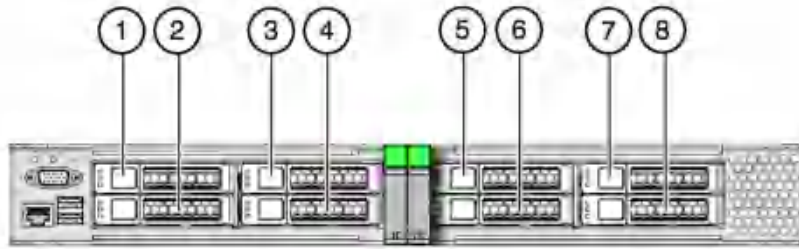
No.	Description	No.	Description
1	Drive 0	5	Drive 4
2	Drive 1	6	Drive 5
3	Drive 2	7	Drive 6
4	Drive 3	8	Drive 7

The hard drives in the server are hot-serviceable, meaning that the drives can be removed and inserted while the server is powered on.

Depending on the configuration of the data on a particular drive, the drive might also be removable while the server is online. However, to hot-service a drive while the server is online you must take the drive offline before you can safely remove it. Taking a drive offline prevents any applications from accessing it, and removes logical software links to it.

You *cannot* hot-service a drive in the following situations:

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

If either of these conditions apply to the drive being serviced, you must take the server offline (shut down the operating system) before you replace the drive.

Related Information

- "Supported Storage and Backup Devices" on page 21
- "Component Service Task Reference" on page 22
- "Hard Drive LEDs" on page 89
- "Determine Which Hard Drive Is Faulty" on page 90

- "Remove a Hard Drive" on page 90
- "Install a Hard Drive" on page 93
- "Verify a Hard Drive" on page 94

Hard Drive LEDs
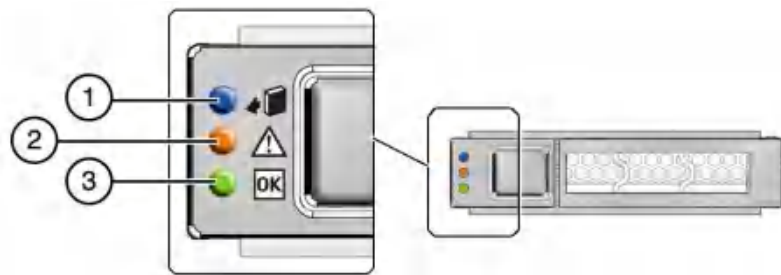
No.	LED	Icon	Description
1	Ready to Remove (blue)		Indicates that a drive can be removed during a hot-service operation.
2	Service Required (amber)		Indicates that the drive has experienced a fault condition.
3	OK/Activity (green)		Indicates the drive's availability for use. ■ On – Read or write activity is in progress. ■ Off – Drive is idle and available for use.

Related Information

- "Hard Drive Configuration" on page 87
- "Determine Which Hard Drive Is Faulty" on page 90
- "Remove a Hard Drive" on page 90
- "Install a Hard Drive" on page 93

■ "Verify a Hard Drive" on page 94

▼ Determine Which Hard Drive Is Faulty

The following LEDs are lit when a hard drive fault is detected:

■ System Service Required LEDs on the front panel and rear I/O module
■ Service Required LED on the faulty drive

1. **Determine if the System Service Required LEDs are lit on the front panel or the rear I/O module.**
   See "Interpreting LEDs" on page 27.

2. **From the front of the server, check the drive LEDs to identify which drive needs to be replaced.**
   See "Hard Drive LEDs" on page 89. The amber Service Required LED is lit on the drive that needs to be replaced.

3. **Remove the faulty drive.**
   See "Remove a Hard Drive" on page 90.

   ### Related Information

   ■ "Hard Drive Configuration" on page 87
   ■ "Hard Drive LEDs" on page 89
   ■ "Remove a Hard Drive" on page 90
   ■ "Install a Hard Drive" on page 93
   ■ "Verify a Hard Drive" on page 94

▼ Remove a Hard Drive

Hard drives are hot-service components that can be replaced by customers. For the location of the hard drives, see "Hard Drive Configuration" on page 87.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Locate the drive in the server that you want to remove.**

- See "Hard Drive Configuration" on page 87 for the locations of the drives in the server.
- See "Determine Which Hard Drive Is Faulty" on page 90 to locate a faulty drive.

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

   - **If the drive cannot be taken offline without shutting down the OS, follow instructions in "Power Off the Server (Oracle ILOM)" on page 51, and go to Step 4.**

   - **If the drive can be taken offline without shutting down the OS, go to Step 3.**

3. **Take the drive offline:**

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

      ```
      # cfgadm -al
      ```

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

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

      You must unconfigure any drive whose status is listed as configured, as described in Step 3b.

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

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

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

    c. **Verify that the blue Ready to Remove LED on the drive is lit.**

4. **Press the drive release button to unlock the drive.**
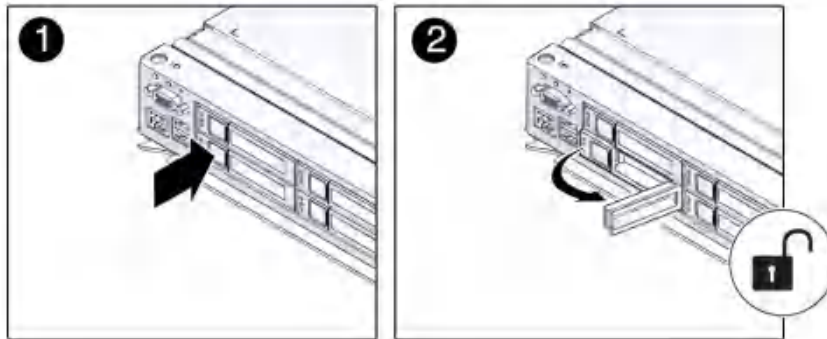
5. **Pull on the latch to remove the drive from the server.**

> ⚠ **Caution -** The latch is not an ejector. Do not force the latch too far to the right. Doing so can damage the latch.
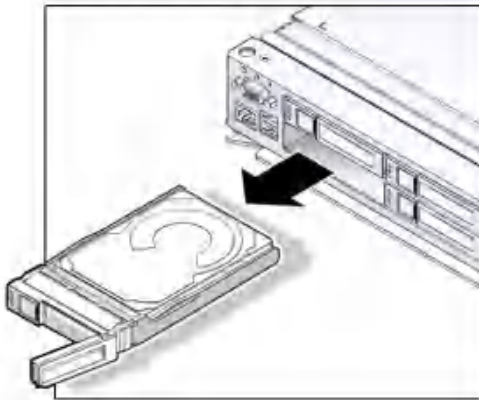
6. **Install the replacement drive or a filler tray.**

See "Install a Hard Drive" on page 93.

Related Information

- "Determine Which Hard Drive Is Faulty" on page 90
- "Install a Hard Drive" on page 93
- "Verify a Hard Drive" on page 94

▼ Install a Hard Drive

Hard drives are hot-service components that can be replaced by customers. For the location of the hard drives, see "Hard Drive Configuration" on page 87.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Align the replacement drive to the drive slot, and slide the drive in until it is seated.**

   Drives are physically addressed according to the slot in which they are installed. If you are replacing a drive, install the replacement drive in the same slot as the drive that was removed. See "Hard Drive Configuration" on page 87 for drive slot information.
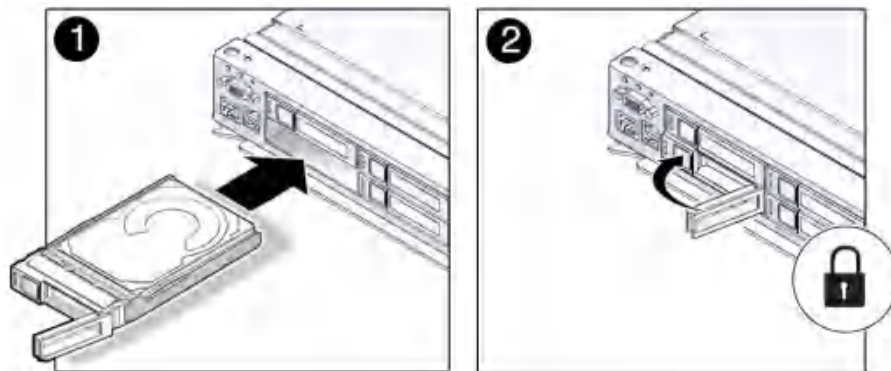
2. **Close the latch to lock the drive in place.**

3. **Verify the installation.**

See "Verify a Hard Drive" on page 94.

Related Information

-
-
-

▼ Verify a Hard Drive

1. **Determine if you replaced or installed a hard drive in a running server or not.**

   - **If you replaced or installed a hard drive in a server that is running (if you hot-serviced the hard drive), then no further action is necessary. The Oracle Solaris OS auto-configures the hard drive.**

   - **If you replaced or installed a hard drive in a powered-down server, then continue with these procedures to configure the hard drive.**

2. **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.

3. **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
   c2::w5000cca00a76d1f5,0 disk-path   connected    configured     unknown
   c3                      scsi-sas    connected    configured     unknown
   c3::sd2                 disk-path   connected    unconfigured   unknown
   c4                      scsi-sas    connected    configured     unknown
   c4::w5000cca00a59b0a9,0 disk-path   connected    configured     unknown
   ...
   ```

4. **Configure the drive using the `cfgadm -c configure` command.**

   For example:

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

   Replace `c2::w5000cca00a76d1f5,0` with the drive name for your configuration.

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

   See "Hard Drive LEDs" on page 89.

6. **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
c2::w5000cca00a76d1f5,0    disk-path   connected   configured  unknown
c3                         scsi-sas    connected   configured  unknown
c3::w5000cca00a772bd1,0    disk-path   connected   configured  unknown
c4                         scsi-sas    connected   configured  unknown
c4::w5000cca00a59b0a9,0    disk-path   connected   configured  unknown
...
```

7. **Perform one of the following tasks based on your verification results.**

   - **If the previous steps did not verify the drive, see "Diagnostics Process" on page 26.**

   - **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

   - "Determine Which Hard Drive Is Faulty" on page 90

-
-

Servicing the Main Module

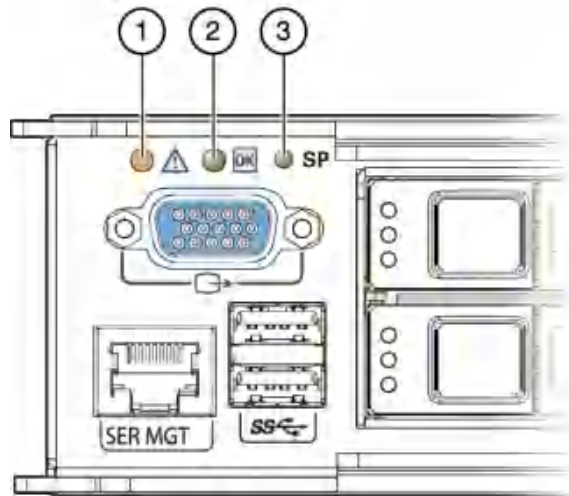For the location of the main module, see "Front Panel Components" on page 14.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

Caution - You must disconnect the power cords before servicing this component. See "Disconnect Power Cords" on page 53.

Step	Description	Link
1.	Determine if the main module is faulty.	"Main Module LEDs" on page 98
2.	Prepare the server for service.	"Preparing for Service" on page 43
3.	Remove the main module.	"Remove the Main Module" on page 99
4.	Service main module components.	■ "Servicing the Main Module" on page 97 ■ "Servicing NVMe Switch Cards" on page 107 ■ "Servicing the SPM" on page 117 ■ "Servicing the SCC PROM" on page 125 ■ "Servicing the Battery" on page 129
5.	Install the main module.	■ "Install the Main Module" on page 102 ■ "Verify the Main Module" on page 105
6.	Return the server to operation.	"Returning the Server to Operation" on page 191

Main Module LEDs

No.	LED	Icon	Description
1	Service Required LED (amber)		Indicates that service is required. POST and Oracle ILOM are two diagnostic tools that can detect a fault or failure resulting in this indication.
			The Oracle ILOM `show faulty` command provides details about any faults that cause this indicator to illuminate.
			Under some fault conditions, individual component fault LEDs are lit in addition to the Service Required LED.
2	Power OK LED (green)		Indicates these conditions:
			■ Off – System is not running in its normal state. System power might be off. The SPM 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	SPM LED (green)	SPM	Indicates these conditions:
			■ Off – AC power might have been connected to the power supplies.

No.	LED	Icon	Description
			■ Steady on, green – SPM is running in its normal operating state. No service actions are required. ■ Blink, green – SPM is initializing the Oracle ILOM firmware. ■ Steady on, amber – A SPM error has occurred and service is required.

Related Information

- "Determine if the Main Module Is Faulty" on page 99
- "Remove the Main Module" on page 99
- "Install the Main Module" on page 102

▼ Determine if the Main Module Is Faulty

● **Check the Service Required LED on the main module.**

The Service Required LED is lit when the server detects a main module fault.

Related Information

- "Main Module LEDs" on page 98
- "Remove the Main Module" on page 99
- "Install the Main Module" on page 102

▼ Remove the Main Module

1. **(Optional) If you are replacing a faulty main module, you must back up ILOM configuration settings.**

   a. **Configure the SER MGT port to enable the configuration parameters to be uploaded.**

   Refer to the ILOM documentation for network configuration instructions.

   b. **Back up the ILOM configuration parameters.**

   Refer to the ILOM documentation (`http://www.oracle.com/goto/ilom/docs`).

2. **Ensure that the server is powered off. Power off the server.**

   See "Removing Power From the Server" on page 50.

3.   Disconnect the power cords.

See "Disconnect Power Cords" on page 53.

4.   Locate the main module in the server.

See "Front Panel Components" on page 14.

5.   Squeeze the release latches together on the two extraction levers, and pull the extraction levers out to disengage the main module from the server.

6.   Pull the main module halfway out of the server.
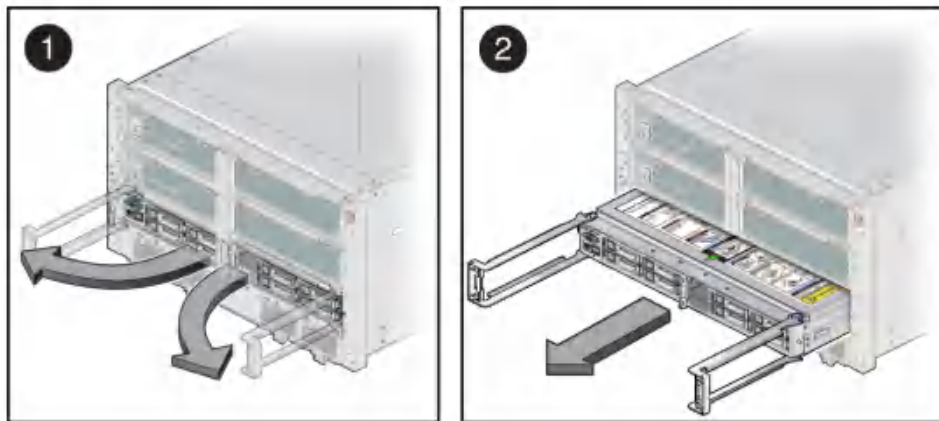
7.   Press the levers back toward the center of the main module.

This will keep the levers from being damaged when the main module is outside the server.

⚠ **Caution -** Due to the weight of the main module, the following step requires two people to perform. Do not attempt to lift the main module alone.

8.   Remove the main module completely from the server.

9.   Consider your next steps:

■   **If you have removed the main module to prepare the server for installation, return to "Preparing for Installation" in *SPARC T8-4 Server Installation Guide*.**

■ **If you have removed the main module to service an internal component, remove the cover from the main module.**

Press the green button near the front edge of the cover and slide the cover back and up off the main module.
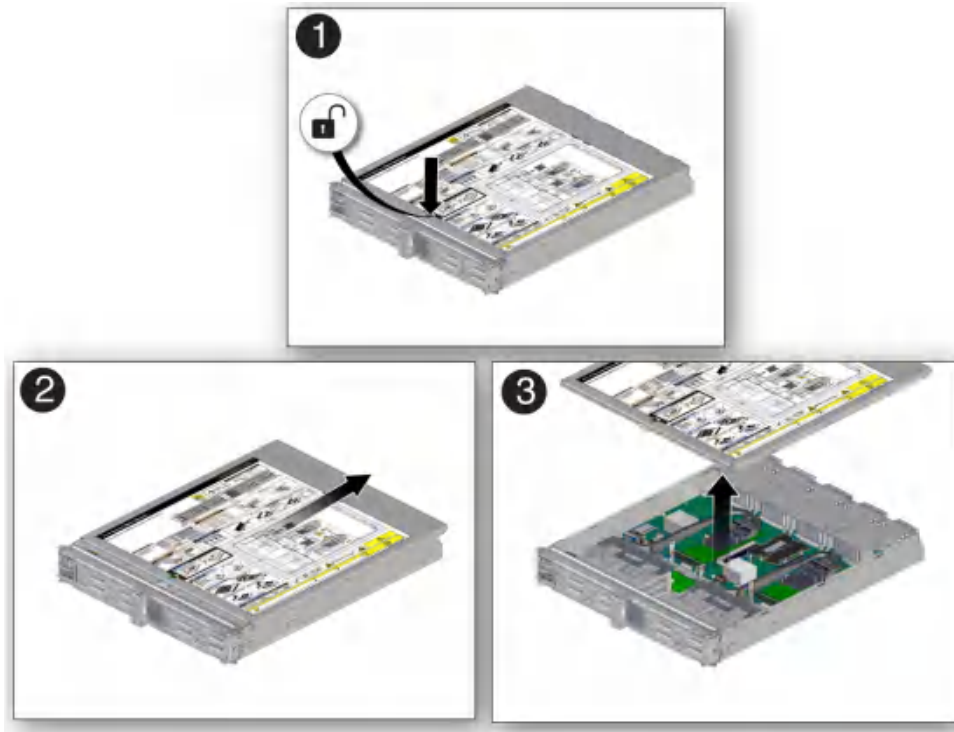
10. **Determine your next step.**

■ **If you are replacing a main module due to a faulty motherboard, remove all of the internal components, and transfer them to the new main module.**

■ **If you are replacing a component inside the main module, use one of the following links:**

