Netra SPARC T4-1B Server Module

Service Manual

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Contents

Using This Documentation

This service manual explains how to identify faults, replace parts, and add additional options in Oracle's Netra SPARC T4-1B server module.

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

- "Related Documentation" on page ix
- "Feedback" on page x
- "Support and Accessibility" on page x

Related Documentation

Documentation	Links
All Oracle products	http://www.oracle.com/documentation
Netra SPARC T4-1B server module	http://www.oracle.com/pls/topic/lookup?ctx=Netra_SPARCT4-1B
Sun Netra 6000 modular system	http://www.oracle.com/pls/topic/lookup?ctx=Netra6000
FEMs (Network Interface Cards)	http://www.oracle.com/technetwork/documentation/oracle-net-sec-hw-190016.html
REMs (Host Bus Adapters)	http://www.oracle.com/technetwork/documentation/oracle-net-sec-hw-190016.html
NEMs (Network Express Modules)	http://www.oracle.com/technetwork/documentation/oracle-blade-sys-190001.html

Documentation	Links
Oracle Integrated Lights Out Manager (Oracle ILOM)	http://www.oracle.com/technetwork/documentation/sys-mgmt-networking-190072.html
Oracle Solaris OS and other system software	http://www.oracle.com/technetwork/indexes/documentation/#sys_sw
Oracle VTS software	http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0

Feedback

Provide feedback on this documentation at:

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

Support and Accessibility

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

Identifying Components

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

Related Information

Illustrated Parts Breakdown

This topic identifies components in the server module that you can install, or remove and replace.
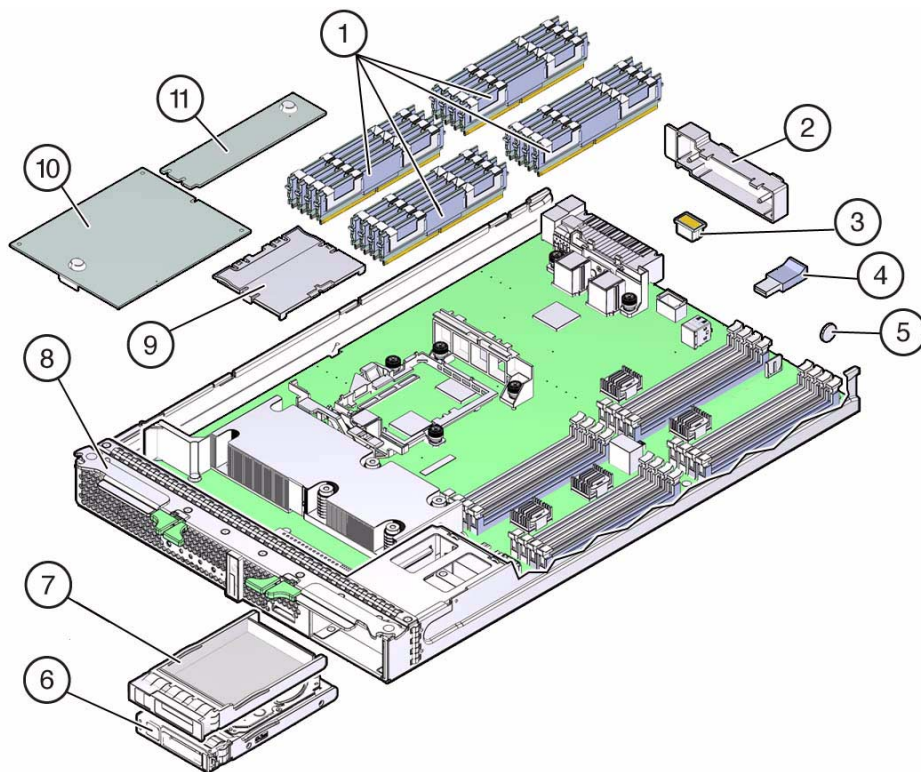
No.	FRU	FRU Name (If Applicable)	Links
1	DIMMs	`/SYS/MB/CMP0/BOBn/CHn/Dn`	"Servicing Memory" on page 75
2	Rear connector cover		Remove before inserting the server module in a slot.
3	ID PROM	`/SYS/MB/SCC`	"Servicing the ID PROM" on page 101
4	USB flash drive		"Servicing a USB Flash Drive" on page 105
5	Clock battery	`/SYS/MB/BAT`	"Servicing the Battery" on page 109
6	Drive (HD or SSD)	`/SYS/HDDn`	"Servicing Drives" on page 65
7	Drive filler		"Servicing Drives" on page 65
8	Enclosure assembly	`/SYS/MB`	"Replacing the Server Module Enclosure Assembly (Motherboard)" on page 113
9	SP	`/SYS/MB/SP`	"Servicing the SP Card" on page 97
10	REM	`/SYS/MB/REM`	"Servicing the REM" on page 89
11	FEM	`/SYS/MB/FEM`	"Servicing the FEM" on page 93

Related Information

- "Front and Rear Panel Components" on page 3
- "Detecting and Managing Faults" on page 5
- "Replacing the Server Module Enclosure Assembly (Motherboard)" on page 113

Front and Rear Panel Components
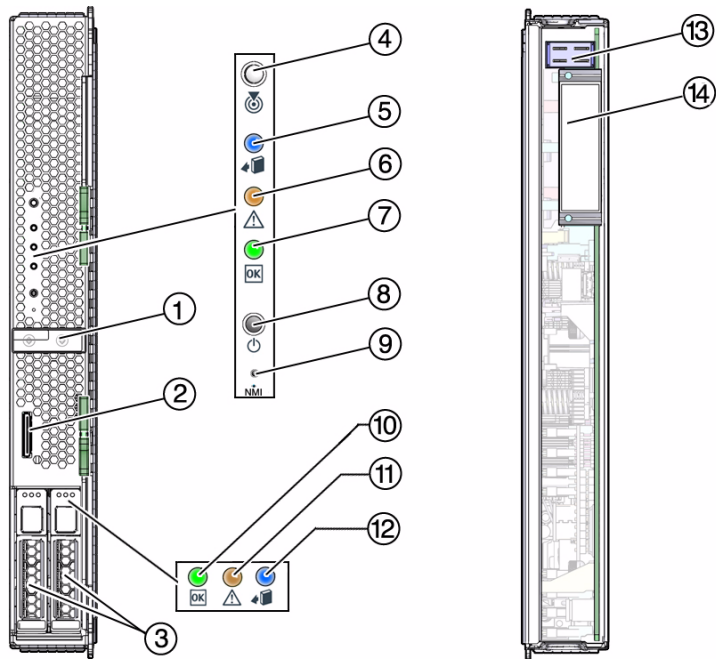
See "Diagnostics LEDs" on page 10 for more information.

No.	Description
1	RFID tag (provides the serial number of the server module)
2	UCP
3	Drive slots
4	White LED: Locator (functions as the physical presence switch)
5	Blue LED: Ready to Remove

No.	Description
6	Amber LED: Fault (Service Action Required)
7	Green LED: OK
8	Power button
9	Reset button: NMI (for service use only)
10	Green LED: Drive OK
11	Amber LED: Drive Fault (Service Action Required)
12	Blue LED: Drive Ready to Remove
13	Rear chassis power connector
14	Rear chassis data connection

Related Information

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Detecting and Managing Faults

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

Related Information

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 PSH technology to keep the server module 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.

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

- **POST** – Performs diagnostics on server module components upon reset to ensure the integrity of those components. POST can be configured and works with Oracle ILOM to take faulty components offline if needed.
- **PSH** – This Oracle Solaris OS 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 server modules 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 server module, provides hardware validation, and discloses possible faulty components with recommendations for repair.

The LEDs, Oracle ILOM, PSH, and many of the log files and console messages are integrated. For example, when the Oracle Solaris OS detects a fault, 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 flowchart in "Diagnostics Process" on page 7 illustrates an approach for using the server module diagnostics to identify a faulty FRU. The diagnostics you use, and the order in which you use them, depend on the nature of the problem you are troubleshooting. Therefore, you might perform some actions and not others.

Related Information

- *SPARC and Netra SPARC T4 Series Servers Administration Guide*
- "Diagnostics Process" on page 7
- "Diagnostics LEDs" on page 10
- "Managing Faults (Oracle ILOM)" on page 11
- "Interpreting Log Files and System Messages" on page 23
- "Managing Faults (PSH)" on page 41
- "Managing Faults (POST)" on page 29
- "Managing Components (ASR)" on page 45
- "Checking if Oracle VTS Software Is Installed" on page 27

Diagnostics Process

Use the flowchart to understand how to use the server module's diagnostic tools to manage faults. Also see the table that follows this flowchart.

Flowchart No.	Diagnostic Action	Possible Outcome	Additional Information
1.	Check the Power OK LED.	If this LED is not lit, check the power source and ensure that the server module is properly installed in the modular system chassis.	• "Diagnostics LEDs" on page 10
2.	Run the Oracle ILOM show faulty command to check for faults.	This command displays the following kinds of faults: • Environmental and configuration • PSH-detected • POST-detected Faulty FRUs are identified in fault messages using the FRU name. All Oracle ILOM detected fault messages begin with the characters SPT.	• "Service-Related Oracle ILOM Commands" on page 22 • "Check for Faults (show faulty Command)" on page 18
3.	Check the Oracle Solaris log files for fault information.	The Oracle Solaris message buffer and log files record system events, and provide information about faults. • If system messages indicate a faulty device, replace the FRU. • For more diagnostic information, review the Oracle VTS report. See number 4.	• "Interpreting Log Files and System Messages" on page 23
4.	Run the Oracle VTS software.	• If Oracle VTS reports a faulty device, replace it. • If Oracle VTS does not report a faulty device, run POST. See number 5.	• "Checking if Oracle VTS Software Is Installed" on page 27
5.	Run POST.	POST performs basic tests of the server module components and reports faulty FRUs.	• "Managing Faults (POST)" on page 29 • "Oracle ILOM Properties That Affect POST Behavior" on page 30
6.	Check if the fault is environmental.	Determine if the fault is an environmental fault or a configuration fault. If the fault listed by the show faulty 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 automatically clears.	• "Check for Faults (show faulty Command)" on page 18

Flowchart No.	Diagnostic Action	Possible Outcome	Additional Information
7.	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. After the FRU is replaced, perform the procedure to clear PSH detected faults.	• "Managing Faults (PSH)" on page 41 • "Clear PSH-Detected Faults" on page 44
8.	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 *reason* where *reason* is the name of the power-on routine that detected the failure.	• "Managing Faults (POST)" on page 29 • "Clear POST-Detected Faults" on page 37 • "POST Output Reference" on page 39
9.	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 Oracle Support or go to: http://support.oracle.com	• "Support and Accessibility" on page x

Related Information

- *SPARC and Netra SPARC T4 Series Servers Administration Guide*
- "Diagnostics Overview" on page 5
- "Diagnostics LEDs" on page 10
- "Managing Faults (Oracle ILOM)" on page 11
- "Interpreting Log Files and System Messages" on page 23
- "Managing Faults (PSH)" on page 41
- "Managing Faults (POST)" on page 29
- "Managing Components (ASR)" on page 45
- "Checking if Oracle VTS Software Is Installed" on page 27
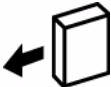
Diagnostics LEDs

The server module has LEDs on the front panel and on the drives. The LEDs conform to ANSI SIS. For the locations of these LEDs, see "Front and Rear Panel Components" on page 3, and "Drive LEDs" on page 67.

