

# **SPARC T3-1B Server Module**

## **Service Manual**



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# Using This Documentation

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This service manual explains how to identify faults, replace parts, and add additional options in the SPARC T3-1B server module from Oracle.

This document is written for technicians, system administrators, authorized service providers, and users who have advanced experience troubleshooting and replacing hardware.

- “Product Notes” on page ix
- “Product Notes” on page ix
- “Feedback” on page x
- “Support and Accessibility” on page xi

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## Product Notes

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

<http://www.oracle.com/pls/topic/lookup?ctx=SPARCT3-1B>

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## Related Documentation

Documentation	Links
All Oracle products	<a href="http://www.oracle.com/documentation">http://www.oracle.com/documentation</a>
SPARC T3-1B server module	<a href="http://www.oracle.com/pls/topic/lookup?ctx=SPARCT3-1B">http://www.oracle.com/pls/topic/lookup?ctx=SPARCT3-1B</a>
Sun Blade 6000 modular system	<a href="http://www.oracle.com/pls/topic/lookup?ctx=E19938-01">http://www.oracle.com/pls/topic/lookup?ctx=E19938-01</a>
Oracle Integrated Lights Out Manager (Oracle ILOM)	<a href="http://www.oracle.com/pls/topic/lookup?ctx=ilom30">http://www.oracle.com/pls/topic/lookup?ctx=ilom30</a>
Oracle Solaris OS and other system software	<a href="http://www.oracle.com/technetwork/indexes/documentation/#sys_sw">http://www.oracle.com/technetwork/indexes/documentation/#sys_sw</a>
Oracle VTS software	<a href="http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0">http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0</a>
SAS-1/SAS-2 Compatibility	<a href="http://www.oracle.com/pls/topic/lookup?ctx=E22513_01">http://www.oracle.com/pls/topic/lookup?ctx=E22513_01</a>

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## Feedback

Provide feedback about this documentation at:

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

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# Support and Accessibility

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





# Identifying Components

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These topics explain the components of the server module, focusing on the components that can be removed and replaced for service.

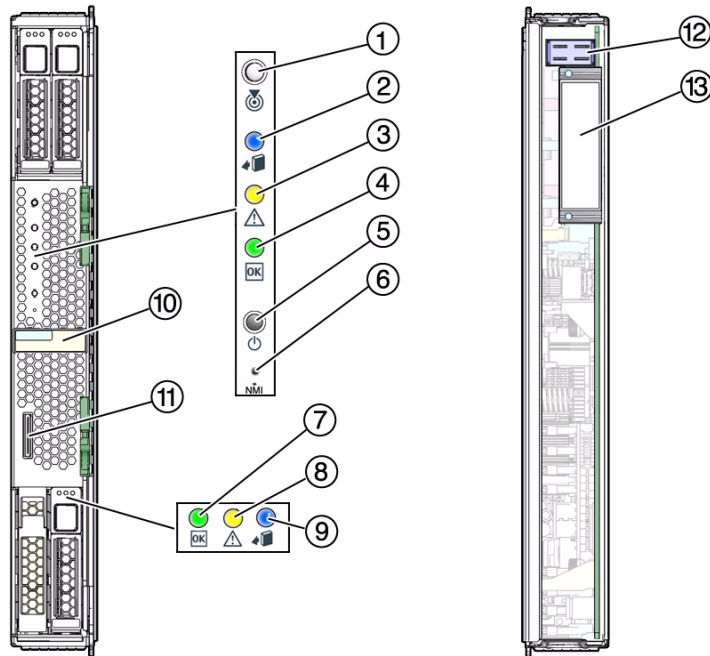
- [“Front and Rear Panel Components” on page 2](#)
- [“Illustrated Parts Breakdown” on page 3](#)

## **Related Information**

- [“Detecting and Managing Faults” on page 5](#)
- [“Replacing the Server Module Enclosure Assembly” on page 107](#)

# Front and Rear Panel Components

**FIGURE:** Front and Rear Components



**Figure Legend**

- 
- 1 White LED: Locator (functions as the physical presence switch)
  - 2 Blue LED: Ready to Remove
  - 3 Amber LED: Service Action Required
  - 4 Green LED: OK
  - 5 Power button
  - 6 Reset button: NMI (for service use only)
  - 7 Green LED: Drive OK
  - 8 Amber LED: Drive Service Action Required
  - 9 Blue LED: Drive Ready to Remove
  - 10 RFID (sticker indicates serial number of the server module)
  - 11 Universal connector port (UCP)
  - 12 Chassis power connector
  - 13 Chassis data connector
-

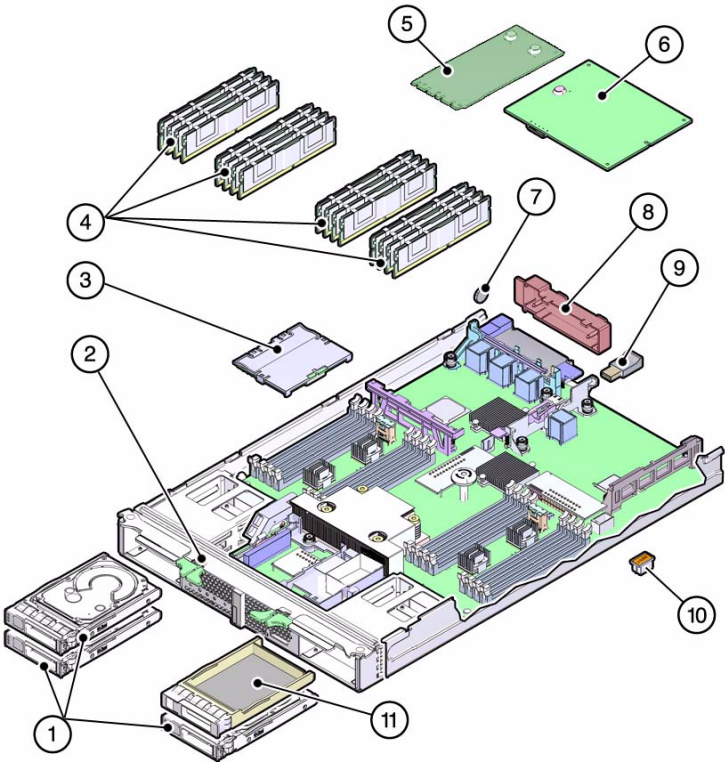
**Related Information**

- [“Diagnostics LEDs” on page 10](#)
- [“Illustrated Parts Breakdown” on page 3](#)

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# Illustrated Parts Breakdown

This topic identifies components in the server module that you can install, or remove and replace.



The following table provides information about the replaceable components.

**TABLE:** Replaceable Components

	FRU	Replacement Instructions	Notes	FRU Name (If Applicable)
1	Hard drives	<a href="#">“Servicing Hard Drives” on page 63</a>		<code>/SYS/HDD<math>n</math></code> where $n = 0 - 3$
2	Replacement enclosure	<a href="#">“Replacing the Server Module Enclosure Assembly” on page 107</a>		<code>/SYS/MB</code>
3	Service processor card	<a href="#">“Servicing a Service Processor Card” on page 93</a>		<code>/SYS/MB/SP</code>
4	DIMMs	<a href="#">“Servicing Memory” on page 69</a>		<code>/SYS/MP/CMP0/BOB<math>n</math>/CH<math>n</math>/D<math>n</math></code>
5	FEM card	<a href="#">“Servicing a FEM” on page 89</a>		<code>/SYS/MB/FEM<math>n</math></code>
6	REM card	<a href="#">“Servicing a REM” on page 85</a>		<code>/SYS/MB/REM</code>
7	Clock battery	<a href="#">“Servicing the Battery” on page 105</a>		<code>/SYS/MB/BAT</code>
8	Connector cover		Remove before inserting the server module in a slot.	
9	USB flash drive	<a href="#">“Servicing a USB Flash Drive” on page 101</a>	Oracle does not offer supported USB flash drives for this server module.	
10	ID PROM	<a href="#">“Servicing the ID PROM” on page 97</a>		<code>/SYS/MB/SCC</code>
11	Drive filler	<a href="#">“Servicing Hard Drives” on page 63</a>		

### Related Information

- [“Front and Rear Panel Components” on page 2](#)
- [“Detecting and Managing Faults” on page 5](#)
- [“Replacing the Server Module Enclosure Assembly” on page 107](#)

# Detecting and Managing Faults

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

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Diagnostics LEDs” on page 10](#)
- [“Managing Faults \(Oracle ILOM\)” on page 12](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(Oracle Solaris PSH\)” on page 25](#)
- [“Managing Faults \(POST\)” on page 31](#)
- [“Managing Components \(ASR Commands\)” on page 44](#)
- [“Checking if Oracle VTS Software Is Installed” on page 48](#)

## Related Information

- [“Preparing for Service” on page 51](#)

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## Diagnostics Overview

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

- **LEDs** – Provide a quick visual notification of the status of the server module and of some of the FRUs.
- **Oracle ILOM** – This firmware runs on the SP. In addition to providing the interface between the hardware and OS, Oracle ILOM also tracks and reports the health of key server module components. Oracle ILOM works closely with POST and Oracle Solaris PSH technology to keep the system running even when there is a faulty component. You can log in to multiple SP accounts simultaneously and have separate Oracle ILOM shell commands executing concurrently under each account.

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

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- **POST** – POST performs diagnostics on system components upon system reset to ensure the integrity of those components. POST can be configured and works with Oracle ILOM to take faulty components offline if needed.
- **Oracle Solaris PSH** - This technology continuously monitors the health of the CPU, memory and other components, and works with Oracle ILOM to take a faulty component offline if needed. The PSH technology enables systems to accurately predict component failures and mitigate many serious problems before they occur.
- **Log files and command interface** – Provide the standard Oracle Solaris OS log files and investigative commands that can be accessed and displayed on the device of your choice.
- **Oracle VTS (formerly SunVTS)** – An application that exercises the system, provides hardware validation, and discloses possible faulty components with recommendations for repair.

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

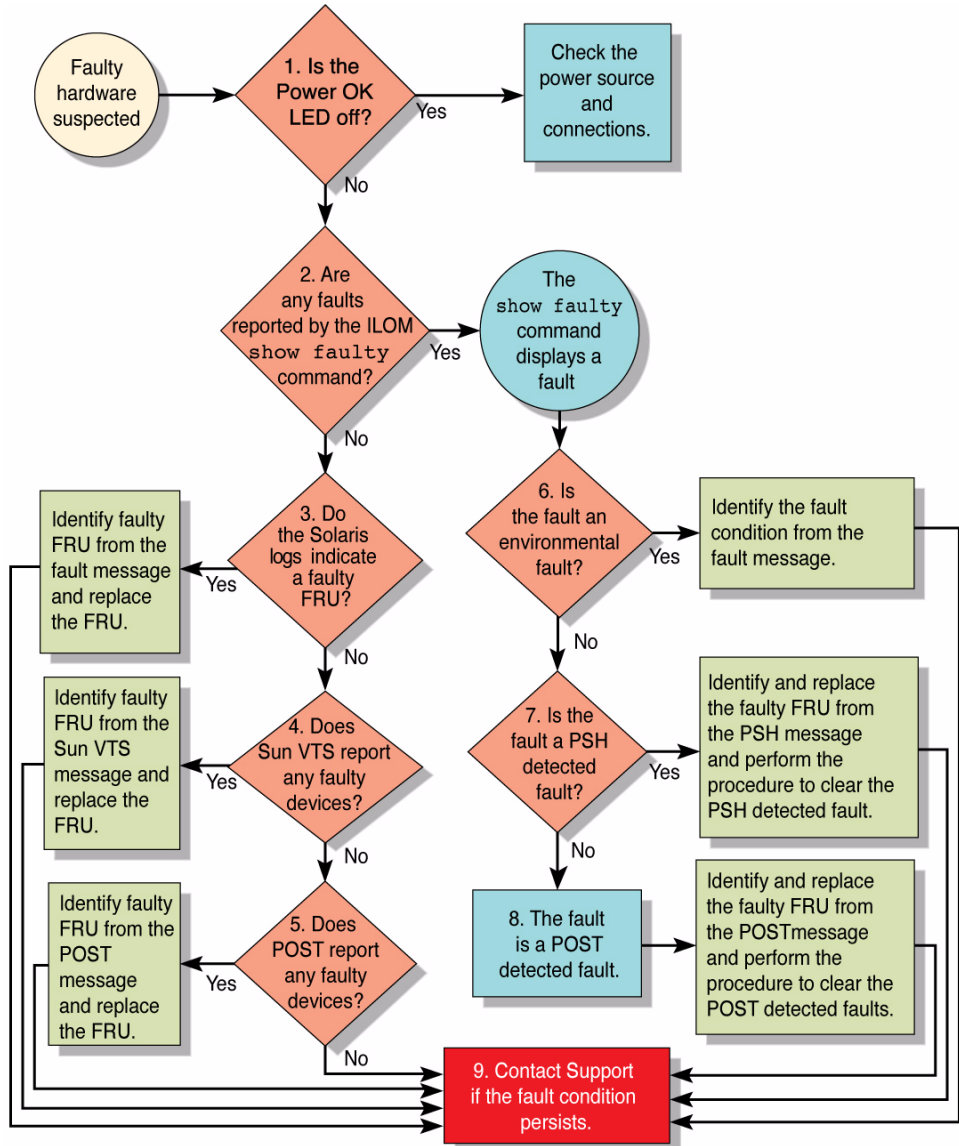
The diagnostic flow chart in [“Diagnostics Process” on page 7](#) describes an approach for using the server module diagnostics to identify a faulty field-replaceable unit (FRU). The diagnostics you use, and the order in which you use them, depend on the nature of the problem you are troubleshooting. Therefore, you might perform some actions and not others.

## **Related Information**

- *SPARC T3 Series Servers Administration Guide*
- [“Diagnostics Process” on page 7](#)
- [“Diagnostics LEDs” on page 10](#)
- [“Managing Faults \(Oracle ILOM\)” on page 12](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(Oracle Solaris PSH\)” on page 25](#)
- [“Managing Faults \(POST\)” on page 31](#)
- [“Managing Components \(ASR Commands\)” on page 44](#)
- [“Checking if Oracle VTS Software Is Installed” on page 48](#)

# Diagnostics Process

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



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

**TABLE:** Diagnostic Flowchart Reference Table

Diagnostic Action	Possible Outcome	Additional Information
<b>Flowchart item 1.</b> Check the Power OK LED.	The Power OK LED is located on the front of the server module.  If this LED is not lit, check the power source and ensure that the server module is properly installed in the modular system chassis.	<ul style="list-style-type: none"> <li>• <a href="#">“Diagnostics LEDs” on page 10</a></li> </ul>
<b>Flowchart item 2.</b> Run the Oracle ILOM <code>show faulty</code> command to check for faults.	<p>The <code>show faulty</code> command displays the following kinds of faults:</p> <ul style="list-style-type: none"> <li>• Environmental and configuration faults</li> <li>• PSH-detected faults</li> <li>• POST-detected faults</li> </ul> <p>Faulty FRUs are identified in fault messages using the FRU name.</p> <p>All Oracle ILOM detected fault messages begin with the characters “SPT”.</p> <p>For additional information on a reported fault, including possible corrective action, go to this web site:  <a href="http://www.sun.com/msg/message-ID">http://www.sun.com/msg/message-ID</a>  where <i>message-ID</i> is the message contained in the fault message.</p>	<ul style="list-style-type: none"> <li>• <a href="#">“Service-Related Oracle ILOM Command Summary” on page 21</a></li> <li>• <a href="#">“Check for Faults (show faulty Command)” on page 18</a></li> </ul>
<b>Flowchart item 3.</b> Check the Oracle Solaris log files for fault information.	<p>The Oracle Solaris message buffer and log files record system events, and provide information about faults.</p> <ul style="list-style-type: none"> <li>• If system messages indicate a faulty device, replace the FRU.</li> <li>• For more diagnostic information, review the VTS report (flowchart item 4).</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">“Interpreting Log Files and System Messages” on page 23</a></li> </ul>
<b>Flowchart item 4.</b> Run VTS software.	<p>VTS is an application you can run to exercise and diagnose FRUs. To run VTS, the server module must be running the Oracle Solaris OS.</p> <ul style="list-style-type: none"> <li>• If VTS reports a faulty device, replace the FRU.</li> <li>• If VTS does not report a faulty device, run POST (flowchart item 5).</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">“Checking if Oracle VTS Software Is Installed” on page 48</a></li> </ul>
<b>Flowchart item 5.</b> Run POST.	POST performs basic tests of the server module components and reports faulty FRUs.	<ul style="list-style-type: none"> <li>• <a href="#">“Managing Faults (POST)” on page 31</a></li> <li>• <a href="#">“Oracle ILOM Properties That Affect POST Behavior” on page 33</a></li> </ul>



**TABLE:** Diagnostic Flowchart Reference Table (*Continued*)

Diagnostic Action	Possible Outcome	Additional Information
<b>Flowchart item 6.</b> Check if the fault is environmental.	Determine if the fault is an environmental fault or a configuration fault. If the fault listed by the <code>show faulty</code> command displays a temperature or voltage fault, then the fault is an environmental fault. Environmental faults can be caused by faulty FRUs, or by environmental conditions such as when computer room ambient temperature is too high, or airflow is blocked. When the environmental condition is corrected, the fault will automatically clear. For additional information on a reported fault, including possible corrective action, go to this web site: <a href="http://www.sun.com/msg/message-ID">http://www.sun.com/msg/message-ID</a> where <i>message-ID</i> is the message contained in the fault message.	<ul style="list-style-type: none"> <li>• “Check for Faults (show faulty Command)” on page 18</li> </ul>
<b>Flowchart item 7.</b> Determine if the fault was detected by PSH.	If the fault message does not begin with the characters “SPT”, the fault was detected by the PSH feature. For additional information on a reported fault, including possible corrective action, go to this web site: <a href="http://www.sun.com/msg/message-ID">http://www.sun.com/msg/message-ID</a> where <i>message-ID</i> is the message contained in the fault message. After the FRU is replaced, perform the procedure to clear PSH detected faults.	<ul style="list-style-type: none"> <li>• “Managing Faults (Oracle Solaris PSH)” on page 25</li> <li>• “Clear PSH-Detected Faults” on page 30</li> </ul>
<b>Flowchart item 8.</b> Determine if the fault was detected by POST.	POST performs basic tests of the server module components and reports faulty FRUs. When POST detects a faulty FRU, POST logs the fault and if possible, takes the FRU offline. POST detected FRUs display the following text in the fault message: Forced fail <i>reason</i> where <i>reason</i> is the name of the power-on routine that detected the failure.	<ul style="list-style-type: none"> <li>• “Managing Faults (POST)” on page 31</li> <li>• “Clear POST-Detected Faults” on page 40</li> </ul>
<b>Flowchart item 9.</b> Contact technical support.	The majority of hardware faults are detected by the server module’s diagnostics. In rare cases a problem might require additional troubleshooting. If you are unable to determine the cause of the problem, contact your service representative for support.	<ul style="list-style-type: none"> <li>• “Support and Accessibility” on page xi</li> </ul>

## Related Information




- *SPARC T3 Series Servers Administration Guide*
- “Diagnostics Overview” on page 5
- “Diagnostics LEDs” on page 10






- “Managing Faults (Oracle ILOM)” on page 12
- “Interpreting Log Files and System Messages” on page 23
- “Managing Faults (Oracle Solaris PSH)” on page 25
- “Managing Faults (POST)” on page 31
- “Managing Components (ASR Commands)” on page 44
- “Checking if Oracle VTS Software Is Installed” on page 48

## Diagnostics LEDs

The server module has LEDs on the front panel and on the hard drives. The LEDs conform to ANSI SIS. For the locations of these LEDs, see [“Front and Rear Panel Components” on page 2](#).