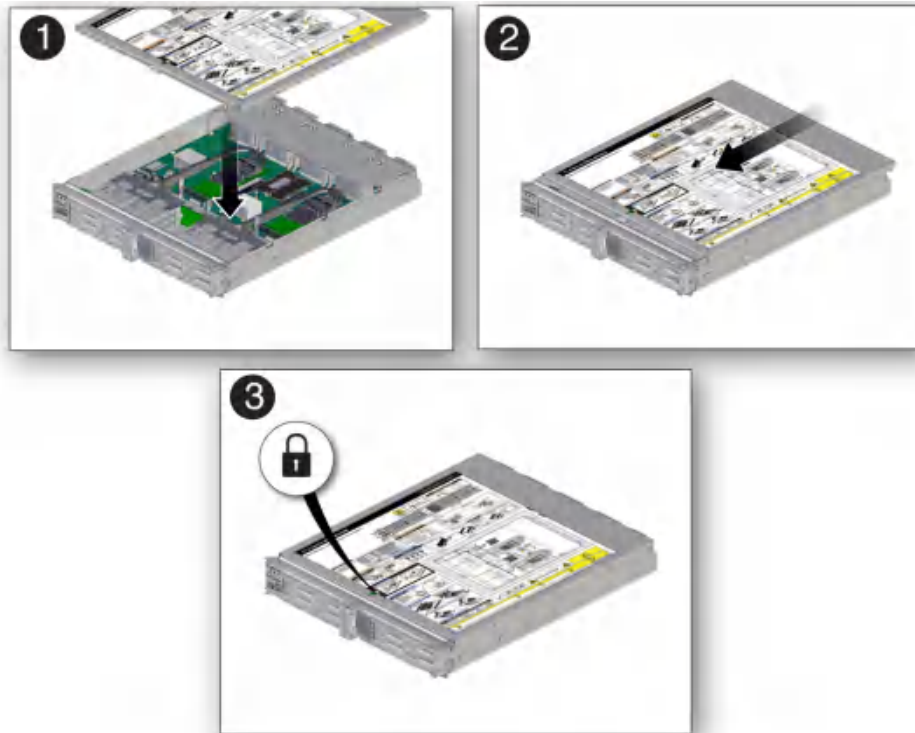■ "Servicing the SPM" on page 117
■ "Servicing the Battery" on page 129

- ■ "Servicing the SCC PROM" on page 125

Related Information

- ■ "Main Module Components" on page 20
- ■ "Main Module LEDs" on page 98
- ■ "Install the Main Module" on page 102

▼ Install the Main Module

1. **Place the cover back onto the main module and slide the cover forward until the latch clicks into place.**
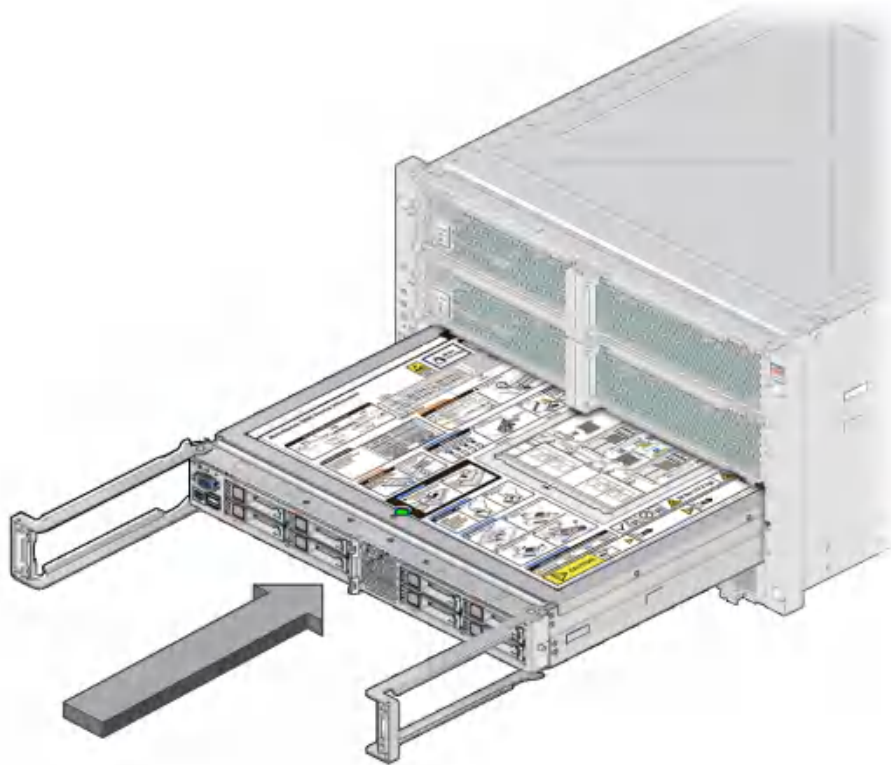

2. **Open the levers so that they are fully open.**

⚠️ **Caution -** Due to the weight of the main module, the following step requires two people to perform. Do not attempt to lift the main module alone.

3. **Insert the main module into its slot in the server until the levers begin to engage.**

4. **Press the levers back together, toward the center of the module, then press the levers firmly against the module to fully seat the module back into the server.**

The levers should click into place when the module is fully seated in the server.
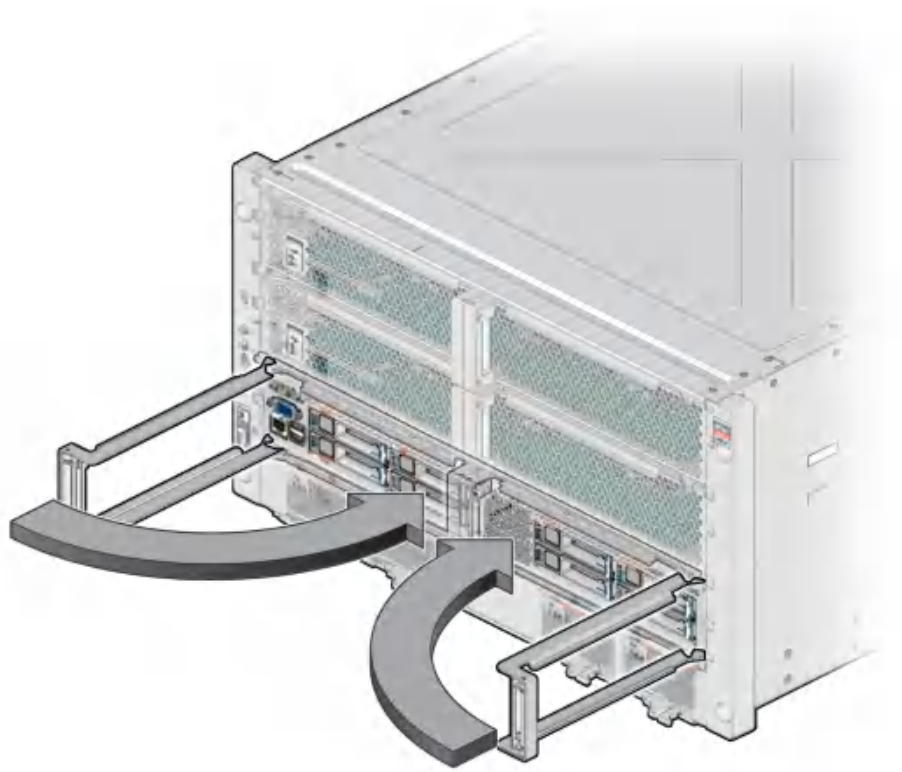
5.   Connect the power cords.

See "Connect Power Cords" on page 191.

6.   If the you are replacing the main module with a new one, connect a terminal or a terminal emulator (PC or workstation) to the SER MGT port.

The following message is delivered over the serial management port.

```
Unrecognized Chassis: This module is installed in an unknown or
unsupported chassis. You must upgrade the firmware to a newer
version that supports this chassis.
```

7.   Download the system firmware.

    a. **Configure the SER MGT port to enable the firmware image to be downloaded.**

Refer to the Oracle ILOM documentation for network configuration instructions.

    b. **Download the system firmware.**

Follow the firmware download instructions in the Oracle ILOM documentation.

Note - You can load any supported system firmware version, including the firmware revision that had been installed prior to the replacement of the main module. However, Oracle strongly recommends installing the newest version of the system firmware.

---

    c. **Restore the ILOM configuration settings.**

Refer to the ILOM documentation (`http://www.oracle.com/goto/ilom/docs`).

8. **Power on the server.**

See "Returning the Server to Operation" on page 191.

Related Information

- "Main Module Components" on page 20
- "Main Module LEDs" on page 98
- "Remove the Main Module" on page 99

▼ Verify the Main Module

1. **Verify that the main module Service Required LED is not lit.**

See "Main Module LEDs" on page 98.

2. **Verify that the front and rear System Service Required LEDs are not lit.**

See "Front Panel Controls and LEDs" on page 29 and "Rear Panel Controls and LEDs" on page 30.

3. **Consider these options.**

- If the previous steps did not clear the fault, see "Diagnostics Process" on page 26.
- If the previous steps indicate that no faults have been detected, then the main module has been replaced successfully. No further action is required.

Related Information

- "Main Module LEDs" on page 98
- "Determine if the Main Module Is Faulty" on page 99
- "Remove the Main Module" on page 99
- "Install the Main Module" on page 102

Servicing NVMe Switch Cards

Two optional NVMe switch cards can be installed in the main module. If you are replacing a faulty main module, you must remove the NVMe switch cards to transfer them to the new main module.
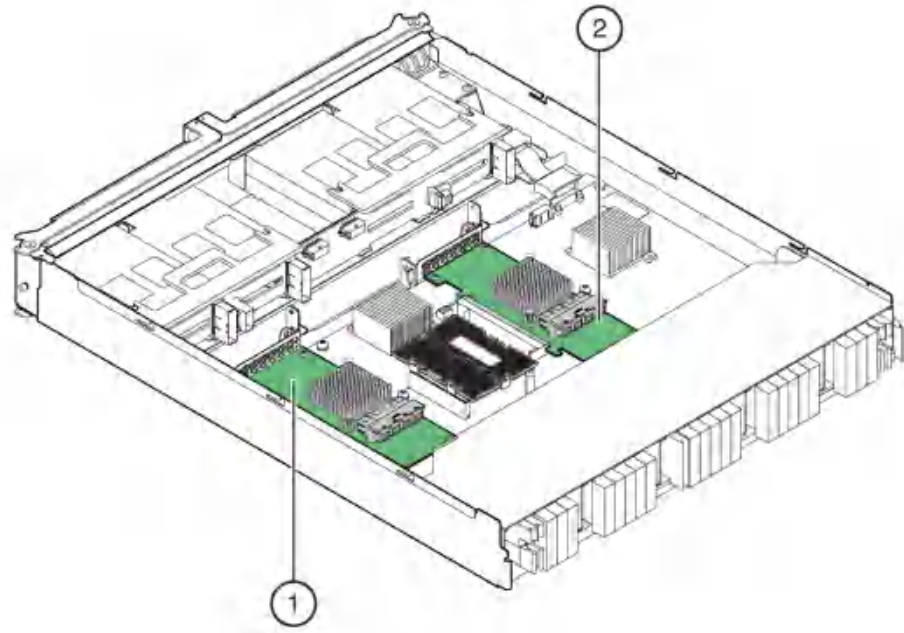
| Part	Description
1	NVMe Switch 2 (/SYS/MB/PCIE2/PCIESW)
2	NVMe Switch 1 (/SYS/MB/PCIE1/PCIESW)

> ⚠ **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

▼ Disconnect the NVMe Cables

1. **Remove the main module.**

   See .

2. **Determine your next step:**

   - **If you are replacing a faulty NVMe switch card, unplug the NVMe cables from the card.**

   - **If you are moving the NVMe switch cards to a new main module, unplug the cables from the backplane.**

   - **If you are replacing the NVMe cables, unplug the cables from the card and the backplane and remove them from the main module.**

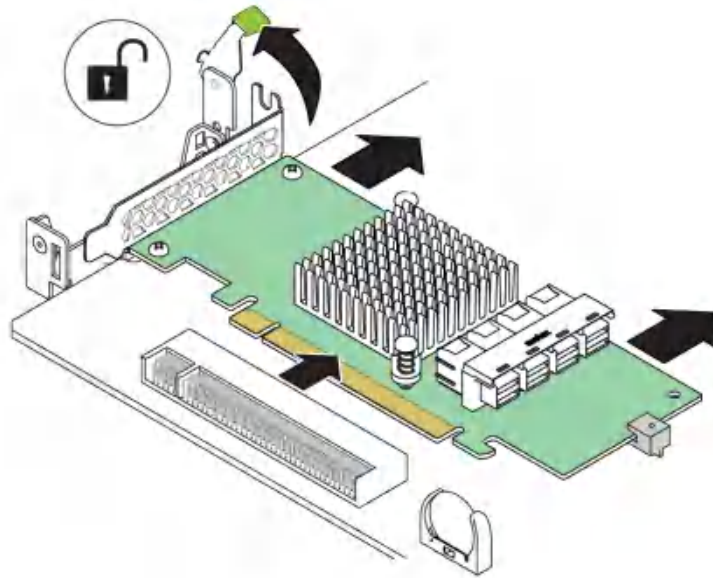Note the locations of the cable connectors so can install them correctly.
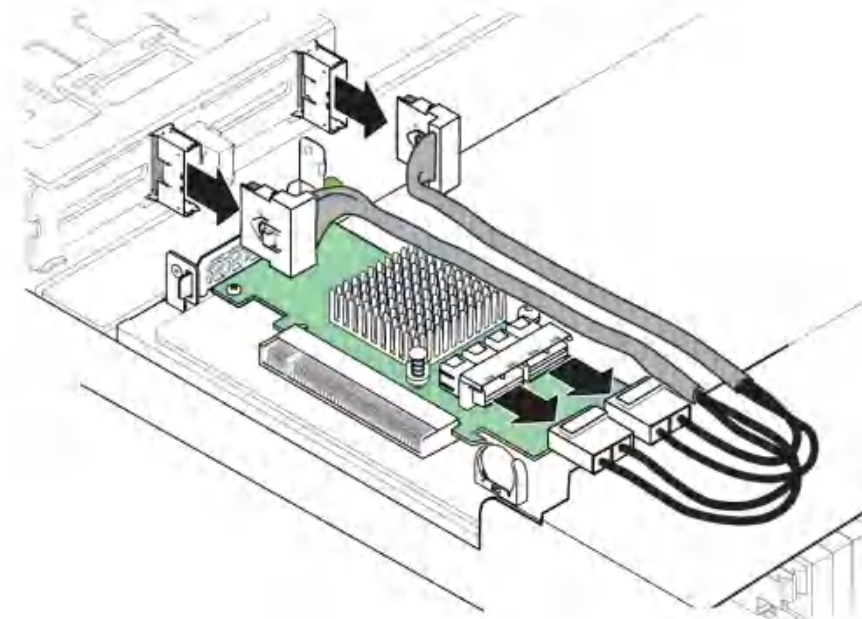
3. **Remove the NVMe switch card.**

   See "Remove a NVMe Switch Card" on page 109.

▼   # Remove a NVMe Switch Card

1. **Identify which NVMe switch card you want to remove.**

2. **Unlock the card.**

Rotate the retention lever away from the card bracket.
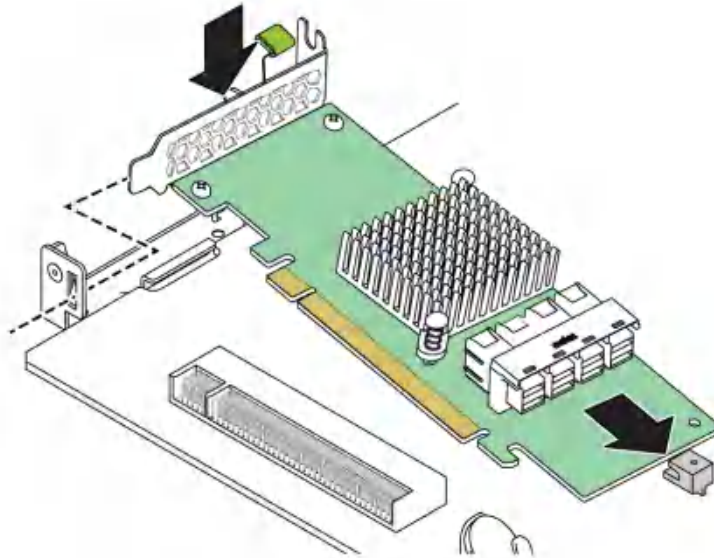

3.   **Push the card away from its connector on the motherboard and lift the card out of the main module.**

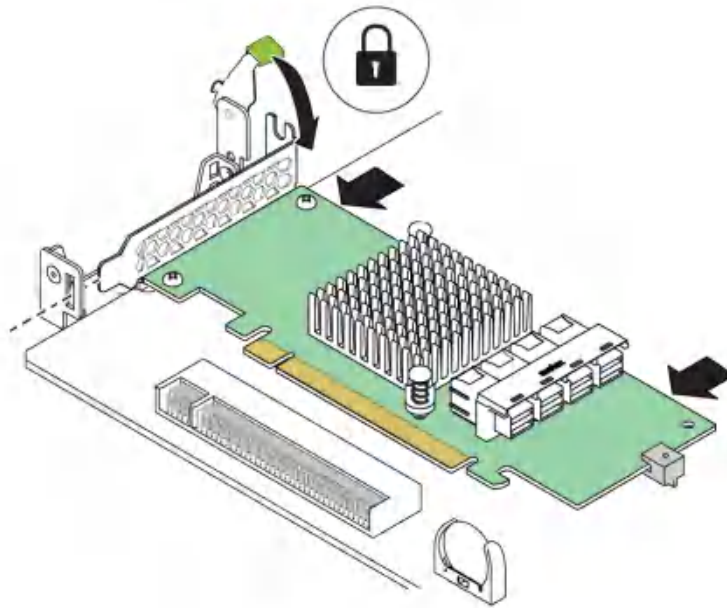# ▼   Install a NVMe Switch Card

1.   **Align the NVMe switch card with its connector on the motherboard.**

Note - Insert the rear edge of the NVMe switch card into the corresponding tab on the motherboard.