LED or Button	Icon or Label	Color	Description
Locator LED and button		White	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: • Issuing the Oracle ILOM command set /SYS/LOCATE value=Fast_Blink. • Pressing the Locator button. The Locator LED functions as the physical presence switch.
Ready to Remove LED		Blue	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.
Service Action Required LED		Amber	Indicates that service is required. POST and Oracle ILOM are two diagnostics tools that can detect a fault or failure resulting in this indication. Also, faults detected by PSH can result in Oracle ILOM lighting this LED. The Oracle ILOM show faulty command provides details about any faults that cause this indicator to light. Under some fault conditions, individual component fault LEDs are turned on in addition to the Service Action Required LED.
Power OK LED	OK	Green	Indicates the following conditions: • Off – Host is not running in its normal state. Host power might be off. The SP might be running. • Steady on – Host is powered on and is running in its normal operating state. No service actions are required. • Fast blink – Host is running in standby mode and can be quickly returned to full function. • Slow blink – A normal, but transitory activity is taking place. Slow blinking might indicate that diagnostics are running, or the host is booting.

LED or Button	Icon or Label	Color	Description
On/Standby button		n/a	The recessed Power button toggles the host on or off. • Press once to turn the host on. • Press once to shut the host down to a standby state. • Press and hold for 4 seconds to perform an emergency shutdown.
Drive Ready to Remove LED		Blue	Indicates that the drive can be removed during a hot-plug operation.
Drive Service Action Required LED		Amber	Indicates that the drive has experienced a fault condition.
Drive OK/Activity LED	**OK**	Green	Indicates the following drive status: • On – Drive is idle and available for use. • Off – Read or write activity is in progress.

Related Information

- "Diagnostics Overview" on page 5
- "Diagnostics Process" on page 7
- "Managing Faults (Oracle ILOM)" on page 11
- "Interpreting Log Files and System Messages" on page 23
- "Managing Faults (PSH)" on page 41
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- "Checking if Oracle VTS Software Is Installed" on page 27

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

Related Information

Oracle ILOM Troubleshooting Overview

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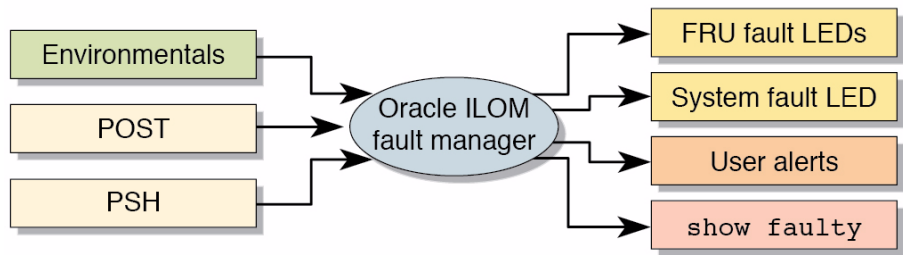
The Oracle ILOM fault manager evaluates error messages it receives to determine whether the condition being reported should be classified as an alert or a fault.

- **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. 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 drive replacement. Oracle ILOM does not automatically clear voltage sensor faults.

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.

Drive Faults

PSH does not monitor drives for faults. As a result, the SP does not recognize drive faults and will not light the fault LEDs on either the server module or the drive itself. Use the Oracle Solaris message files to view drive faults. See "View System Message Log Files" on page 24.

Related Information

- Oracle ILOM 3.0 documentation
- *SPARC and Netra SPARC T4 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

▼ Access the SP (Oracle ILOM)

You can access the server module's SP either directly or through the CMM of the modular system. You can manage the server module through the Oracle ILOM CLI or through the Oracle ILOM web interface.

Use this procedure to log into the CMM to access the SP and to use the Oracle ILOM CLI.

For alternative methods to access the server module SP, refer to the *Server Module Installation Guide*.

1. **Establish connectivity to the CMM using one of the following methods:**

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

     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).

   - **NET MGT port** – Connect this CMM port to your Ethernet network. On the CMM, this connector is labeled NET MGT. This port requires an IP address. By default, this port uses DHCP to obtain and IP address, or you can assign a static IP address.

Note – Alternatively, you can connect directly to the server module SP by using a dongle cable to connect to the server module SER MGT or NET MGT ports. For more information, refer to the *Netra SPARC T4-1B Server Module Installation Guide*.

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2. **Decide which interface to use.**

   - **Oracle ILOM CLI (default)** – Most of the commands and examples in this document use this interface. The default login account is root with a password of changeme.

   - **Oracle ILOM web interface** – Can be used when you access the SP through the NET MGT port and have a browser. Refer to the Oracle ILOM 3.0 documentation for details. This interface is not referenced in this document.

3. **Open an SSH session to log into Oracle ILOM on the CMM.**

   The default Oracle ILOM login account is `root` with a default password of `changeme`. The password might be different in your environment.

```
ssh root@CMM_IP_Address
Password:
Waiting for daemons to initialize...
Daemons ready
Oracle (R) Integrated Lights Out Manager
Version 3.0
Copyright (c) 2011, 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 Oracle ILOM CLI.

4. **Navigate to the server module.**

```
-> cd /CH/BLn/SP/cli
```

   Replace *n* with an integer that identifies the target server module (the slot in which the server module is installed).

5. **Start the server module SP Oracle ILOM CLI.**

```
-> start
Are you sure you want to start /CH/BL0/SP/cli? y
start: Connecting to /CH/BL0/SP/cli using Single Sign On
```

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

   These 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

▼ Display FRU Information (show Command)

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

- **At the Oracle ILOM prompt, type 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 = P0/B0/C0/D0
        component_state = Enabled
        fru_name = 8192MB DDR3 SDRAM
        fru_description = DDR3 DIMM 8192 Mbytes
        fru_manufacturer = Samsung
        fru_version = 00
        fru_part_number = ****************
        fru_serial_number = ******************
        fault_state = OK
        clear_fault_action = (none)
```

Related Information

▼ 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 that might be caused by a faulty fan or power input. 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 PSH.

1. **At the Oracle ILOM prompt, type 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 the chassis 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             | 2011-10-14/20:14:13
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. For
more information, see "Managing Faults (POST)" on page 29.

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

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

```
-> show faulty
Target             | Property              | Value
-------------------+-----------------------+-------------------------------
/SP/faultmgmt/0    | fru                   | /SYS/MB
/SP/faultmgmt/0/   | class                 | fault.fruid.replay
 faults/0          |                       |
/SP/faultmgmt/0/   | sunw-msg-id           | PCIEX-8000-8R
 faults/0          |                       |
/SP/faultmgmt/0/   | uuid                  | c448cc2b-9f9e-4ae7-c494-c8fe99ed
 faults/0          |                       | dd58
/SP/faultmgmt/0/   | timestamp             | 2011-08-29/16:31:51
 faults/0          |                       |
/SP/faultmgmt/0/   | chassis_serial_number | *******-**********
 faults/0          |                       |
/SP/faultmgmt/0/   | product_serial_number | **********
 faults/0          |                       |
```

```
/SP/faultmgmt/0/      | fru_serial_number   | 465769T+**********
 faults/0             |                     |
/SP/faultmgmt/0/      | fru_part_number     | 7015272
 faults/0             |                     |
->
```

Related Information

▼ 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.

You must run the Oracle Solaris `fmadm faulty` command 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 Oracle ILOM 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
------------------- ---------------------------------- ------------ -------
2011-08-11/14:54:23 *******-****-****-****-*******     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 Commands" on page 22

▼ 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. For
PSH-diagnosed faults, if the replacement of the FRU is detected by the SP 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 44.

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

  For 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

Service-Related Oracle ILOM Commands

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

Oracle ILOM Command	Description
help [*command*]	Displays a list of all available commands with syntax and descriptions. Specifying a command name as an option displays help for that command.
set /HOST send_break_action=break	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.
set /SYS/*component* clear_fault_action=true	Manually clears host-detected faults. The *component* is the unique ID of the device with a fault to be cleared.
start /HOST/console	Connects to the host.
show /HOST/console/history	Displays the contents of the host's console buffer.
set /HOST/bootmode *property=value*	Controls the host server module OBP firmware method of booting. *property* is state, config, or script
stop /SYS start /SYS	Powers off the host server module and then powers on the host server module.
stop /SYS	Powers off the host server module.
start /SYS	Powers on the host server module.
reset /SYS	Generates a hardware reset on the host server module.
reset /SP	Reboots the SP.
set /SYS keyswitch_state=*value*	Sets the virtual keyswitch. *value* is normal, standby, diag, or locked.
set /SYS/LOCATE value=*value*	Turns the Locator LED on the server module on or off. *value* is Fast_blink or Off.
show faulty	Displays current server module faults. See "Check for Faults (show faulty Command)" on page 18.
show /SYS keyswitch_state	Displays the status of the virtual keyswitch.

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

Related Information

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

Related Information

- "Diagnostics Overview" on page 5
- "Diagnostics Process" on page 7
- "Managing Faults (Oracle ILOM)" on page 11
- "Managing Faults (PSH)" on page 41
- "Managing Faults (POST)" on page 29
- "Managing Components (ASR)" on page 45
- "Checking if Oracle VTS Software Is Installed" on page 27

▼ 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 System Message Log Files" on page 24
- "List FRU Status (prtdiag Command)" on page 25

▼ View System Message Log Files

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

The /var/adm directory contains several message files. The most recent messages are in the /var/adm/messages file. After a period of time (usually every week), a new 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)

● **At an Oracle Solaris OS command line, type the** prtdiag **command.**

FRU status information is displayed.