The table identifies the server module LEDs, and explains how to interpret their behavior.

LED or Button	Icon or Label	Color	Description
Locator LED and button		White	<p>You can turn on the Locator LED to identify a particular server module. When on, the LED blinks rapidly. There are two methods for turning a Locator LED on:</p> <ul style="list-style-type: none"> <li>• Issuing the Oracle ILOM command <code>set /SYS/LOCATE value=Fast_Blink.</code></li> <li>• Pressing the Locator button.</li> </ul> <p>The Locator LED functions as the physical presence switch.</p>
Ready to Remove LED		Blue	<p>Steady state - If LED is off, it is not safe to remove the server module from the modular system chassis. You must use Oracle ILOM to shut down the server module and put the blade into ready to remove state before this LED is on.</p>
Service Action Required LED		Amber	<p>Indicates that service is required. POST and Oracle ILOM are two diagnostics tools that can detect a fault or failure resulting in this indication. Also, faults detected by Solaris PSH can result in Oracle ILOM lighting this LED.</p> <p>The Oracle ILOM <code>show faulty</code> command provides details about any faults that cause this indicator to light.</p> <p>Under some fault conditions, individual component fault LEDs are turned on in addition to the Service Action Required LED.</p>

LED or Button	Icon or Label	Color	Description
Power OK LED		Green	<p>Indicates the following conditions:</p> <ul style="list-style-type: none"> <li>• Off – System is not running in its normal state. System power might be off. The SP might be running.</li> <li>• Steady on – System is powered on and is running in its normal operating state. No service actions are required.</li> <li>• Fast blink – System is running in standby mode and can be quickly returned to full function.</li> <li>• Slow blink – A normal, but transitory activity is taking place. Slow blinking might indicate that system diagnostics are running, or the system is booting.</li> </ul>
On/Standby button		n/a	<p>The recessed Power button toggles the system on or off.</p> <ul style="list-style-type: none"> <li>• Press once to turn the system on.</li> <li>• Press once to shut the system down to a standby state.</li> <li>• Press and hold for 4 seconds to perform an emergency shutdown.</li> </ul>
HDD Ready to Remove LED		Blue	Indicates that a hard drive can be removed during a hot-plug operation.
HDD Service Action Required LED		Amber	Indicates that the hard drive has experienced a fault condition.
HDD OK/Activity LED		Green	<p>On HDDs, indicates the following drive status:</p> <ul style="list-style-type: none"> <li>• On – Drive is idle and available for use.</li> <li>• Off – Read or write activity is in progress.</li> </ul>

## Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Managing Faults \(Oracle ILOM\)” on page 12](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(Oracle Solaris PSH\)” on page 25](#)
- [“Managing Faults \(POST\)” on page 31](#)
- [“Managing Components \(ASR Commands\)” on page 44](#)
- [“Checking if Oracle VTS Software Is Installed” on page 48](#)

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# Managing Faults (Oracle ILOM)

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

- [“Oracle ILOM Troubleshooting Overview” on page 12](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Display FRU Information \(show Command\)” on page 17](#)
- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 20](#)
- [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#)
- [“Service-Related Oracle ILOM Command Summary” on page 21](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)

## Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(Oracle Solaris PSH\)” on page 25](#)
- [“Managing Faults \(POST\)” on page 31](#)
- [“Managing Components \(ASR Commands\)” on page 44](#)
- [“Checking if Oracle VTS Software Is Installed” on page 48](#)
- [“POST Overview” on page 32](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)

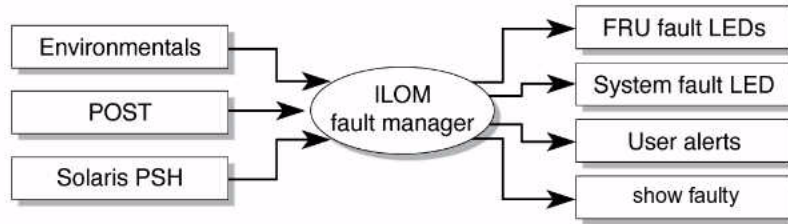
## Oracle ILOM Troubleshooting Overview

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

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

# Fault Management

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



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

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

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

If the conditions responsible for the alert go away, the fault manager will detect the change and will stop logging alerts for that condition.

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

You must replace a FRU identified as having a *fault* condition.

In the event of a system fault, Oracle ILOM ensures that the Service Action Required LED is turned on, FRUID PROMs are updated, the fault is logged, and alerts are displayed. Faulty FRUs are identified in fault messages using the FRU name.

## Fault Clearing

The SP can detect when a fault is no longer present. When this happens, it clears the fault state in the FRU PROM and extinguishes the Service Action Required LED.

A fault condition can be removed in two ways:

- **Unaided recovery** – Faults caused by environmental conditions can clear automatically if the condition responsible for the fault is no longer present.

- **Repaired fault** – When a fault is repaired by human intervention, such as a FRU replacement, the SP will usually detect the repair automatically and extinguish the Service Action Required LED. If the SP does not perform these actions, you must perform these tasks manually by setting the Oracle ILOM `component_state` or `fault_state` of the faulted component. The procedure for clearing faults manually is described in [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#).

Many environmental faults can automatically recover. For example, a temporary condition might cause the computer room temperature to rise above the maximum threshold, producing an overtemperature fault in the server module. If the computer room temperature then returns to the normal range and the server module’s internal temperature also drops back to an acceptable level, the SP will detect the new fault-free condition. The SP will extinguish the Service Action Required LED and clear the fault state from the FRU PROM.

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

---

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

---

## Oracle Solaris Fault Manager Commands in Oracle ILOM

The Oracle ILOM CLI includes a feature that enables you to access Oracle Solaris fault manager commands, such as `fmadm`, `fmdump`, and `fmstat`, from within the Oracle ILOM shell. This feature is referred to as the Oracle ILOM `faultmgmt` shell.

## HDD Faults

The Oracle Solaris PSH technology does not monitor hard drives for faults. As a result, the SP does not recognize hard drive faults and will not light the fault LEDs on either the server module or the hard drive itself. Use the Oracle Solaris message files to view hard drive faults. See [“View the System Message Log Files” on page 24](#).

### Related Information

- *Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide*
- *SPARC T3 Series Servers Administration Guide*
- [“Oracle ILOM Troubleshooting Overview” on page 12](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)

- “Display FRU Information (show Command)” on page 17
- “Check for Faults (show faulty Command)” on page 18
- “Check for Faults (fmadm faulty Command)” on page 20
- “Clear Faults (clear\_fault\_action Property)” on page 21
- “Service-Related Oracle ILOM Command Summary” on page 21
- “Oracle ILOM Properties That Affect POST Behavior” on page 33

## ▼ Access the SP (Oracle ILOM)

---

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

---

You can access the server module’s SP either directly or through the CMM of the modular system. The following steps are in terms of connecting directly to the server module.

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

- **Serial management port** – Connect a terminal device (such as an ASCII terminal or laptop with terminal emulation) to the serial management port. On the CMM, this connector is labeled SER MGT.  
  
Set up your terminal device for 9600 baud, 8 bit, no parity, 1 stop bit, and no handshaking, and use a null-modem configuration (transmit and receive signals crossed over to enable DTE-to-DTE communication). The crossover adapters supplied with the server module provide a null-modem configuration.
- **Network management port** – Connect this port to an Ethernet network. On the CMM, this connector is labeled NET MGT. This port requires an IP address. By default, this port is configured for DHCP, or you can assign an IP address.

### 2. Decide which interface to use:

- **Oracle ILOM CLI** – The CLI is the default Oracle ILOM UI. Most of the commands and examples in this service manual use this interface. The default login account is `root` with a password of `changeme`.
- **Oracle ILOM browser interface** – Can be used when you access the SP through the network management port and have a browser. Refer to the Oracle ILOM 3.0 documentation for details. This interface is not referenced in this service manual.

### 3. Log in to Oracle ILOM.

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

Example of logging in to the Oracle ILOM CLI:

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

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

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

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

- `show command` – Displays information about individual FRUs.  
See [“Display FRU Information \(show Command\)” on page 17](#).
- `show faulty command` – Displays environmental, POST-detected, and PSH-detected faults.  
See [“Check for Faults \(show faulty Command\)” on page 18](#).

---

**Note** – You can use `fmadm faulty` in the Oracle ILOM `faultmgmt` shell as an alternative to `show faulty`.

---

- `clear_fault_action property of the set command` – Manually clears PSH-detected faults.  
See [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#).

#### Related Information

- *Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide*
- [“Display FRU Information \(show Command\)” on page 17](#)
- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 20](#)
- [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#)
- [“Service-Related Oracle ILOM Command Summary” on page 21](#)



- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)

## ▼ Display FRU Information (show Command)

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

- **At the `->` prompt, enter the `show` command.**

In the following example, the `show` command displays information about a memory module.

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

/SYS/MB/CMP0/BOB0/CH0/D0
Targets:
  T_AMB
  SERVICE

Properties:
  Type = DIMM
  ipmi_name = B0/C0/D0
  component_state = Enabled
  fru_name = 2048MB DDR3 SDRAM
  fru_description = DDR3 DIMM 2048 Mbytes
  fru_manufacturer = Samsung
  fru_version = 0
  fru_part_number = *****
  fru_serial_number = *****
  fault_state = OK
  clear_fault_action = (none)

Commands:
  cd
  set
  show
```

### Related Information

- [“Diagnostics Process” on page 7](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 20](#)
- [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#)
- [“Service-Related Oracle ILOM Command Summary” on page 21](#)

## ▼ Check for Faults (show faulty Command)

Use the Oracle ILOM show faulty command to display the following kinds of faults and alerts:

- **Environmental or configuration faults** – Faults caused by temperature or voltage problems. Environmental faults can also be caused by room temperature or blocked air flow.
- **POST-detected faults** – Faults on devices detected by the POST diagnostics.
- **PSH-detected faults** – Faults detected by the Oracle Solaris PSH technology.

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

2. If a fault is displayed, check the output to determine the nature of the fault.

The following examples show the different kinds of output that might be displayed:

- Example of the `show faulty` command when no faults are present:

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

- Example of the `show faulty` command displaying a fault when one of the AC inputs for power supply PS0 is not plugged in:

```
-> show faulty
Target                | Property                | Value
-----+-----+-----
/SP/faultmgmt/0      | fru                    | /SYS/PS0
/SP/faultmgmt/0      | class                  | fault.chassis.env.power.loss
faults/0              |
/SP/faultmgmt/0      | sunw-msg-id            | SPT-8000-5X
faults/0              |
/SP/faultmgmt/0      | uuid                   | 64d52ce4-614e-693f-bb71-ea3f829d
faults/0              |                         | ad73
/SP/faultmgmt/0      | timestamp               | 2010-10-14/20:14:13
faults/0              |
/SP/faultmgmt/0      | detector                | /SYS/PS0/S1/V_IN_ERR
faults/0              |
/SP/faultmgmt/0      | product_serial_number  | 1030NND0D2
faults/0              |
```

/SP/faultmgmt/0	chassis_serial_number	0000000-0000000000
faults/0		
->		

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

-> <b>show faulty</b>		
Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB1/CH0/D0
/SP/faultmgmt/0/ faults/0	timestamp	Oct 12 16:40:56
/SP/faultmgmt/0/ faults/0	sp_detected_fault	/SYS/MB/CMP0/BOB1/CH0/D0 Forced fail (POST)

- Example of the show faulty command displaying a fault that was detected by the PSH technology. These kinds of faults are identified by the presence of a UUID value.

-> <b>show faulty</b>		
Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB0/CH0/D0
/SP/faultmgmt/0	timestamp	Mar 29 22:43:59
/SP/faultmgmt/0/ faults/0	sunw-msg-id	SUN4V-8000-DX
/SP/faultmgmt/0/ faults/0	uuid	3aa7c854-9667-e176-efe5-e487e520 7a8a
/SP/faultmgmt/0/ faults/0	timestamp	Mar 29 22:43:59

### Related Information

- [“Diagnostics Process” on page 7](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Display FRU Information \(show Command\)” on page 17](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 20](#)
- [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#)
- [“Service-Related Oracle ILOM Command Summary” on page 21](#)

## ▼ Check for Faults (fmadm faulty Command)

The following is an example of the `fmadm faulty` command, which is an alternative to the `show faulty` command.

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

---

**Note** – The characters `SPT` at the beginning of a message ID indicate that Oracle ILOM detected the fault.

---

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

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

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

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                msgid                Severity
-----
2010-08-11/14:54:23 *****_****-****-****-***** SPT-8000-LC  Critical
...
```

3. Type the `exit` command when you are finished using the Oracle ILOM `faultmgt` shell.

```
faultmgmtsp> exit
```

### Related Information

- “Diagnostics Process” on page 7
- “Access the SP (Oracle ILOM)” on page 15
- “Display FRU Information (show Command)” on page 17
- “Check for Faults (show faulty Command)” on page 18
- “Clear Faults (clear\_fault\_action Property)” on page 21
- “Service-Related Oracle ILOM Command Summary” on page 21

## ▼ Clear Faults (clear\_fault\_action Property)

Use the `clear_fault_action` property with the `set` command to manually clear PSH-detected faults for a FRU.

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

---

**Note** – This procedure clears the fault from the SP but not from the host. If the fault persists in the host, clear it manually as described in [“Clear PSH-Detected Faults” on page 30](#).

---

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

Example:

```
-> set /SYS/MB/CMP0/BOB0/CH0/D0 clear_fault_action=True
Are you sure you want to clear /SYS/MB/CMP0/BOB0/CH0/D0 (y/n)? y
Set 'clear_fault_action' to 'true'
```

### Related Information

- [“Diagnostics Process” on page 7](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Display FRU Information \(show Command\)” on page 17](#)
- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 20](#)
- [“Service-Related Oracle ILOM Command Summary” on page 21](#)

## Service-Related Oracle ILOM Command Summary

The following table describes the Oracle ILOM shell commands most frequently used when performing service-related tasks.

Oracle ILOM Command	Description
<code>help [command]</code>	Displays a list of all available commands with syntax and descriptions. Specifying a command name as an option displays help for that command.
<code>set /HOST send_break_action=break</code>	Takes the host server module from the OS to either kmdb or OBP (equivalent to a Stop-A), depending on the mode Oracle Solaris software was booted.
<code>set /SYS/component clear_fault_action=true</code>	Manually clears host-detected faults. The <i>component</i> is the unique ID of the device with a fault to be cleared.
<code>start /HOST/console</code>	Connects you to the host system.
<code>show /HOST/console/history</code>	Displays the contents of the system's console buffer.
<code>set /HOST/bootmode property=value</code>	Controls the host server module OBP firmware method of booting. <i>property</i> is <i>state</i> , <i>config</i> , or <i>script</i> .
<code>stop /SYS</code> <code>start /SYS</code>	Powers off the host server module and then powers on the host server module.
<code>stop /SYS</code>	Powers off the host server module.
<code>start /SYS</code>	Powers on the host server module.
<code>reset /SYS</code>	Generates a hardware reset on the host server module.
<code>reset /SP</code>	Reboots the SP.
<code>set /SYS keyswitch_state=value</code>	Sets the virtual keyswitch. <i>value</i> is <i>normal</i> , <i>standby</i> , <i>diag</i> , or <i>locked</i> .
<code>set /SYS/LOCATE value=value</code>	Turns the Locator LED on the server module on or off. <i>value</i> is <i>Fast_blink</i> or <i>Off</i> .
<code>show faulty</code>	Displays current system faults. See <a href="#">“Check for Faults (show faulty Command)” on page 18</a> .
<code>show /SYS keyswitch_state</code>	Displays the status of the virtual keyswitch.
<code>show /SYS/LOCATE</code>	Displays the current state of the Locator LED as either on or off.
<code>show /SP/logs/event/list</code>	Displays the history of all events logged in the SP event buffers (in RAM or the persistent buffers).
<code>show /HOST</code>	Displays information about the operating state of the host system, whether the hardware is providing service, and system firmware version information.
<code>show /SYS</code>	Displays information about the system serial number.

### Related Information

- [“Oracle ILOM Troubleshooting Overview” on page 12](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Display FRU Information \(show Command\)” on page 17](#)
- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 20](#)
- [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)

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## Interpreting Log Files and System Messages

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

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

- [“Check the Message Buffer \(dmesg Command\)” on page 24](#)
- [“View the System Message Log Files” on page 24](#)
- [“List FRU Status \(prtdiag Command\)” on page 25](#)

### Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Managing Faults \(Oracle ILOM\)” on page 12](#)
- [“Managing Faults \(Oracle Solaris PSH\)” on page 25](#)
- [“Managing Faults \(POST\)” on page 31](#)
- [“Managing Components \(ASR Commands\)” on page 44](#)
- [“Checking if Oracle VTS Software Is Installed” on page 48](#)

## ▼ Check the Message Buffer (dmesg Command)

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 the System Message Log Files” on page 24](#)
- [“List FRU Status \(prtdiag Command\)” on page 25](#)

## ▼ View the System Message Log Files

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

The `/var/adm` directory contains several message files. The most recent messages are in the `/var/adm/messages` file. After a period of time (usually every week), a new message file is automatically created. The original contents of the messages file are rotated to a file named `messages.0`. Over a period of time, the messages are further rotated to `messages.1` and `messages.2`, and then deleted.

1. Log in as superuser.

2. Type:

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

Or, if you want to view all logged messages, type:

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

### Related Information

- [“Check the Message Buffer \(dmesg Command\)” on page 24](#)



## ▼ List FRU Status (prtdiag Command)

- From an Oracle Solaris OS command line, run the `prtdiag` command.  
FRU status information is displayed.

Example:

```
# prtdiag
System Configuration:  Sun Microsystems   sun4v SPARC T3-1B
Memory size: 130560 Megabytes
===== Virtual CPUs =====

CPU ID Frequency Implementation      Status
-----
0      1649 MHz  SPARC-T3             on-line
1      1649 MHz  SPARC-T3             on-line
<...>
<...>

===== FRU Status =====
All FRUs are enabled.
```

### Related Information

- [“Check the Message Buffer \(dmesg Command\)” on page 24](#)
- [“View the System Message Log Files” on page 24](#)
- [“Display FRU Information \(show Command\)” on page 17](#)

---

## Managing Faults (Oracle Solaris PSH)

The following topics describe the Oracle Solaris PSH feature:

- [“Oracle Solaris PSH Technology Overview” on page 26](#)
- [“PSH-Detected Fault Example” on page 27](#)
- [“Check for PSH-Detected Faults” on page 28](#)
- [“Clear PSH-Detected Faults” on page 30](#)

### Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)

- “Managing Faults (Oracle ILOM)” on page 12
- “Interpreting Log Files and System Messages” on page 23
- “Managing Faults (POST)” on page 31
- “Managing Components (ASR Commands)” on page 44
- “Checking if Oracle VTS Software Is Installed” on page 48
- “POST Overview” on page 32

## Oracle Solaris PSH Technology Overview

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

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

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

The PSH technology covers the following server module components:

- CPU
- Memory
- I/O subsystem

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

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

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

### Related Information

- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“PSH-Detected Fault Example” on page 27](#)
- [“Check for PSH-Detected Faults” on page 28](#)
- [“Clear PSH-Detected Faults” on page 30](#)

## PSH-Detected Fault Example

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

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

---

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

---

### Related Information

- [“Oracle Solaris PSH Technology Overview” on page 26](#)
- [“Check for PSH-Detected Faults” on page 28](#)
- [“Clear PSH-Detected Faults” on page 30](#)

## ▼ Check for PSH-Detected Faults

Use the `fmadm faulty` command to display the list of faults detected by the Oracle Solaris PSH facility. You can run this command either from the host or through the Oracle ILOM `fmadm` shell.