2. **Insert the card into its connector.**

The card is inserted laterally into the motherboard connector.
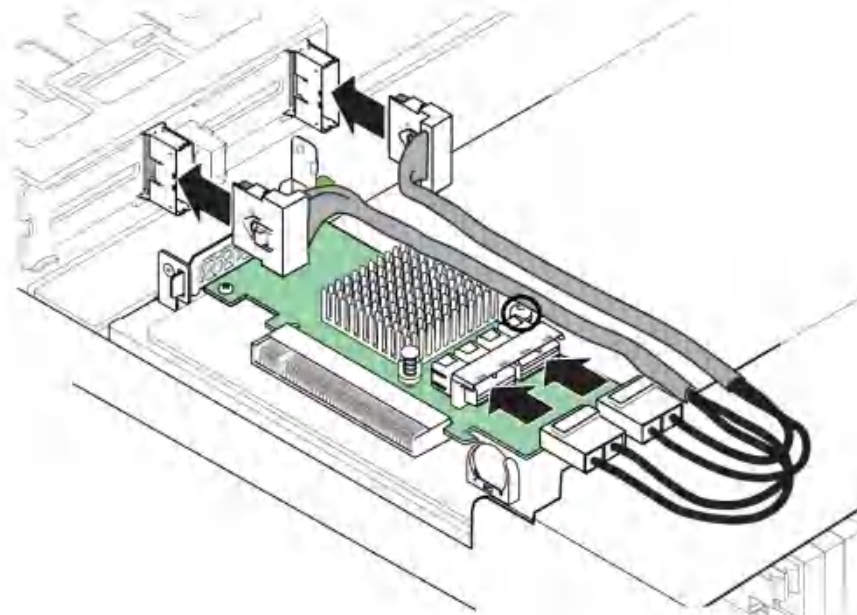

3. **Lock the card.**

Rotate the retention lever toward the card bracket.

▼ Connect the NVMe Cables

1. **Plug the two NVMe data cables into the connectors on the NVMe switch card.**

2. **Install the NVMe cable clamp.**

Using the screw provided with the NVMe kit, secure the cable clamp to the board, then tuck the NVMe cable into the cable clamp.

3. **Install the main module.**

See
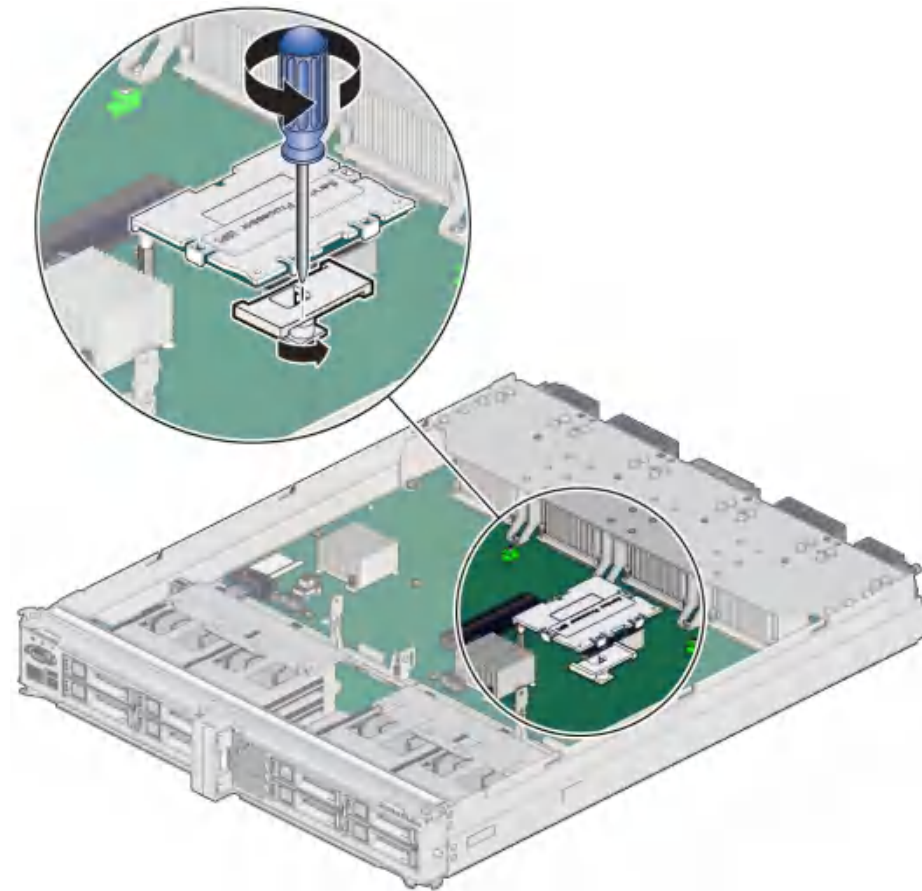
▼ Verify a NVMe Switch Card

1. **Use the Oracle ILOM fault management shell to determine if the replacement NVMe switch card is shown as enabled or disabled:**

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

faultmgmtsp> fmadm faulty
```

a. **If the output from the fmadm faulty command shows no faults, go to Step 2.**

b. **If the output from the fmadm faulty command shows the replacement NVMe switch card as disabled, go to "Detecting and Managing Faults" on page 25 to clear the PSH-detected fault from the server.**

2. **Verify that the front and rear Service Required LEDs are not lit.**

   See "Front Panel Controls and LEDs" on page 29 and "Rear Panel Controls and LEDs" on page 30.

3. **Consider these options:**

   - If the previous steps did not clear the fault, see "Diagnostics Process" on page 26
   - If Step 1 and Step 2 indicate that no faults have been detected, then the processor module has been replaced successfully. No further action is required.

   ### Related Information

   - "Main Module Components" on page 20
   - "Remove the Main Module" on page 99
   - "Install the Main Module" on page 102
   - "Servicing the Main Module" on page 97

Servicing the SPM

These topics describe service procedures for the service processor module (SPM) in the server.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

Steps	Description	Links
1.	Determine if the SPM is faulty.	"Determine if the SPM Is Faulty" on page 117
2.	Remove the main module.	"Remove the Main Module" on page 99
3.	Replace the SPM.	■ "Remove the SPM" on page 118
		■ "Install the SPM" on page 121
4.	Install the main module.	"Install the Main Module" on page 102
5.	Verify the replacement SPM.	"Verify the SPM" on page 124

▼ Determine if the SPM Is Faulty

The following LEDs are illuminated when a SPM fault is detected:

■ System Service Required LEDs on the front panel and rear I/O module
■ Server SP LED on the main module or rear I/O module

1. **Determine if the Server Service Required LEDs are illuminated on the front panel or the rear I/O module.**

   See "Interpreting LEDs" on page 27.

2. **Check the SP LED on the main module or the rear I/O module to determine if the SPM needs to be replaced.**

   See "Main Module LEDs" on page 98 or "Rear Panel Controls and LEDs" on page 30. The SP LED is illuminated amber if the SPM needs to be replaced.

3. **Remove the faulty SPM.**

See .

Related Information

-
-
-

▼ Remove the SPM

The SPM is a cold-service component that can be replaced by a customer.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Back up the SPM configuration information before removing the SPM.**

   At the Oracle ILOM prompt, type:

   ```
   -> cd /SP/config
   -> dump -destination uri target
   ```

   where:

   - **The acceptable values for** *uri* **are:**
     - tftp
     - ftp
     - sftp
     - scp
     - http
     - https

   - *target* **is the remote location where you want to store the configuration information.**

   For example:

   ```
   -> dump -destination tftp://129.99.99.99/pathname
   ```

2. **Take the necessary ESD precautions.**

See "Prevent ESD Damage" on page 49.

3. **Remove the main module from the server.**

See "Remove the Main Module" on page 99.

4. **Locate the SPM on the main module.**

See "Main Module Components" on page 20.

5. Grasp the SPM by the two grasp points, and lift up to disengage the SPM from the connectors on the motherboard.
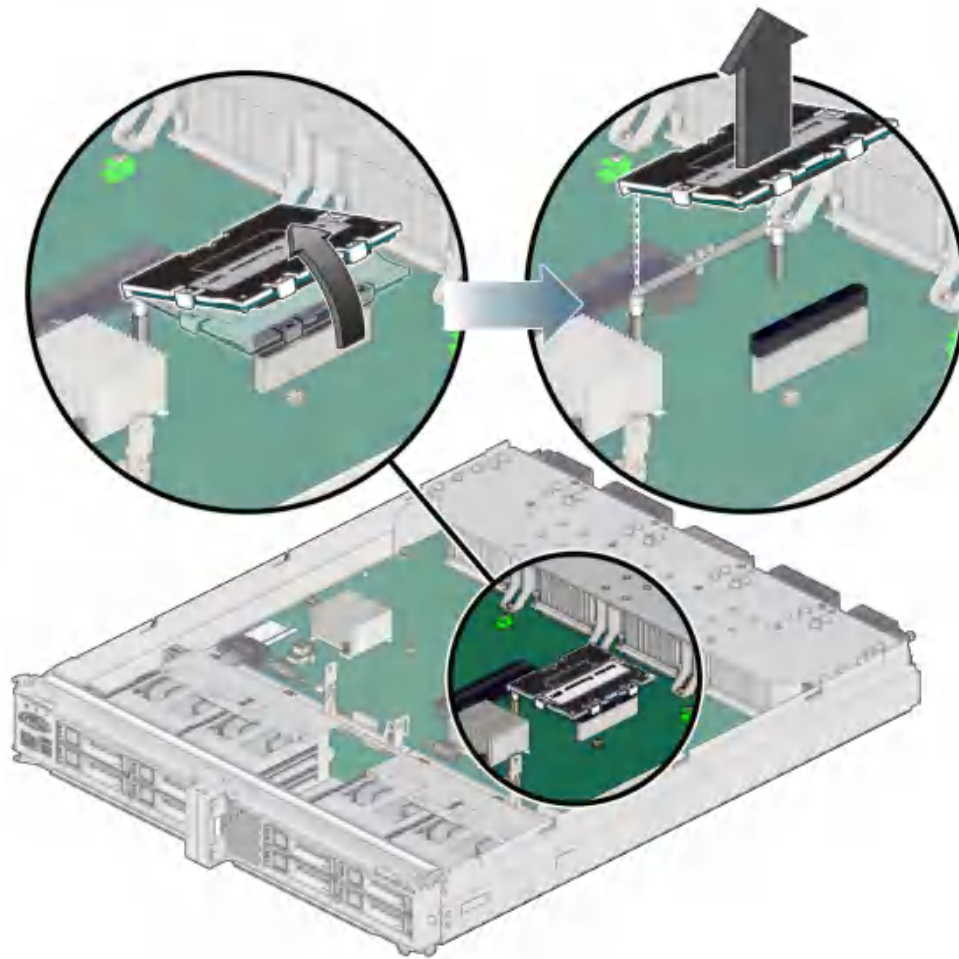
**6. Lift the SPM up and away from the motherboard.**

Related Information

- "Determine if the SPM Is Faulty" on page 117
- "Install the SPM" on page 121
- "Verify the SPM" on page 124

▼ Install the SPM

⚡ **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Take the necessary ESD precautions.**

   See "Prevent ESD Damage" on page 49.

2. **Lower the side of the SPM with the Align Tab sticker down on the service processor tab on the motherboard.**
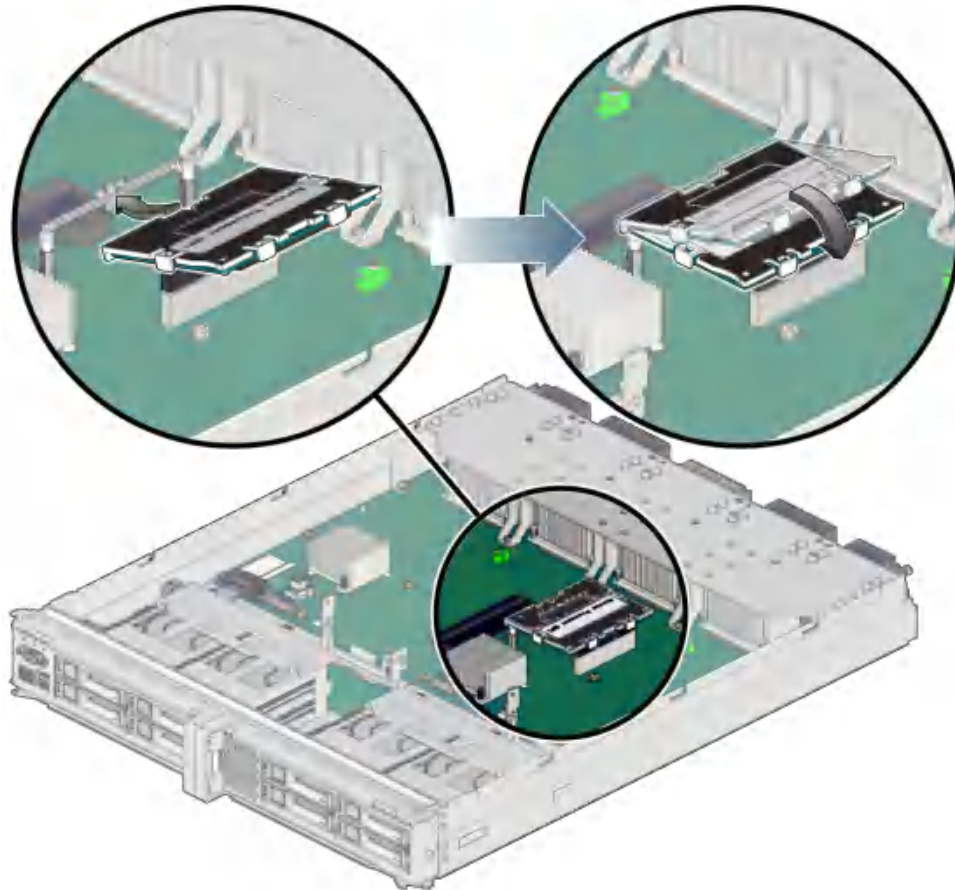
3. **Lower the other side of the SPM down and press down on the SPM to seat it into the connectors on the motherboard.**

4. **Install the main module back into the server.**

   See "Install the Main Module" on page 102.

5. **Connect a terminal or a terminal emulator (PC or workstation) to the SER MGT port.**

   If the replacement SPM detects that the SPM firmware is not compatible with the existing host firmware, further action is suspended and the following message is delivered over the SER MGT port.

   ```
   Unrecognized Chassis: This module is installed in an unknown or
   unsupported chassis. You must upgrade the firmware to a newer
   version that supports this chassis.
   ```

   If you see this message, go on to Step 6.

   If you do not see this message, go to Step Step 7.

6. **Download the system firmware.**

   a. **Configure the SER MGT port to enable the firmware image to be downloaded.**

      Refer to the Oracle ILOM documentation for network configuration instructions.

   b. **Download the system firmware.**

      Follow the firmware download instructions in the Oracle ILOM documentation.

   Note - You can load any supported system firmware version, including the firmware revision that had been installed prior to the replacement of the SPM. However, Oracle strongly recommends installing the newest version of the system firmware.

   ---

7. **Restore the service processor configuration information that you backed up earlier.**

   At the Oracle ILOM prompt, type:

   ```
   -> cd /SP/config
   -> load -source uri target
   ```

   where:

- ■ **The acceptable values for** *uri* **are:**

    - ■ tftp
    - ■ ftp
    - ■ sftp
    - ■ scp
    - ■ http
    - ■ https

- ■ *target* **is the remote location where you stored the configuration information.**

    For example:

    ```
    -> load -source tftp://129.99.99.99/pathname
    ```

8. **If TPM was initialized on the replaced SPM, complete these steps:**

    a. **Reinitialize TPM and reset the `tpmadm failover` command if it was previously in use.**

    For information about initializing TPM using the Oracle ILOM interface to enable failover, see Securing Systems and Attached Devices in Oracle Solaris 11.3.

    b. **Restore the TPM data and keys that were backed up to the new SP you install.**

    For information about migrating or restoring TPM data and keys, see Securing Systems and Attached Devices in Oracle Solaris 11.3.

9. **Verify the installation of the SPM.**

    See "Verify the SPM" on page 124.

10. **Verify that the SPM date is correct.**

    ```
    -> show /SP/clock

    /SP/clock
       Properties:
            datetime = Tue Sep 07 08:09:59 2013
            timezone = GMT (GMT)
            uptime = 0 days, 00:01:18
            usentpserver = disabled
    ->
    ```

    a. Set the `datetime` property, if necessary.

```
-> set /SP/clock datetime=MMDDhhmmYYYY
```

    b. Set the `timezone` property, if necessary.