Example:

```
# prtdiag
System Configuration:  Oracle Corporation  sun4v Netra SPARC T4-1B
Memory size: 32256 Megabytes

============================== Virtual CPUs ================================

CPU ID Frequency Implementation        Status
------ --------- --------------------- -------
0      2548 MHz  SPARC-T4              on-line
1      2548 MHz  SPARC-T4              on-line
2      2548 MHz  SPARC-T4              on-line
<...>
<...>
61     2548 MHz  SPARC-T4              on-line
62     2548 MHz  SPARC-T4              on-line
63     2548 MHz  SPARC-T4              on-line

===================== Physical Memory Configuration =======================
Segment Table:
--------------------------------------------------------------
Base            Segment  Interleave  Bank    Contains
Address         Size     Factor      Size    Modules
--------------------------------------------------------------
0x0             32 GB    2           16 GB   /SYS/MB/CMP0/BOB0/CH0/D0
                                             /SYS/MB/CMP0/BOB0/CH1/D0
                                             /SYS/MB/CMP0/BOB1/CH0/D0
                                             /SYS/MB/CMP0/BOB1/CH1/D1
```

```
                                 16 GB    /SYS/MB/CMP0/BOB2/CH0/D0
                                          /SYS/MB/CMP0/BOB2/CH1/D0
                                          /SYS/MB/CMP0/BOB3/CH0/D0
                                          /SYS/MB/CMP0/BOB3/CH1/D0


============================== IO Devices ==============================
Slot +              Bus   Name +                            Model
Status              Type  Path
------------------------------------------------------------------------
/SYS/MB/REM         PCIE  LSI,sas-pciex1000,72              LSI,2008
                          /pci@400/pci@1/pci@0/pci@c/LSI,sas@0
/SYS/MB/NET0        PCIE  network-pciex8086,10c9
                          /pci@400/pci@2/pci@0/pci@c/network@0
/SYS/MB/NET1        PCIE  network-pciex8086,10c9
                          /pci@400/pci@2/pci@0/pci@c/network@0,1
/SYS/MB/USB         PCIE  usb-pciclass,0c0310
                          /pci@400/pci@1/pci@0/pci@0/pci@0/usb@0
/SYS/MB/USB         PCIE  usb-pciclass,0c0310
                          /pci@400/pci@1/pci@0/pci@0/pci@0/usb@0,1
/SYS/MB/USB         PCIE  usb-pciclass,0c0320
                          /pci@400/pci@1/pci@0/pci@0/pci@0/usb@0,2
/SYS/MB/VIDEO       PCIX  display-pci1a03,2000
                          /pci@400/pci@2/pci@0/pci@d/pci@0/display@0


=========================== Environmental Status ===========================
Fan sensors:
All fan sensors are OK.

Fan indicators:
All fan indicators are OK.

Temperature sensors:
All temperature sensors are OK.

Temperature indicators:
All temperature indicators are OK.

Current sensors:
All current sensors are OK.

Current indicators:
All current indicators are OK.

Voltage sensors:
All voltage sensors are OK.

Voltage indicators:
All voltage indicators are OK.
```

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

Related Information

-
-
-

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. These topics provide an overview and a way to check if Oracle VTS is installed. For comprehensive Oracle VTS information, refer to the Oracle VTS documentation.

-
-

Related Information

-
-
-
-
-
-
-

Oracle VTS Overview

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

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

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

You can run Oracle VTS through a web browser, a terminal, or CLI.

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

Oracle VTS also provides a choice of security mechanisms.

Oracle 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

1. **Log in as superuser.**

2. **Check for the presence of Oracle VTS packages.**

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

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

■ As a download from the web

Related Information
■ Oracle VTS documentation

Managing Faults (POST)

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

Related Information

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 (CPU, memory, and I/O subsystem).

You can also run POST as a 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 30.

If POST detects a faulty component, the component is disabled automatically. If the server module 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 server module boots and uses the remaining cores.

Related Information

- "Diagnostics Overview" on page 5
- "Oracle ILOM Properties That Affect POST Behavior" on page 30
- "Configure POST" on page 33
- "Run POST With Maximum Testing" on page 35
- "Interpret POST Fault Messages" on page 37
- "Clear POST-Detected Faults" on page 37
- "POST Output Reference" on page 39

Oracle ILOM Properties That Affect POST Behavior

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

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

Parameter	Values	Description
/SYS keyswitch_state	normal	The host can power on and run POST (based on the other parameter settings). This parameter overrides all other commands.
	diag	The host runs POST based on predetermined settings that perform maximum verbose testing.
	standby	The host cannot power on.

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

Host
reset

set /SYS
keyswitch
_state=

normal

diag

off

set /HOST/
diag mode

normal

set /HOST/
diag trigger

hw-change
power-on-reset
error-reset
all-resets

Diag Mode
Forces a prescribed
level of diagnostic
execution.
Overrides
user-defined
settings, as if
parameters are:
`level=max`,
`verbosity=max`,
`trigger=all-resets`.
User-defined
settings are not
modified.

Normal Mode
Diagnostic
execution is
enabled.
User-defined
settings control
test coverage and
verbosity via:
`level`,
`verbosity`,
`trigger`.

Host boot
settings

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	
/HOST/diag level	max		

Oracle ILOM Parameter	Normal Diagnostic Mode (Default Settings)	No POST Execution	Service Mode Using the Keyswitch_state
`/HOST/diag trigger`	`hw-change error-reset`	`none`	
`/HOST/diag verbosity`	`normal`		
Description of POST execution	This is the default POST configuration. This configuration tests the server module thoroughly and suppresses some of the detailed POST output.	POST does not run, resulting in quick 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

▼ Configure POST

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

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'
   ```

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 30 for a list of parameters and values.

For examples:

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

or

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

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

For 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 29
- "Oracle ILOM Properties That Affect POST Behavior" on page 30

▼ Run POST With Maximum Testing

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 server module so that POST runs.**

   There are several ways to initiate a reset. The following example shows a reset using 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 host console to view the POST output.**

   ```
   -> start /HOST/console
   Are you sure you want to start /HOST/console (y/n)? y
   ```

   The following example shows abridged POST output.

   ```
   Serial console started.  To stop, type #.
   [CPU 0:0:0] NOTICE:  Checking Flash File System
   [CPU 0:0:0] NOTICE:  Initializing TOD: 2011/08/30 00:38:11
   [CPU 0:0:0] NOTICE:  Loaded ASR status DB data. Ver. 2.
   [CPU 0:0:0] WARNING: TPM not supported
   ```

```
[CPU 0:0:0] NOTICE:  Serial#:
0000000000000000.000900802c1cf133
[CPU 0:0:0] NOTICE:  Version:       003e003012030607
[CPU 0:0:0] NOTICE:  T4 Revision: 1.2
[CPU 0:0:0] NOTICE:  MCU0: Memory Capacity is 64GB
[CPU 0:0:0] NOTICE:  MCU1: Memory Capacity is 64GB
[CPU 0:0:0] NOTICE:  Usable strands: ffffffffffffffff
[CPU 0:0:0] NOTICE:  System memory capacity is 128GB
[CPU 0:0:0] NOTICE:  Clocks: CMP: 2848 MHz DRAM: 533 MHz (6.4 Gbps)
CL: 1466 MHz (8.8 Gbps)
[CPU 0:0:0] NOTICE:  Initializing TSR Hoovers
[CPU 0:0:0] NOTICE:  Initializing FSR Hoovers
[CPU 0:0:0] NOTICE:  Initializing MCU 0 serdes
[CPU 0:0:0] NOTICE:  Initializing MCU 1 serdes
[CPU 0:0:0] NOTICE:  Updating Config Information for Guest Manager
<...>
<...>
2011-08-30 00:47:29.301 0:0:0>| NODE:PORT 0:1 | AST2200          |
Addr: f850.01000000 | BDF 16: 0:0 | VID-1a03 | DID-1150 | Width=01
G1 |
2011-08-30 00:47:29.351 0:0:0>| NODE:PORT 0:1 | AST2100 Display
| Addr: f850.01100000 | BDF 17: 0:0 | VID-1a03 | DID-2000 | Width=
00 G0 |
2011-08-30 00:47:31.388 0:0:0>     PCIE PROBE Node 0 port 1,
devices found = 12
2011-08-30 00:47:31.404 0:0:0>     PCIE PROBE devices found = 23
2011-08-30 00:47:31.439 0:0:0>End  : Probe PCI Devices
2011-08-30 00:47:31.452 0:0:0>Begin: Network Tests
2011-08-30 00:47:31.496 0:0:0>End  : Network Tests
2011-08-30 00:47:31.555 0:0:0>INFO:
2011-08-30 00:47:31.563 0:0:0>    POST Passed all devices.
2011-08-30 00:47:31.576 0:0:0>POST:    Return to Host Config.
[CPU 0:0:0] NOTICE:  Reconfiguring System
```

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

See "Interpret POST Fault Messages" on page 37.

Related Information

- "POST Overview" on page 29
- "Oracle ILOM Properties That Affect POST Behavior" on page 30
- "Configure POST" on page 33
- "Interpret POST Fault Messages" on page 37
- "Clear POST-Detected Faults" on page 37

▼ Interpret POST Fault Messages

1. **Run POST.**

   See "Run POST With Maximum Testing" on page 35.

2. **View the output and watch for messages.**

   See "POST Output Reference" on page 39.

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

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

In most cases, when POST detects a faulty component, POST logs the fault and automatically takes the failed component out of operation by placing the component in the ASR blacklist. See "Managing Components (ASR)" on page 45.

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

1. **Replace the faulty FRU.**

2. **At the Oracle ILOM prompt, type the** `show faulty` **command to identify POST detected faults.**

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

```
-> show faulty
Target                 | Property               | Value
-----------------------+------------------------+---------------------------
/SP/faultmgmt/0        | fru                    | /SYS/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)

3. **Take action based on the** show faulty **output.**

   ■ No fault is reported – The server module cleared the fault and you do not need to manually clear the fault. Do not perform the subsequent steps.

   ■ Fault reported – Go to Step 4.

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

   Use the FRU name that was reported in the fault in Step 2. For 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.