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

### 1. Check the event log:

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

Platform      : sun4v          Chassis_id      :
Product_sn    :

Fault class   : fault.cpu.generic-sparc.strand
Affects       : cpu:///cpuid=**/serial=*****
                faulted and taken out of service
FRU           : "/SYS/MB"
(hc:///product-id=*****:product-sn=*****:server-id=***-*****-*****:
chassis-id=*****:*****-*****:serial=*****:revision=05/
chassis=0/motherboard=0)
                faulty

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

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

Impact        : System performance may be affected.

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

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

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

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

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

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

In the current example, enter this in the browser address window:

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

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

```
Correctable strand errors exceeded acceptable levels

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

## 3. Follow the suggested actions to repair the fault.

### Related Information

- “PSH-Detected Fault Example” on page 27
- “Clear PSH-Detected Faults” on page 30

## ▼ Clear PSH-Detected Faults

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

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

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

Platform      : sun4v          Chassis_id      :
Product_sn    :

Fault class   : fault.cpu.generic-sparc.strand
Affects       : cpu:///cpuid=**/serial=*****
                faulted and taken out of service
FRU           : "/SYS/MB"
(hc://:product-id=****:product-sn=****:server-id=***-****-****:
chassis-id=****:****-****:serial=****:revision=05/
chassis=0/motherboard=0)
                faulty

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

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

Impact        : System performance may be affected.

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

- If no fault is reported, you do not need to do anything else. Do not perform the subsequent steps.
- If a fault is reported, continue to the next step.

### 3. Clear the fault from all persistent fault records.

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

```
# fmadm repair UUID
```

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

```
# fmadm repair 21a8b59e-89ff-692a-c4bc-f4c5cccca8c8
```

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

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

#### Related Information

- [“Oracle Solaris PSH Technology Overview” on page 26](#)
- [“PSH-Detected Fault Example” on page 27](#)
- [“Clear PSH-Detected Faults” on page 30](#)

---

## Managing Faults (POST)

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

- [“POST Overview” on page 32](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)
- [“Configure How POST Runs” on page 35](#)
- [“Run POST With Maximum Testing” on page 37](#)
- [“Interpret POST Fault Messages” on page 39](#)
- [“Clear POST-Detected Faults” on page 40](#)
- [“POST Error Message Syntax” on page 42](#)

#### Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)

- [“Managing Faults \(Oracle ILOM\)” on page 12](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(Oracle Solaris PSH\)” on page 25](#)
- [“Managing Components \(ASR Commands\)” on page 44](#)
- [“Checking if Oracle VTS Software Is Installed” on page 48](#)

## POST Overview

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

You can also run POST as system-level hardware diagnostic tool. To do this, use the Oracle ILOM `set` command to set the parameter `keyswitch_state` to `diag`.

You can also set other Oracle ILOM properties to control various other aspects of POST operations. For example, you can specify the events that cause POST to run, the level of testing POST performs, and the amount of diagnostic information POST displays. These properties are listed and described in [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#).

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

### Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)
- [“Configure How POST Runs” on page 35](#)
- [“Run POST With Maximum Testing” on page 37](#)
- [“Interpret POST Fault Messages” on page 39](#)
- [“Clear POST-Detected Faults” on page 40](#)
- [“POST Error Message Syntax” on page 42](#)



# Oracle ILOM Properties That Affect POST Behavior

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

---

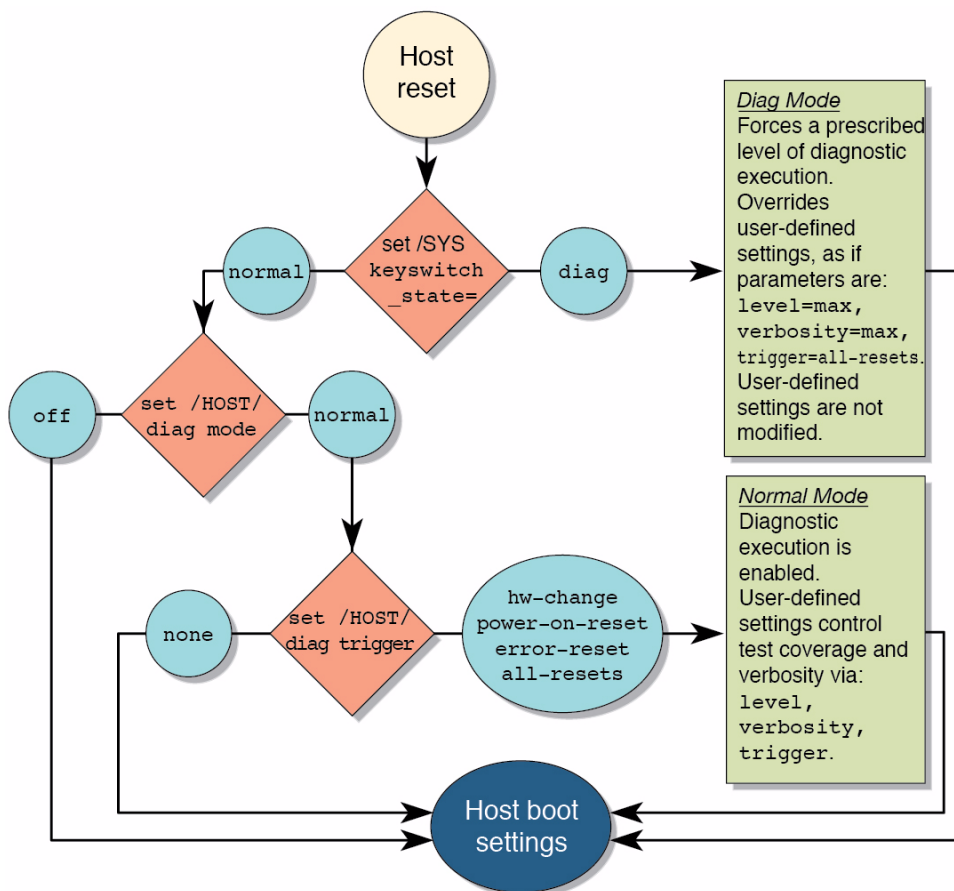
**Note** – The value of `keyswitch_state` must be `normal` when individual POST parameters are changed.

---

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

Parameter	Values	Description
	max	POST displays all test, informational, and some debugging messages.
	debug	
	none	No POST output is displayed.

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



The following table shows combinations of Oracle ILOM parameters and associated POST modes.

Oracle ILOM Parameter	Normal Diagnostic Mode (Default Settings)	No POST Execution	Service Mode Using the Keyswitch_state
keyswitch_state*	normal	normal	diag
/HOST/diag mode	normal	Off	N/A
/HOST/diag level	max	N/A	N/A
/HOST/diag trigger	hw-change error-reset	none	N/A
/HOST/diag verbosity	normal	N/A	N/A
Description of POST Execution	This is the default POST configuration. This configuration tests the system thoroughly and suppresses some of the detailed POST output.	POST does not run, resulting in quick system initialization. This configuration is not suggested.	POST runs the full spectrum of tests with the maximum output displayed.

\* The keyswitch\_state parameter, when set to diag, overrides all the other POST variables.

### Related Information

- [“POST Overview” on page 32](#)
- [“Configure How POST Runs” on page 35](#)
- [“Run POST With Maximum Testing” on page 37](#)
- [“Interpret POST Fault Messages” on page 39](#)
- [“Clear POST-Detected Faults” on page 40](#)
- [“POST Error Message Syntax” on page 42](#)

## ▼ Configure How POST Runs

### 1. Log in to Oracle ILOM -> prompt.

See [“Access the SP \(Oracle ILOM\)” on page 15](#).

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

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

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

For possible values for the `keyswitch_state` parameter, see [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#).

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

Syntax:

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

See [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#) for a list of parameters and values.

Examples:

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

or

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

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

Example, showing default values:

```
-> show /HOST/diag

/HOST/diag
  Targets:

  Properties:
    error_reset_level = max
    error_reset_verbosity = normal
    hw_change_level = max
    hw_change_verbosity = normal
    level = max
    mode = normal
    power_on_level = max
    power_on_verbosity = normal
    trigger = hw-change error-reset
    verbosity = normal
```

```
Commands :  
    cd  
    set  
    show  
->
```

### Related Information

- [“POST Overview” on page 32](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)
- [“Run POST With Maximum Testing” on page 37](#)
- [“Interpret POST Fault Messages” on page 39](#)
- [“Clear POST-Detected Faults” on page 40](#)

## ▼ Run POST With Maximum Testing

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

### 1. Access the Oracle ILOM -> prompt:

See [“Access the SP \(Oracle ILOM\)” on page 15](#).

### 2. Set the virtual keyswitch to diag so that POST will run in service mode.

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

### 3. Reset the system so that POST runs.

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

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

---

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

---

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

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

The following example shows abridged POST output.

```
0:0:0>SPARC T3-1B POST 4.32.1.b 2010/11/15 21:42
0:0:0>
0:0:0>Copyright (c) 2010, Oracle and/or its affiliates. All rights reserved.
0:0:0>POST enabling CMP 0 threads: ffffffff.fffffff.fffffff.fffffff
0:0:0>Diag mode      : 1 [Normal]
0:0:0>Diag level    : 1 [Max]
0:0:0>Diag verbosity : 2 [Normal]
0:0:0>Test Memory....Done
0:0:0>Setup POST Mailbox ....Done
0:0:0>Master CPU Tests Basic....Done
0:0:0>Init MMU.....
0:0:0>Setup POST Mailbox ....Done
0:0:0>L2 Tests....Done
0:0:0>Extended CPU Tests....Done
0:0:0>Scrub Memory....Done
0:0:0>Functional CPU Tests....Done
0:0:0>Extended Memory Tests....Done
0:0:0>SPU CWQ Tests...Done
0:0:0>MAU Tests...Done
0:0:0>IOS register tests....Done
0:0:0>Network Interface Unit Port 0 Tests ..Done
0:0:0>Network Interface Unit Port 1 Tests ..Done
2010-11-18 22:24:47.330 0:0:0>INFO:
2010-11-18 22:24:47.338 0:0:0> POST Passed all devices.
2010-11-18 22:24:47.351 0:0:0>POST:      Return to Host Config.
```

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

See [“Interpret POST Fault Messages”](#) on page 39.

#### Related Information

- [“POST Overview”](#) on page 32
- [“Oracle ILOM Properties That Affect POST Behavior”](#) on page 33
- [“Configure How POST Runs”](#) on page 35
- [“Interpret POST Fault Messages”](#) on page 39
- [“Clear POST-Detected Faults”](#) on page 40

## ▼ Interpret POST Fault Messages

### 1. Run POST.

See “Run POST With Maximum Testing” on page 37.

### 2. View the output and watch for messages that look similar to the following syntax descriptions and example:

- POST error messages use the following syntax, where  $c$  = the core number,  $s$  = the strand number:

```
c:s> ERROR: TEST = failing-test
```

```
c:s > H/W under test = FRU
```

```
c:s > Repair Instructions: Replace items in order listed by  
H/W under test above
```

```
c:s> MSG = test-error-message
```

```
c:s > END_ERROR
```

In this syntax,  $c$  = the core number,  $s$  = the strand number.

- Warning and informational messages use the following syntax:

```
INFO: message
```

or

```
WARNING: message
```

Example:

```
3:2>ERROR: TEST = Data Bitwalk  
3:2>H/W under test = /SYS/MB/BOB1/CH0/D0  
3:2>Repair Instructions: Replace items in order listed by 'H/W  
under test' above.  
3:2>MSG = Pin 149 failed on /SYS/MB/BOB1/CH0/D0 (J1101)  
3:2>END_ERROR  
  
3:2>Decode of Dram Error Log Reg Channel 2 bits  
60000000.0000108c  
3:2> 1 MEC 62 R/W1C Multiple corrected  
errors, one or more CE not logged  
3:2> 1 DAC 61 R/W1C Set to 1 if the error  
was a DRAM access CE  
3:2> 108c SYND 15:0 RW ECC syndrome.  
3:2>  
3:2> Dram Error AFAR channel 2 = 00000000.00000000  
3:2> L2 AFAR channel 2 = 00000000.00000000
```

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

See [“Check for Faults \(show faulty Command\)” on page 18](#).

### Related Information

- [“Clear POST-Detected Faults” on page 40](#)
- [“POST Overview” on page 32](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)
- [“Diagnostics Overview” on page 5](#)
- [“Configure How POST Runs” on page 35](#)
- [“Run POST With Maximum Testing” on page 37](#)

## ▼ Clear POST-Detected Faults

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

In most cases, when POST detects a faulty component, POST logs the fault and automatically takes the failed component out of operation by placing the component in the ASR blacklist. (See [“Managing Components \(ASR Commands\)” on page 44](#)).

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

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

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

```
-> show faulty
```

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



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

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

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

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

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

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

4. Reset the server module.

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

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

Example:

```
-> show faulty
```

Target	Property	Value
-----+-----+-----		
->		

## Related Information

- [“POST Overview” on page 32](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)
- [“Configure How POST Runs” on page 35](#)
- [“Run POST With Maximum Testing” on page 37](#)
- [“Clear POST-Detected Faults” on page 40](#)

# POST Error Message Syntax

POST error messages use the following syntax:

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

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

Warning messages use the following syntax:

```
WARNING: message
```

Informational messages use the following syntax:

```
INFO: message
```

In the following example, POST reports an uncorrectable memory error affecting DIMM locations /SYS/MB/CMP0/BOB0/CH0/D0 and /SYS/MB/CMP0/BOB1/CH0/D0. The error was detected by POST running on node 0, core 7, strand 2.

```
2010-07-03 18:44:13.359 0:7:2>Decode of Disrupting Error Status Reg
(DESR HW Corrected) bits 00300000.00000000
2010-07-03 18:44:13.517 0:7:2>          1    DESR_SOCSRE:      SOC
(non-local) sw_recoverable_error.
2010-07-03 18:44:13.638 0:7:2>          1    DESR_SOCHCCE:     SOC
(non-local) hw_corrected_and_cleared_error.
2010-07-03 18:44:13.773 0:7:2>
2010-07-03 18:44:13.836 0:7:2>Decode of NCU Error Status Reg bits
00000000.22000000
2010-07-03 18:44:13.958 0:7:2>          1    NESR_MCU1SRE:     MCU1 issued
a Software Recoverable Error Request
2010-07-03 18:44:14.095 0:7:2>          1    NESR_MCU1HCCE:     MCU1
issued a Hardware Corrected-and-Cleared Error Request
2010-07-03 18:44:14.248 0:7:2>
2010-07-03 18:44:14.296 0:7:2>Decode of Mem Error Status Reg Branch 1
bits 33044000.00000000
2010-07-03 18:44:14.427 0:7:2>          1    MEU 61      R/W1C Set to 1
on an UE if VEU = 1, or VEF = 1, or higher priority error in same cycle.
2010-07-03 18:44:14.614 0:7:2>          1    MEC 60      R/W1C Set to 1
on a CE if VEC = 1, or VEU = 1, or VEF = 1, or another error in same cycle.
```

```

2010-07-03 18:44:14.804 0:7:2>      1      VEU 57      R/W1C Set to 1
on an UE, if VEF = 0 and no fatal error is detected in same cycle.
2010-07-03 18:44:14.983 0:7:2>      1      VEC 56      R/W1C Set to 1
on a CE, if VEF = VEU = 0 and no fatal or UE is detected in same cycle.
2010-07-03 18:44:15.169 0:7:2>      1      DAU 50      R/W1C Set to 1
if the error was a DRAM access UE.
2010-07-03 18:44:15.304 0:7:2>      1      DAC 46      R/W1C Set to 1
if the error was a DRAM access CE.
2010-07-03 18:44:15.440 0:7:2>
2010-07-03 18:44:15.486 0:7:2>      DRAM Error Address Reg for Branch
1 = 00000034.8647d2e0
2010-07-03 18:44:15.614 0:7:2>      Physical Address is
00000005.d21bc0c0
2010-07-03 18:44:15.715 0:7:2>      DRAM Error Location Reg for Branch
1 = 00000000.00000800
2010-07-03 18:44:15.842 0:7:2>      DRAM Error Syndrome Reg for Branch
1 = dd1676ac.8c18c045
2010-07-03 18:44:15.967 0:7:2>      DRAM Error Retry Reg for Branch 1
= 00000000.00000004
2010-07-03 18:44:16.086 0:7:2>      DRAM Error RetrySyndrome 1 Reg for
Branch 1 = a8a5f81e.f6411b5a
2010-07-03 18:44:16.218 0:7:2>      DRAM Error Retry Syndrome 2 Reg
for Branch 1 = a8a5f81e.f6411b5a
2010-07-03 18:44:16.351 0:7:2>      DRAM Failover Location 0 for
Branch 1 = 00000000.00000000
2010-07-03 18:44:16.475 0:7:2>      DRAM Failover Location 1 for
Branch 1 = 00000000.00000000
2010-07-03 18:44:16.604 0:7:2>
2010-07-03 18:44:16.648 0:7:2>ERROR: POST terminated prematurely. Not
all system components tested.
2010-07-03 18:44:16.786 0:7:2>POST: Return to VBSC
2010-07-03 18:44:16.795 0:7:2>ERROR:
2010-07-03 18:44:16.839 0:7:2>      POST toplevel status has the following
failures:
2010-07-03 18:44:16.952 0:7:2>      Node 0 -----
2010-07-03 18:44:17.051 0:7:2>      /SYS/MB/CMP0/BOB0/CH1/D0 (J1001)
2010-07-03 18:44:17.145 0:7:2>      /SYS/MB/CMP0/BOB1/CH1/D0 (J3001)
2010-07-03 18:44:17.241 0:7:2>END_ERROR

```

## Related Information

- [“Oracle ILOM Properties That Affect POST Behavior” on page 33](#)
- [“Run POST With Maximum Testing” on page 37](#)
- [“Clear POST-Detected Faults” on page 40](#)

---

# Managing Components (ASR Commands)

The following topics explain the role played by the Automatic System Recovery (ASR) feature and how to manage the components it controls.

- [“ASR Overview” on page 44](#)
- [“Display System Components” on page 45](#)
- [“Disable System Components” on page 47](#)
- [“Enable System Components” on page 48](#)

## Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Managing Faults \(Oracle ILOM\)” on page 12](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(Oracle Solaris PSH\)” on page 25](#)
- [“Managing Faults \(POST\)” on page 31](#)
- [“Checking if Oracle VTS Software Is Installed” on page 48](#)

## ASR Overview

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

- CPU strands
- Memory DIMMs
- I/O subsystem

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

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

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

**TABLE:** ASR Commands

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

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

After you enable or disable a component, you must reset (or power cycle) the system for the component’s change of state to take effect. See the *SPARC T3 Series Servers Administration Guide*

**Related Information**

- [“Display System Components” on page 45](#)
- [“Disable System Components” on page 47](#)
- [“Enable System Components” on page 48](#)

▼ **Display System Components**

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

- **At the -> prompt, type the show components command.**  
In the following example, one of the DIMMs (BOB1/CH0/D0) is shown as disabled.

-> <b>show components</b>		
Target	Property	Value
-----+-----+-----		
/SYS/MB/REM	component_state	Enabled

/SYS/MB/FEM0	component_state	Enabled
/SYS/MB/CMP0/L2T0	component_state	Enabled
/SYS/MB/CMP0/L2T1	component_state	Enabled
/SYS/MB/CMP0/L2T2	component_state	Enabled
/SYS/MB/CMP0/L2T3	component_state	Enabled
/SYS/MB/CMP0/L2T4	component_state	Enabled
/SYS/MB/CMP0/L2T5	component_state	Enabled
/SYS/MB/CMP0/L2T6	component_state	Enabled
/SYS/MB/CMP0/L2T7	component_state	Enabled
/SYS/MB/CMP0/CORE0/ P0	component_state	Enabled
/SYS/MB/CMP0/CORE0/ P1	component_state	Enabled
<...>		
<...>		
/SYS/MB/CMP0/MCU0	component_state	Enabled
/SYS/MB/CMP0/MCU1	component_state	Enabled
/SYS/MB/CMP0/NIU0	component_state	Enabled
/SYS/MB/CMP0/NIU1	component_state	Enabled
/SYS/MB/CMP0/ NIU_CORE	component_state	Enabled
/SYS/MB/CMP0/PEX	component_state	Enabled
/SYS/MB/CMP0/PEU0	component_state	Enabled
/SYS/MB/CMP0/PEU1	component_state	Enabled
/SYS/MB/CMP0/BOB0/ CH0/D0	component_state	Enabled
/SYS/MB/CMP0/BOB0/ CH1/D0	component_state	Enabled
/SYS/MB/CMP0/BOB1/ CH0/D0	component_state	Disabled
/SYS/MB/CMP0/BOB1/ CH1/D0	component_state	Enabled
/SYS/MB/CMP0/BOB2/ CH0/D0	component_state	Enabled
/SYS/MB/CMP0/BOB2/ CH1/D0	component_state	Enabled
/SYS/MB/CMP0/BOB3/ CH0/D0	component_state	Enabled
/SYS/MB/CMP0/BOB3/ CH1/D0	component_state	Enabled
/SYS/MB/GBE	component_state	Enabled
/SYS/MB/USB	component_state	Enabled
/SYS/MB/VIDEO	component_state	Enabled
/SYS/MB/PCI- SWITCH0	component_state	Enabled
/SYS/MB/PCI-	component_state	Enabled