```
-> set /SP/clock timezone=3-to-4-characters
```

where the `timezone` value equals a three- or four-character timezone abbreviation, such as EST.

Related Information

- "Determine if the SPM Is Faulty" on page 117
- "Remove the SPM" on page 118
- "Verify the SPM" on page 124

▼ Verify the SPM

1. Verify that the SP LED on the main module or rear I/O module is lit green.

See "Main Module LEDs" on page 98 or "Rear I/O Module LEDs" on page 173.

2. Verify that the front and rear Service Required LEDs are not lit.

See "Interpreting LEDs" on page 27.

3. Consider these options.

- If the previous steps did not clear the fault, see "Diagnostics Process" on page 26.
- If the previous steps indicate that no faults have been detected, then the SPM has been replaced successfully. No further action is required.

Related Information

- "Determine if the SPM Is Faulty" on page 117
- "Remove the SPM" on page 118
- "Install the SPM" on page 121

Servicing the SCC PROM

These topics describe service procedures for the SCC PROM in the server.

The SCC PROM stores the host ID and MAC address. If you have to replace the motherboard, be sure to move the System configuration PROM from the old motherboard to the new motherboard. This step will ensure that the server will retain its original host ID and MAC address.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

Steps	Description	Links
1.	Remove the main module.	"Remove the Main Module" on page 99
2.	Replace the SCC PROM.	"Remove the SCC PROM" on page 125
		"Install the SCC PROM" on page 126
3.	Install the main module.	"Install the Main Module" on page 102
4.	Verify the SCC PROM.	"Verify the SCC PROM" on page 128

▼ Remove the SCC PROM

The SCC PROM is a cold-service component that can be replaced only by authorized service personnel. To identify and locate the SCC PROM, see "Processor Module Components" on page 18.

Before beginning this procedure, ensure that you are familiar with the cautions and safety instructions described in "Safety Information" on page 43.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. Remove the main module from the server.
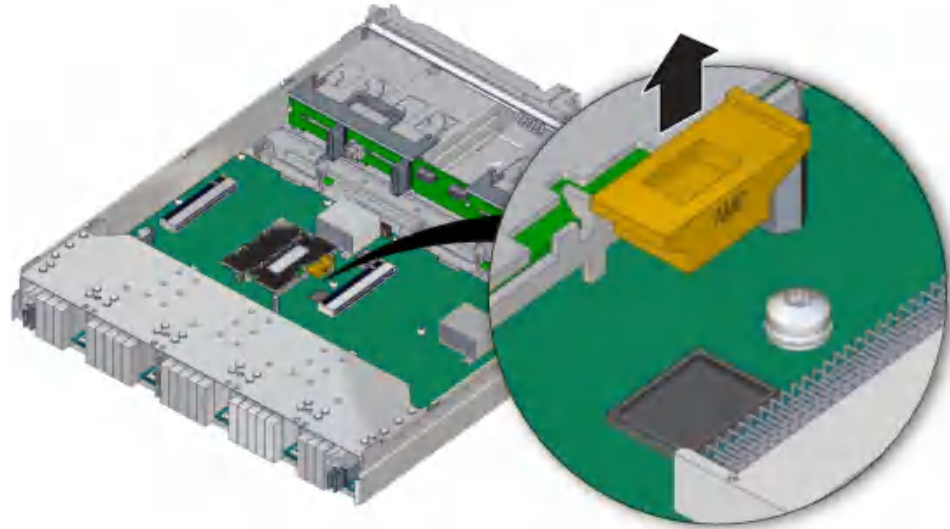
See "Remove the Main Module" on page 99.

2. Take the necessary ESD precautions.

See "Prevent ESD Damage" on page 49.

3. Locate the SCC PROM on the main module.

See "Main Module Components" on page 20.

4. Grasp the SCC PROM and lift it up to remove it from the main module.

**Related Information**

- "Install the SCC PROM" on page 126

▼ # Install the SCC PROM

Before beginning this procedure, ensure that you are familiar with the cautions and safety instructions described in "Safety Information" on page 43.

> ⚡ **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Orient the SCC PROM properly onto the main module.**
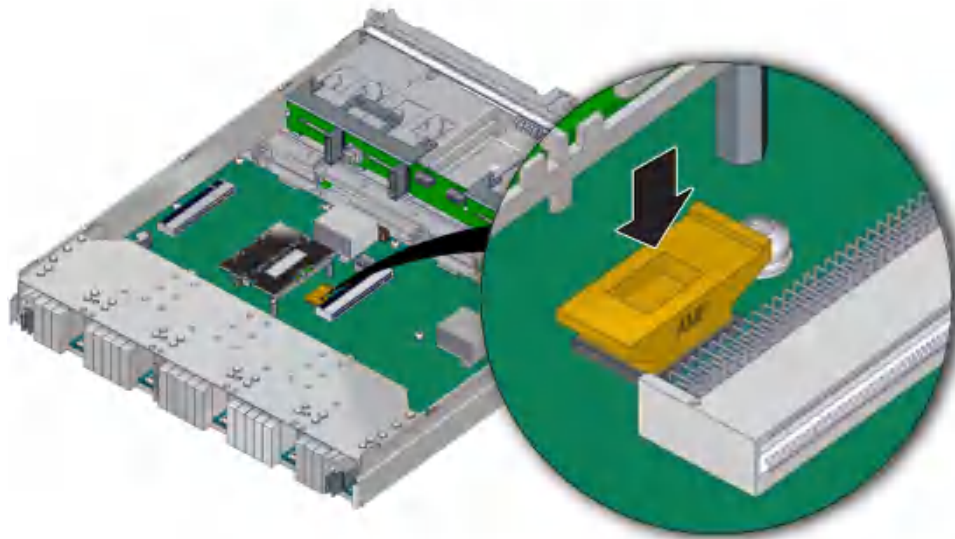
2. **Press down on the SCC PROM until it is completely seated on the main module.**

3. **Insert the main module back into the server.**

   See "Install the Main Module" on page 102.

4. **Return the server to operation. See "Returning the Server to Operation" on page 191.**

   Related Information

   - "Remove the SCC PROM" on page 125
   - "Verify the SCC PROM" on page 128

▼ Verify the SCC PROM

1. Verify that the banner display includes an Ethernet address and a Host ID value.

The Ethernet address and Host ID values are read from the SCC PROM. Their presence in the banner verifies that the SPM and the host can read the SCC PROM.

```
SPARC T8-4, No Keyboard
.
OpenBoot X.XX, 16256 MB memory available, Serial
#87304604.Ethernet address *:**:**:**:**:**, Host ID: ********
```

2. For additional verification, run specific commands to display data stored in the SCC PROM.

- Use the Oracle ILOM show command to display the MAC address:

```
-> show /HOST macaddress
  /HOST
    Properties:
    macaddress = **:**:**:**:**:**
```

- Use Oracle Solaris OS commands to display the hostid and Ethernet address:

```
# hostid
8534299c

# ifconfig -a
lo0: flags=2001000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4,VIRTUAL> mtu 8232
index 1
        inet 127.0.0.1 netmask ff000000
igb0: flags=201004843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 2
        inet 10.6.88.150 netmask fffffe00 broadcast 10.6.89.255
        ether *:**:**:**:**:**
```

Servicing the Battery

The battery is a cold-service component that can be replaced by a customer. For the location of the battery, see "Processor Module Components" on page 18.

⚠ **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

- "Replace the Battery" on page 129
- "Verify the Battery" on page 132

▼ Replace the Battery

1. **Prepare the host for battery replacement.**
   To correctly reset the date and time before replacing a battery, you must revent the host from automatically powering on and disable any NTP connections.

   a. **Check the HOST_AUTO_POWER_ON property.**

   ```
   -> show /SP/policy HOST_AUTO_POWER_ON
     Properties:
        HOST_AUTO_POWER_ON = enabled
   ```

   b. **If enabled, set the HOST_AUTO_POWER_ON property to disabled.**

   ```
   -> set /SP/policy HOST_AUTO_POWER_ON=disabled
   ```

   c. **Check the NTP policy for the /SP/clock.**

   ```
   -> show /SP/clock usentpserver
     Properties:
        usentpserver = enabled
   ```

   d. **If enabled, set the property to disabled.**

   ```
   -> set /SP/clock usentpserver=disabled
   ```

2. Replace the battery.

Replacing the battery is a cold-service procedure. The server must be completely powered off and power cables disconnected before performing this procedure.

a. Prepare the server for service.

b. Remove the main module from the server.

See "Remove the Main Module" on page 99.

c. Locate the battery in the main module.
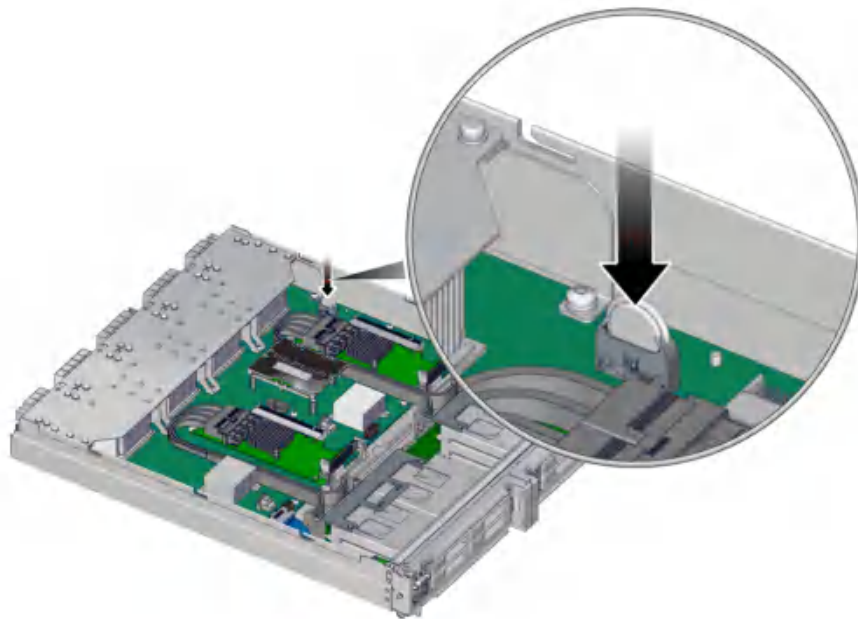
See "Main Module Components" on page 20.

d. Remove the old battery.

Gently push the battery toward the side of the server to release it from the retention clip.
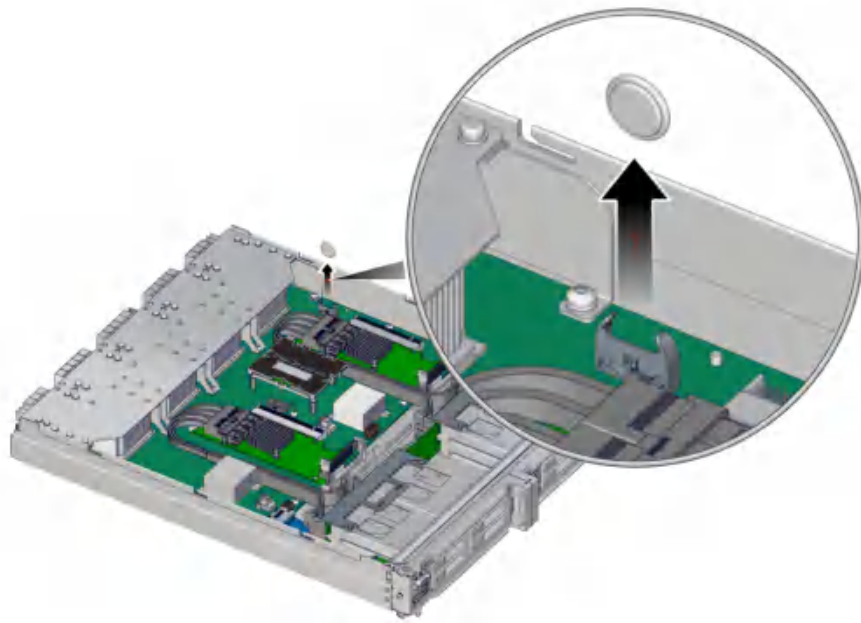
e. Unpack and install the new battery.

Press the new battery into the battery holder with the positive side (+) facing away from the metal tab that holds it in place.

f. **Install the main module back into the server.**
See "Install the Main Module" on page 102.

g. **Return the Server to Operation.**

3. **Reset the system clock.**

a. **Use the Oracle ILOM `clock` command to reset the system clock.**
The following example sets the date to August 22, 2016, and the timezone to EDT.

```
-> set /SP/clock datetime=081221302016 timezone=EDT
Set 'datetime' to '081221302016'
set 'timezone' to 'EDT'

-> show -d properties /SP/clock
 Properties
    datetime = Mon Aug 22 13:20:16 2016
```

```
            timezone = EDT (EST5EDT)
            uptime = 2 days 19:56:49
            usentpserver = disabled
```

b. **If the SP policy `HOST_AUTO_POWER_ON` was enabled before you replaced the battery, you must re-enable it.**

```
-> set /SP/policy HOST_AUTO_POWER_ON=enabled
```

c. **If the `/SP/clock usentpserver` property was enabled before you replaced the battery, you must re-enable it.**

```
-> set /SP/clock usentpserver=enabled
```

4. **Verify the battery.**

Related Information

- "Detecting and Managing Faults" on page 25

▼ Verify the Battery

1. **Run `show /SYS/MB/V_BAT` to check the status of the system battery.**
In the output, the `/SYS/MB/BAT` status should be `OK`, as in the following example.