5. **Reset the server module.**

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

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

   For example:

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

   Related Information

   ■ "POST Overview" on page 29

   ■ "Oracle ILOM Properties That Affect POST Behavior" on page 30

   ■ "Configure POST" on page 33

   ■ "Run POST With Maximum Testing" on page 35

   ■ "Clear POST-Detected Faults" on page 37

POST Output Reference

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.

```
2011-07-03 18:44:13.359 0:7:2>Decode of Disrupting Error Status Reg
(DESR HW Corrected)  bits 00300000.00000000
2011-07-03 18:44:13.517 0:7:2>        1    DESR_SOCSRE:     SOC
(non-local) sw_recoverable_error.
2011-07-03 18:44:13.638 0:7:2>        1    DESR_SOCHCCE:     SOC
(non-local) hw_corrected_and_cleared_error.
2011-07-03 18:44:13.773 0:7:2>
2011-07-03 18:44:13.836 0:7:2>Decode of NCU Error Status Reg bits
00000000.22000000
2011-07-03 18:44:13.958 0:7:2>        1    NESR_MCU1SRE:     MCU1 issued
a Software Recoverable Error Request
2011-07-03 18:44:14.095 0:7:2>        1    NESR_MCU1HCCE:     MCU1
issued a Hardware Corrected-and-Cleared Error Request
2011-07-03 18:44:14.248 0:7:2>
2011-07-03 18:44:14.296 0:7:2>Decode of Mem Error Status Reg Branch 1
bits 33044000.00000000
2011-07-03 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.
2011-07-03 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.
2011-07-03 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.
2011-07-03 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.
2011-07-03 18:44:15.169 0:7:2>          1    DAU 50    R/W1C Set to 1
if the error was a DRAM access UE.
2011-07-03 18:44:15.304 0:7:2>          1    DAC 46    R/W1C Set to 1
if the error was a DRAM access CE.
2011-07-03 18:44:15.440 0:7:2>
2011-07-03 18:44:15.486 0:7:2>          DRAM Error Address Reg for Branch
1 = 00000034.8647d2e0
2011-07-03 18:44:15.614 0:7:2>           Physical Address is
00000005.d21bc0c0
2011-07-03 18:44:15.715 0:7:2>          DRAM Error Location Reg for Branch
1 = 00000000.00000800
2011-07-03 18:44:15.842 0:7:2>          DRAM Error Syndrome Reg for Branch
1 = dd1676ac.8c18c045
2011-07-03 18:44:15.967 0:7:2>          DRAM Error Retry Reg for Branch 1
= 00000000.00000004
2011-07-03 18:44:16.086 0:7:2>          DRAM Error RetrySyndrome 1 Reg for
Branch 1 = a8a5f81e.f6411b5a
2011-07-03 18:44:16.218 0:7:2>          DRAM Error Retry Syndrome 2 Reg
for Branch 1 = a8a5f81e.f6411b5a
2011-07-03 18:44:16.351 0:7:2>          DRAM Failover Location 0 for
Branch 1 = 00000000.00000000
2011-07-03 18:44:16.475 0:7:2>          DRAM Failover Location 1 for
Branch 1 = 00000000.00000000
2011-07-03 18:44:16.604 0:7:2>
2011-07-03 18:44:16.648 0:7:2>ERROR: POST terminated prematurely. Not
all system components tested.
2011-07-03 18:44:16.786 0:7:2>POST: Return to VBSC
2011-07-03 18:44:16.795 0:7:2>ERROR:
2011-07-03 18:44:16.839 0:7:2>    POST toplevel status has the following
failures:
2011-07-03 18:44:16.952 0:7:2>    Node 0 -------------------------------
2011-07-03 18:44:17.051 0:7:2>        /SYS/MB/CMP0/BOB0/CH1/D0
2011-07-03 18:44:17.145 0:7:2>        /SYS/MB/CMP0/BOB1/CH1/D0
2011-07-03 18:44:17.241 0:7:2>END_ERROR
```

Related Information

- "Oracle ILOM Properties That Affect POST Behavior" on page 30
- "Run POST With Maximum Testing" on page 35
- "Clear POST-Detected Faults" on page 37

Managing Faults (PSH)

These topics describe the PSH feature:

- "PSH Overview" on page 41
- "Check for PSH-Detected Faults" on page 42
- "Clear PSH-Detected Faults" on page 44

Related Information

PSH 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 server module. 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 server modules.

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 a system administrator

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

Related Information

- "Check for Faults (show faulty Command)" on page 18
- "Check for PSH-Detected Faults" on page 42
- "Clear PSH-Detected Faults" on page 44

▼ Check for PSH-Detected Faults

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

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

1. **Check the event log.**

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


Platform    : sun4v     Chassis_id  :
Product_sn  :

Fault class : fault.cpu.generic-sparc.strand
Affects     : cpu:///cpuid=**/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.

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.
- EVENT-ID, which is unique for every fault (21a8b59e-89ff-692a-c4bc-f4c5cccca8c8).
- MSG-ID, which can be used to obtain additional fault information (SUN4V-8002-6E).
- Faulted FRU. The information provided in the example includes the part number of the FRU and the serial number of the FRU. 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.**

   a. **Obtain the message ID from console output or from the Oracle ILOM** show faulty **command.**

   b. **Sign into the Oracle support site,** http://support.oracle.com**.**

      c. Select the Knowledge tab.

      d. Search for that message ID in the Knowledge Base.

      e. Follow the suggested actions to repair the fault.

Related Information

-

▼ Clear PSH-Detected Faults

When PSH detects faults, the faults are logged and displayed on the console. In most cases, after the fault is repaired, the server module 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, determine if 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.

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 Step 3.

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

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

   ```
   # fmadm repair EVENT-ID
   ```

   For the EVENT-ID in the example shown in Step 2, type:

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

4. **Use the Oracle ILOM** `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

- "PSH Overview" on page 41
- "Clear PSH-Detected Faults" on page 44

Managing Components (ASR)

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

- "ASR Overview" on page 46
- "Display System Components" on page 47
- "Disable System Components" on page 48
- "Enable System Components" on page 49

Related Information

ASR Overview

ASR 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 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, add, or remove components (asrkeys) from the ASR blacklist. You run these commands from the Oracle ILOM prompt.

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 server module for the component's change of state to take effect. See the *SPARC and Netra SPARC T4 Series Servers Administration Guide*

Related Information

- "Display System Components" on page 47
- "Disable System Components" on page 48
- "Enable System Components" on page 49

▼ Display System Components

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

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

  In the following example, one of the DIMMs (`BOB1/CH0/D0`) is shown as disabled.

```
->show components
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/ | component_state       | Enabled
P0                  |
/SYS/MB/CMP0/CORE0/ | component_state       | Enabled
P1                  |
<...>
<...>
```

```
/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/        | component_state      | Enabled
 NIU_CORE            |                      |
/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/   | component_state      | Enabled
 CH0/D0              |                      |
/SYS/MB/CMP0/BOB0/   | component_state      | Enabled
 CH1/D0              |                      |
/SYS/MB/CMP0/BOB1/   | component_state      | Disabled
 CH0/D0              |                      |
/SYS/MB/CMP0/BOB1/   | component_state      | Enabled
 CH1/D0              |                      |
/SYS/MB/CMP0/BOB2/   | component_state      | Enabled
 CH0/D0              |                      |
/SYS/MB/CMP0/BOB2/   | component_state      | Enabled
 CH1/D0              |                      |
/SYS/MB/CMP0/BOB3/   | component_state      | Enabled
 CH0/D0              |                      |
/SYS/MB/CMP0/BOB3/   | component_state      | Enabled
 CH1/D0              |                      |
/SYS/MB/GBE          | component_state      | Enabled
/SYS/MB/USB          | component_state      | Enabled
/SYS/MB/VIDEO        | component_state      | Enabled
/SYS/MB/PCI-         | component_state      | Enabled
 SWITCH0             |                      |
/SYS/MB/PCI-         | component_state      | Enabled
 SWITCH1             |                      |

->
```

Related Information

- "View System Message Log Files" on page 24
- "Disable System Components" on page 48
- "Enable System Components" on page 49

▼ Disable System Components

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

1. **At the Oracle ILOM prompt, set the** component_state **property to** Disabled**.**

```
-> set /SYS/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 System Message Log Files" on page 24
- "Display System Components" on page 47
- "Enable System Components" on page 49

▼ Enable System Components

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

1. **At the Oracle ILOM prompt, set the** component_state **property to** Enabled**.**

```
-> set /SYS/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 System Message Log Files" on page 24
- "Display System Components" on page 47
- "Disable System Components" on page 48

Preparing for Service

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

Step	Description	Links
1.	Review the safety and handling information.	"Safety Information" on page 51 "Handling Precautions" on page 53
2.	Gather the tools for service.	"Tools Needed for Service" on page 54
3.	find serial numbers for the modular system and the server module.	"Find the Modular System Chassis Serial Number" on page 54 "Find the Server Module Serial Number" on page 55
4.	Identify the server module that you want to service.	"Locate the Server Module" on page 56
5.	Shut down the OS and host, and place the server module in a ready-to-remove state.	"Preparing the Server Module for Removal" on page 56
6.	Remove the server module from the modular system chassis.	"Remove the Server Module From the Modular System" on page 61
7.	Remove the server module cover.	"Remove the Cover" on page 63

Related Information

- "Returning the Server Module to Operation" on page 117

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 server module and in the *Netra SPARC T4-1B 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 ESD 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 – Components inside the server module might be hot. Use caution when servicing components inside the server module.

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

ESD Measures

ESD sensitive devices, such as the motherboard, cards, drives, and DIMMs require special handling.

Caution – Circuit boards and drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy 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 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

- "Handling Precautions" on page 53
- "Tools Needed for Service" on page 54

Handling Precautions

Review the following cautions.

Caution – A server module can weigh as much as 20 pounds (9.0 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.

Related Information

- "Safety Information" on page 51
- "Tools Needed for Service" on page 54

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 *Server Module Installation Guide*)
- Blade filler panel

Related Information

- "Safety Information" on page 51
- "Handling Precautions" on page 53
- "Find the Modular System Chassis Serial Number" on page 54

▼ Find the Modular System Chassis Serial Number

To obtain support for your server module, you need the serial number of the Sun Netra 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 Netra 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 55
- "Locate the Server Module" on page 56

▼ Find the Server Module Serial Number

Note – To obtain support for your server module, you need the serial number of the Sun Netra 6000 modular system in which the server module is located, not the serial number of the server module. See "Find the Modular System Chassis Serial Number" on page 54.

The serial number of the server module is located on a sticker on the RFID tag that is mounted in the center of the front panel. However, this label is not present on a server module 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:
        MB
        MB_ENV
        HDD0
        <...>
        <...>
    Properties:
        type = Host System
        ipmi_name = /SYS
        keyswitch_state = Normal
        product_name = Netra SPARC T4-1B
        product_part_number = T4-1B-ATO1-PNET
        product_serial_number = 1131NN10F5    <---
        product_manufacturer = Oracle Corporation
        fault_state = OK
        clear_fault_action = (none)
        prepare_to_remove_status = NotReady
        prepare_to_remove_action = (none)
        return_to_service_action = (none)
        power_state = On
```

Related Information

- ■ "Locate the Server Module" on page 56
- ■ "Find the Modular System Chassis Serial Number" on page 54

▼ 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 61

Preparing the Server Module for Removal

There are several ways to shut down the server module before you remove it from the chassis.

Description	Links
Perform a graceful shutdown using commands.	"Shut Down the OS and Host (Commands)" on page 57
	"Set the Server Module to a Ready-to-Remove State" on page 60
Perform a graceful shutdown using the power button and commands.	"Shut Down the OS and Host (Power Button – Graceful)" on page 59
	"Set the Server Module to a Ready-to-Remove State" on page 60
Perform a nongraceful shutdown (last resort or emergency situations).	"Shut Down the OS and Host (Emergency Shutdown)" on page 59
	"Set the Server Module to a Ready-to-Remove State" on page 60

Related Information

- "Remove the Server Module From the Modular System" on page 61

▼ Shut Down the OS and Host (Commands)

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 2011

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

Netra SPARC T4-1B, No Keyboard
Copyright (c) 1998, 2011, Oracle and/or its affiliates. All Rights
reserved.
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 host console to the Oracle ILOM prompt by typing the** `#.` **(Hash Period) key sequence.**

7. **At the Oracle ILOM prompt, type.**

```
-> stop /SYS
```

8. **Prepare the server module for removal.**

   See "Set the Server Module to a Ready-to-Remove State" on page 60.

Related Information

- "Shut Down the OS and Host (Power Button – Graceful)" on page 59
- "Shut Down the OS and Host (Emergency Shutdown)" on page 59
- "Set the Server Module to a Ready-to-Remove State" on page 60

▼ Shut Down the OS and Host (Power Button – Graceful)

This procedure gracefully shuts down the OS and 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 3.

Note – 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

- "Shut Down the OS and Host (Commands)" on page 57
- "Shut Down the OS and Host (Emergency Shutdown)" on page 59
- "Set the Server Module to a Ready-to-Remove State" on page 60

▼ Shut Down the OS and Host (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. See "Front and Rear Panel Components" on page 3

Related Information

- "Shut Down the OS and Host (Commands)" on page 57
- "Shut Down the OS and Host (Power Button – Graceful)" on page 59
- "Set the Server Module to a Ready-to-Remove State" on page 60

▼ Set the Server Module to a Ready-to-Remove State

1. **Log in to Oracle ILOM on the server module you plan to remove.**

2. **Ensure that the server module is in standby mode, with the host powered off.**

```
-> 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 OS and Host (Commands)" on page 57.