```
SWITCH1
```

```
->
```

### Related Information

- [“View the System Message Log Files” on page 24](#)
- [“Disable System Components” on page 47](#)
- [“Enable System Components” on page 48](#)

## ▼ Disable System Components

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

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

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

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

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

---

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

---

### Related Information

- [“View the System Message Log Files” on page 24](#)
- [“Display System Components” on page 45](#)
- [“Enable System Components” on page 48](#)

## ▼ Enable System Components

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

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

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

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

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

---

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

---

### Related Information

- [“View the System Message Log Files” on page 24](#)
- [“Display System Components” on page 45](#)
- [“Disable System Components” on page 47](#)

---

## Checking if Oracle VTS Software Is Installed

Oracle VTS (previously named SunVTS) is a validation test suite that you can use to test this server module. This section provides an overview and a way to check if VTS is installed. For comprehensive VTS information, refer to the Oracle VTS 7.0 documentation.

- [“Oracle VTS Overview” on page 49](#)
- [“Check if Oracle VTS Software Is Installed” on page 50](#)



## Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Managing Faults \(Oracle ILOM\)” on page 12](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(Oracle Solaris PSH\)” on page 25](#)
- [“Managing Faults \(POST\)” on page 31](#)
- [“Managing Components \(ASR Commands\)” on page 44](#)

## Oracle VTS Overview

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

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

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

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

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

VTS also provides a choice of security mechanisms.

VTS software is provided in the preinstalled Oracle Solaris OS that shipped with the server module.

## Related Information

- Oracle VTS documentation
- [“Check if Oracle VTS Software Is Installed” on page 50](#)

## ▼ Check if Oracle VTS Software Is Installed

1. Log in as superuser.
2. Check for the presence of VTS packages:.

```
# pkginfo -l SUNWvts SUNWvtsr SUNWvtsts SUNWvtsmn
```

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

### Related Information

- Oracle VTS documentation

# Preparing for Service

---

The following topics describe how to prepare the server module for servicing.

- [“General Safety Information” on page 51](#)
- [“Tools Needed for Service” on page 53](#)
- [“Find the Modular System Serial Number” on page 53](#)
- [“Find the Server Module Serial Number” on page 54](#)
- [“Locate the Server Module” on page 55](#)
- [“Removing the Server Module From the Modular System for Service” on page 55](#)
- [“Remove the Server Module From the Modular System” on page 59](#)
- [“Remove the Cover” on page 62](#)

## **Related Information**

- [“Returning the Server Module to Operation” on page 111](#)

---

## General Safety Information

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

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

## Safety Symbols

You will see the following symbols in various places in the server module documentation. Note the explanations provided next to each symbol.



---

**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 Safety Measures

ESD sensitive devices, such as the motherboard, 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.

---

## Antistatic Wrist Strap Use

Wear an antistatic wrist strap and use an antistatic mat when handling components such as hard drive assemblies, circuit boards, or PCI cards. When servicing or removing server module 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 module.

## Antistatic Mat

Place ESD-sensitive components such as cards and DIMMs on an antistatic mat.

### Related Information

- [“Returning the Server Module to Operation” on page 111](#)

---

## Tools Needed for Service

The following tools are required for service procedures:

- Antistatic wrist strap
- Antistatic mat
- Stylus or pencil (to operate the power button)
- UCP-3 dongle (UCP-4 dongle can be used, but see instructions in the *SPARC T3-1B Server Module Installation Guide*)
- Blade filler panel

### Related Information

- [“General Safety Information” on page 51](#)

---

## ▼ Find the Modular System Serial Number

To obtain support for your server module, you need the serial number of the Sun Blade 6000 modular system in which the server module is located, not the serial number of the server module. The serial number of the modular system is provided on a label on the upper left edge of the front bezel.

Use the following procedure to obtain the serial number remotely.

**1. Log in to the CMM of the modular system.**

See the documentation for the Sun Blade 6000 modular system.

**2. Type**

```
-> show /CH
```

3. In the output, locate the value for `product_serial_number`.

That number is the serial number of the modular system.

### Related Information

- [“Find the Server Module Serial Number” on page 54](#)
- [“Locate the Server Module” on page 55](#)

---

## ▼ Find the Server Module Serial Number

---

**Note** – To obtain support for your server module, you need the serial number of the Sun Blade 6000 modular system in which the server module is located, not the serial number of the server module. See [“Find the Modular System Serial Number” on page 53](#).

---

The serial number of the server module is located on a sticker on the RFID mounted in the center of the front panel. However, this label is not present on a system that has been moved into a new enclosure assembly. You also can type the Oracle ILOM `show /SYS` command to display the number.

- **Access the Oracle ILOM CLI and type:**

```
-> show /SYS

/SYS
  Targets:
    SERVICE
    LOCATE
    ACT
    PS_FAULT
    TEMP_FAULT
    FAN_FAULT
  ...
  Properties:
    type = Host System
    keyswitch_state = Normal
    product_name = SPARC T3-1B
    product_serial_number = 0723BBC006 <-
    fault_state = OK
    clear_fault_action = (none)
    power_state = On
```

### Related Information

- [“Locate the Server Module” on page 55](#)
- [“Find the Modular System Serial Number” on page 53](#)

---

## ▼ Locate the Server Module

To identify a specific server module from others in the modular system, perform the following steps.

1. Log in to Oracle ILOM on the server module you plan to locate.
2. Type:

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

The Locator LED on the server module blinks.

3. Identify the server module with a blinking white LED.
4. Once you locate the server module, press the Locator LED to turn it off.

---

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

---

### Related Information

- [“Remove the Server Module From the Modular System” on page 59](#)

---

## Removing the Server Module From the Modular System for Service

Perform the following tasks:

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Prepare the Server Module for Removal” on page 58](#)
- [“Remove the Server Module From the Modular System” on page 59](#)

- [“Remove the Cover” on page 62](#)

## Related Information

- [“Install the Server Module Into the Modular System” on page 112](#)

## ▼ Shut Down the Oracle Solaris OS

This topic describes one method for shutting down the Oracle Solaris OS. For information on other ways to shut down the Oracle Solaris OS, refer to the Oracle Solaris OS documentation.

### 1. Log in as superuser or equivalent.

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

### 2. Notify affected users that the server module will be shut down.

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

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

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

### 4. (If applicable) Shut down all logical domains.

Refer to the Oracle Solaris system administration and Oracle VM Manager for SPARC documentation for additional information.

### 5. Shut down the Oracle Solaris OS and reach the `ok` prompt.

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

The following example uses the Oracle Solaris `shutdown` command:

```
# shutdown -g0 -i0 -y

Shutdown started.      Tue Jun 28 13:06:20 PDT 2010

Changing to init state 0 - please wait
Broadcast Message from root (console) on server1 Tue Jun 28
13:06:20...
THE SYSTEM server1 IS BEING SHUT DOWN NOW ! ! !
Log off now or risk your files being damaged
# svc.startd: The system is coming down.  Please wait.
svc.startd: 100 system services are now being stopped.
```



```
Jun 28 13:06:34 dt90-366 syslogd: going down on signal 15
svc.startd: The system is down.
syncing file systems... done
Program terminated

SPARC T3-1B, No Keyboard
OpenBoot 4.30, 16256 MB memory available, Serial # 87305111.
Ethernet address 0:21:28:34:2b:90, Host ID: 85342b90.
{0} ok
```

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

7. At the `->` prompt, type:

```
->stop /SYS
```

---

**Note** – You can also use the Power button on the front of the server module to initiate a graceful shutdown. (See [“Power Off the Server Module \(Power Button - Standby Mode\)”](#) on page 57. This button is recessed to prevent accidental server module power-off. Use the tip of a pen or other stylus to operate this button.

---

#### Related Information

- [“Power Off the Server Module \(Power Button - Standby Mode\)”](#) on page 57
- [“Power Off the Server Module \(Emergency Shutdown\)”](#) on page 58
- [“Prepare the Server Module for Removal”](#) on page 58

## ▼ Power Off the Server Module (Power Button - Standby Mode)

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

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

Use a stylus or the tip of a pen to operate this button. See [“Front and Rear Panel Components”](#) on page 2.

#### Related Information

- [“Shut Down the Oracle Solaris OS”](#) on page 56
- [“Power Off the Server Module \(Emergency Shutdown\)”](#) on page 58

- [“Prepare the Server Module for Removal” on page 58](#)

## ▼ Power Off the Server Module (Emergency Shutdown)



---

**Caution** – All applications and files will be closed abruptly without saving changes. File system corruption might occur.

---

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

Use a stylus or the tip of a pen to operate this button.

### **Related Information**

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Power Off the Server Module \(Power Button - Standby Mode\)” on page 57](#)
- [“Prepare the Server Module for Removal” on page 58](#)

## ▼ Prepare the Server Module for Removal

1. **Log in to Oracle ILOM on the server module you plan to remove.**
2. **Ensure the server module is in standby mode, with the host powered off. Type:**

```
-> show /SYS/ power_state

/SYS
properties:
  power_state = Off
```

If you do not see this message, check that you have performed all the steps in [“Shut Down the Oracle Solaris OS” on page 56](#)

3. **Type:**