```
-> show /SYS/MB/BAT
    Targets:
    Properties:
        type = Battery
        ipmi_name = MB/BAT
        class = Threshold Sensor
        value = 3.140 Volts
        upper_nonrecov_threshold = N/A
        upper_critical_threshold = N/A
        upper_noncritical_threshold = N/A
        lower_noncritical_threshold = 2.704 Volts
        lower_critical_threshold = N/A
        lower_nonrecov_threshold = N/A
        alarm_status = cleared
    Commands:
        cd
        show
```

2. **Verify that the value in the `value` column shows a voltage of 2.8V or more.**

Related Information

-

Servicing Power Supplies

The server contains four power supplies, which provide 2 + 2 power redundancy. If you need to replace a power supply, you can do so while the server is operating.

Note - To take full advantage of the server's power redundancy, plug the four power supplies into at least two separate power sources.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

These topics describe service procedures for the power supplies in the server.

- "Power Supply Configuration" on page 135
- "Power Supply and AC Power Connector LEDs" on page 137
- "Determine Which Power Supply Is Faulty" on page 138
- "Remove a Power Supply" on page 139
- "Install a Power Supply" on page 142
- "Verify a Power Supply" on page 144

Power Supply Configuration

Power supply units are accessed from the front of the server.
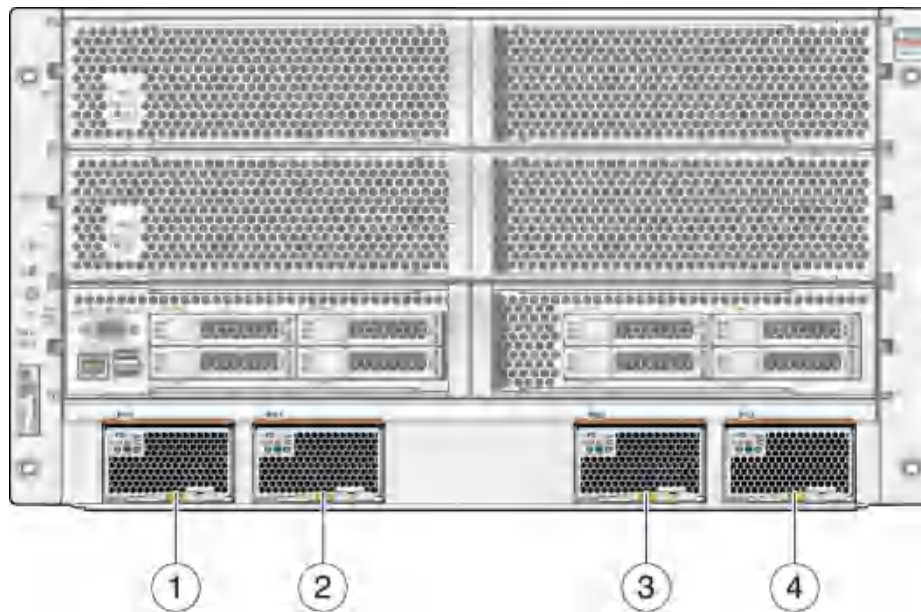
1	Power supply 0 (PS0)
2	Power supply 1 (PS1)
3	Power supply 2 (PS2)
4	Power supply 3 (PS3)

Power cords are accessed from the rear of the server.
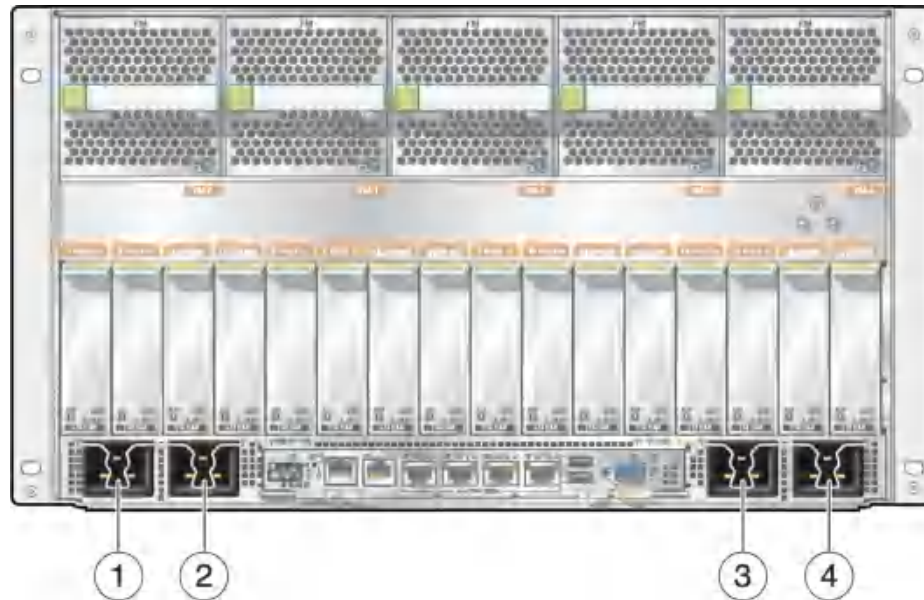
1	Connector for power supply 3 (PS3)
2	Connector for power supply 2 (PS2)
3	Connector for power supply 1 (PS1)
4	Connector for power supply 0 (PS0)

Related Information

-
-
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-
-

Power Supply and AC Power Connector LEDs

Each power supply is provided with a set of three LEDs, which are located at the front of the server.

No.	LED	Icon	Description
1	Fault (amber)		Illuminates when the power supply is faulty. **Note -** The front and rear panel Service Required LEDs are also illuminated if the server detects a power supply fault.
2	OK (green)		Lights when the power supply DC voltage from the PSU to the server is within tolerance.
3	AC Present (green)	~AC	Lights when AC voltage is applied to the power supply.

Each AC power connector has a single LED that is located on the rear I/O module (See "Interpreting LEDs" on page 27).

Related Information

- "Power Supply Configuration" on page 135
- "Determine Which Power Supply Is Faulty" on page 138
- "Remove a Power Supply" on page 139
- "Install a Power Supply" on page 142
- "Verify a Power Supply" on page 144

▼ Determine Which Power Supply Is Faulty

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

- System Service Required LEDs on the front panel and rear I/O module
- Fault LED on the faulty power supply

1. **Determine if the System Service Required LEDs are lit on the front panel or the rear I/O module.**

   See "Interpreting LEDs" on page 27.

2. **From the front of the server, check the power supply Fault LEDs to identify which power supply needs to be replaced.**

   See "Power Supply and AC Power Connector LEDs" on page 137. The amber Service Required LED is lit on the power supply that needs to be replaced.

3. **Remove the faulty power supply.**

   See "Remove a Power Supply" on page 139.

   ### Related Information

   - "Power Supply Configuration" on page 135
   - "Power Supply and AC Power Connector LEDs" on page 137
   - "Remove a Power Supply" on page 139
   - "Install a Power Supply" on page 142
   - "Verify a Power Supply" on page 144

▼ Remove a Power Supply

The power supply is a hot-service component that can be replaced by a customer.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Locate the power supply that you want to remove.**

   - See "Front Panel Components" on page 14 for the locations of the power supplies in the server.
   - See "Determine Which Power Supply Is Faulty" on page 138 to locate a faulty power supply.

2. **Go to the rear of the server and locate the AC power connector at the rear of the server that supplies power to the faulty power supply.**

   See "Power Supply Configuration" on page 135.

3. **Disconnect that power cord.**

4. **Go to the front of the server and, on the power supply to be removed, squeeze the release latches together, then pull the extraction lever toward you to disengage the power supply from the server.**
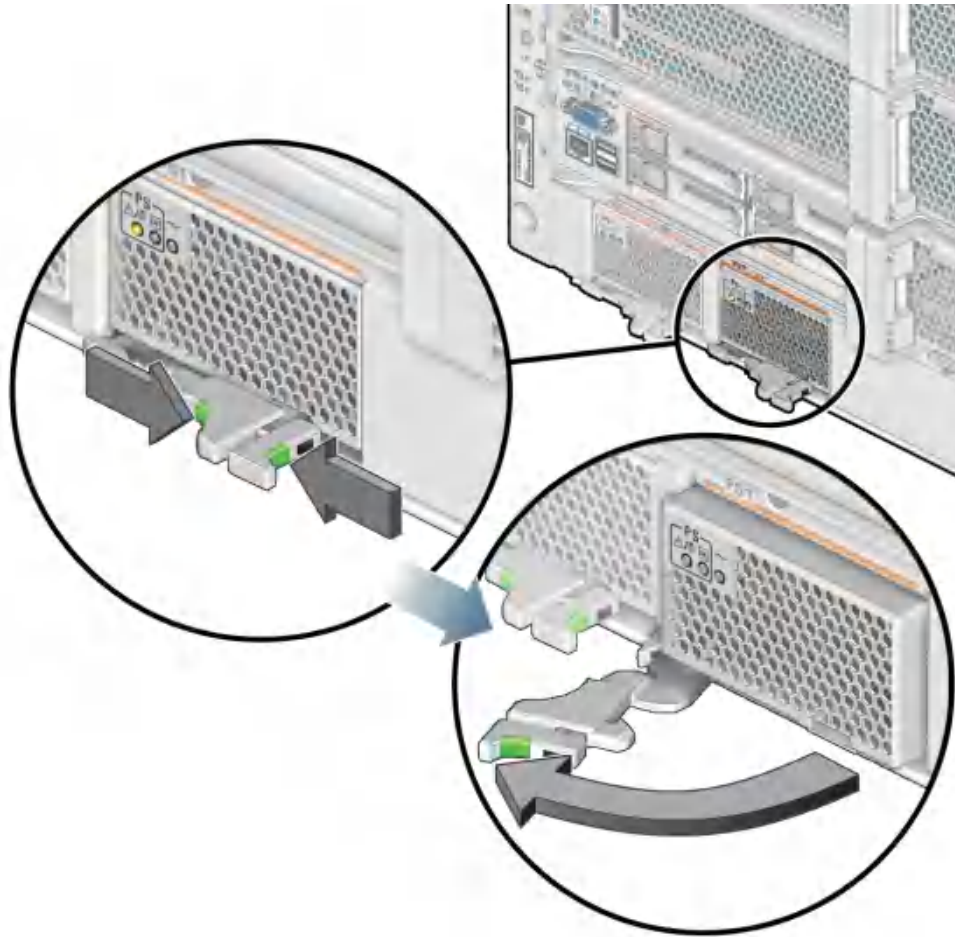
5. Pull the power supply out of the server.
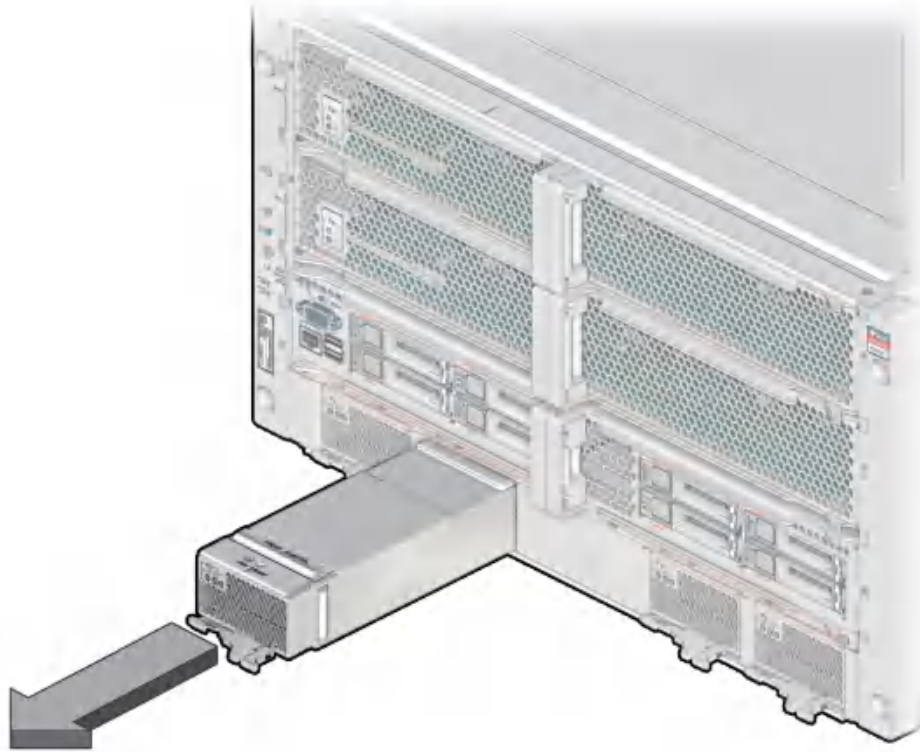
6. Install the replacement power supply.

See "Install a Power Supply" on page 142.

Related Information

- "Power Supply Configuration" on page 135
- "Power Supply and AC Power Connector LEDs" on page 137
- "Determine Which Power Supply Is Faulty" on page 138
- "Install a Power Supply" on page 142
- "Verify a Power Supply" on page 144

▼ Install a Power Supply

The power supply is a hot-service component that can be replaced by a customer.

⚡ Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Open the latch on the replacement power supply, and align the power supply with the empty bay.**

   Verify that the power supply is oriented as shown in the following figure.
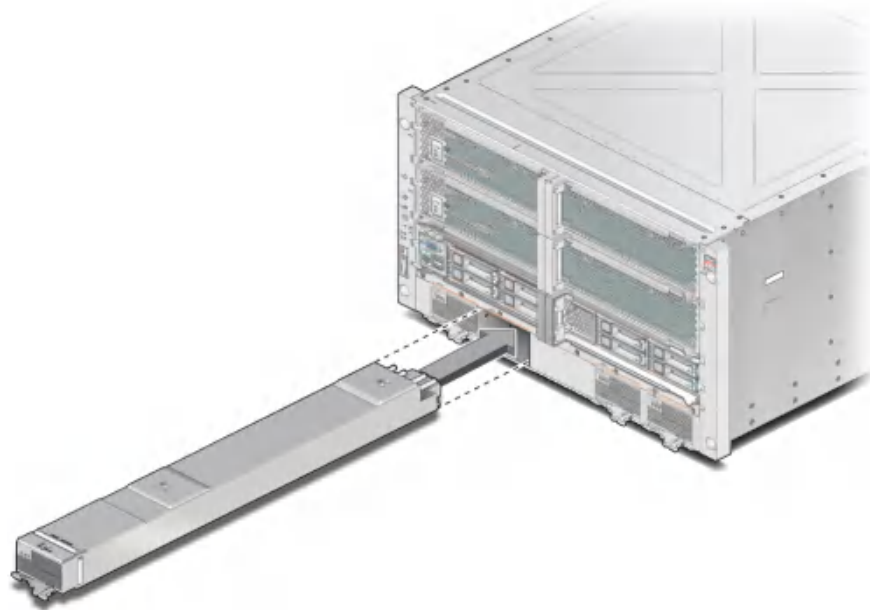
2. **Slide the power supply into the chassis.**

3. Press the lever against the power supply to fully seat the power supply in the server.
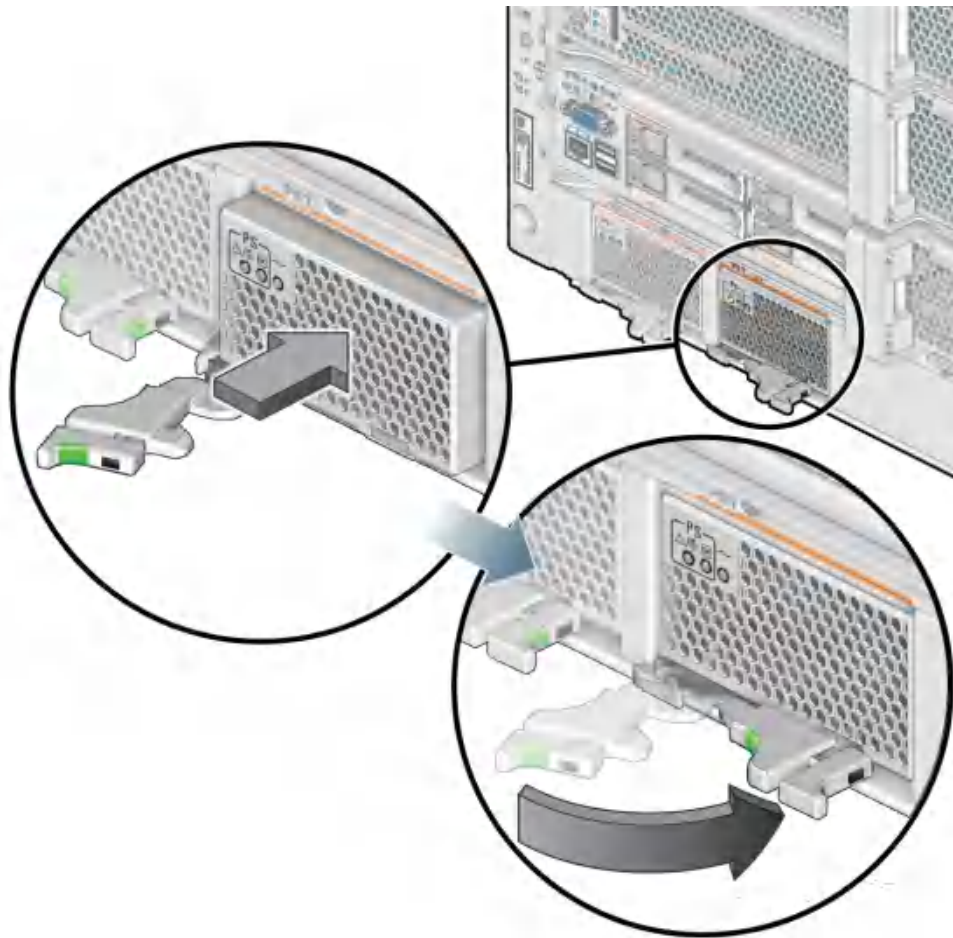
4. Insert the power cord into the AC connector for the power supply that you just installed.

5. Verify the power supply.

See "Verify a Power Supply" on page 144.

Related Information

- "Power Supply Configuration" on page 135
- "Power Supply and AC Power Connector LEDs" on page 137
- "Determine Which Power Supply Is Faulty" on page 138
- "Remove a Power Supply" on page 139
- "Verify a Power Supply" on page 144

▼ Verify a Power Supply

1. **Verify that the power supply Power OK and AC Present LEDs are lit, and that the Fault LED is not lit.**

   See "Power Supply and AC Power Connector LEDs" on page 137.

2. **Verify that the front and rear Service Required LEDs are not lit.**

   See "Interpreting LEDs" on page 27.

3. **Consider these options:**

   - If the previous steps did not clear the fault, see "Diagnostics Process" on page 26.
   - If Step 1 and Step 2 indicate that no faults have been detected, then the power supply has been replaced successfully. No further action is required.

Related Information

- "Power Supply Configuration" on page 135
- "Power Supply and AC Power Connector LEDs" on page 137
- "Determine Which Power Supply Is Faulty" on page 138
- "Remove a Power Supply" on page 139
- "Install a Power Supply" on page 142

Servicing Fan Modules

The server continues to operate at full capacity if one or two fan modules is not operational. You can perform a hot-service on a fan module only when four or five fan modules are operational.

These topics describe service procedures for the fan modules in the server.

Fan Module Configuration

Part	Description
1	Fan module 0
2	Fan module 1
3	Fan module 2
4	Fan module 3
5	Fan module 4

Related Information

- "Determine Which Fan Module Is Faulty" on page 147
- "Remove a Fan Module" on page 148
- "Install a Fan Module" on page 151
- "Verify a Fan Module" on page 152

Fan Module LED

Each fan module has a single Service Required LED.
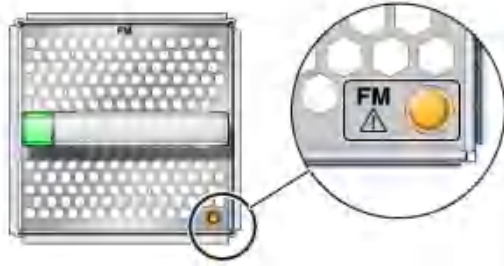
▼ Determine Which Fan Module Is Faulty

The following LEDs are illuminated when a fan module fault is detected:

- System Service Required LEDs on the front panel and rear I/O module
- Server Fan Fail LED on the front panel
- Service Required LED on the faulty fan module

1. **Determine if the System Service Required LEDs are illuminated on the front panel or the rear I/O module.**

   See "Interpreting LEDs" on page 27.

2. **Determine if the Server Fan Fail LED on the front panel is illuminated.**

   See "Front Panel Controls and LEDs" on page 29.

3. **From the rear of the server, check the fan module LEDs to identify which fan module needs to be replaced.**

   The fan module Service Required LED is illuminated on the fan module that needs to be replaced.

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

   See "Remove a Fan Module" on page 148.

Related Information

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-
-

▼ Remove a Fan Module

The fan module is a hot-service component that can be replaced by a customer.

> ⚠ **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. Locate the faulty fan module that you want to remove from the server.

- See **"Rear Panel Components" on page 15** for the locations of the fan modules in the server.

- See **"Determine Which Fan Module Is Faulty" on page 147** to locate a faulty fan module.

2. Determine if you can remove the fan module with the server running or not.

See "Fan Module Configuration" on page 146 to determine if you can remove a fan module with the server running or if you must shut down the server before removing a fan module.

- If you can remove a fan module with the server running, go to **Step 3**.

- If you cannot remove a fan module with the server running, see **"Removing Power From the Server" on page 50** to power down the server before continuing.

3. **Press the green button to disengage the fan module from the chassis.**
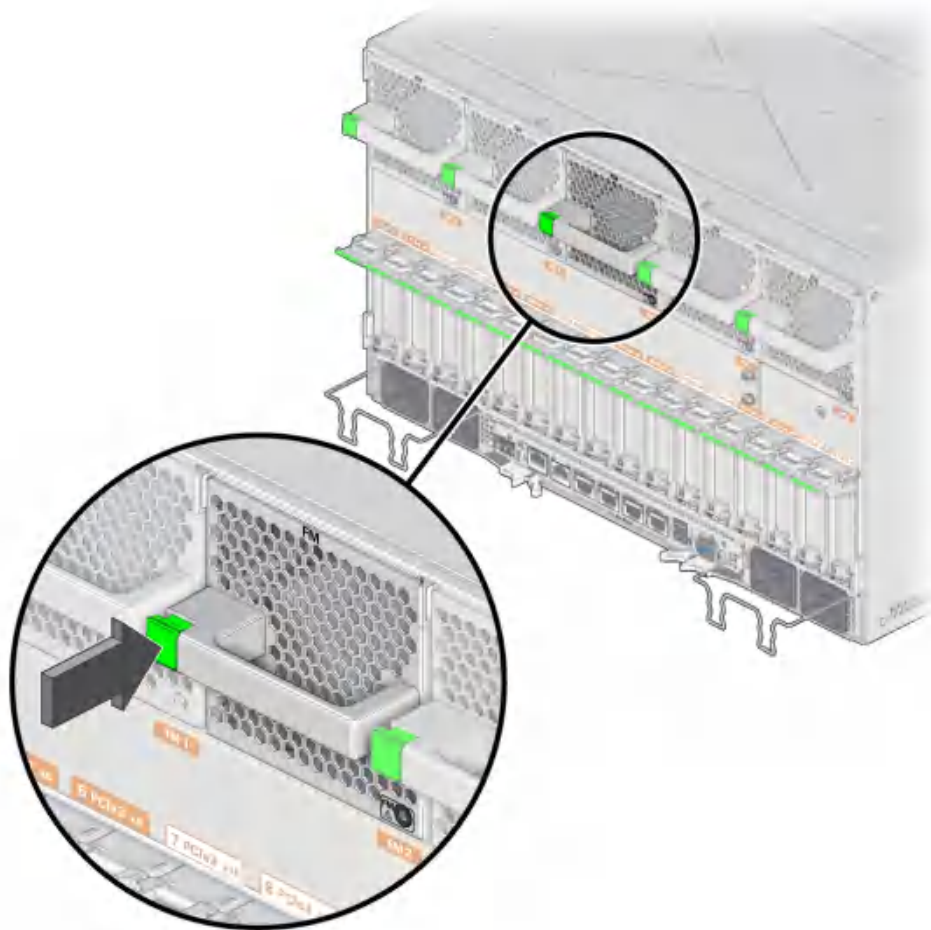
4. Pull the fan module out of the server.
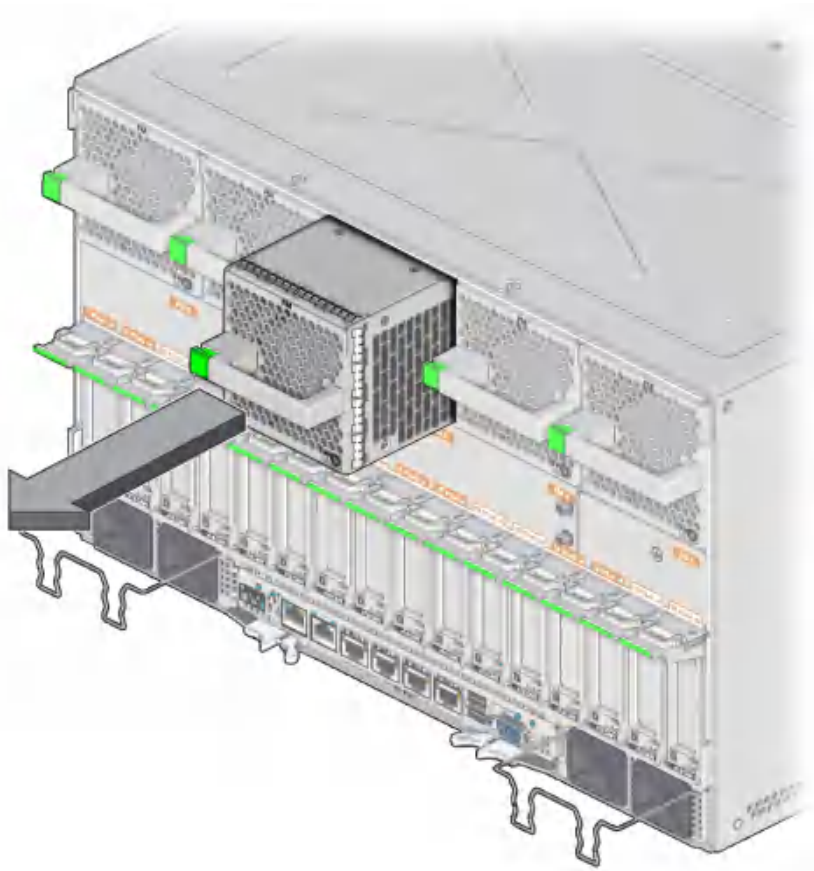
Related Information

▼ Install a Fan Module

The fan module is a hot-service component that can be replaced by a customer.

⚡ **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Insert the fan module into the empty fan module slot.**

   The fan snaps into position with an audible click.
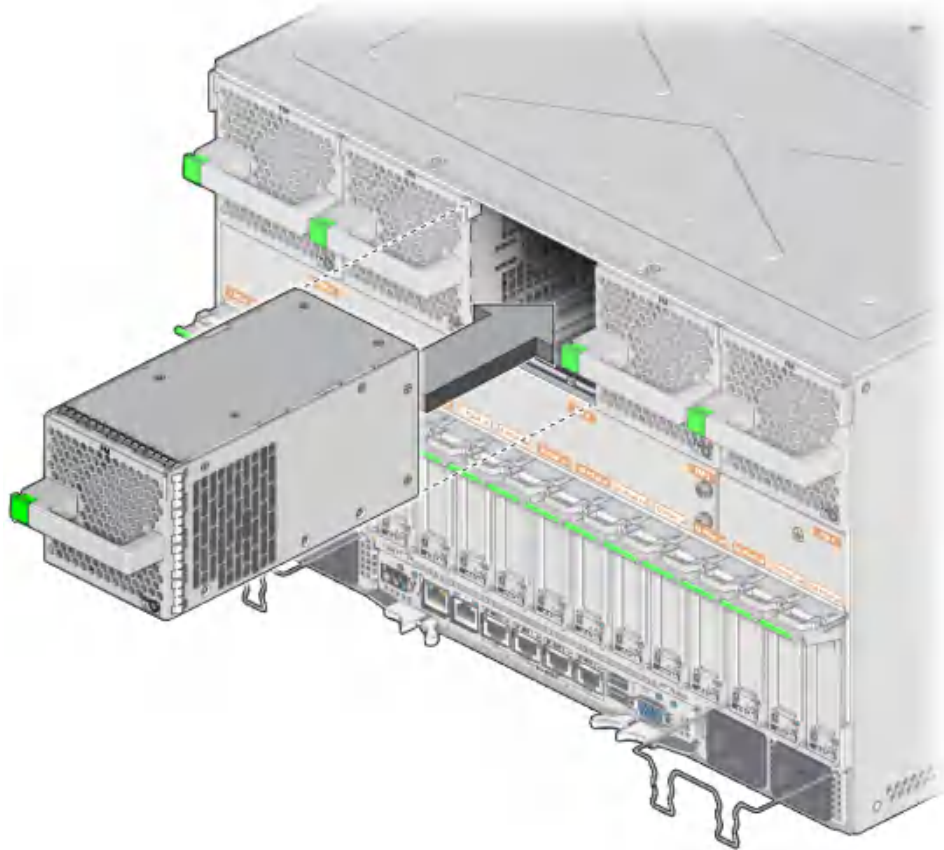
2. **Power on the server, if necessary.**

If you had to power off the server before removing and installing a new fan module, see "Returning the Server to Operation" on page 191 to power on the server again.

3. Verify the fan module functionality.

See "Verify a Fan Module" on page 152.

Related Information

- "Determine Which Fan Module Is Faulty" on page 147
- "Remove a Fan Module" on page 148
- "Verify a Fan Module" on page 152

▼ Verify a Fan Module

1. Ensure that you have completed the following:

- Applied power to the server.

  See "Connect Power Cords" on page 191.
- Powered on the server.

  See "Power On the Server (Oracle ILOM)" on page 192.

2. Check the front or rear panel LEDs for the following:

- Green System OK LED – lit
- Amber System Fault LED – not lit
- Amber System Fan Fault LED – not lit

See "Front Panel Controls and LEDs" on page 29 and "Rear Panel Controls and LEDs" on page 30.

If these conditions are met, continue to Step 3.

If these conditions are not met, perform the actions described in "Diagnostics Process" on page 26.

3. Log in to Oracle ILOM.

See "Log In to Oracle ILOM (Service)" on page 32.

4. Start the `faultmgmt` shell.

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

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

faultmgmtsp>
```