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 3 to locate this LED. If the Ready to Remove LED is on, the server module is ready for removal from the modular system chassis.

5. **Remove the server module from the chassis.**

See "Remove the Server Module From the Modular System" on page 61.

Related Information

- "Remove the Server Module From the Modular System" on page 61
- "Shut Down the OS and Host (Commands)" on page 57
- "Shut Down the OS and Host (Power Button – Graceful)" on page 59
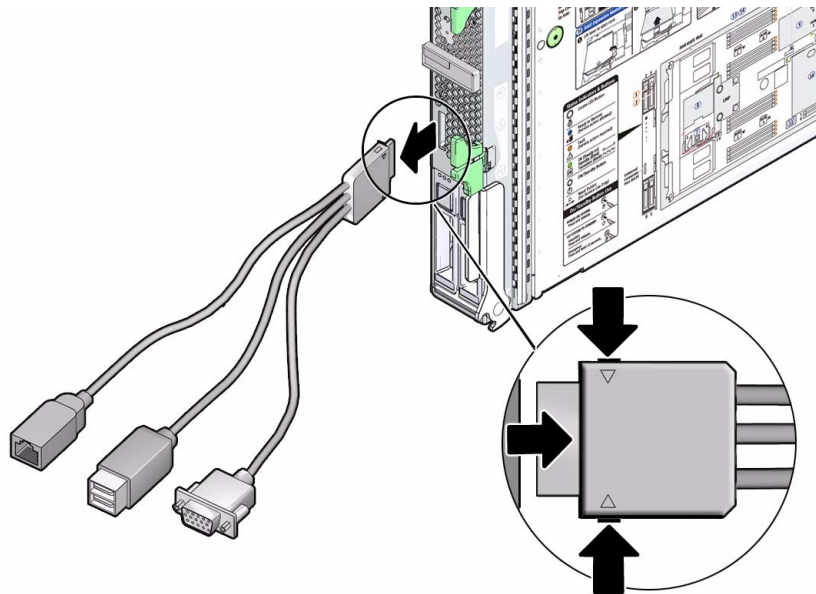- "Shut Down the OS and Host (Emergency Shutdown)" on page 59

▼ Remove the Server Module From the Modular System

1. **Review the safety and handling precautions.**

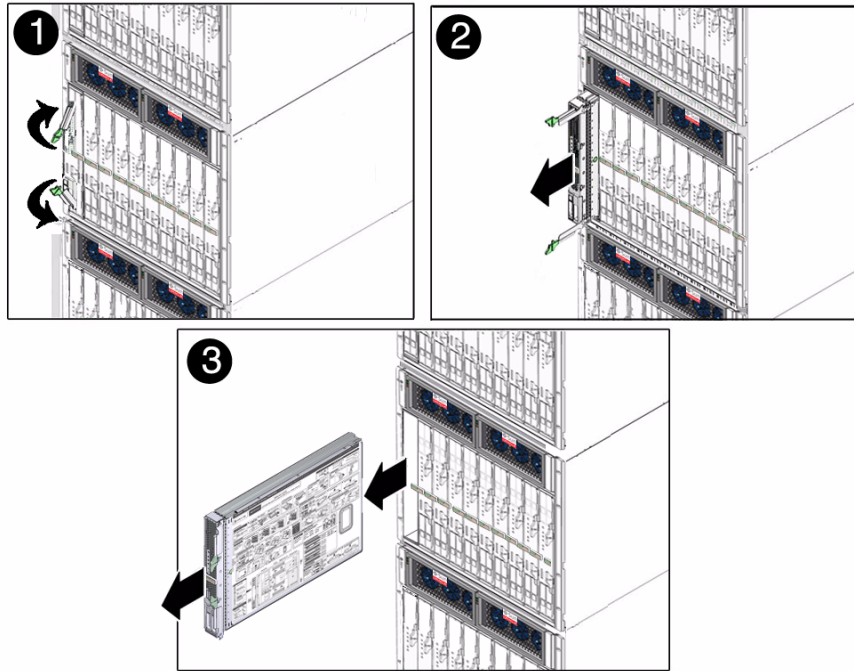   See "Safety Information" on page 51 and "Handling Precautions" on page 53.

2. **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.

3. **Open both ejector arms (panel 1).**

   Squeeze both latches on each of the two ejector arms.

4. Pull the server module out (panel 2 and panel 3).

5. Close the ejector arms.

6. Remove the server module from the modular system (panel 3).

Lift the server module with two hands.

7. Place the server module on an antistatic mat or surface.

8. 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.

---

9. Remove the server module cover.

See "Remove the Cover" on page 63.

Related Information

- "Remove the Cover" on page 63
- "Install the Server Module Into the Modular System" on page 118

▼ Remove the Cover

1. **(If needed) Remove the server module from the modular system.**

   See "Remove the Server Module From the Modular System" on page 61.

2. **Attach an antistatic strap to your wrist and then to a metal area on the server module.**

3. **While pressing the cover release button, slide the cover toward the rear of the server module about half an inch (1 cm).**
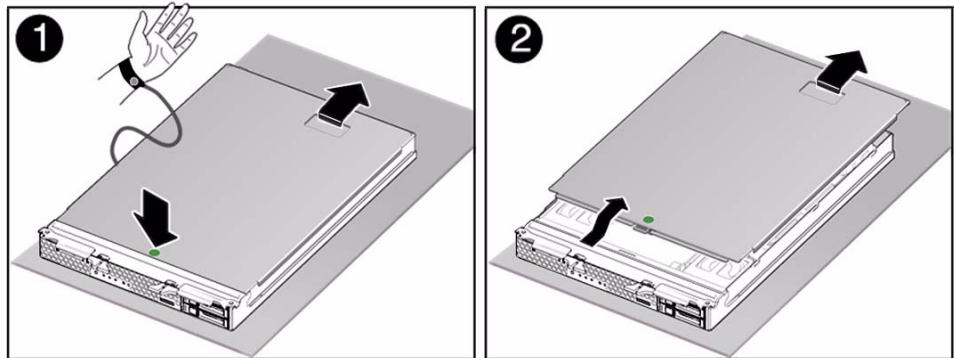
4. **Lift the cover off the server module chassis.**

5. **Service the faulty component.**

   See "Illustrated Parts Breakdown" on page 1.

Related Information

- "Illustrated Parts Breakdown" on page 1
- "Replace the Cover" on page 117

Servicing Drives

The following topics apply to hard drives and solid state drives installed in the front slots of the server module.

Note – The term *drive* applies to either a hard drive or a solid state drive.

Description	Links
Replace a faulty drive.	"Drive Hot-Plugging Guidelines" on page 68
	"Drive Configuration" on page 66
	"Locate a Faulty Drive" on page 68
	"Remove a Drive" on page 69
	"Install a Drive" on page 71
	"Verify Drive Functionality" on page 74
Add an additional drive.	"Drive Configuration" on page 66
	"Remove a Drive Filler" on page 70
	"Install a Drive" on page 71
	"Verify Drive Functionality" on page 74
Remove a drive without replacing it.	"Drive Configuration" on page 66
	"Locate a Faulty Drive" on page 68
	"Install a Drive Filler" on page 73
Identify drive LEDs.	"Drive LEDs" on page 67

Related Information

- "Detecting and Managing Faults" on page 5
- "Preparing for Service" on page 51

Drive Configuration

The following figure and table describe the physical addresses assigned to the drives installed when the drive is installed into a particular slot.

Note – The Oracle Solaris OS now uses the *WWN* syntax in place of the unique *tn* (target ID) field in logical device names. This change affects how a target storage device is identified. Refer to the *Server Module Product Notes* for details.
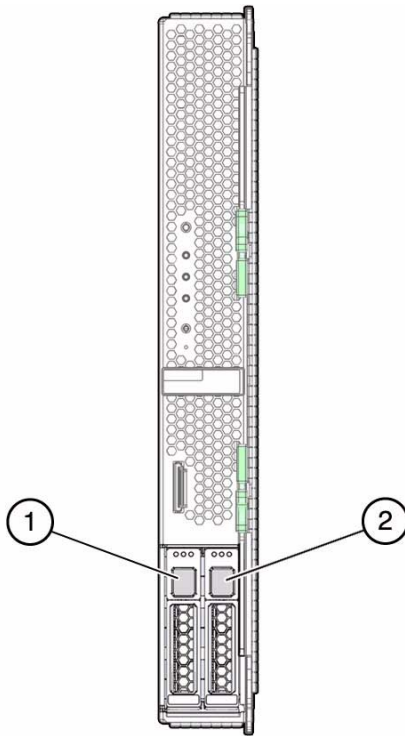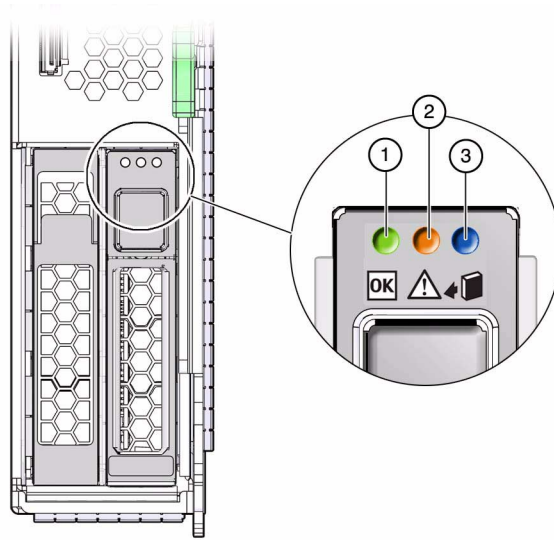

No.	Description
1	Drive slot 0
2	Drive slot 1

Drive LEDs

No.	LED or Button	Color	Icon	Description
1	Drive OK/Activity LED	Green	**OK**	Indicates the following drive status: • On – Drive is idle and available for use. • Off – Read or write activity is in progress.
3	Drive Service Action Required LED	Amber	⚠	Indicates that the drive has experienced a fault condition.
2	Drive Ready to Remove LED	Blue	←	Indicates that a drive can be removed during a hot-plug operation.