```
-> set /SYS/ prepare_to_remove_action=true
Set 'prepare_to_remove_action' to 'true'
```

The server module is in standby mode. Power is removed from the host while standby power is applied to the SP.

4. Confirm that the server module is in standby mode by viewing the blue Ready to Remove LED on the front of the server module.

See [“Front and Rear Panel Components” on page 2](#) to locate this LED. If the Ready to Remove LED is on, the server module is ready for removal from the modular system chassis.

#### Related Information

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Power Off the Server Module \(Power Button - Standby Mode\)” on page 57](#)
- [“Power Off the Server Module \(Emergency Shutdown\)” on page 58](#)

## ▼ Remove the Server Module From the Modular System

Before performing this task, review the following cautions.



---

**Caution** – A server module can weigh as much as 17 pounds (8.0 kg). During removal, hold the server module firmly with both hands.

---



---

**Caution** – Do not stack server modules higher than five units tall.

---



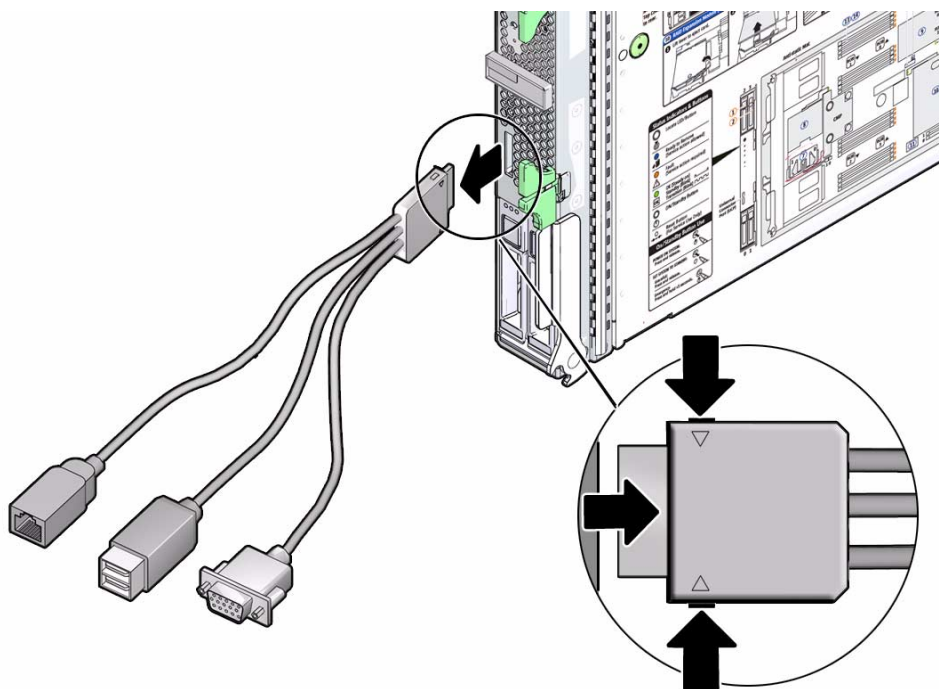
---

**Caution** – Insert a filler panel into the empty server module slot within 60 seconds after removing a server module ensure proper modular system chassis cooling.

---

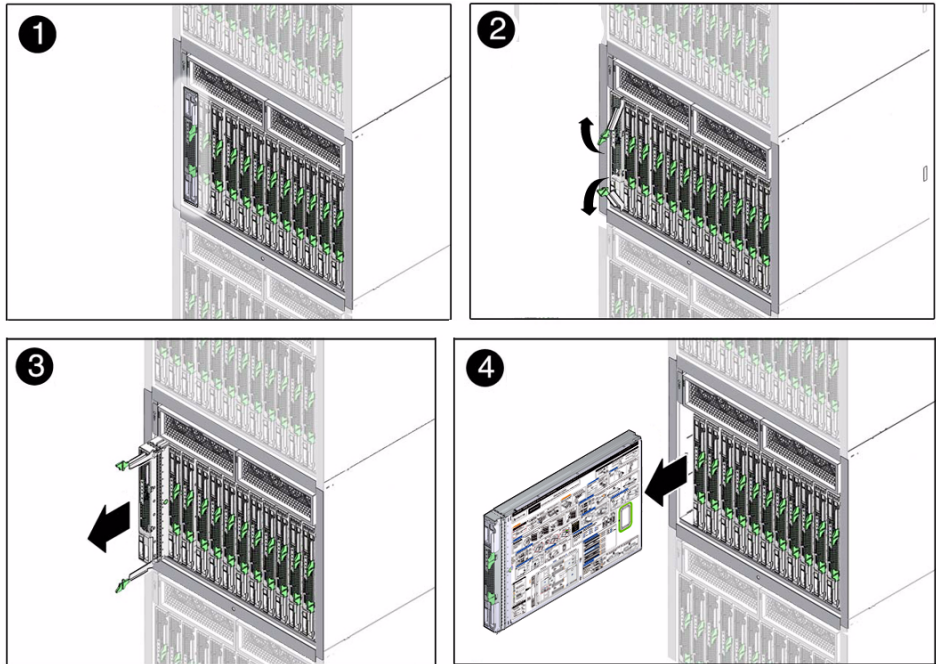
1. If a cable is connected to the front of the server module, disconnect it.

Press the buttons on either side of the UCP to release the connector.



**2. Open both ejector arms (panel 2).**

Squeeze both latches on each of the two ejector arms.



3. Pull the server module halfway out (panel 3).
4. Close the ejector arms.
5. Remove the server module from the modular system.  
Lift the server module with two hands.
6. Place the server module on an antistatic mat or surface.
7. Insert a filler panel into the empty chassis slot.

---

**Note** – When the modular system is operating, you must fill every slot with a filler panel or a server module within 60 seconds.

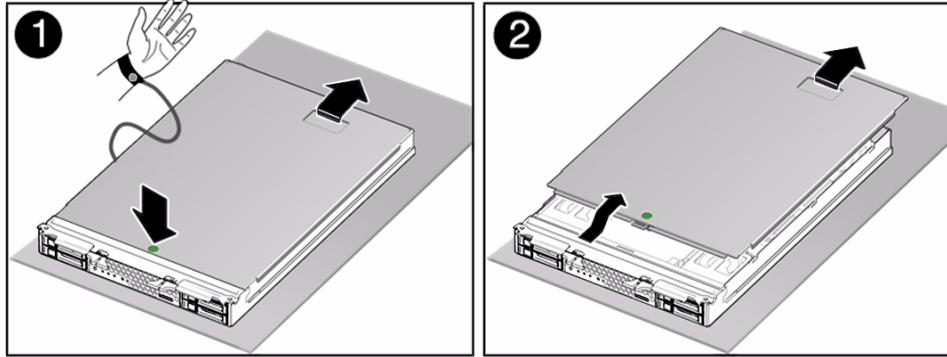
---

#### **Related Information**

- [“Remove the Cover” on page 62](#)
- [“Install the Server Module Into the Modular System” on page 112](#)

## ▼ Remove the Cover

1. Attach an antistatic strap to your wrist and then to a metal area on the server module.
2. While pressing the cover release button, slide the cover toward the rear of the server module about half an inch (1 cm).



3. Lift the cover off the server module chassis.

### Related Information

- [“Illustrated Parts Breakdown” on page 3](#)
- [“Replace the Cover” on page 111](#)

# Servicing Hard Drives

---

The following topics apply to hard drives installed in the external slots of the server module.

Description	Links
Determine if you can remove and replace a drive using hot-plugging capabilities.	<a href="#">“Drive Hot-Plugging Rules” on page 63</a>
Replace a drive.	<a href="#">“Remove a Drive” on page 64</a> <a href="#">“Replace or Add a Drive” on page 65</a>
Add an additional drive to the server module.	<a href="#">“Remove a Drive Filler” on page 67</a> <a href="#">“Replace or Add a Drive” on page 65</a>
Install a drive filler.	<a href="#">“Install a Drive Filler” on page 67</a>

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

---

## Drive Hot-Plugging Rules

To safely remove a hard drive, you must:

- Prevent any applications from accessing the drive.
- Remove the logical software links.

Drives cannot be hot-plugged if:

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

If your drive falls into these conditions, you must shut down the Oracle Solaris OS before you replace the drive.

### Related Information

- [“Remove a Drive” on page 64](#)
- [“Replace or Add a Drive” on page 65](#)
- [“Shut Down the Oracle Solaris OS” on page 56](#)

---

## ▼ Remove a Drive

### 1. Identify the drive you plan to remove.

Use the Ready to Remove indicator. See [“Diagnostics LEDs” on page 10](#).

### 2. Prepare the drive for removal by performing one of the following:

- Take the drive offline.

The exact commands required to take the drive offline depend on the configuration of your drives. For example, you might need to unmount file systems or perform certain RAID commands.

One command that is commonly used to take a drive offline is the `cfgadm` command. For more information, refer to the Solaris `cfgadm` man page.

- Shut down the Solaris OS.

If the drive cannot be taken offline, shut down the Solaris OS on the server module. See [“Shut Down the Oracle Solaris OS” on page 56](#)

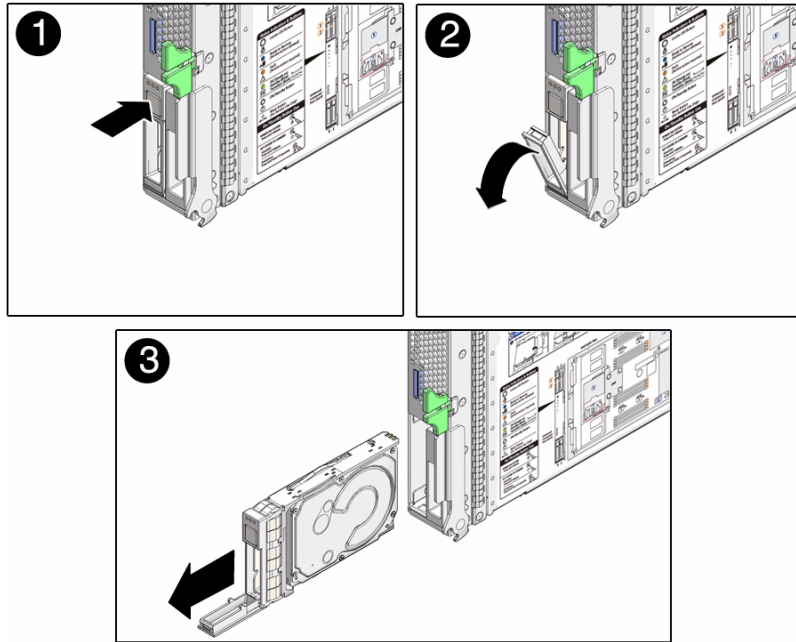
### 3. Verify whether the blue Drive Ready LED is illuminated on the front of the drive.

See [“Diagnostics LEDs” on page 10](#). The blue LED will only be illuminated if the drive was taken offline using `cfgadm` or an equivalent command. It will not be illuminated if Oracle Solaris was shut down.

### 4. Remove the drive as described in the following steps:

- a. Push the latch release button on the drive (panels 1 and 2).





b. Grasp the latch and pull the drive out of the drive slot (panel 3).

5. Insert a drive filler if you are not replacing the drive in this slot.

See [“Install a Drive Filler”](#) on page 67

#### Related Information

- [“Install a Drive Filler”](#) on page 67
- [“Replace or Add a Drive”](#) on page 65

## ▼ Replace or Add a Drive

The physical address of a hard drive is based on the hard drive is physically addressed based on the slot in which it is installed.

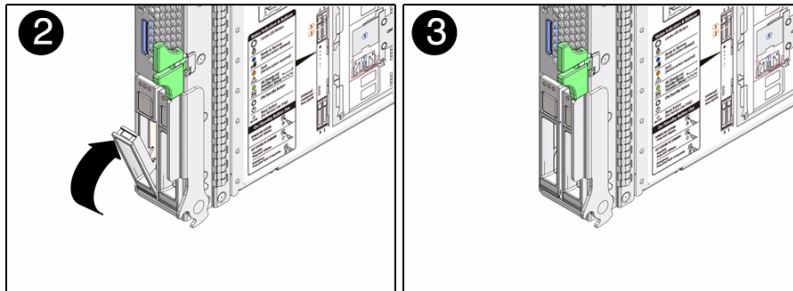
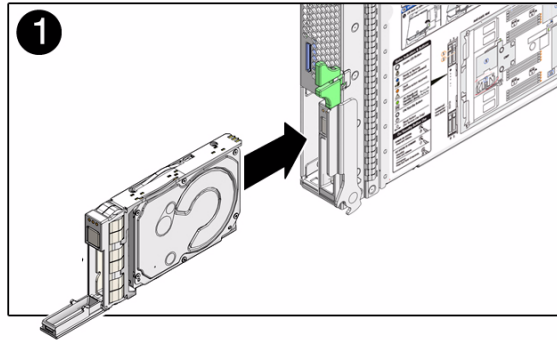
1. Identify the slot in which to install the drive.

- If you are replacing a drive, ensure that you install the replacement drive in the same slot as the drive you removed.
- If you are adding an additional drive, install the drive in the next available drive slot.

2. If necessary, remove the drive filler from this slot.

See [“Remove a Drive Filler”](#) on page 67.

3. Slide the drive into the bay until it is fully seated (panel 1).



4. Close the latch to lock the drive in place (panels 2 and 3).

5. Perform administrative tasks to reconfigure the drive.

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

The following commands might apply to your circumstances:

- You can use the Solaris command `cfgadm -al` to list all disks in the device tree, including unconfigured disks.
- If the disk is not in the list, such as with a newly installed disk, you can use `devfsadm` to configure it into the tree. See the `devfsadm` man page for details.

### Related Information

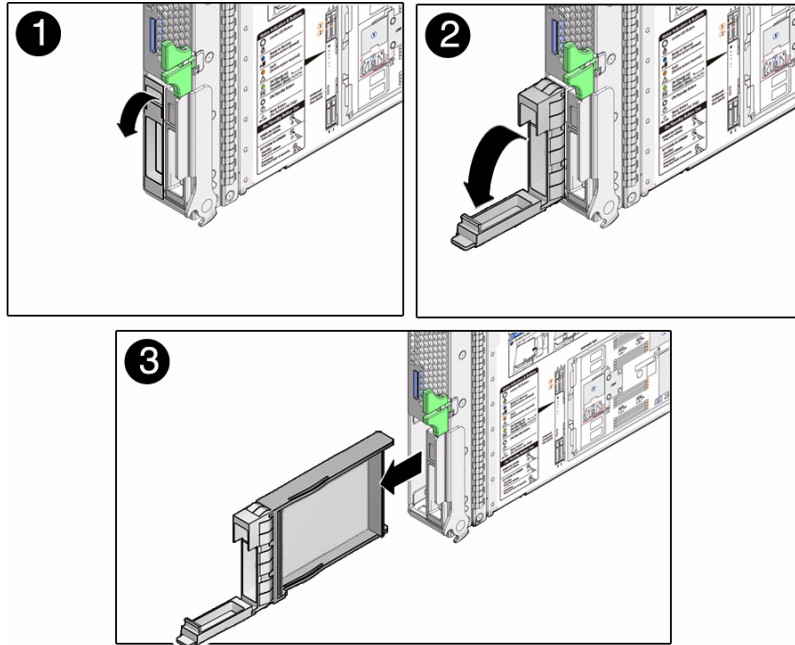
- [“Remove a Drive”](#) on page 64

---

## ▼ Remove a Drive Filler

All drive bays must be populated by either a drive or a filler.

1. Open the filler lever (panels 1 and 2).



2. Pull to remove the filler (panel 3).

### Related Information

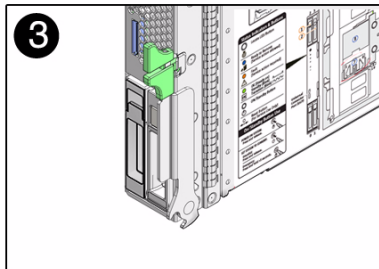
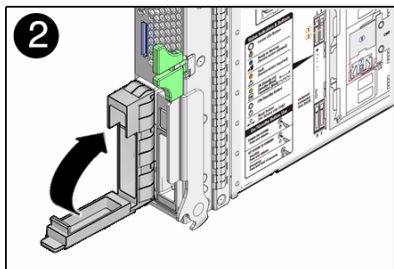
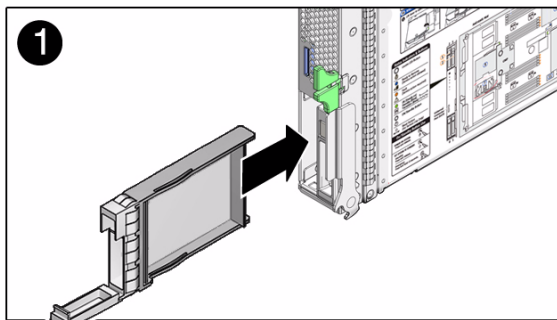
- [“Replace or Add a Drive” on page 65](#)
- [“Install a Drive Filler” on page 67](#)

---

## ▼ Install a Drive Filler

All drive bays must be populated by either a drive or a filler.

1. Extend the filler handle, then align the filler to the empty drive bay (panel 1).



2. Push the filler into place.
3. Close the filler lever (panels 2 and 3).

### Related Information

- [“Remove a Drive” on page 64](#)
- [“Remove a Drive Filler” on page 67](#)

# Servicing Memory

The following topics describe how to determine which DIMMs are faulty, remove DIMMs, install DIMMs, and verify DIMM functionality after installation.

Description	Links
Understand memory faults.	<a href="#">“Memory Faults” on page 69</a>
Replace a faulty DIMM.	<a href="#">“Locate a Faulty DIMM (LEDs)” on page 70</a> <a href="#">“Remove a DIMM” on page 73</a> <a href="#">“Locate a Faulty DIMM (LEDs)” on page 70</a> <a href="#">“Install a Replacement DIMM” on page 74</a> <a href="#">“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 75</a>
Add memory to the server module.	<a href="#">“Install a Replacement DIMM” on page 74</a> <a href="#">“Verify DIMM Functionality” on page 79</a> <a href="#">“DIMM Configuration Reference” on page 81</a>

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

# Memory Faults

A variety of features play a role in how the memory subsystem is configured and how memory faults are handled. Understanding the underlying features helps you identify and repair memory problems. This topic describes how the server module deals with memory faults.

The server module uses advanced ECC technology that corrects up to 4 bits in error on nibble boundaries, as long as the bits are all in the same DRAM. On some DIMMs, if a DRAM fails, the DIMM continues to function.

The following server module features independently manage memory faults:

- **POST** – Based on Oracle ILOM configuration variables, POST runs when the server module is powered on.

For correctable memory errors (sometimes called CEs), POST forwards the error to the Oracle Solaris PSH daemon for error handling.

If an uncorrectable memory fault is detected, POST displays the fault with the device name of the faulty DIMMs, and logs the fault. POST then disables the faulty DIMMs. Depending on the memory configuration and the location of the faulty DIMM, POST disables half of physical memory in the system, or half the physical memory and half the processor threads. When the offlining process occurs in normal operation, you must replace the faulty DIMMs based on the fault message and then enable the disabled DIMMs. See [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 75](#).

- **Oracle Solaris PSH technology** – A feature of the Solaris OS, PSH uses the fault manager daemon (`fmfd`) to watch for various kinds of faults. When a fault occurs, the fault is assigned a UUID and logged. PSH reports the fault and suggests a replacement for the DIMMs associated with the fault.

If you suspect that the server module has a memory problem, follow the [“Diagnostics Process” on page 7](#). The flowchart helps you determine if the memory problem was detected by POST or by the PSH technology.

Once you identify which DIMMs you want to replace, see [“Locate a Faulty DIMM \(LEDs\)” on page 70](#). After replacing a faulty DIMM, You must perform the instructions in [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 75](#).

### Related Information

- [“Locate a Faulty DIMM \(LEDs\)” on page 70](#)
- [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 75](#)
- [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 75](#)
- [“Detecting and Managing Faults” on page 5](#)

---

## ▼ Locate a Faulty DIMM (LEDs)

This procedure describes how to use the DIMM LEDs on the motherboard to pinpoint the physical location of a faulty DIMM.

---

**Note** – You can also obtain the location of the faulty DIMM using the Oracle ILOM `show faulty` command. This command displays the FRU name (such as `/SYS/MB/CMP0/BOB0/CH0`). Use the FRU name and information to locate the faulty DIMM. See [“DIMM Configuration Reference” on page 81](#).

---

**1. Check the front panel Fault LED.**

See [“Diagnostics LEDs” on page 10](#).

When a faulty DIMM is detected, the front panel Fault LED and the motherboard DIMM Fault LEDs are illuminated. Before opening the server module to check the DIMM Fault LEDs, verify that the System Fault LED is lit.

- If the System Fault LED is not lit, and you suspect there is a problem, see [“Diagnostics Process” on page 7](#).
- If the System Fault LED is lit, go to the next step.

**2. (If needed) Prepare for service. See:**

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Prepare the Server Module for Removal” on page 58](#)
- [“Remove the Server Module From the Modular System” on page 59](#)
- [“Remove the Cover” on page 62](#)
- [“ESD Safety Measures” on page 52](#)

**3. Press the Remind button on the motherboard.**

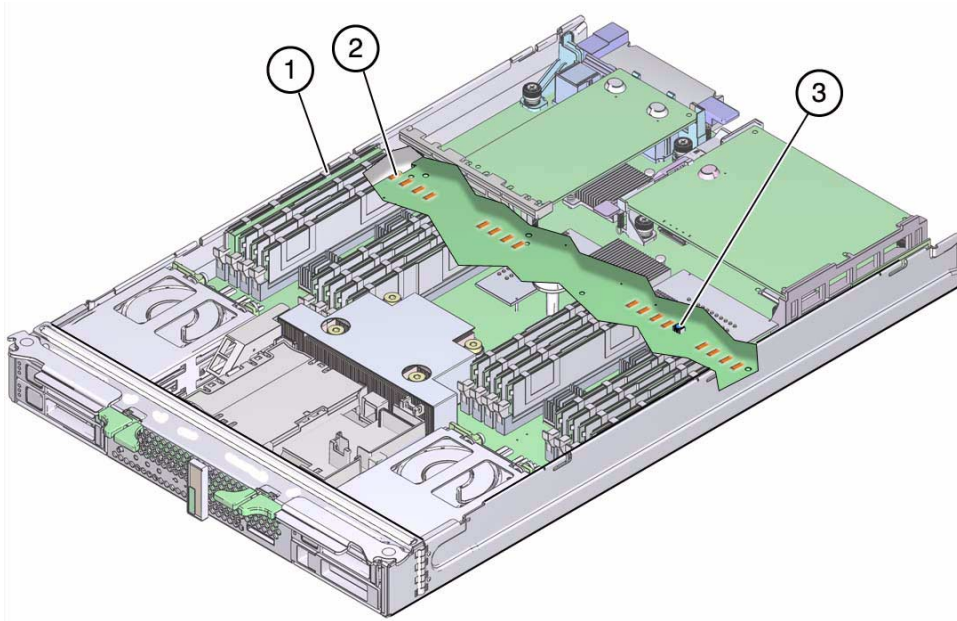
While the Remind button is pressed, an LED next to the faulty DIMM illuminates, enabling you to identify the faulty DIMM.

---

**Tip** – The DIMM Fault LEDs are small and difficult to identify when they are not illuminated. If you do not see any illuminated LEDs in the area of the DIMM LEDs, assume that the DIMMs are not faulty.

---

**FIGURE:** Locating Faulty DIMMs



**Figure Legend**

- 
- |   |  |
|---|--|
| 1 | DIMM 1 (BOB0/CH1/D0)                   |
| 2 | Fault LED for DIMM 1                   |
| 3 | Locate button for LEDs of faulty DIMMs |
- 

#### 4. Remove the faulty DIMM.

See [“Remove a DIMM” on page 73](#).

#### Related Information

- [“DIMM Configuration Reference” on page 81](#)
- [“Remove a DIMM” on page 73](#)



## ▼ Remove a DIMM



**Caution** – This procedure involves handling circuit boards that are extremely sensitive to static electricity. Ensure that you follow ESD preventative practices to avoid damaging the circuit boards.



**Caution** – Components inside the chassis might be hot. Use caution when servicing components inside the chassis.

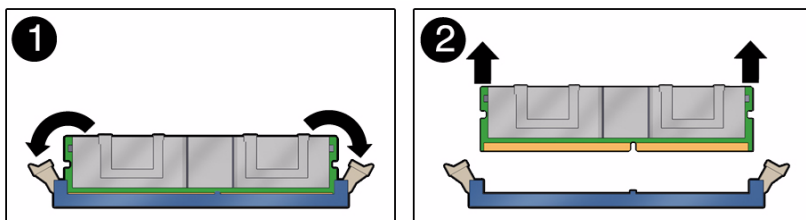
**1. (If needed) Prepare for service. See:**

- “Shut Down the Oracle Solaris OS” on page 56
- “Prepare the Server Module for Removal” on page 58
- “Remove the Server Module From the Modular System” on page 59
- “Remove the Cover” on page 62
- “ESD Safety Measures” on page 52

**2. (If needed) Locate the faulty DIMM.**

See “Locate a Faulty DIMM (LEDs)” on page 70.

**3. Remove the DIMM from the motherboard as described in the following steps:**



- a. Push down on the ejector tabs on each side of the DIMM until the DIMM is released (panel 1).
  - b. Grasp the top corners of the DIMM, and lift and remove it from the server module (panel 2).
  - c. Place the DIMM on an antistatic mat.
- 4. Install a replacement DIMM.**
- See “Install a Replacement DIMM” on page 74.

### Related Information

- [“Install a Replacement DIMM” on page 74](#)
- [“DIMM Configuration Reference” on page 81](#)

## ▼ Install a Replacement DIMM

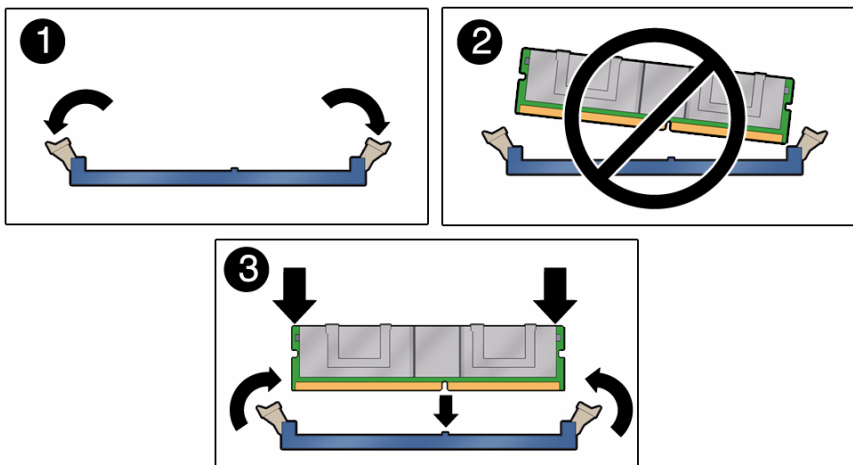


**Caution** – This procedure involves handling circuit boards that are extremely sensitive to static electricity. Ensure that you follow ESD preventative practices to avoid damaging the circuit boards.



**Caution** – Components inside the chassis might be hot. Use caution when servicing components inside the chassis.

1. (If needed) Prepare the server module for service and remove the faulty DIMM.  
See [“Remove a DIMM” on page 73](#).
2. Unpackage the replacement DIMM and set it on an antistatic mat.
3. Ensure that the DIMM ejector tabs are in the open position (panel 1).



4. Line up the replacement DIMM with the connector.

Align the DIMM notch with the key in the connector, as in panel 3. This action ensures that the DIMM is oriented correctly. Panel 2 shows an incorrect alignment.

5. **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, verify that the orientation of the DIMM is correct. Never apply excessive force.
6. **Return the server module to operation.**  
See [“Returning the Server Module to Operation”](#) on page 111
7. **Perform one of the following tasks to verify the DIMM:**
  - Verify a replacement DIMM. See [“Clear the Fault and Verify the Functionality of the Replacement DIMM”](#) on page 75.
  - Verify additional memory. See [“Verify DIMM Functionality”](#) on page 79.

#### **Related Information**

- [“Remove a DIMM”](#) on page 73
- [“DIMM Configuration Reference”](#) on page 81

---

## ▼ Clear the Fault and Verify the Functionality of the Replacement DIMM

This procedure describes how to clear a memory fault and how to verify the functionality of the replacement DIMM.

Ensure that the following conditions are met:

- The server module is in Standby mode (installed in a powered modular system, but the server module’s host is not started).  
See [“Prepare the Server Module for Removal”](#) on page 58.
  - You have connectivity to the SP.  
See [“Access the SP \(Oracle ILOM\)”](#) on page 15
1. **Access the Oracle ILOM -> prompt.**  
See [“Access the SP \(Oracle ILOM\)”](#) on page 15.

## 2. Determine how to clear the fault.

The method you use to clear a fault depends on how the fault is identified by the `show faulty` command.

Examples:

- If the fault is a *host-detected fault* (displays a UUID), continue to [Step 3](#). For example:

-> <b>show faulty</b>		
Target	Property	Value
-----+-----+-----		
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB0/CH0/D0
/SP/faultmgmt/0	timestamp	Dec 14 22:43:59
/SP/faultmgmt/0/ faults/0	sunw-msg-id	SUN4V-8000-DX
/SP/faultmgmt/0/ faults/0	uuid	3aa7c854-9667-e176-efe5-e487e520 7a8a
/SP/faultmgmt/0/ faults/0	timestamp	Apr 24 22:43:59

- If the fault was detected by POST and resulted in the DIMM being disabled, you will see something similar to the following output:

-> <b>show faulty</b>		
Target	Property	Value
-----+-----+-----		
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB1/CH0/D0
/SP/faultmgmt/0	timestamp	Apr 24 16:40:56
/SP/faultmgmt/0/ faults/0	timestamp	Apr 24 16:40:56 faults/0
/SP/faultmgmt/0/ faults/0	sp_detected_fault	/SYS/MB/CMP0/BOB1/CH0/D0 Forced fail (POST)

In most cases, the replacement of the faulty DIMM is detected when the SP is power cycled. In this case, the fault is automatically cleared from the system. If the fault is still displayed by the `show faulty` command, then use the `set` command to enable the DIMM and clear the fault.

Example:

```
-> set /SYS/MB/CMP0/BOB0/CH0/D0 component_state=Enabled
```

## 3. Perform the following steps to verify the repair:

a. Set the virtual keyswitch to diag so that POST will run in Service mode.

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

b. Power cycle the system.

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

---

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

---

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

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

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

```
.  
.   
.   
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 vbosc runpost command and spin...
```

---

**Note** – Depending on the configuration of Oracle ILOM variables that affect POST and whether POST detected faults or not, the system might boot, or the system might remain at the ok prompt. If the system is at the ok prompt, type **boot**.

---

d. Return the virtual keyswitch to Normal mode.

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

- e. Switch to the system console and type the Solaris OS `fmadm faulty` command.