5. **Use the `fmadm faulty` command to check for faults.**

    ■ If faults are reported, see "Diagnostics Process" on page 26.
    ■ If no faults are reported, then the fan module has been replaced successfully.

    ### Related Information

    ■ "Determine Which Fan Module Is Faulty" on page 147
    ■ "Remove a Fan Module" on page 148
    ■ "Install a Fan Module" on page 151

Servicing PCIe Cards

These topics describe service procedures for the PCIe cards that are installed in the PCIe card carriers in the server.

Understanding PCIe Root Complex Connections

All 16 PCIe slots support PCIe cards with the following characteristics:

- Hot-plug low-profile adapters
- x8 Gen1, x8 Gen2, and x8 Gen3 cards

In addition, the following PCIe slots support x16 Gen3 cards at full bandwidth:

- Slot 3
- Slot 4
- Slot 7
- Slot 8
- Slot 11
- Slot 12
- Slot 15

■ Slot 16

A root complex is the CMP circuitry that provides the base to a PCIe I/O fabric. Each PCIe I/O fabric consists of the PCIe switches, PCIe slots, and leaf devices associated with the root complex. Understanding the relationship of the PCIe root complexes to the PCIe I/O fabrics will help you properly assign devices when configuring Oracle VM Server for SPARC logical domains.
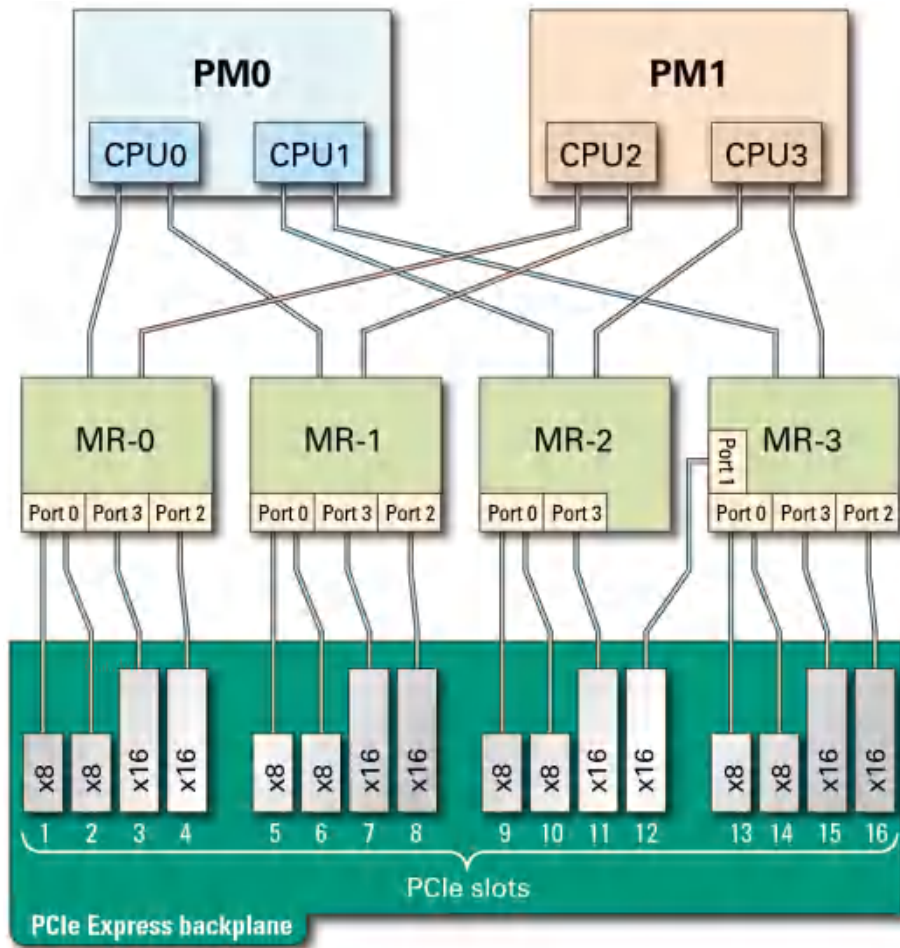
This diagram illustrates the root complex connections between the four CPUs and the 16 PCIe I/O slots. Each CPU supports all I/O root complex fabrics. In single-PM configurations, all

PCIe slots are available. In addition, all 16 PCIe slots are still available even if PM1 goes offline.

The port ID values shown in the diagram correspond to the pci@ values reported in the showdevs command output.

PCIe Slot	Device Path	MR	IOS	RP	Maximum bandwidth
Slot 1	/pci@305/pci@2	MR0	0	1	x8
Slot 2	/pci@305/pci@1	MR0	0	0	x8
Slot 3	/pci@306/pci@1	MR0	3	0	x16
Slot 4	/pci@307/pci@1	MR0	2	0	x16
Slot 5	/pci@308/pci@2	MR1	0	1	x8
Slot 6	/pci@308/pci@1	MR1	0	0	x8
Slot 7	/pci@309/pci@1	MR1	3	0	x16
Slot 8	/pci@30a/pci@1	MR1	2	0	x16
Slot 9	/pci@30b/pci@2	MR2	0	1	x8
Slot 10	/pci@30b/pci@1	MR2	0	0	x8
Slot 11	/pci@30c/pci@1	MR2	3	0	x16
Slot 12	/pci@30d/pci@1	MR3	1	0	x16
Slot 13	/pci@30e/pci@2	MR3	0	1	x8
Slot 14	/pci@30e/pci@1	MR3	0	0	x8
Slot 15	/pci@30f/pci@1	MR3	3	0	x16
Slot 16	/pci@310/pci@1	MR3	2	0	x16

If you are reviewing root complex changes after adding a second processor module, return to .

Related Information

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PCIe Card Configuration

For optimal load balancing, install the PCIe cards in this order: Slot 3, 16, 4, 15, 7, 12, 8, 11, 1, 14, 5, 10, 2, 13, 6, 9.

You may populate the PCIe slots in a different order to satisfy LDom or redundant failover considerations, but load balancing might not be as efficient. For example, you may distribute PCIe cards evenly across available root complexes.

If you are reviewing PCIe installation order after adding a second processor module, return to .

Related Information

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- ■
- ■

PCIe Carrier Handle and LEDs

No.	Button/LED	Icon	Description
1			Card carrier handle.
2	Attention Required button	ATTN	Press this button to bring the PCIe card offline.
			Press this button again to bring the PCIe card online.
3	OK (green)		Indicates the following conditions:
			■ **Off** – The server is powered off, or the PCIe card is not operating. You can remove the PCIe card, or install a new card.
			■ **On** – The PCIe card is connected and online. Do not insert or remove the card.
			■ **Blinking** – The PCIe card is powering up or powering down. Do not insert or remove the card.

No.	Button/LED	Icon	Description
4	Service Required (amber)		The Service Required LED indicates the following conditions: ■ **Off** – No fault is detected. ■ **On** – A fault has been detected.

Note - If a PCIe card fails and you do not have a replacement available, leave the failed PCIe card and carrier installed to ensure proper airflow in the server.

Related Information

- "Understanding PCIe Root Complex Connections" on page 155
- "PCIe Card Configuration" on page 158
- "Determine Which PCIe Card Is Faulty" on page 160
- "Remove a PCIe Card Carrier" on page 161
- "Remove a PCIe Card" on page 164
- "Install a PCIe Card" on page 167
- "Install a PCIe Card Carrier" on page 170
- "Verify a PCIe Card" on page 171

▼ Determine Which PCIe Card Is Faulty

The following LEDs are illuminated when a fault is detected:

- System Service Required LEDs on the front panel and rear I/O module
- System PCIe Fault LED on the front panel
- Service Required LED on card carrier containing the faulty PCIe card

1. Determine if the System Service Required LEDs are illuminated on the front panel or the rear I/O module.

See "Interpreting LEDs" on page 27.

2. Determine if the PCIe Fault LED is illuminated on the front panel.

See "Front Panel Controls and LEDs" on page 29.

3. From the rear of the server, find the PCIe carrier that has an amber Service Required LED lit.

4. **Remove the faulty PCIe card.**
   See "Remove a PCIe Card Carrier" on page 161.

   Related Information

   - "Understanding PCIe Root Complex Connections" on page 155
   - "PCIe Card Configuration" on page 158
   - "PCIe Carrier Handle and LEDs" on page 159
   - "Remove a PCIe Card Carrier" on page 161
   - "Remove a PCIe Card" on page 164
   - "Install a PCIe Card" on page 167
   - "Install a PCIe Card Carrier" on page 170
   - "Verify a PCIe Card" on page 171

▼ Remove a PCIe Card Carrier

The SPARC T8-4 server supports single-wide and double-wide card carriers. The removal steps are the same for both carrier types. This topic includes illustrations only for the single-wide carrier.

Note - If you are installing a PCIe card that requires a double-wide carrier, you must remove two adjacent PCIe card carriers.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

Note - Removing PCIe card carriers while the server is at the OpenBoot prompt is not supported. The server must be either powered off, or booted into the Oracle Solaris OS.

---

1. **Take the necessary ESD precautions.**
   See "Prevent ESD Damage" on page 49.

2. **Locate the PCIe card carrier at the rear of the server.**
   See "Determine Which PCIe Card Is Faulty" on page 160 to locate a faulty PCIe card.

3. **Determine if you are removing a PCIe card carrier from a running server.**

   - If you are removing a PCIe card carrier from a server that is running (that is, if you are hot-plugging the PCIe card), go to Step 4.

■ If you are removing a PCIe card carrier from a powered-down server, go to Step 5.

4. **Take one of these actions to bring the PCIe card offline.**

   ■ **Press the ATTN button to take the card offline. The Power OK LED should go off, indicating that the card is ready to be removed. Go to Step 5.**

   ■ **Use the `hotplug` command to bring the card offline:**

      a. **List all devices in the device tree, including PCIe cards:**

```
# hotplug list -cv
```

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

For example:

```
# hotplug list -cv
Connection            State           Description
_____
PCIE1                 EMPTY           PCIe-Native
...
PCIE7                 ENABLED         PCIe-Native
 Device                     Usage

 _____
 SUNW,qlc@0                  -
 fp                          -
 disk                        -
 fp@0,0                      -
 SUNW,qlc@0,1                -
 fp                          -
 disk                        -
 fp@0,0                      -
PCIE13                EMPTY           PCIe-Native
PCIE15                EMPTY           PCIe-Native
```

      b. **Bring the PCIe card offline.**
         For example:

```
# hotplug disable PCIE7
```

      c. **Verify that the PCIe card status is PRESENT.**

For example:

```
# hotplug list -cv PCIE7
Connection          State          Description
_____
PCIE7               PRESENT        PCIe-Native
```

    d. Verify that the card's green Power OK LED is off.

5. Disconnect any cables connected to the PCIe card.

Tip - Label the cables to ensure proper connection to the replacement PCIe card.

---

6. Pull the PCIe card carrier handle down to disengage the carrier from the card cage.

7. Remove the PCIe card carrier from the server.

Related Information

- "Understanding PCIe Root Complex Connections" on page 155
- "PCIe Card Configuration" on page 158
- "PCIe Carrier Handle and LEDs" on page 159
- "Determine Which PCIe Card Is Faulty" on page 160

▼ Remove a PCIe Card

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

1. **Ensure that you have already taken antistatic measures.**

   See "Prevent ESD Damage" on page 49.