Drive Hot-Plugging Guidelines

To safely remove a 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. See "Shut Down the OS and Host (Commands)" on page 57.

Related Information

- "Remove a Drive" on page 69
- "Install a Drive" on page 71

▼ Locate a Faulty Drive

This procedure describes how to identify a faulty drive using the fault LEDs on the drive.

You can also use the diskinfo(1M) command to identify the slot in which a particular drive is installed. Refer to the *Administration Guide* and to the *Product Notes* for more information.

- **View the drive LEDs to determine the status of the drive.**

  When the amber drive Service Required LED on the front of a drive is lit, a fault has occurred on that drive.

  See "Drive LEDs" on page 67.

Related Information

- "Detecting and Managing Faults" on page 5
- "Remove a Drive" on page 69

- "Install a Drive" on page 71

▼ Remove a Drive

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

   See "Locate a Faulty Drive" on page 68.

2. **Prepare the drive for removal by performing one of the following steps:**
   - 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 Oracle Solaris `cfgadm` man page.
   - Shut down the Oracle Solaris OS.

     If the drive cannot be taken offline, shut down the Oracle Solaris OS on the server module. See "Shut Down the OS and Host (Commands)" on page 57

3. **Verify whether the blue Drive Ready to Remove LED is illuminated on the front of the drive.**

   See "Drive LEDs" on page 67. The blue LED will be illuminated only if the drive was taken offline using `cfgadm` or an equivalent command. The LED will not be illuminated if Oracle Solaris was shut down.

4. **Remove the drive.**

   a. **Push the latch release button on the drive (panels 1 and 2).**
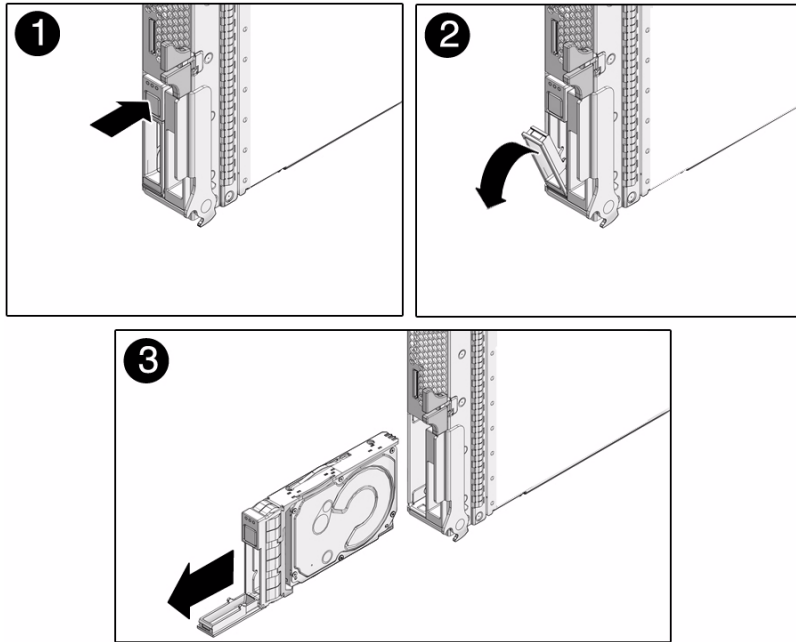
b. Grasp the latch and pull the drive out of the drive slot (panel 3).

5. **Consider your next step.**

   - If you are replacing the drive, see "Install a Drive" on page 71.
   - If you are not replacing the drive, install a drive filler. See "Install a Drive Filler" on page 73.

Related Information

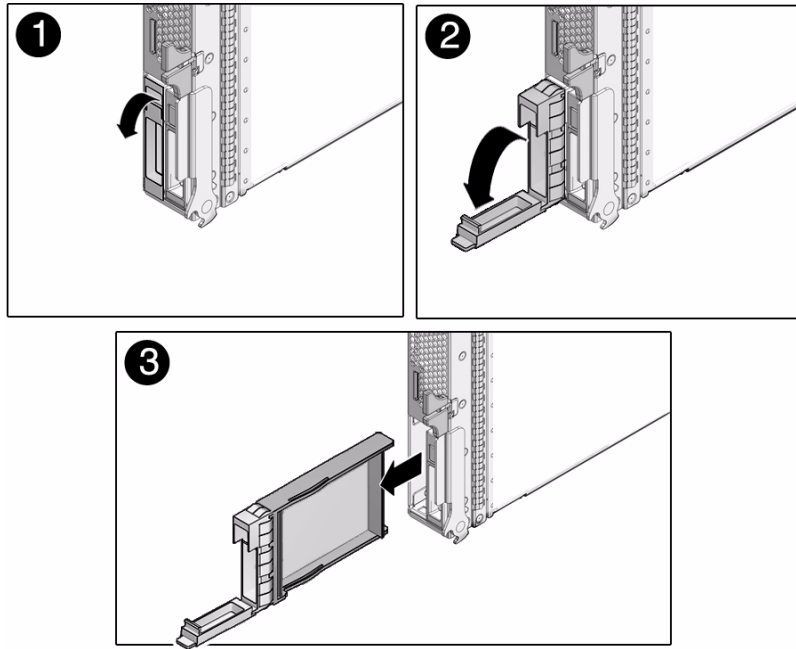- "Install a Drive Filler" on page 73
- "Install a Drive" on page 71

▼ 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).**

3. **Install a drive in this slot.**

   See "Install a Drive" on page 71.

Related Information

- "Install a Drive" on page 71
- "Install a Drive Filler" on page 73

▼ Install a Drive

The physical address of a drive is based the slot in which it is installed. See "Drive Configuration" on page 66.

1. **(If needed) Remove a drive.**

   See "Remove a Drive" on page 69.

2. **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.

3. **(If needed) Remove the drive filler from this slot.**

   See "Remove a Drive Filler" on page 70.

4. **Slide the drive into the bay until it is fully seated (panel 1).**
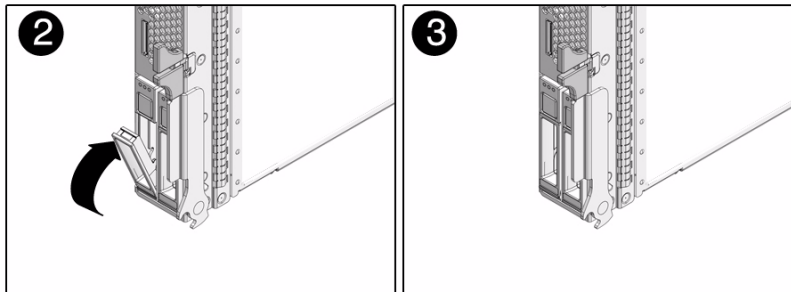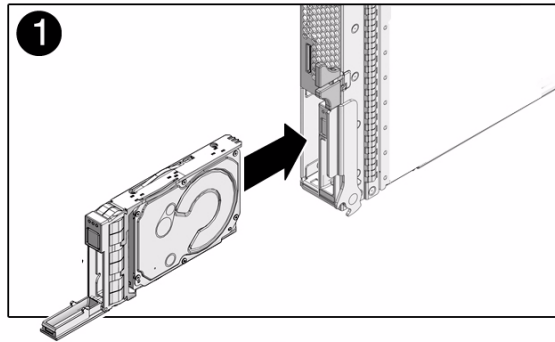
5. **Close the latch to lock the drive in place (panels 2 and 3).**

6. **Verify the functionality of the new drive.**

   See "Verify Drive Functionality" on page 74.

Related Information

- "Remove a Drive" on page 69

▼ 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).**
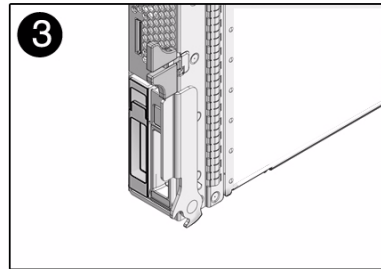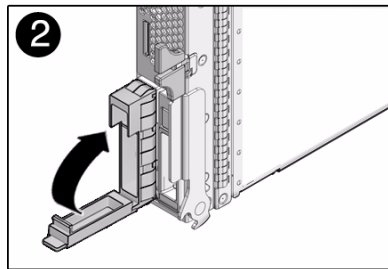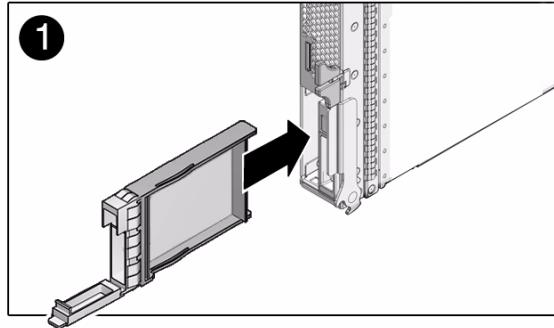
2. **Push the filler into place.**

3. **Close the filler lever (panels 2 and 3).**

Related Information

- "Remove a Drive" on page 69
- "Remove a Drive Filler" on page 70

▼ Verify Drive Functionality

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

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

2. **Verify that the drive's blue Ready to Remove LED is no longer lit on the drive that you installed.**

   See "Drive LEDs" on page 67.

   If the fault LED is not illuminated, the drive is ready to be configured according to your requirements. Go to Step 3.

   If the fault LED is lit, see "Detecting and Managing Faults" on page 5.

3. **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 Oracle Solaris command `cfgadm -al` to list all drives in the device tree, including unconfigured drives.

   - If the drive is not in the list, such as with a newly installed drive, you can use `devfsadm` to configure it into the tree. See the `devfsadm` man page for details.

   Related Information

   - "Detecting and Managing Faults" on page 5
   - "Locate a Faulty Drive" on page 68
   - "Remove a Drive" on page 69
   - "Install a Drive" on page 71

Servicing Memory

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

Related Information

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 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 incorrect 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 server module, 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 82.

- **PSH** – A feature of the Oracle Solaris OS, PSH uses the fault manager daemon (fmd) 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 PSH.

Once you identify which DIMMs you want to replace, see "Locate a Faulty DIMM" on page 79. After replacing a faulty DIMM, you must perform the instructions in "Clear the Fault and Verify the Functionality of the Replacement DIMM" on page 82.