```
# fmadm faulty
```

No memory faults should be displayed.

If faults are reported, refer to the [“Diagnostics Process” on page 7](#) for an approach to diagnose the fault.

4. Switch to the Oracle ILOM prompt (`->`).

5. Type the `show faulty` command.

- If the fault was detected by the host and the fault information persists, the output will be similar to the following example:

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB0/CH0/D0
/SP/faultmgmt/0	timestamp	Dec 14 22:43:59
/SP/faultmgmt/0/ faults/0	sunw-msg-id	SUN4V-8000-DX
/SP/faultmgmt/0/ faults/0	uuid	3aa7c854-9667-e176-efe5-e487e520 7a8a
/SP/faultmgmt/0/ faults/0	timestamp	Dec 14 22:43:59

- If the `show faulty` command does not report a fault with a UUID, the fault is cleared. You do not need to proceed with the following steps.

6. (Only if previous steps did not clear the fault) Type the `set` command.

```
-> set /SYS/MB/CMP0/BOB0/CH0/D0 clear_fault_action=true
Are you sure you want to clear /SYS/MB/CMP0/BOB0/CH0/D0 (y/n)? y
Set 'clear_fault_action' to 'true'
```

7. (Only if previous steps did not clear the fault) Switch to the system console and type the `fmadm repair` command with the UUID.

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

```
# fmadm repair 3aa7c854-9667-e176-efe5-e487e5207a8a
```

## Related Information

- [“Install a Replacement DIMM” on page 74](#)

- “Verify DIMM Functionality” on page 79

---

## ▼ Verify DIMM Functionality

### 1. Access the Oracle ILOM -> prompt.

Refer to the *SPARC T3 Series Servers Administration Guide* for instructions.

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

- If `show faulty` indicates a POST-detected fault, go to [Step 3](#).
- If `show faulty` output displays a UUID, which indicates a host-detected fault, skip [Step 3](#) and go to [Step 4](#).

### 3. 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 SP is power cycled. In those cases, the fault is automatically cleared from the system. If `show faulty` still displays the fault, the `set` command will clear it.

```
-> set /SYS/MB/CMP0/BOB0/CH0/D0 component_state=Enabled
```

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

#### a. Set the virtual keyswitch to `diag` so that POST will run in Service mode.

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

#### b. Power cycle the server module host.

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

---

**Note** – Use the `show /HOST` command to determine when the host has been powered off. The console will display `status=Powered Off`. Allow approximately one minute before running this command.

---

**c. 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
.
.
.
0:7:2>INFO:
0:7:2>      POST Passed all devices.
0:7:2>POST:      Return to VBSC.
0:7:2>Master set ACK for vbsc runpost command and spin...
```

---

**Note** – The system might boot automatically at this point. If so, go directly to [Step e](#). If it remains at the ok prompt go to [Step d](#).

---

**d. If the server module remains at the ok prompt, type boot.**

**e. Return the virtual keyswitch to Normal mode.**

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

**f. Switch to the system console and type the Oracle Solaris OS `fmadm faulty` command.**

```
# fmadm faulty
```

If any faults are reported, see the diagnostics instructions in [“Oracle ILOM Troubleshooting Overview”](#) on page 12.

**5. Switch to the Oracle ILOM command shell.**



6. Type the `show faulty` command.

-> <b>show faulty</b>		
Target	Property	Value
-----		
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB0/CH1/D0
/SP/faultmgmt/0	timestamp	Dec 14 22:43:59
/SP/faultmgmt/0/ faults/0	sunw-msg-id	SUN4V-8000-DX
/SP/faultmgmt/0/ faults/0	uuid	3aa7c854-9667-e176-efe5-e487e520 7a8a
/SP/faultmgmt/0/ faults/0	timestamp	Dec 14 22:43:59

If the `show faulty` command reports a fault with a UUID go to [Step 7](#). If `show faulty` does *not* report a fault with a UUID, you have completed the verification process.

7. Switch to the system console and type the `fmadm repair` command with the UUID.

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

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

Related Information

- [“Remove a DIMM” on page 73](#)
- [“Install a Replacement DIMM” on page 74](#)
- [“DIMM Configuration Reference” on page 81](#)



# DIMM Configuration Reference

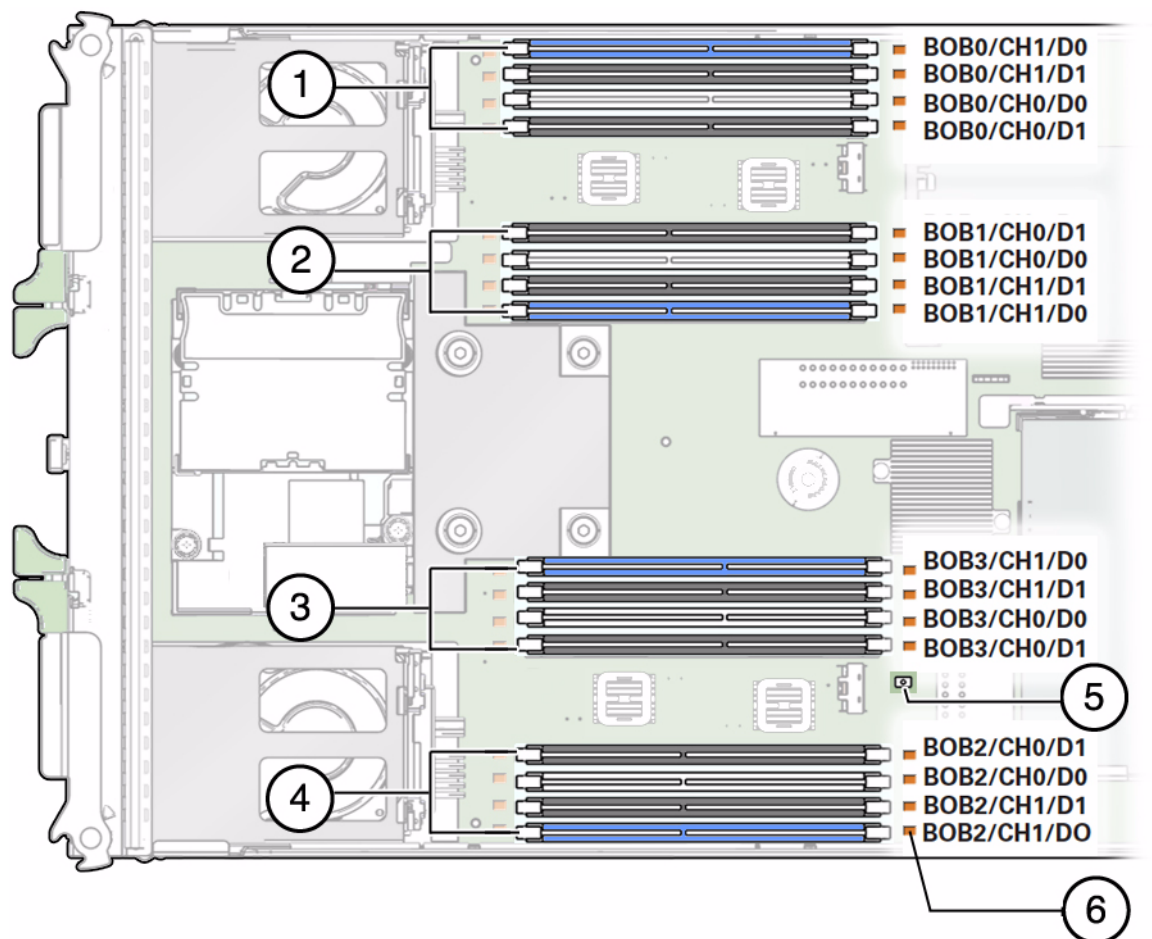
This topic provides configuration guidelines, and the relationships between the DIMM physical locations and FRU names.

DIMM configuration guidelines:

- There are 16 DIMM slots that support industry-standard DIMMs.
  - You can install quantities of 4, 8, or 16 DIMMs.
  - Supported DIMM capacities: 2 Gbyte, 4 Gbyte, and 8 Gbyte.
- Refer to the *SPARC T3-1B Server Module Product Notes* for the latest information.

- All DIMMs in the server module must be the same capacity.

**FIGURE:** DIMM Slot Locations



**Figure Legend**

- 
- 1 DIMM slots controlled by BOB0
  - 2 DIMM slots controlled by BOB1
  - 3 DIMM slots controlled by BOB3
  - 4 DIMM slots controlled by BOB2
  - 5 Fault remind button
  - 6 Memory fault LED for the adjacent DIMM
-

The slots are color coded to indicate which slots to use to install different quantities of DIMMs.

- 4 DIMMs: Blue slots
- 8 DIMMs: White and blue slots
- 16 DIMMs: Black, white, and blue slots

The following table summarizes details on using each of the 16 DIMM slots.

DIMM Location*	Slot Color	Slot Is Used For This Quantity of DIMMs	FRU Name (all start with /SYS/MB/CMP0/)
1	Blue	4, 8, 16	BOB0/CH1/D0
2	Black	16	BOB0/CH1/D1
3	White	8, 16	BOB0/CH0/D0
4	Black	16	BOB0/CH0/D1
5	Black	16	BOB1/CH0/D1
6	White	8, 16	BOB1/CH0/D0
7	Black	16	BOB1/CH1/D1
8	Blue	4, 8, 16	BOB1/CH1/D0
9	Blue	4, 8, 16	BOB3/CH1/D0
10	Black	16	BOB3/CH1/D1
11	White	8, 16	BOB3/CH0/D0
12	Black	16	BOB3/CH0/D1
13	Black	16	BOB2/CH0/D1
14	White	8, 16	BOB2/CH0/D0
15	Black	16	BOB2/CH1/D1
16	Blue	4, 8, 16	BOB2/CH1/D0

\* From top to bottom when viewed with the front panel of the server module on your left.

## Related Information

- [“Memory Faults” on page 69](#)
- [“Locate a Faulty DIMM \(LEDs\)” on page 70](#)
- [“Remove a DIMM” on page 73](#)
- [“Install a Replacement DIMM” on page 74](#)

- “Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 75

# Servicing a REM

The server module support the installation of one REM. Only certain REMs are supported. For a list of supported REMs, refer to the *SPARC T3-1B Server Module Product Notes*.

Description	Links
Replace a REM.	<a href="#">“Remove a REM” on page 85</a> <a href="#">“Install a REM” on page 86</a>
Install a REM.	<a href="#">“Install a REM” on page 86</a>

## Related Information

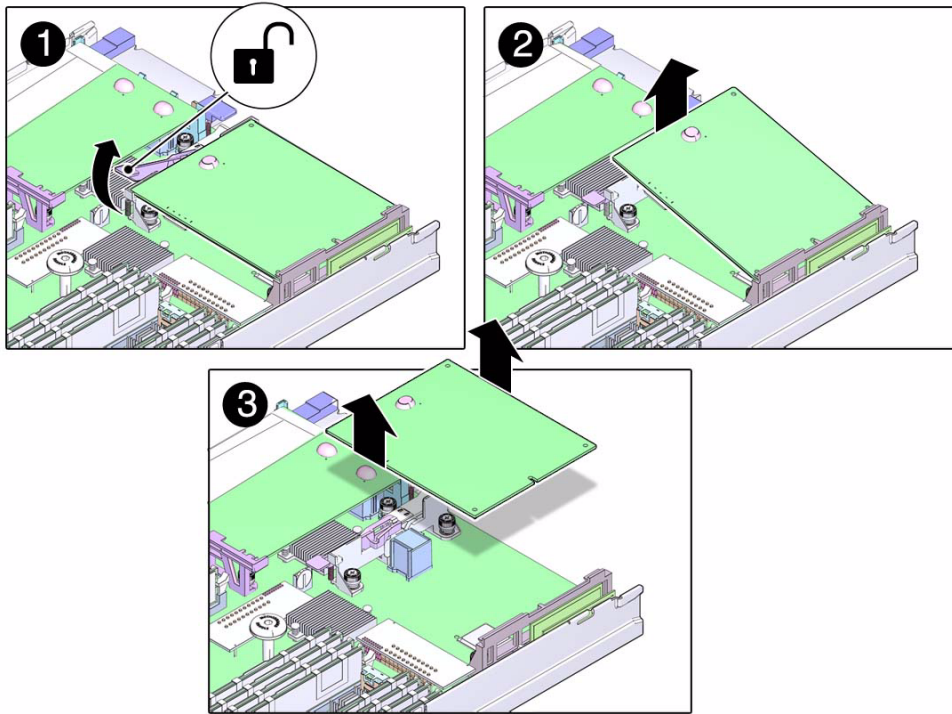
- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

## ▼ Remove a REM

### 1. Prepare for service. See:

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Prepare the Server Module for Removal” on page 58](#)
- [“Remove the Server Module From the Modular System” on page 59](#)
- [“Remove the Cover” on page 62](#)
- [“ESD Safety Measures” on page 52](#)

### 2. Lift up on the REM lever (panel 1).



3. Rotate the card up and off the retainer (panels 2 and 3).

4. Set the card on an antistatic surface.

5. Install a REM.

See [“Install a REM” on page 86](#).

#### Related Information

- [“Install a REM” on page 86](#)

---

## ▼ Install a REM

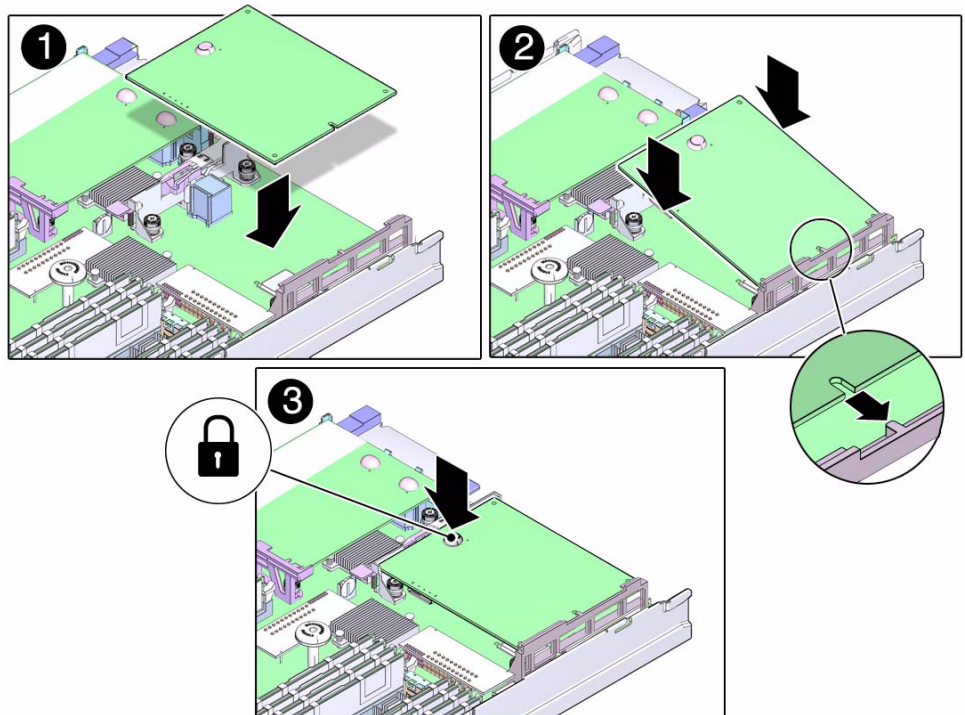
This task describes how to install a REM onto the server module. For information about specific configuration tasks for your REM, refer to the REM documentation.

1. Prepare for service by performing the following tasks:

- [“Shut Down the Oracle Solaris OS” on page 56](#)

- “Prepare the Server Module for Removal” on page 58
- “Remove the Server Module From the Modular System” on page 59
- “Remove the Cover” on page 62
- “ESD Safety Measures” on page 52
- (If needed) “Remove a REM” on page 85

2. Align the REM for installation (panel 1)
3. Slide the end of the REM that is opposite the connector under the tabs of the plastic standoff (panel 2).



4. Press the REM until the connector is fully seated on the motherboard (panel 3).  
If there is a rubber bumper on the REM, you can press down on it directly to seat the connector.
5. Return the server module to operation.  
See “Returning the Server Module to Operation” on page 111.
6. Configure or verify the RAID after installing the REM.  
Refer to the *SPARC T3 Series Servers Administration Guide* for information about RAID configuration on this server module.

### **Related Information**

- [“Remove a REM” on page 85](#)



# Servicing a FEM

The server module supports the installation of one FEM. To see a list of supported FEMs for this server module, refer to the *SPARC T3-1B Server Module Product Notes*.