2.   Unlatch and open the PCIe card carrier top cover.
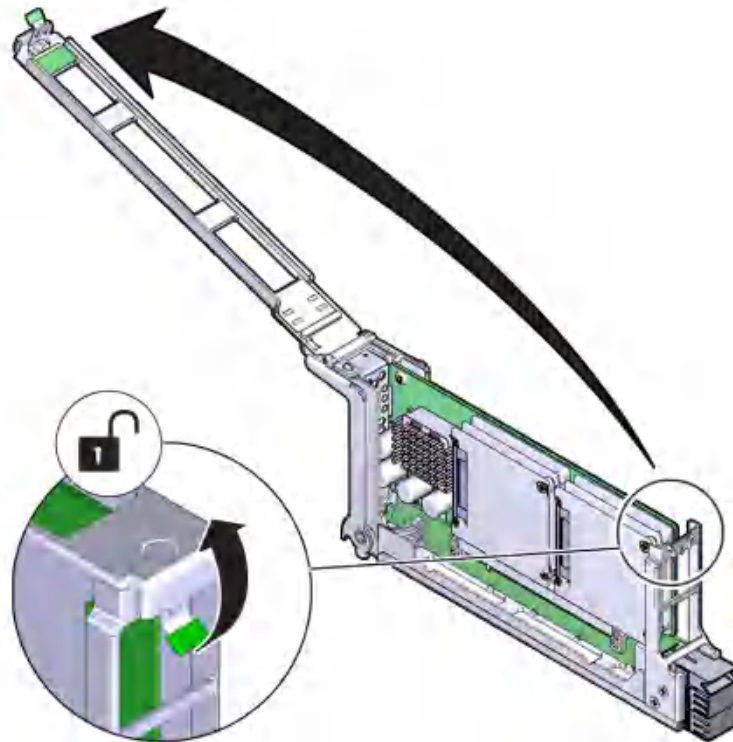
3. **Carefully remove the PCIe card from the PCIe card carrier.**
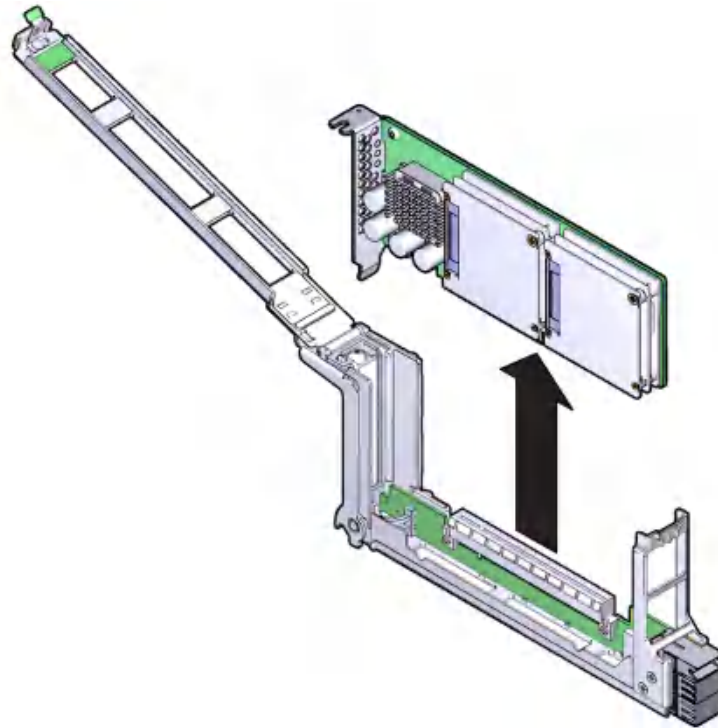
4. **Place the PCIe card on an antistatic mat or into its antistatic packaging.**

Related Information

- "Understanding PCIe Root Complex Connections" on page 155
- "PCIe Card Configuration" on page 158
- "PCIe Carrier Handle and LEDs" on page 159
- "Determine Which PCIe Card Is Faulty" on page 160
- "Remove a PCIe Card Carrier" on page 161
- "Install a PCIe Card" on page 167
- "Install a PCIe Card Carrier" on page 170
- "Verify a PCIe Card" on page 171

▼ Install a PCIe Card

> **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.
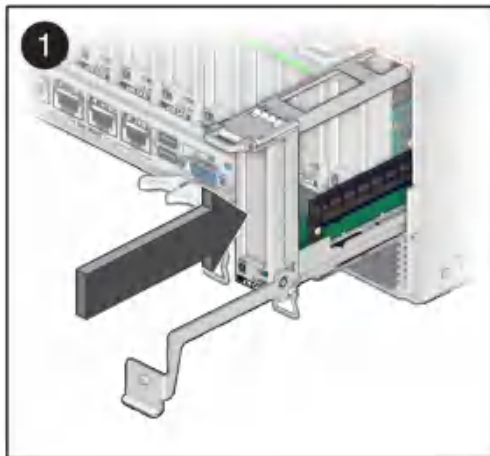
1. **Determine your first step.**

   ■ **If you are installing a new PCIe card and need an empty PCIe card carrier, see "Remove a PCIe Card Carrier" on page 161.**

   ■ **If you are replacing a faulty PCIe card and have already removed its carrier from the server, go to Step 2.**

2. **Remove the PCIe card from its packaging.**

3. **Insert the PCIe card into the PCIe card carrier until the bottom connector is firmly seated in the PCIe card carrier's connector.**
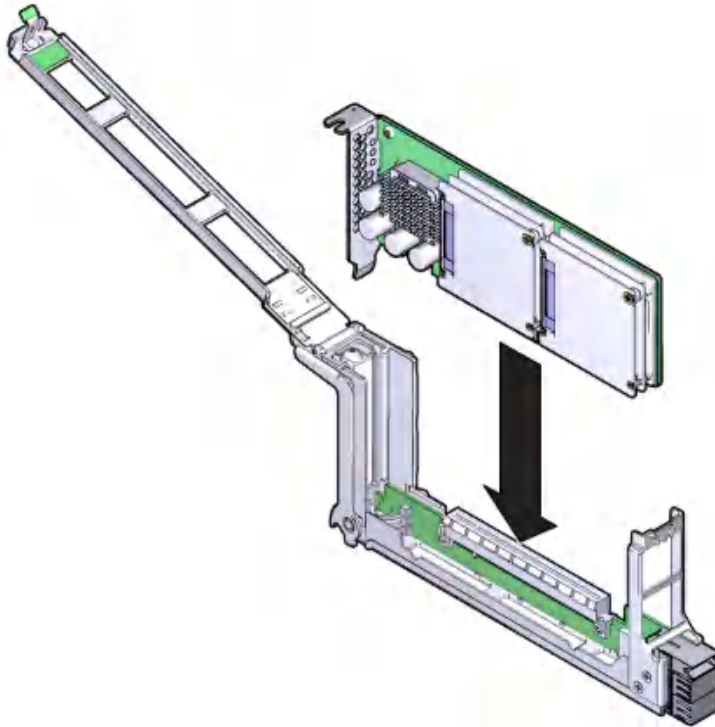
⚠️ **Caution -** Do not twist or turn the PCIe card as you insert it into the PCIe card carrier. Ensure that the PCIe card's connector is fully seated in the PCIe card carrier's slot, and that the notch in the PCIe card's rear bulkhead is seated around the PCIe carrier's alignment tab.

4. **Close and latch the PCIe card carrier's top cover.**
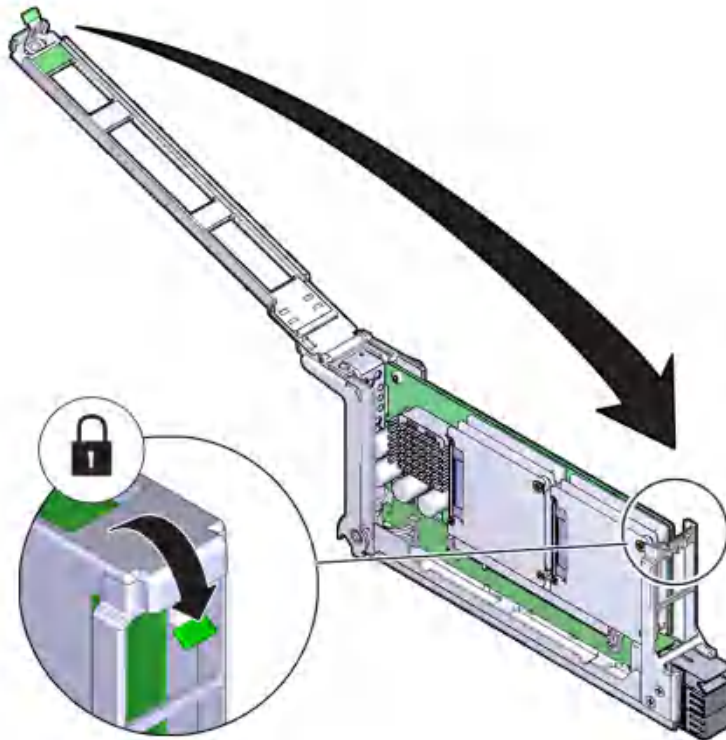
Related Information

- "Understanding PCIe Root Complex Connections" on page 155
- "PCIe Card Configuration" on page 158
- "PCIe Carrier Handle and LEDs" on page 159
- "Determine Which PCIe Card Is Faulty" on page 160
- "Remove a PCIe Card Carrier" on page 161
- "Remove a PCIe Card" on page 164
- "Install a PCIe Card Carrier" on page 170
- "Verify a PCIe Card" on page 171

▼ Install a PCIe Card Carrier

⚠ **Caution -** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

Note - Installing PCIe card carriers while the server is at the OpenBoot prompt is not supported. The server must either be powered off, or booted into the Oracle Solaris OS.

1. Insert the PCIe card carrier into the card cage until it stops.

⚠ **Caution -** Do not press on the PCIe back panel, or force the PCIe card carrier into the card cage.

2. Close the PCIe carrier handle.

Rotate the handle up until it latches into place.

3. Reconnect the cables to the PCIe card.

4. Determine your next step:

■ **If you replaced or installed a PCIe card in a server that is running (that is, if you hot-serviced the PCIe card), go to Step 5.**

- **If you replaced or installed a PCIe card in a powered-down server, power on the server, then verify the PCIe card.**
  See and

5. **Take the PCIe card online. Do one of the following:**

- **Press the ATTN button. The PCIe card carrier's Power OK LED should light, indicating that the PCIe card is online.**

- **Use the Oracle Solaris `hotplug` command.**
  For example:

  ```
  # hotplug enable PCIE7
  ```

Related Information

-
-
-
-
-
-
-
-

▼ Verify a PCIe Card

1. **Verify that the Fault LED is not illuminated on the PCIe card.**

2. **Verify that the System Service Required LEDs on the front panel and rear I/O module are not illuminated.**
   See .

3. **Verify that the System PCIe Fault LED on the front panel is not illuminated.**
   See .

4. **Consider your next steps.**

- **If any of the LEDs are illuminated, see "Diagnostics Process" on page 26.**

- **If none of the LEDs are illuminated, go to Step 6.**

5. **Verify that the green Power LED is lit on the PCIe card carrier that you installed.**

6. **At the Oracle Solaris prompt, ensure that the PCIe card is connected and online:**

```
# hotplug list -cv
Connection          State          Description
_____
PCIE1               EMPTY          PCIe-Native
...
PCIE7               ENABLED        PCIe-Native
 Device                     Usage

 _____
 SUNW,qlc@0                 -
 fp                         -
 disk                       -
 fp@0,0                     -
 SUNW,qlc@0,1               -
 fp                         -
 disk                       -
 fp@0,0                     -
PCIE13              EMPTY          PCIe-Native
PCIE15              EMPTY          PCIe-Native
```

Related Information

- "Understanding PCIe Root Complex Connections" on page 155
- "PCIe Card Configuration" on page 158
- "PCIe Carrier Handle and LEDs" on page 159
- "Determine Which PCIe Card Is Faulty" on page 160
- "Remove a PCIe Card Carrier" on page 161
- "Remove a PCIe Card" on page 164
- "Install a PCIe Card" on page 167
- "Install a PCIe Card Carrier" on page 170

Servicing the Rear I/O Module

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

Caution - You must disconnect the power cords before servicing this component. See "Disconnect Power Cords" on page 53.

These topics describe service procedures for the rear I/O module in the server.

- "Rear I/O Module LEDs" on page 173
- "Determine if the Rear I/O Module Is Faulty" on page 176
- "Remove the Rear I/O Module" on page 176
- "Install the Rear I/O Module" on page 178
- "Verify the Rear I/O Module" on page 181

Rear I/O Module LEDs

The LEDs on the rear I/O module give server status information and link information on the NET ports.
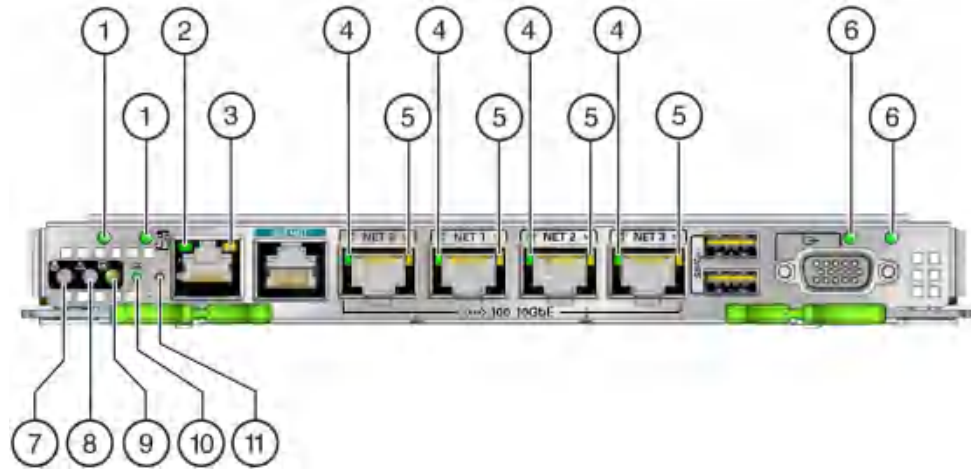
No.	LED	Icon	Description
1	AC3 connector LED (amber/green)		Indicates the state of the AC connector. Green indicates that the AC connector is functioning correctly. Amber indicates a fault with PSU3.
1	AC2 connector LED (amber/green)		Indicates the state of the AC connector. Green indicates that the AC connector is functioning correctly. Amber indicates a fault with PSU2.
2	NET MGT link and activity LED (green)		Indicates the following conditions: ■ **On or blinking** – A link is established. ■ **Off** – No link is established.
3	NET MGT speed (green)		Indicates the following conditions: ■ **Blinking** – A link is established. ■ **Off** – No link is established.
4	NET link and activity (green)		Indicates the following conditions: ■ **On** – A link is established. ■ **Blinking** – Transfer activity is present on the link. ■ **Off** – No link is established.
5	NET speed (amber/green)		Indicates the following conditions: ■ **Green on** – The link is operating as a 100-Mbps connection. ■ **Off** – There is no link.
6	AC1 connector LED (amber/green)		Indicates the state of the AC connector. Green indicates that the AC connector is functioning correctly. Amber indicates a fault with PSU1.
6	AC0 connector LED (amber/green)		Indicates the state of the AC connector. Green indicates that the AC connector is functioning correctly. Amber indicates a fault with PSU 0.

No.	LED	Icon	Description
7	System Locator LED and button (white)		The Locator LED can be turned on to identify a particular server. When on, it blinks rabidly. There are two methods for turning a Locator LED on: ■ Issuing the Oracle ILOM command `set /SYS/LOCATE value=Fast_Blink` ■ Pressing the Locator button
8	System Service Required LED (amber)		Indicates that service is required. POST and Oracle ILOM are two diagnostic tools that can detect a fault or failure resulting in this indication. The Oracle ILOM `show faulty` command provides details about any faults that cause this indicator to illuminate. The System Service Required LED also illuminates on the rear I/O module if the rear I/O module has failed.
9	System Power OK LED (green)		Indicates the following conditions: ■ **Off** – Server is not running in its normal state. Server power might be off. The SPM might be running. ■ **Steady on** – Server is powered on and is running in its normal operating state. No service actions are required. ■ **Fast blink** – Server 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 server diagnostics are running or the server is booting.
10	Service Processor LED	SP	Indicates the following conditions: ■ **Off** – The AC power might have been connected to the power supplies. ■ **Steady on, green** – The SPM is running in its normal operating state. No service actions are required. ■ **Blink, green**–The SPM is initializing the Oracle ILOM firmware. ■ **Steady on, amber** – A SPM error has occurred and service is required.
11	Overtemperature		Indicates the following conditions: ■ **Off** – Server is powered on and is running in its normal operating state, or it is powered off (no overtemperature fault present). ■ **Steady on, amber** – An overtemperature fault has been detected.

Related Information

- "Determine if the Rear I/O Module Is Faulty" on page 176
- "Remove the Rear I/O Module" on page 176
- "Install the Rear I/O Module" on page 178

- "Verify the Rear I/O Module" on page 181
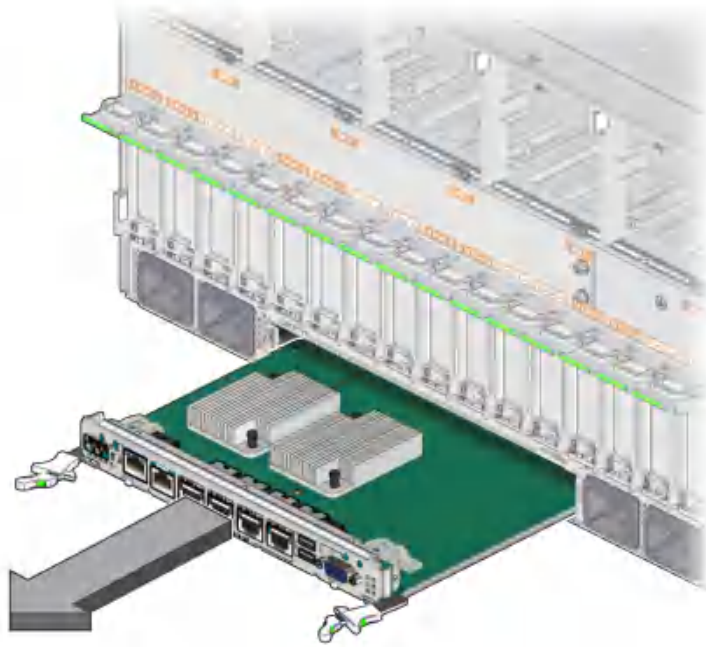
▼ Determine if the Rear I/O Module Is Faulty

The System Service Required LED on the rear I/O module illuminates when a rear I/O module fault is detected.

1. Determine if the System Service Required LED is illuminated on the rear I/O module.

See "Rear I/O Module LEDs" on page 173.

2. Remove the faulty rear I/O module.

See "Remove the Rear I/O Module" on page 176.

Related Information

- "Rear I/O Module LEDs" on page 173
- "Remove the Rear I/O Module" on page 176
- "Install the Rear I/O Module" on page 178
- "Verify the Rear I/O Module" on page 181

▼ Remove the Rear I/O Module

The rear I/O module is a cold-service component that can be replaced by a customer.

1. Take the necessary ESD precautions.

See "Prevent ESD Damage" on page 49.

2. Locate the failed rear I/O module.

- See **"Rear Panel Components" on page 15** for the location of the rear I/O module in the server.

- See **"Determine if the Rear I/O Module Is Faulty" on page 176** to verify that the rear I/O module has failed.

3. Power off the server.

See "Removing Power From the Server" on page 50.

4.   Disconnect the power cords.

See "Disconnect Power Cords" on page 53.

5.   Label the cables connected to the ports on the rear I/O module, and then disconnect the cables from the ports.

You will reconnect the cables to the same ports on the replacement rear I/O module.

6.   Press the green buttons on the rear I/O module ejection levers, and spread the levers open to eject the rear I/O module.

7. Pull the module away from the server to remove it.

8. Remove the eUSB devices on both old and new rear I/O modules, swap, and re-install eUSB devices on both boards.

Related Information

- "Preparing for Service" on page 43
- "Rear I/O Module LEDs" on page 173
- "Determine if the Rear I/O Module Is Faulty" on page 176
- "Install the Rear I/O Module" on page 178
- "Verify the Rear I/O Module" on page 181

▼ Install the Rear I/O Module

1. Take the necessary ESD precautions.

See "Prevent ESD Damage" on page 49.