Related Information

- "Locate a Faulty DIMM" on page 79
- "Clear the Fault and Verify the Functionality of the Replacement DIMM" on page 82
- "Clear the Fault and Verify the Functionality of the Replacement DIMM" on page 82
- "Detecting and Managing Faults" on page 5

DIMM Configuration
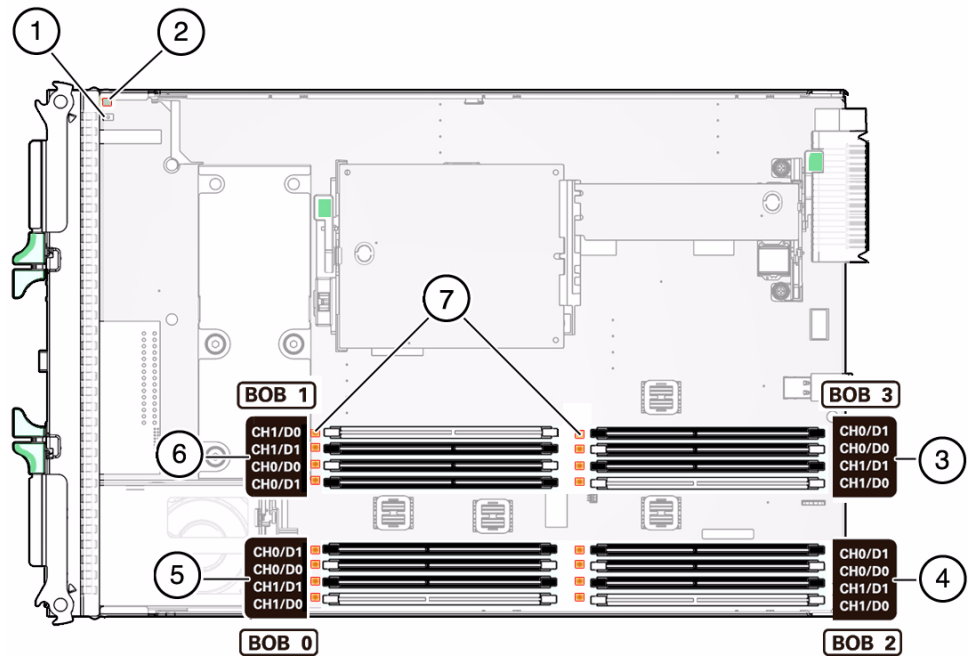
No.	Description or Partial FRU Name (full names start with `/SYS/MB/CMP0/`)
1	Fault Remind button
2	Fault Remind Power LED

3	DIMMs controlled by BOB3:
	`CH0/D1`
	`CH0/D0`
	`CH1/D1`
	`CH1/D0`

4	DIMMs controlled by BOB4:
	`CH0/D1`
	`CH0/D0`
	`CH1/D1`
	`CH1/D0`

No.	Description or Partial FRU Name (full names start with `/SYS/MB/CMP0/`)
5	DIMMs controlled by BOB0:
	CH0/D1
	CH0/D0
	CH1/D1
	CH1/D0
6	DIMMs controlled by BOB1:
	CH1/D0
	CH1/D1
	CH0/D0
	CH0/D1
7	DIMM Fault LEDs

DIMM configuration guidelines:

- Use only supported industry-standard DDR-3 DIMMs.
- Use supported DIMM capacities: 4 Gbyte, 8 Gbyte, and 16 Gbyte.

  Refer to the *Netra SPARC T4-1B Server Module Product Notes* for the latest information.

- Install quantities of 4, 8, or 16 DIMMs, in the correct slots:
  - 4 DIMMs: CH1/D0 slots (white sockets)
  - 8 DIMMs: CH1/D0 and CH0/D0 slots
  - 16 DIMMs: All slots
- Ensure that all DIMMs have the same part number.

Related Information

- "Memory Faults" on page 75
- "Locate a Faulty DIMM" on page 79
- "Remove a DIMM" on page 80
- "Install a DIMM" on page 81
- "Clear the Fault and Verify the Functionality of the Replacement DIMM" on page 82

DIMM Handling Precautions

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.

Related Information

- "Locate a Faulty DIMM" on page 79
- "Remove a DIMM" on page 80
- "Install a DIMM" on page 81

▼ Locate a Faulty DIMM

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" on page 77.

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 Fault LED is lit.

   - If the Fault LED is not lit, and you suspect there is a problem, see "Diagnostics Process" on page 7.
   - If the Fault LED is lit, go to the next step.

2. (If needed) Prepare for service.

See "Preparing for Service" on page 51.

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. See "DIMM Configuration" on page 77.

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.

---

4. Remove the faulty DIMM.

See "Remove a DIMM" on page 80.

Related Information

- "DIMM Configuration" on page 77
- "Remove a DIMM" on page 80

▼ Remove a DIMM

1. (If needed) Prepare for service.
See "Preparing for Service" on page 51.

2. (If needed) Locate the faulty DIMM.
See "Locate a Faulty DIMM" on page 79.

3. Remove the DIMM from the motherboard.
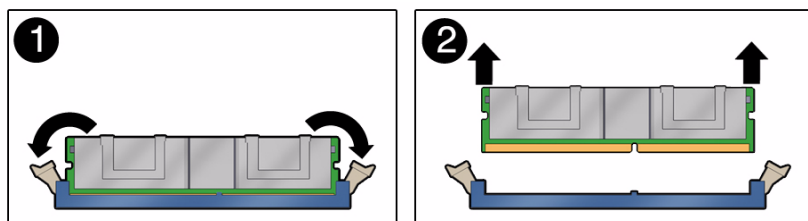
a. Push down on the ejector tabs on each side of the DIMM until the DIMM is released (panel 1).

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 DIMM" on page 81.

Related Information

■ "Install a DIMM" on page 81
■ "DIMM Configuration" on page 77

▼ Install a DIMM

1. **(If needed) Prepare the server module for service and remove the faulty DIMM.**

   See "Preparing for Service" on page 51 and "Remove a DIMM" on page 80.

2. **Unpack the replacement DIMM and set it on an antistatic mat.**

   See "DIMM Handling Precautions" on page 79.

3. **Ensure that the DIMM ejector tabs are in the open position (panel 1).**
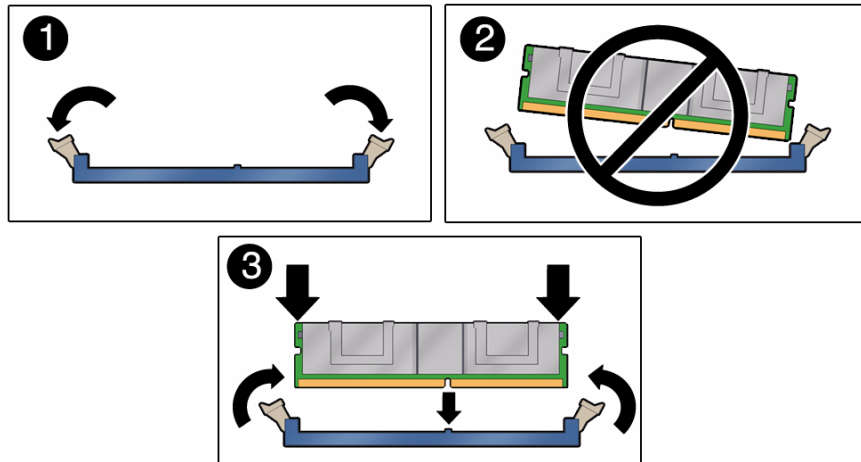
4. **Line up the replacement DIMM with the connector.**

   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 117

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 82.
   - Verify additional memory. See "Verify DIMM Functionality" on page 86.

   Related Information

   - "Remove a DIMM" on page 80
   - "DIMM Configuration" on page 77

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

1. **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 "Set the Server Module to a Ready-to-Remove State" on page 60.

   - You have connectivity to the SP.

     See "Access the SP (Oracle ILOM)" on page 15

2. **Access the Oracle ILOM prompt.**

   See "Access the SP (Oracle ILOM)" on page 15.

3. **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 4. For 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/    | sunw-msg-id            | SUN4V-8000-DX
faults/0            |                        |
/SP/faultmgmt/0/    | uuid                   | 3aa7c854-9667-e176-efe5-e487e520
faults/0            |                        | 7a8a
/SP/faultmgmt/0/    | timestamp              | Apr 24 22:43:59
faults/0            |                        |
```

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

```
-> show faulty
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/    | timestamp              | Apr 24 16:40:56 faults/0
/SP/faultmgmt/0/    | sp_detected_fault      | /SYS/MB/CMP0/BOB1/CH0/D0
faults/0            |                        | 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. 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
```

4. **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 server module.

```
-> 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 host 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 vbsc runpost command and spin...
```

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

d. Return the virtual keyswitch to Normal mode.

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

    e. **Switch to the host console and type the Oracle 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.

5. Switch to the Oracle ILOM prompt.

6. 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/     | sunw-msg-id            | SUN4V-8000-DX
faults/0             |                        |
/SP/faultmgmt/0/     | uuid                   | 3aa7c854-9667-e176-efe5-e487e520
faults/0             |                        | 7a8a
/SP/faultmgmt/0/     | timestamp              | Dec 14 22:43:59
faults/0             |                        |
```

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

7. (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'
```

8. (Only if previous steps did not clear the fault) Switch to the host 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 DIMM" on page 81

▼ Verify DIMM Functionality

1. **Access the Oracle ILOM prompt.**

   Refer to the *SPARC T4 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, 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 server module. 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, 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 typing this command.

c. Switch to the host 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 server module 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 'ketswitch_state' to 'Normal'
```

f. Switch to the host 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.**

```
-> show faulty
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/        | sunw-msg-id            | SUN4V-8000-DX
faults/0                |                        |
/SP/faultmgmt/0/        | uuid                   | 3aa7c854-9667-e176-efe5-e487e520
faults/0                |                        | 7a8a
/SP/faultmgmt/0/        | timestamp              | Dec 14 22:43:59
faults/0                |                        |
```

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

7. Switch to the host 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 80
- "Install a DIMM" on page 81
- "DIMM Configuration" on page 77

Servicing the REM

The server module supports the installation of one REM. For a list of supported REMs, refer to the *Netra SPARC T4-1B Server Module Product Notes*.

Description	Links
Troubleshoot a REM problem.	Refer to the documentation for the REM.
Replace a REM.	"Remove a REM" on page 89 "Install a REM" on page 90
Install a REM.	"Install a REM" on page 90

Related Information

- "Detecting and Managing Faults" on page 5
- "Preparing for Service" on page 51

▼ Remove a REM

1. **Prepare for service.**

   See "Preparing for Service" on page 51.