Description	Links
Replace a FEM.	<a href="#">“Remove a FEM” on page 89</a> <a href="#">“Install a FEM” on page 90</a>
Install a FEM.	<a href="#">“Install a FEM” on page 90</a>

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

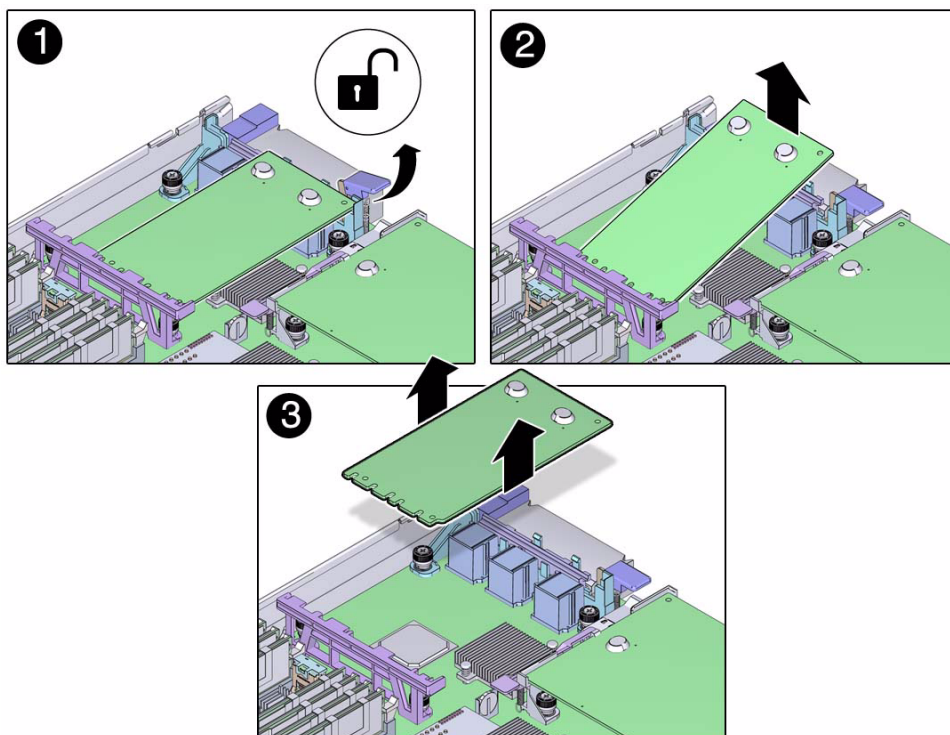
## ▼ Remove a FEM

In addition to when you replace a FEM, you might need to remove a FEM in the FEM-1 connector to access the clock battery.

### 1. Prepare for service. See:

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Prepare the Server Module for Removal” on page 58](#)
- [“Remove the Server Module From the Modular System” on page 59](#)
- [“Remove the Cover” on page 62](#)
- [“ESD Safety Measures” on page 52](#)

### 2. Lift the lever to eject the card (panel 1).



3. Rotate the card up and off the retainer (panels 2 and 3).

4. Place the removed FEM on an antistatic mat.

5. Install a FEM.

See [“Install a FEM” on page 90](#).

### Related Information

- [“Install a FEM” on page 90](#)

## ▼ Install a FEM

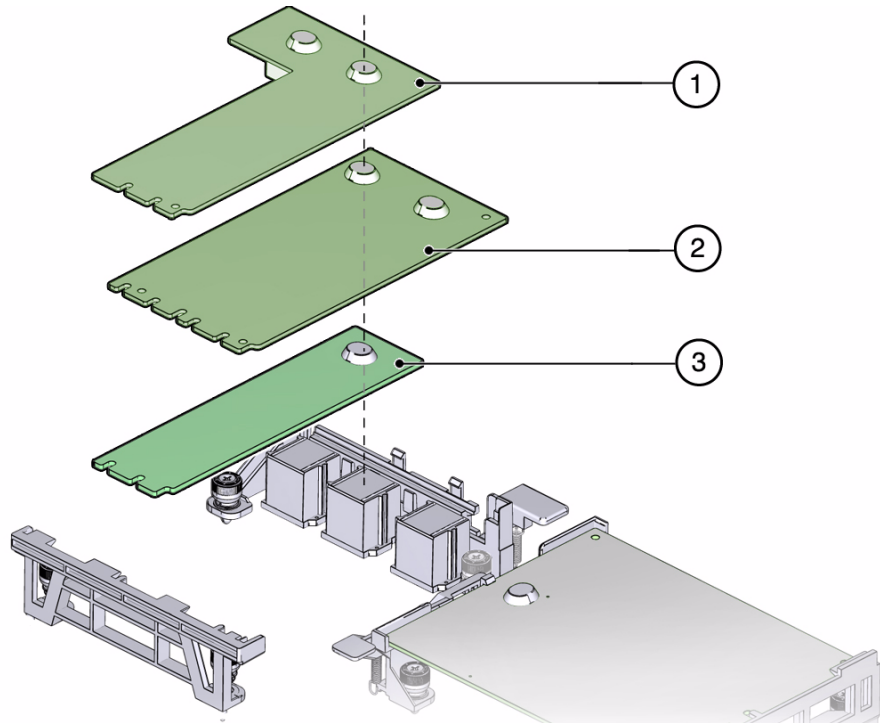
This procedure applies to any of the form factors of FEM cards that are supported by this server module.

1. Prepare for service by performing the following tasks:

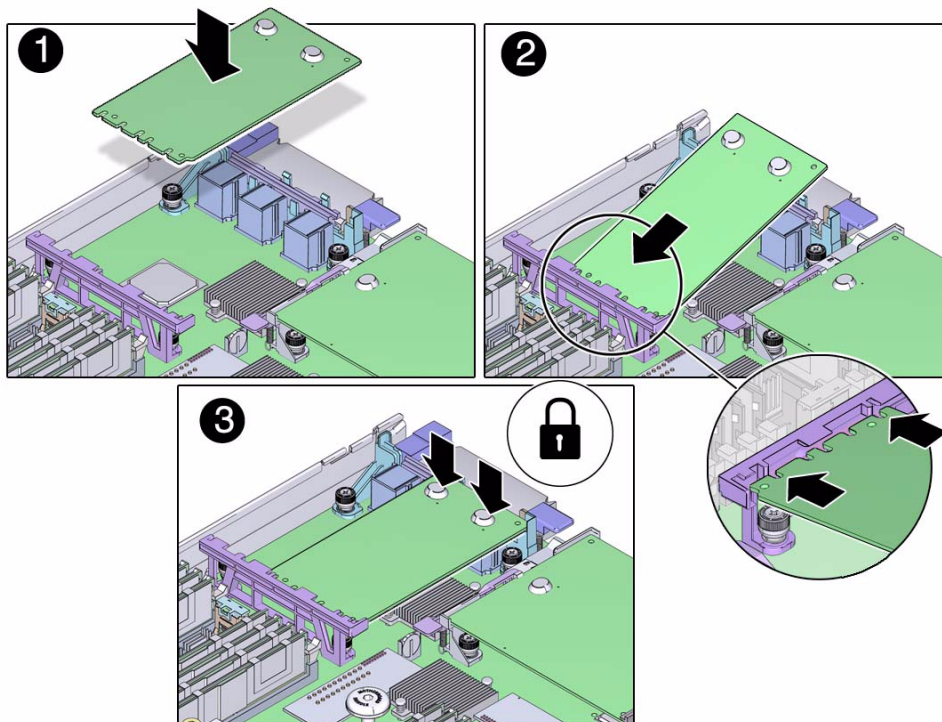
- [“Shut Down the Oracle Solaris OS” on page 56](#)

- “Prepare the Server Module for Removal” on page 58
- “Remove the Server Module From the Modular System” on page 59
- “Remove the Cover” on page 62
- “ESD Safety Measures” on page 52
- (If needed) “Remove a FEM” on page 89

**2. Determine the correct set of motherboard FEM connectors for your FEM.**



- An L-shaped FEM (card 1) uses connectors FEM-X and FEM-0.
  - A rectangular double-width FEM (card 2) uses connectors FEM-0 and FEM-1.
  - A rectangular single-width FEM (card 3) uses connector FEM-0.
- 3. Insert the FEM edge into the bracket and carefully align the FEM so that the card connects with the correct motherboard connectors.**



**4. Lower the card and press the card into place.**

If the card has rubber bumpers you can press directly on them to seat the card into the connectors.

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

See [“Returning the Server Module to Operation”](#) on page 111.

**Related Information**

- [“Remove a FEM”](#) on page 89

# Servicing a Service Processor Card

---

The server module has a service processor card with firmware that provides the SP.

- [“Remove the Service Processor Card” on page 93](#)
- [“Install the Service Processor Card” on page 94](#)

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

---

## ▼ Remove the Service Processor Card

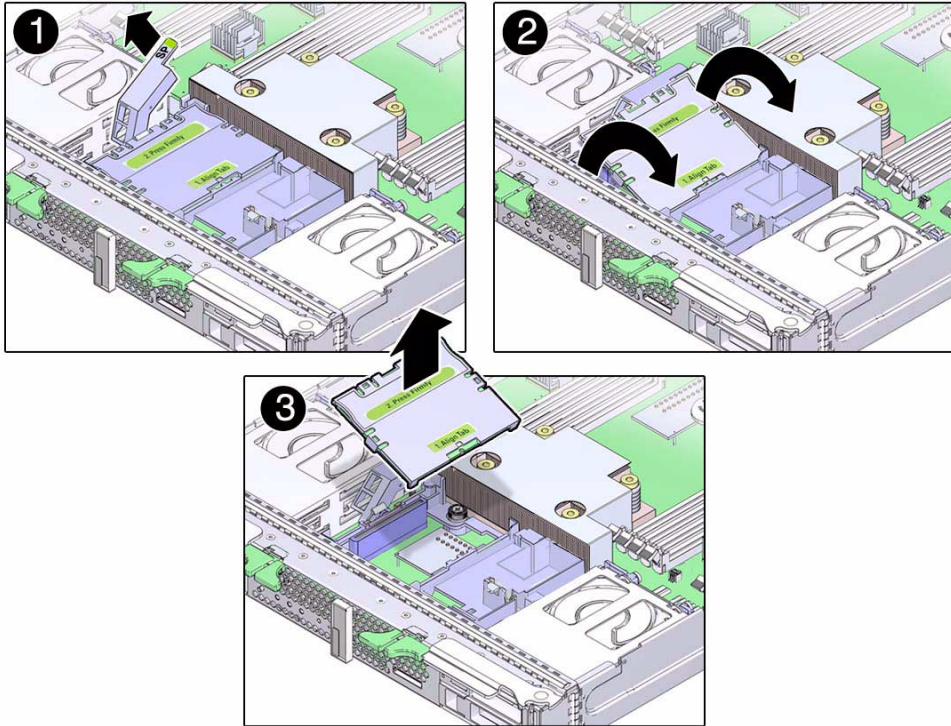
### 1. If possible, save the configuration information for the SP.

Refer to the related procedures using Oracle ILOM in the *SPARC T3 Series Servers Administration Guide*.

### 2. Prepare for service. See:

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Prepare the Server Module for Removal” on page 58](#)
- [“Remove the Server Module From the Modular System” on page 59](#)
- [“Remove the Cover” on page 62](#)
- [“ESD Safety Measures” on page 52](#)

### 3. Lift the lever to eject the SP card (panel 1).



**4. Rotate the card up and off the retainer (panels 2 and 3).**

Set the card on an antistatic mat.

**5. Continue to install the new card.**

See [“Install the Service Processor Card” on page 94](#).

**Related Information**

- [“Install the Service Processor Card” on page 94](#)

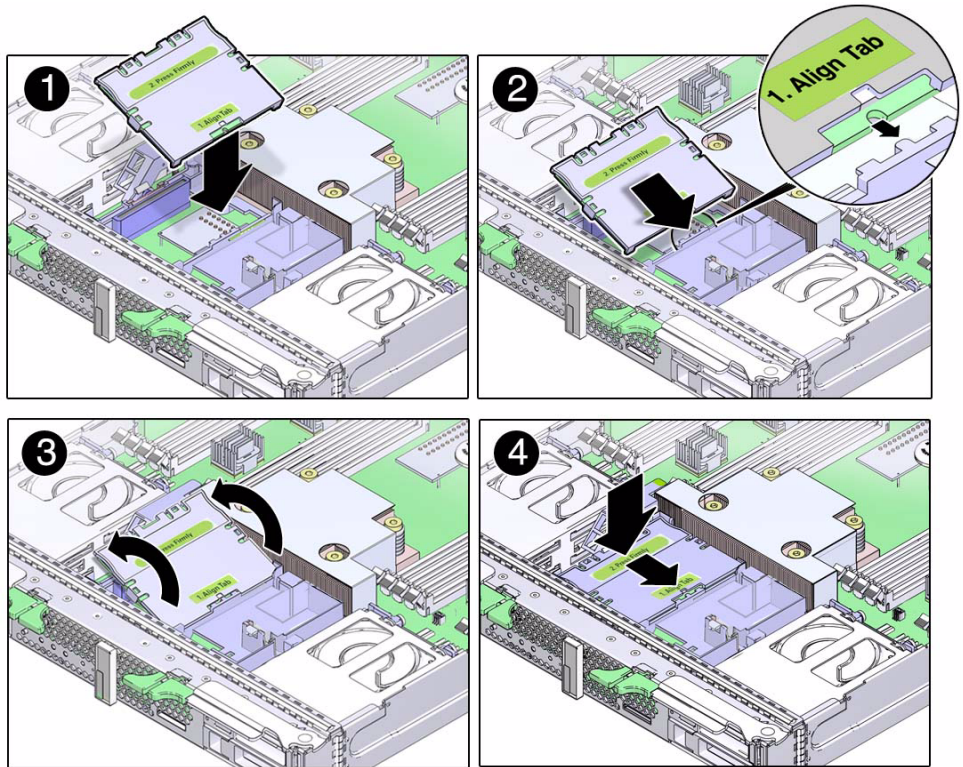
## ▼ Install the Service Processor Card

**1. (If needed) Remove the service processor card.**

See [“Remove the Service Processor Card” on page 93](#).



2. Insert the replacement service processor card into the retainer (panel 1).  
Make sure the tab is aligned with the key (panel 2)



3. Lower the service processor card until it is aligned with the connector (panel 3).
4. Seat the service processor card into the connector by pressing the card toward the tabs while pressing down (panel 4).  
When the service processor card is in place, the lever will close.
5. Return the server module to the chassis.  
See [“Returning the Server Module to Operation”](#) on page 111

**6. Access Oracle ILOM on the SP.**

See [“Access the SP \(Oracle ILOM\)” on page 15.](#)

If the replacement service processor detects that the service processor firmware is not compatible with the existing host firmware, further action is suspended and the following message is displayed:

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 to [Step 7](#). Otherwise, go to [Step 8](#).

**7. Download the system firmware.**

Refer to the Oracle ILOM documentation for instructions.

**8. If you created a backup of the SP configuration, use the Oracle ILOM restore utility to restore the configuration.**

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

**Related Information**

- [“Remove the Service Processor Card” on page 93](#)



# Servicing the ID PROM

---

The system ID PROM, sometimes referred to as the SCC, provides the server module with the host ID, MAC addresses, and some Oracle ILOM configuration information.

The system ID PROM does not typically require replacement. However, if you replace the ID PROM, be aware that the host ID and MAC address will change.

When you replace the enclosure assembly, swap the system ID PROM from the original enclosure assembly to the replacement enclosure assembly. This action ensures that your server module will maintain the same host ID and MAC address.

- [“Remove the ID PROM” on page 97](#)
- [“Install the ID PROM” on page 98](#)
- [“Verify the ID PROM” on page 99](#)

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

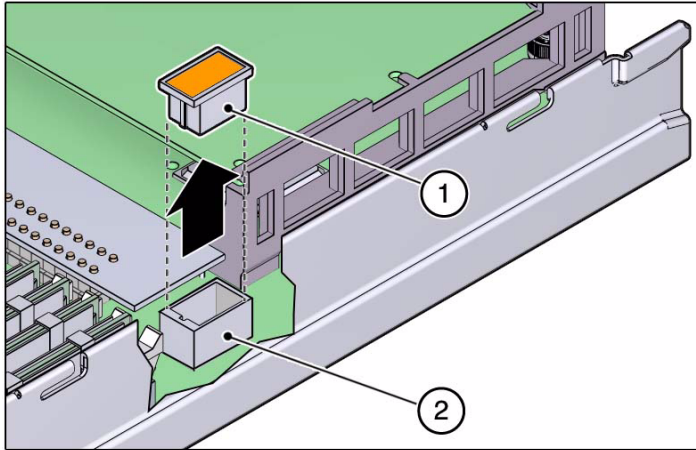
---

## ▼ Remove the ID PROM

### 1. Prepare for service. See:

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Prepare the Server Module for Removal” on page 58](#)
- [“Remove the Server Module From the Modular System” on page 59](#)
- [“Remove the Cover” on page 62](#)
- [“ESD Safety Measures” on page 52](#)

### 2. Locate the ID PROM on the motherboard.



3. Lift the ID PROM (1) straight up from its socket (2).

Place the ID PROM on an antistatic mat.

4. Install the ID PROM.

See [“Install the ID PROM” on page 98](#).

#### **Related Information**

- [“Install the ID PROM” on page 98](#)
- [“Verify the ID PROM” on page 99](#)

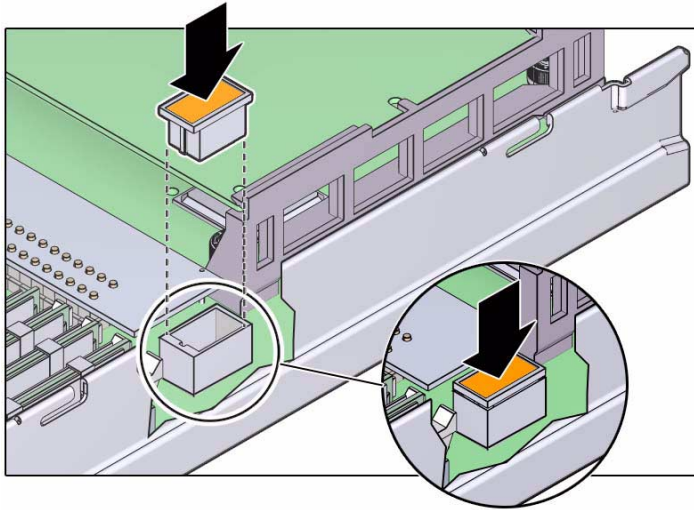
---

## ▼ Install the ID PROM

1. (If needed) Remove the ID PROM.

See [“Remove the ID PROM” on page 97](#).

2. Locate the ID PROM socket on the motherboard.



3. Align the ID PROM notched end with the notched end on the motherboard socket and press in place.
4. Return the server module to operation.  
See [“Returning the Server Module to Operation”](#) on page 111.
5. Verify the ID PROM.  
See [“Verify the ID PROM”](#) on page 99.

#### Related Information

- [“Remove the ID PROM”](#) on page 97
- [“Verify the ID PROM”](#) on page 99

---

## ▼ Verify the ID PROM

The host MAC address and the Host ID values are stored in the ID PROM. This task describes ways to display these values.

1. Display the MAC address that is stored in the ID PROM.

Example using the Oracle ILOM `show` command:

```
-> show /HOST macaddress
```

```
/HOST
Properties:
macaddress = 00:21:28:34:29:9c
```

## 2. Display the host ID.

Example using the Solaris `hostid` command:

```
# hostid
857f6844
```

## 3. Display the Ethernet address.

Example using the Solaris `ifconfig` command:

```
# ifconfig -a
lo0: flags=2001000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4,VIRTUAL> mtu 8232
index 1
    inet 127.0.0.1 netmask ff000000
igb0: flags=1004843<UP,BROADCAST,RUNNING,MULTICAST,DHCP,IPv4> mtu 1500 index
    inet 10.6.91.117 netmask fffffe00 broadcast 10.6.91.255
    ether 0:21:28:7f:68:44
#
```

## Related Information

- [“Remove the ID PROM” on page 97](#)
- [“Install the ID PROM” on page 98](#)

# Servicing a USB Flash Drive

---

You can install one USB flash drive in the server module.