2. **With the levers in the extended position, insert the rear I/O module into the slot at the rear of the server.**
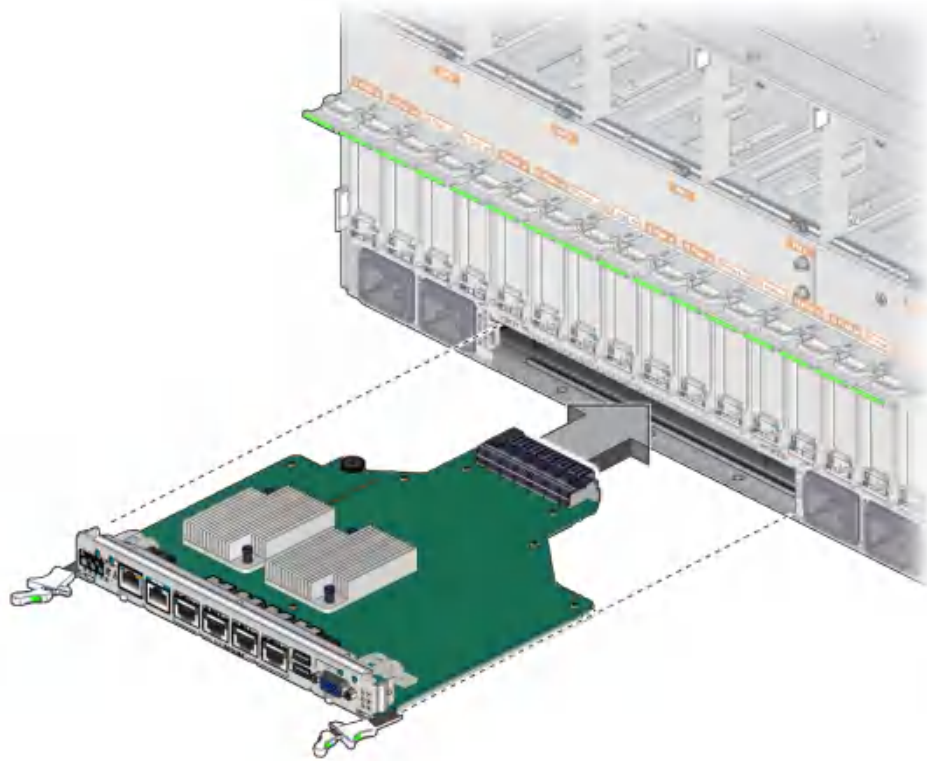
3.   Close the extraction levers until they click into place to fully seat the rear I/O module into the server.

4.   Connect the cables to the appropriate ports on the rear I/O module.

5.   Connect the power cords.

See "Connect Power Cords" on page 191.

6.   Power on the server.

See "Returning the Server to Operation" on page 191.

7. Verify the rear I/O installation.
See "Verify the Rear I/O Module" on page 181.

Related Information

- "Rear I/O Module LEDs" on page 173
- "Determine if the Rear I/O Module Is Faulty" on page 176
- "Remove the Rear I/O Module" on page 176
- "Verify the Rear I/O Module" on page 181
- "Returning the Server to Operation" on page 191

▼ Verify the Rear I/O Module

1. Ensure that you have completed the following:

- Applied power to the server.

  See "Connect Power Cords" on page 191.
- Started the system.

  See "Power On the Server (Oracle ILOM)" on page 192.

2. Verify that the System Service Required LED on the rear I/O module is not lit.
See "Rear I/O Module LEDs" on page 173.

3. Log in to Oracle ILOM.
See "Log In to Oracle ILOM (Service)" on page 32.

4. Start the faultmagmt shell.

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

faultmgmtsp>
```

5. Use the `fmadm faulty` command to determine if the server is operating normally.

- If a fault was detected, see "Diagnostics Process" on page 26.
- If no faults were detected, then the rear I/O module has been replaced successfully. No further action is required.

Related Information

- "Detecting and Managing Faults" on page 25
- "Rear I/O Module LEDs" on page 173
- "Determine if the Rear I/O Module Is Faulty" on page 176
- "Remove the Rear I/O Module" on page 176
- "Install the Rear I/O Module" on page 178

Servicing the Rear Chassis Subassembly

For the location of the rear chassis subassembly, see "Rear Panel Components" on page 15.

Caution - This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause failure of server components.

Caution - You must disconnect the power cords before servicing this component. See "Disconnect Power Cords" on page 53.

- "Rear Chassis Subassembly Components" on page 183
- "Remove the Rear Chassis Subassembly" on page 184
- "Install the Rear Chassis Subassembly" on page 187
- "Verify the Rear Chassis Subassembly" on page 188

Related Information

- "Identifying Components" on page 13
- "Detecting and Managing Faults" on page 25
- "Preparing for Service" on page 43
- "Returning the Server to Operation" on page 191

Rear Chassis Subassembly Components

You remove and install the rear chassis subassembly as a single unit.
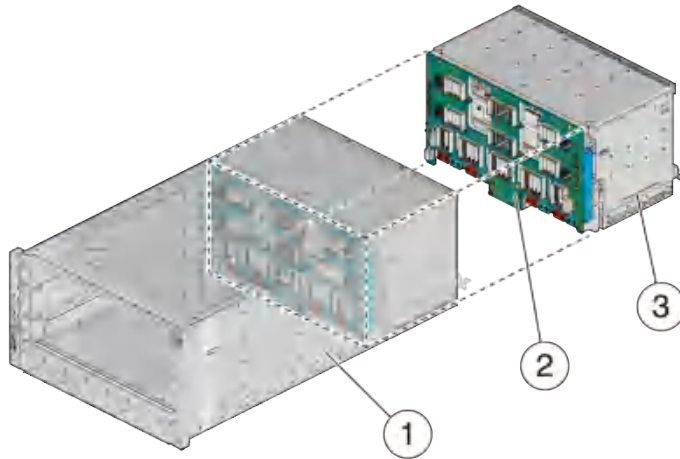
No.	Description
1	Server chassis
2	Midplane subassembly
3	Rear chassis subassembly chassis

Related Information

-
-

▼ Remove the Rear Chassis Subassembly

1. **Verify that the rear chassis subassembly needs to be replaced.**
   Use the server software to determine if the rear chassis subassembly needs to be replaced. See "Detecting and Managing Faults" on page 25 for more information.

2. **Power off the server.**
   See "Removing Power From the Server" on page 50.

3. **Disconnect the power cords.**
   See "Disconnect Power Cords" on page 53.

4. **Go to the rear of the server and remove the following components:**

- All five fan modules – see "Remove a Fan Module" on page 148.
- All PCIe carriers or PCIe fillers – see "Remove a PCIe Card Carrier" on page 161. Make note of the slots for each carrier or filler panel so that you can install them into the same slots.
- Rear I/O module – see "Remove the Rear I/O Module" on page 176.

You will install these components into the replacement rear chassis subassembly once you have replaced the faulty subassembly.

5. **Go to the front of the server and remove the following components:**

- Both processor modules or processor filler modules – see "Remove a Processor Module or Processor Filler Module" on page 60.
- Main module – see "Remove the Main Module" on page 99.
- All four power supplies – see "Remove a Power Supply" on page 139.

6. **Using a Phillips screwdriver, loosen the five screws that secure the rear chassis subassembly to the system chassis.**
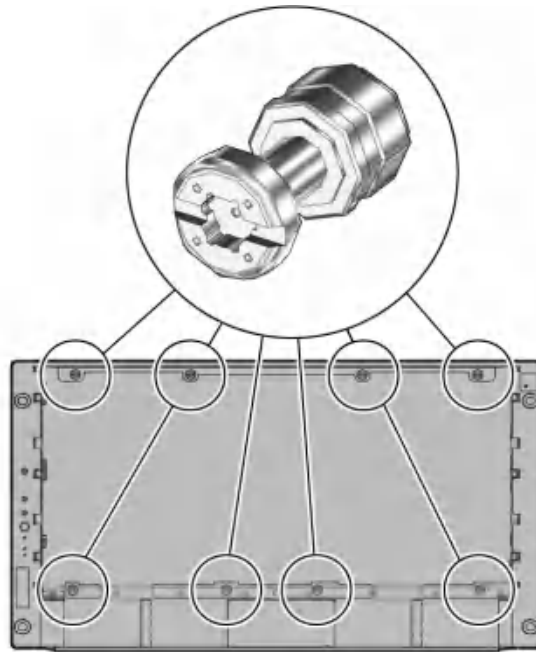
7.   Slide the rear chassis subassembly out and away from the server.
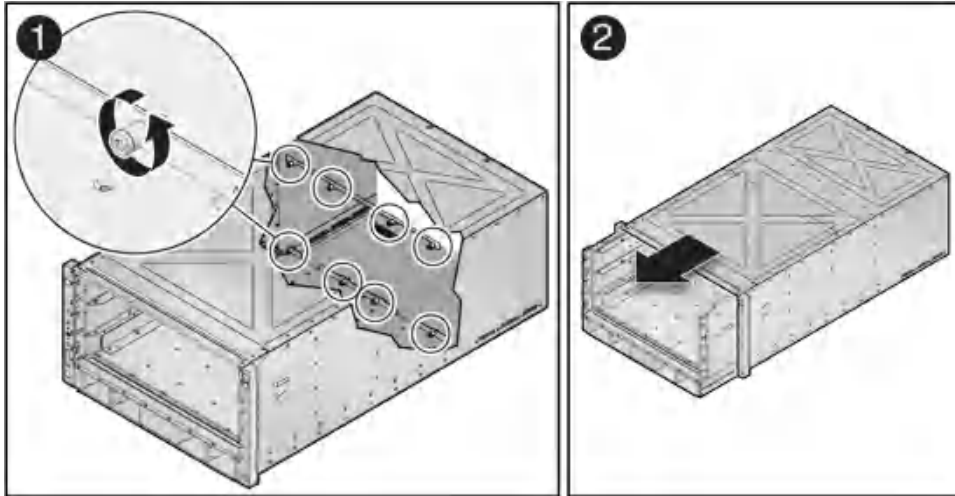
Related Information

-

▼ Install the Rear Chassis Subassembly

1. **Slide the rear chassis subassembly into the server.**
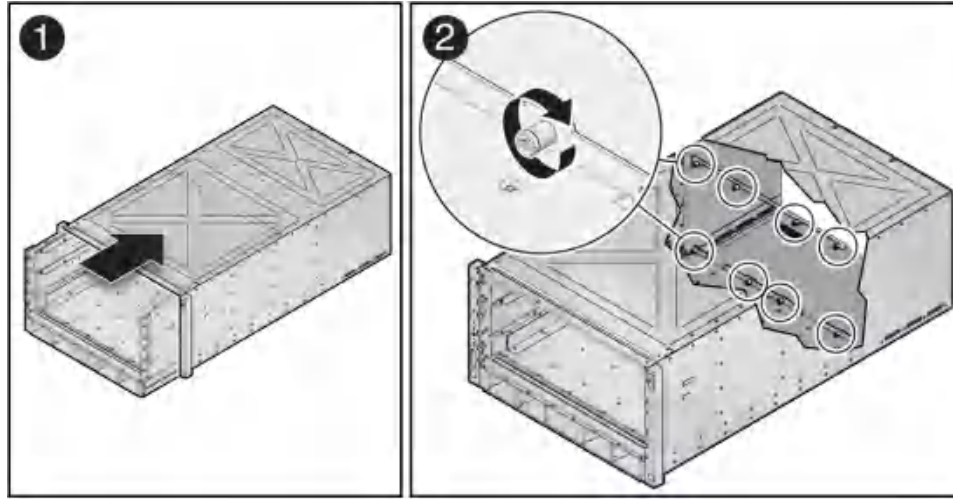
2. **From the front of the server, tighten the five green screws that secure the rear chassis subassembly in the server.**

3. **Remove the connector covers from the replacement rear chassis subassembly.**

4. **Install the following components:**

   - All four power supplies – see "Install a Power Supply" on page 142.
   - Main module – see "Install the Main Module" on page 102.
   - Both processor modules or processor filler modules – see ."Install a Processor Module or Processor Filler Module" on page 63

5. **Go to the rear of the server and install the following components:**

   - Rear I/O module – see "Install the Rear I/O Module" on page 178.
   - All PCIe carriers or fillers – see "Install a PCIe Card Carrier" on page 170. Verify that you are installing the PCIe cards back in their original slots using the notes that you took when removing the cards from the slots earlier.
   - All five fan modules – see "Install a Fan Module" on page 151.

6. **Connect the power cords.**

   See "Connect Power Cords" on page 191.

7. **Power on the server.**

   See "Returning the Server to Operation" on page 191.

8. **Verify the rear chassis subassembly.**

   See "Verify the Rear Chassis Subassembly" on page 188.

   ### Related Information

   - "Remove the Rear Chassis Subassembly" on page 184
   - "Returning the Server to Operation" on page 191

▼ Verify the Rear Chassis Subassembly

1. **Ensure that you have completed the following:**

   - Applied power to the server.

     See "Connect Power Cords" on page 191.
   - Started the system.

     See "Power On the Server (Oracle ILOM)" on page 192.

2. **Log in to Oracle ILOM.**

   See "Log In to Oracle ILOM (Service)" on page 32.

3. **Start the faultmagmt shell.**

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

   faultmgmtsp>
   ```

4. **Use the `fmadm faulty` command to determine if the server is operating normally.**

   - If a fault was detected, see "Diagnostics Process" on page 26.
   - If no faults were detected, then the rear chassis subassembly has been replaced successfully. No further action is required.

Related Information

- "Detecting and Managing Faults" on page 25
- "Rear I/O Module LEDs" on page 173
- "Remove the Rear Chassis Subassembly" on page 184
- "Install the Rear Chassis Subassembly" on page 187

Returning the Server to Operation

These topics explain how to return the Oracle SPARC T8-4 server to operation after you have performed service procedures.

Steps	Description	Links
1.	Connect the power cords.	"Connect Power Cords" on page 191
2.	Power on the server.	"Power On the Server (Oracle ILOM)" on page 192
3.	Continue the service operation you were performing (if applicable).	"Component Service Task Reference" on page 22

Related Information

- "Identifying Components" on page 13
- "Detecting and Managing Faults" on page 25
- "Preparing for Service" on page 43

▼ Connect Power Cords

Note - Standby power is applied as soon as the power cords are connected. Depending on how the firmware is configured, the server might boot automatically.

1. Locate the AC connectors on the rear of the server.

See "Rear Panel Components" on page 15.

2. Connect the power cords to the AC connectors.

Related Information

- "Power On the Server (Oracle ILOM)" on page 192

▼ **Power On the Server (Oracle ILOM)**

Note - The boot process depends on the most recent power state of the server and on Oracle ILOM policy settings. You must determine if the server is running before you issue the start /System command.

---

1. **Check the server power state. Type:**

```
-> show /System power_state
 /System
    Properties:
        power_state = Off
```

2. **If the server is powered off, power on the server. Type:**

```
-> start /System
Starting /System
```

3. **(***Optional***.) To view server boot output, start a host console stream. Type:**

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

4. **If you are adding a second processor module, return to "Server Upgrade Process" on page 56.**

Related Information

- "Connect Power Cords" on page 191

Glossary

A

ANSI SIS   American National Standards Institute Status Indicator Standard.

ASR   Auto Service Request

ASR   automatic system recovery

AWG   American wire gauge.

B

BMC   Baseboard management controller.

BOB   Memory buffer on board.

C

chassis   Server enclosure.

CMA   Cable management arm (SPARC T7-1 and SPARC T7-2); cable management assembly (SPARC T7-4).

CMP   Chip multiprocessor.

CRU   Customer-replaceable unit.

D

DHCP   Dynamic Host Configuration Protocol.

DMP   Dynamic multipathing.

DTE   Data terminal equipment.

E

EIA   Electronics Industries Alliance.

ESD   Electrostatic discharge.

EUSB drive   Embedded universal serial bus drive.

F

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* SPM.

hot-pluggable Describes a component that can be replaced with power applied, but the component must be prepared for removal.

hot-swappable Describes a component that can be replaced with power applied, and no preparation is required.

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

LDom   Logical domain managed by Oracle VM Server for SPARC. *See* Oracle VM Server for SPARC.

LwA   Sound power level.

M

MAC   Machine access code.

MAC address Media access controller address.

MSGID   Message identifier.

N

NAC name   Network Device Container name. Physical device address used for remote access, configuration, management. *See* Oracle ILOM *and* SDM name

name space   Top-level Oracle ILOM target.

NEBS   Network Equipment-Building System (Netra products only).

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.

NVMe   Non-volatile memory express controller. The optional NVMe switch card provides NVMe services in the SPARC T8-4 server.

NVMHCI   Non-Volatile Memory Host Controller Interface. A specification for accessing solid-state drives (SSDs) via a PCI Express bus device. *See* NVMe.

O

OBP OpenBoot PROM. Sometimes OBP is used in file names and messages to indicate a relationship to OpenBoot.

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 ILOM CMM Oracle ILOM that runs on the CMM (server modules only). *See* Oracle ILOM.

Oracle Solaris OS Oracle Solaris operating system.

Oracle VM Server for SPARC Virtualization server for SPARC platforms.

P

PCI Peripheral component interconnect.

PCIe PCI Express, an industry-standard bus architecture that supports high-bandwidth peripherals and I/O devices.

POST Power-on self-test.

PROM Programmable read-only memory.

PSH Predictive self healing.

S

SAS Serial attached SCSI.

SCC System configuration chip.

SCC PROM System configuration chip on programmable read-only memory. Removable module containing system configuration data.

SDM name Simplified Data Model name. A way of providing device information on Oracle ILOM consistently across different types of servers. See NAC name.

SER MGT port	Serial management port. A serial port on the server SP, the server module SP, and the CMM.
SPM	Service processor module. In the server, the SPM is a card with its own OS that is operating and accessible whenever the server power cords are connected and energized, regardless of host power state. The SPM processes Oracle ILOM commands providing lights out management control of the host. *See* host.
SSD	Solid-state drive.
SSH	Secure shell.

T

| **TIA** | Telecommunications Industry Association (Netra products only). |
| **Tma** | Maximum ambient temperature. |

U

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

W

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

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