Description	Links
Replace a USB flash drive.	<a href="#">“Remove a USB Flash Drive” on page 101</a> <a href="#">“Install a USB Flash Drive” on page 102</a>
Add a USB flash drive.	<a href="#">“Install a USB Flash Drive” on page 102</a>

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

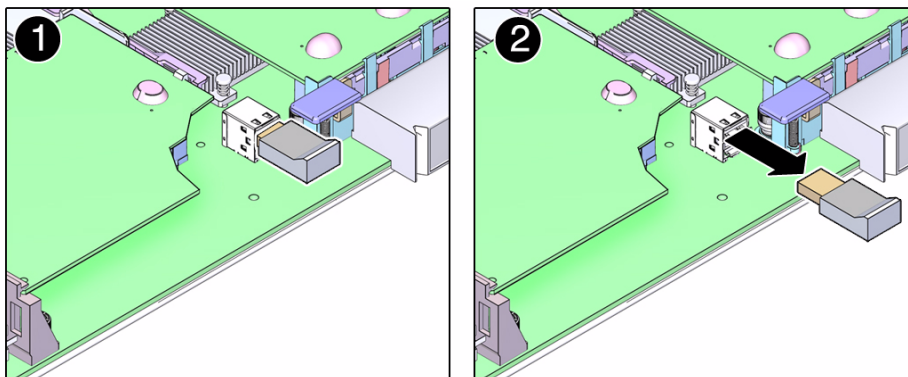
---

## ▼ Remove a USB Flash Drive

### 1. Prepare for service. See:

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Prepare the Server Module for Removal” on page 58](#)
- [“Remove the Server Module From the Modular System” on page 59](#)
- [“Remove the Cover” on page 62](#)
- [“ESD Safety Measures” on page 52](#)

### 2. Locate the USB flash drive at the rear of the server module (panel 1).



3. Pull the drive out (panel 2).
4. (If needed) Install a USB flash drive.  
See [“Install a USB Flash Drive” on page 102](#).

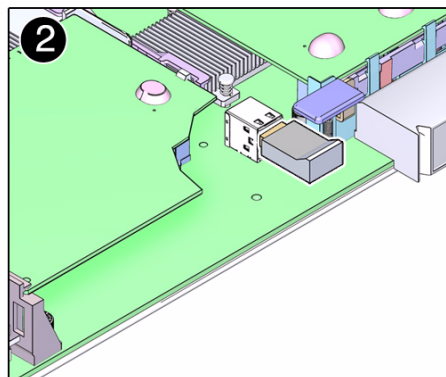
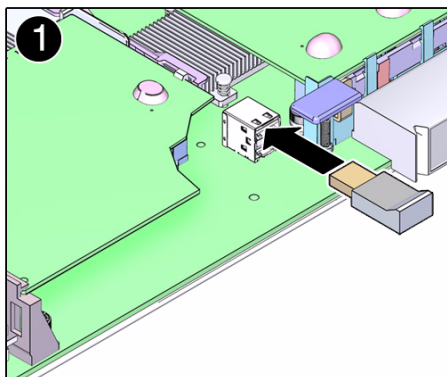
#### Related Information

- [“Install a USB Flash Drive” on page 102](#)

## ▼ Install a USB Flash Drive

The server module has a USB port on the motherboard. The USB port accepts USB flash drives that do not exceed a length of 39 mm.

1. Prepare for service. See:
  - [“Shut Down the Oracle Solaris OS” on page 56](#)
  - [“Prepare the Server Module for Removal” on page 58](#)
  - [“Remove the Server Module From the Modular System” on page 59](#)
  - [“Remove the Cover” on page 62](#)
  - [“ESD Safety Measures” on page 52](#)
  - (If needed) [“Remove a USB Flash Drive” on page 101](#)
2. Locate the USB connector on the motherboard.



3. Plug your USB flash drive into the upper port of the USB connector (panels 1 and 2).

Do not use the lower port of this connector.

4. Return the server module to operation.

See [“Returning the Server Module to Operation”](#) on page 111.

### Related Information

- [“Remove a USB Flash Drive”](#) on page 101





# Servicing the Battery

---

The battery operates the clock for the server module.

- [“Replace the Battery” on page 105](#)

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

---

## ▼ Replace the Battery

The battery maintains system time when the server module is powered off. If the server module fails to maintain the proper time when it is powered off, replace the battery.

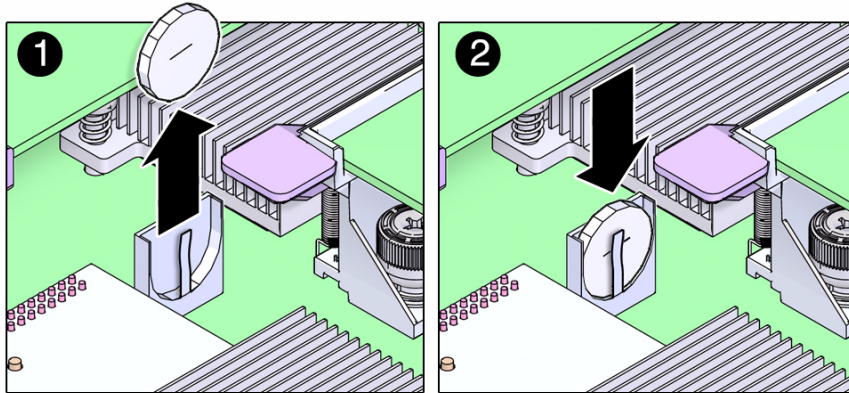
### 1. Prepare for service by performing the following tasks:

- [“Shut Down the Oracle Solaris OS” on page 56](#)
- [“Prepare the Server Module for Removal” on page 58](#)
- [“Remove the Server Module From the Modular System” on page 59](#)
- [“Remove the Cover” on page 62](#)
- [“ESD Safety Measures” on page 52](#)

### 2. Remove a FEM card using connector FEM 1 (if present).

See [“Remove a FEM” on page 89](#).

### 3. Push the top of the battery forward, then lift the battery from the holder (panel 1).



4. Install the replacement battery with the negative (-) side out.
5. Put the FEM back in place if you needed to remove it to access the battery.  
See [“Install a FEM” on page 90.](#)
6. Return the server module to operation.  
See [“Returning the Server Module to Operation” on page 111](#)
7. Use an Oracle ILOM command to set the clock’s day and time.  
For example:

```
-> set /SP/clock datetime=061716192010
-> show /SP/clock

/SP/clock
Targets:
Properties:
  datetime = Thu JUN 17 16:19:56 2010
  timezone = GMT (GMT)
  usntpserver = disabled
```

### Related Information

- [“Servicing a FEM” on page 89](#)
- [“Returning the Server Module to Operation” on page 111](#)

# Replacing the Server Module Enclosure Assembly

---

When certain parts and components in the server module, such as the motherboard, require replacing, you must replace a high-level assembly called the *enclosure assembly*. This includes a new server module chassis with the motherboard and many other components already installed.

If you determine that a faulty component is not one of the replaceable FRUs described in this service manual, replace the enclosure assembly of the faulty server module with a new enclosure assembly.

---

**Note** – This procedure must be performed by an Oracle field service representative.

---

When you use an enclosure assembly, you must move the following parts from the original server module to the same locations in the replacement enclosure assembly: Drives, drive fillers, DIMMs, REM, FEMs, SP, ID PROM, and USB flash drive.

- [“Transfer Components to Another Enclosure Assembly” on page 108](#)

## Related Information

- [“Identifying Components” on page 1](#)
- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

---

## ▼ Transfer Components to Another Enclosure Assembly

1. **Prepare to take all ESD precautions when working with both the original server module and the new enclosure assembly.**

Prepare to place all components on an antistatic mat unless you install each component immediately in the new enclosure assembly.

Follow the precautions explained in [“Preparing for Service”](#) on page 51.

2. **Remove the top cover from the original server module and the new enclosure assembly.**

See [“Remove the Cover”](#) on page 62.

3. **Transfer the drives from the original server module to the enclosure assembly.**

See [“Servicing Hard Drives”](#) on page 63.

4. **Transfer the drive fillers from the original server module to the enclosure assembly.**

See [“Remove a Drive Filler”](#) on page 67 and [“Install a Drive Filler”](#) on page 67.

5. **Transfer the DIMMs from the original server module to the enclosure assembly.**

Move each DIMM to the same slot in the enclosure assembly. See [“Servicing Memory”](#) on page 69.

6. **Transfer the REM from the original server module to the enclosure assembly.**

See [“Servicing a REM”](#) on page 85.

7. **Transfer the FEM from the original server module to the enclosure assembly.**

Install the FEM in the same connectors in the enclosure assembly. See [“Servicing a FEM”](#) on page 89.

8. **Transfer the service processor card from the original server module to the enclosure assembly.**

See [“Servicing a Service Processor Card”](#) on page 93.

9. **Transfer the ID PROM from the original server module to the enclosure assembly.**

See [“Servicing the ID PROM”](#) on page 97.

10. **Transfer the USB flash drive (if present) from the original server module to the enclosure assembly.**

Ensure that you install a USB flash drive only in the top slot of the connector. See [“Servicing a USB Flash Drive” on page 101](#).

---

**Note** – Do not move the battery from the original server module. The replacement enclosure assembly includes a battery.

---

11. **Attach the cover to the enclosure assembly.**

See [“Replace the Cover” on page 111](#).

12. **Insert the completed enclosure assembly in the same slot as the original server module.**

See [“Install the Server Module Into the Modular System” on page 112](#).

13. **Start the server module host.**

See [“Start the Server Module Host” on page 114](#)

14. **Access Oracle ILOM on the SP.**

See [“Access the SP \(Oracle ILOM\)” on page 15](#).

If the replacement service processor detects that the service processor firmware is not compatible with the existing host firmware, further action is suspended and the following message is displayed:

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 to [Step 15](#). Otherwise, go to [Step 16](#).

15. **Download the system firmware.**

Refer to the Oracle ILOM documentation for instructions.

16. **Perform diagnostics to verify the proper operation of the server module.**

17. **Transfer the serial number and product number to the FRUID of the new enclosure assembly.**

Refer to the SPARC T3-1B knowledge article for specific instructions for updating FRUID.

---

**Note** – The replacement enclosure assembly does not have a label with the serial number on the front of the system, as was present on the original server module.

---

18. **Update any customer database that contains RFID data to include data from the RFID on the new enclosure assembly.**

The RFID on the original server module contained different values.

#### **Related Information**

- [“Detecting and Managing Faults” on page 5](#)
- [“Identifying Components” on page 1](#)

# Returning the Server Module to Operation

---

The following topics describe how to return the server module to operation after removing it from the modular system for service:

- [“Replace the Cover” on page 111](#)
- [“Install the Server Module Into the Modular System” on page 112](#)
- [“Start the Server Module Host” on page 114](#)

## Related Information

- [“Preparing for Service” on page 51](#)

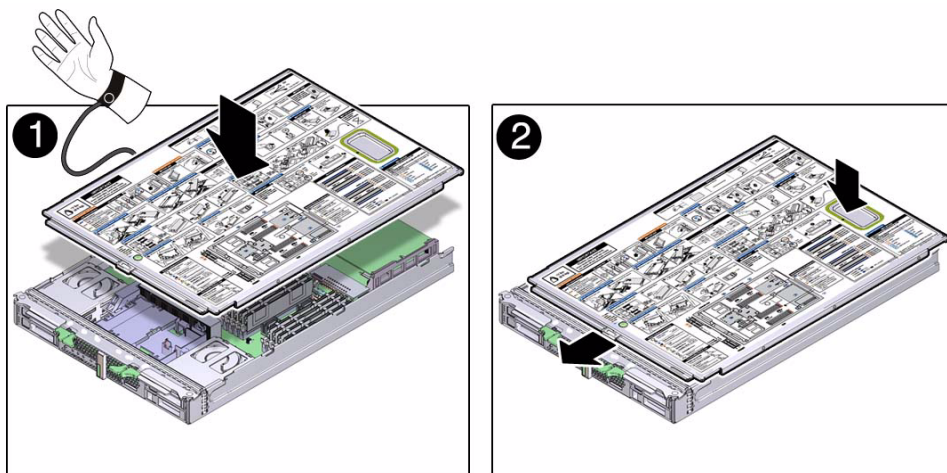
---

## ▼ Replace the Cover

Perform this task after completing installation or servicing of components inside the server module.

### 1. Set the cover on the server module (panel 1).

The cover edge hangs over the rear of the server module by about half an inch (1 cm).



2. Slide the cover forward until it latches into place (panel 2).

3. Install the server module into the modular system chassis.

See [“Install the Server Module Into the Modular System”](#) on page 112.

#### Related Information

- [“Install the Server Module Into the Modular System”](#) on page 112
- [“Remove the Cover”](#) on page 62

## ▼ Install the Server Module Into the Modular System



---

**Caution** – Insert a filler panel into an empty modular system slot within 60 seconds of server module removal to ensure proper chassis cooling.

---



---

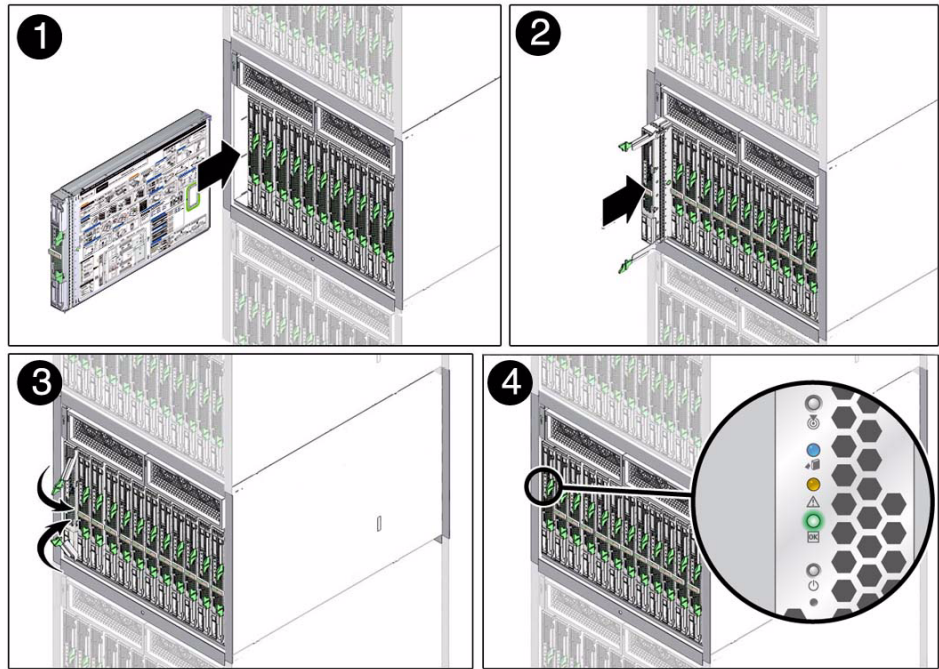
**Caution** – Hold the server module firmly with both hands so that you do not drop it. The server module weighs approximately 17 pounds (8.0 kg).

---

1. Remove the rear connector cover from the server module before inserting it in the modular system.



2. **Remove a filler panel from the modular system chassis slot you intend to use.**  
When the modular system is operating, you must fill every slot with a filler panel or a server module within 60 seconds.
3. **Hold the server module in a vertical position so that both ejector levers are on the right (panel 1).**



4. **Slide the server module into the chassis (panel 2).**
5. **Close both latches simultaneously, locking the server module in the modular system chassis (panel 3).**

Once installed, the following server module activities take place:

- Standby power is applied.
- The front panel LEDs blink three times, then the green OK LED on the front panel blinks for a few minutes.
- Oracle ILOM is initialized on the server module SP and ready to use, but the server module host is not started.

6. **Start the server module host.**

See [“Start the Server Module Host”](#) on page 114.

### Related Information

- [“Start the Server Module Host”](#) on page 114

- [“Remove the Server Module From the Modular System” on page 59](#)

---

## ▼ Start the Server Module Host

Perform this step after the server module is installed in a powered modular system.

**1. Perform one of the following actions:**

- Press the Power button on the front of the server module.  
See [“Front and Rear Panel Components” on page 2](#) to locate the Power button.
- Access Oracle ILOM on the server module and run the `start /SYS` command.

---

**Note** – The server module power-on process can take several minutes to complete, depending on the amount of installed memory and the configured diagnostic level.

---

By default, the server module boots the Oracle Solaris OS.

**2. Perform any diagnostics that verify the results of servicing the server module.**

**Related Information**

- [“Detecting and Managing Faults” on page 5](#)

# Glossary

---

---

## A

**ANSI SIS** American National Standards Institute Status Indicator Standard.

**ASR** Automatic system recovery.

---

## B

**blade** Generic term for server modules and storage modules.

**blade server** Server module.

---

## C

**chassis** Modular system enclosure.

**CLI** Command-line interface.

**CMM** Chassis monitoring module. ILOM runs on the CMM, providing lights out management of the components in the modular system chassis. *See* [ILOM](#).

**CMM ILOM** ILOM that runs on the CMM. *See* [ILOM](#).

---

## D

<b>DHCP</b>	Dynamic Host Configuration Protocol.
<b>disk module or disk blade</b>	Interchangeable terms for storage module.
<b>DTE</b>	Data terminal equipment.

---

## E

<b>ESD</b>	Electrostatic discharge.
------------	--------------------------

---

## F

<b>FEM</b>	Fabric expansion module. FEMs enable server modules to use the 10GbE connections provided by certain NEMs. <i>See</i> <a href="#">NEM</a> .
<b>FRU</b>	Field-replaceable unit.

---

## H

<b>HBA</b>	Host bus adapter. <i>See</i> <a href="#">REM</a> .
------------	--

---

## I

<b>ILOM</b>	Oracle Integrated Lights Out Manager. ILOM firmware is preinstalled on a variety of Oracle systems. ILOM enables you to remotely manage your Oracle servers regardless of the state of the host system.
<b>ID PROM</b>	Chip that contains system information for the server module.
<b>IP</b>	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.

---

## M

**MAC or MAC address** Media access controller address.

**MSGID** Message ID.

---

## N

**name space** Top-level ILOM CMM target.

**NEM** Network express module. NEMs provide 10/100/1000 Ethernet, 10GbE Ethernet ports, and SAS connectivity to storage modules.

**NET MGT** Network management port. An Ethernet port on the CMM and on server module service processors.

**NMI** Non-maskable interrupt.

---

## O

**OBP** OpenBoot PROM.

---

## P

**PCI EM** PCIe ExpressModule. Modular components that are based on the PCI Express industry-standard form factor and offer I/O features such as Gigabit Ethernet and Fibre Channel.

<b>POST</b>	Power-on self-test.
<b>PSH</b>	Predictive self-healing.

---

## R

<b>REM</b>	RAID expansion module. Sometimes referred to as an HBA <i>See <a href="#">HBA</a></i> . Supports the creation of RAID volumes on disk drives.
------------	---

---

## S

<b>SAS</b>	Serial attached SCSI.
<b>SCC</b>	System configuration chip.
<b>SER MGT</b>	Serial management port. A serial port on the CMM and on server modules service processors.
<b>server module</b>	Modular component that provides the main compute resources (CPU and memory) in a modular system. Server modules might also have onboard storage and connectors that hold REMs and FEMs.
<b>SP</b>	Service processor.
<b>SSH</b>	Secure shell.
<b>storage module</b>	Modular component that provides computing storage to the server modules.

---

## U

<b>UCP</b>	Universal connector port.
<b>UI</b>	User interface.
<b>UTC</b>	Coordinated Universal Time.
<b>UUID</b>	Universal unique identifier.

---

## W

**WWID** World-wide identifier. A unique number that identifies a SAS target.





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