2. **Lift the REM ejector arm (panel 1).**
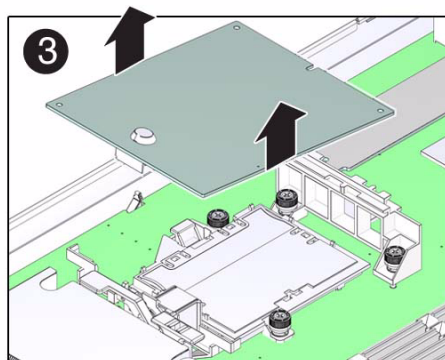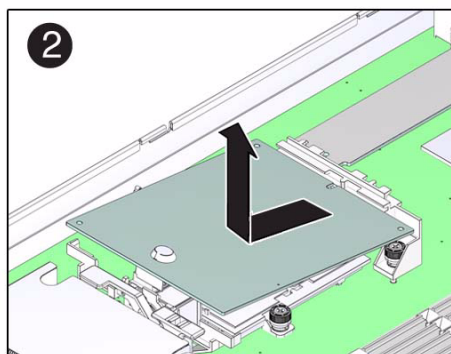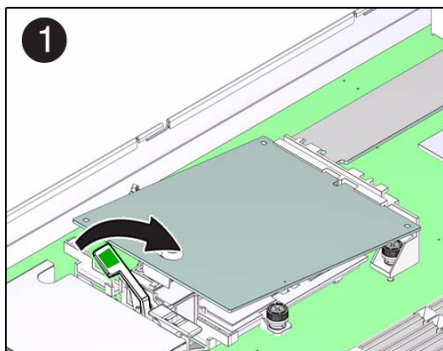
3. **Rotate the card up and off the retainer (panels 2 and 3).**

4. **Set the card on an antistatic surface.**

5. **Install a REM.**

   See "Install a REM" on page 90.

Related Information

■ "Install a REM" on page 90

▼ Install a REM

For information about specific configuration tasks for your REM, refer to the REM documentation.

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

   See "Preparing for Service" on page 51.

2. **(If needed) Remove a REM.**

   See "Remove a REM" on page 89.

3. **Align the REM for installation (panel 1).**

4. **Slide the end of the REM that is opposite the connector under the tabs of the plastic standoff (panel 2).**
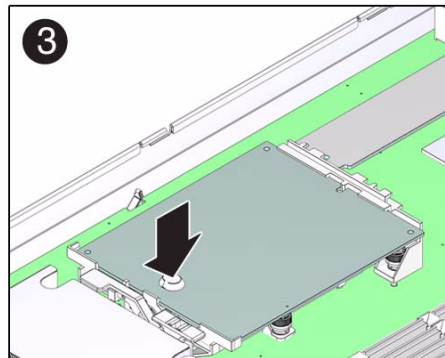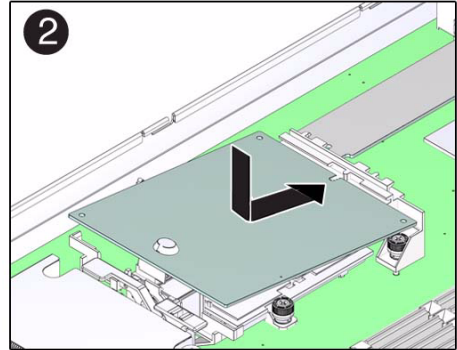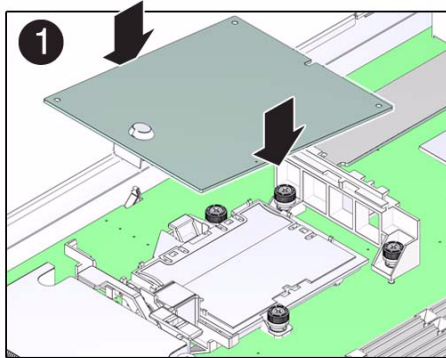
5. **Press the REM until the connector is fully seated on the motherboard (panel 3).**

   If there is a rubber bumper on the REM, you can press down on it directly to seat the connector.

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

   See "Returning the Server Module to Operation" on page 117.

7. **Configure or verify the RAID after installing the REM.**

   Refer to the *SPARC and Netra SPARC T4 Series Servers Administration Guide* for information about RAID configuration on this server module.

Related Information

■ "Remove a REM" on page 89

Servicing the FEM

The server module supports the installation of one FEM. To see a list of supported FEMs for this server module, refer to the *Netra SPARC T4-1B Server Module Product Notes*.

Description	Links
Replace a FEM.	"Remove a FEM" on page 93
	"Install a FEM" on page 94
Install a FEM.	"Install a FEM" on page 94

Related Information

- "Detecting and Managing Faults" on page 5
- "Preparing for Service" on page 51

▼ Remove a FEM

FEMs are available in single and double widths. Figures in this procedure depict a single-width FEM, but the procedure applies to both types of FEMs.

1. **Prepare for service.**

   See "Preparing for Service" on page 51.

2. **Lift the lever to eject the FEM (panel 1).**
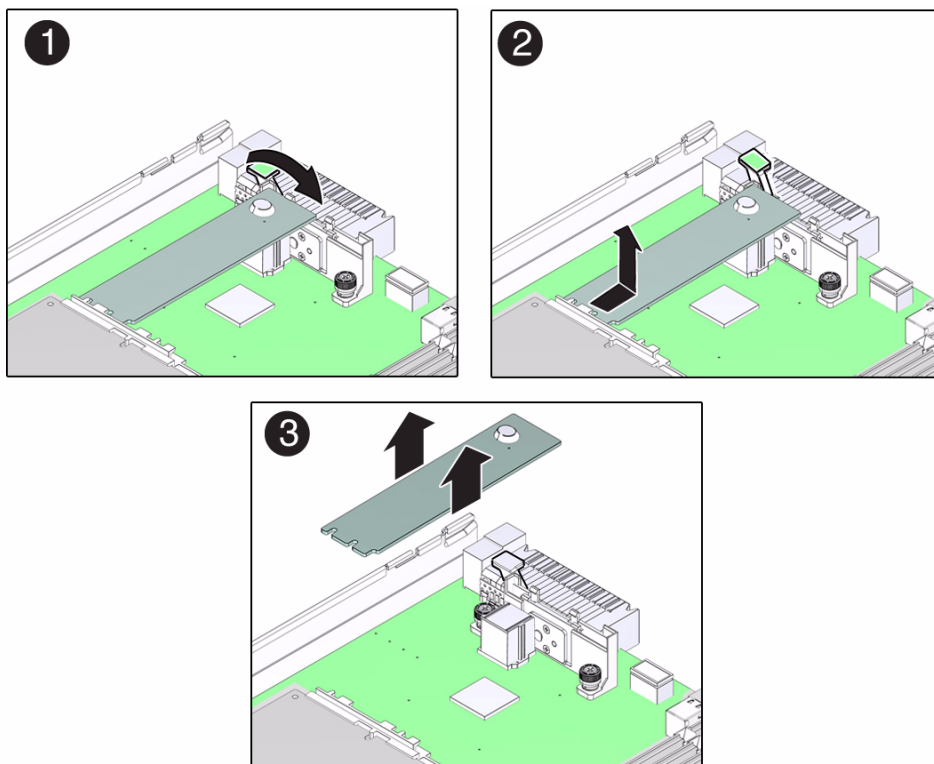
3. **Tilt the FEM up (panel 2).**

4. **Remove the FEM (panel 3) and place the FEM on an antistatic mat.**

5. **(If needed) Install a FEM.**

   See "Install a FEM" on page 94.

Related Information

■ "Install a FEM" on page 94

▼ 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.**

   See "Preparing for Service" on page 51.

2. **(If needed) Remove a FEM.**

   See "Remove a FEM" on page 93.

3. **Determine the correct set of motherboard FEM connectors for your FEM.**
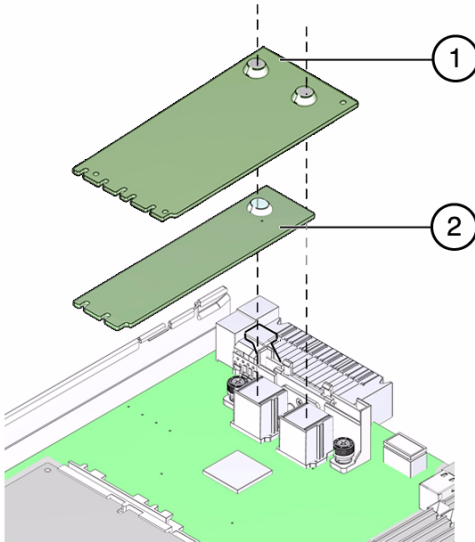
   - A double-width FEM (card 1) uses connectors FEM-0 and FEM-1.
   - A single-width FEM (card 2) uses connector FEM-0.

4. **Insert the FEM edge into the bracket and carefully align the FEM so that the card connects with the correct motherboard connectors (panels 1 and 2).**
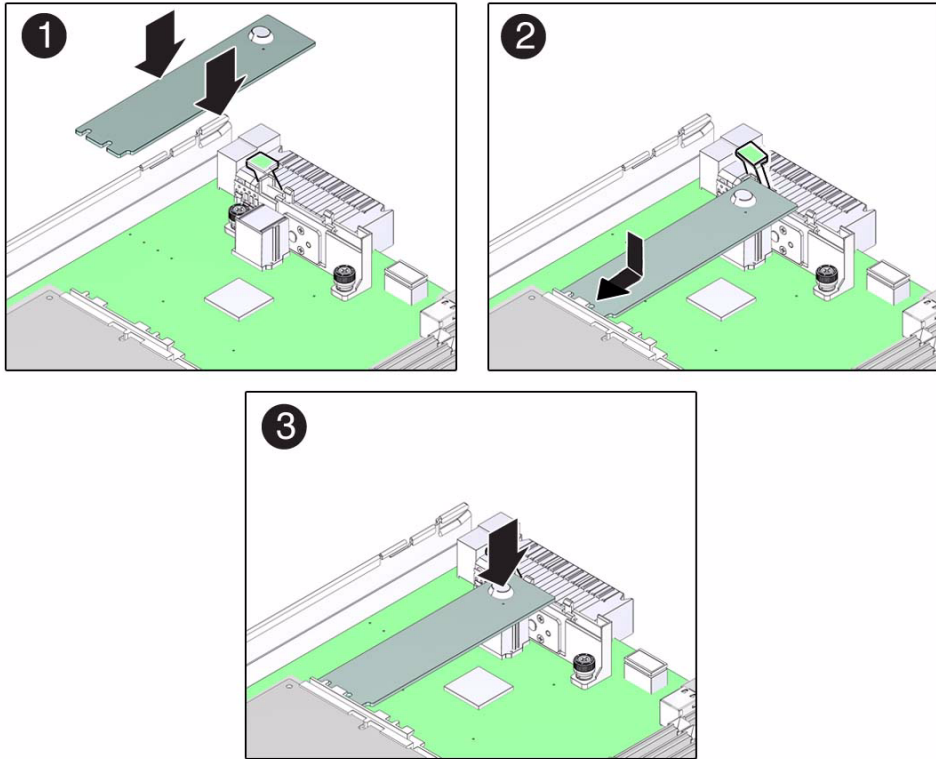
5. Lower the card and press the card into place (Panel 3).

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

6. Return the server module to operation.

See "Returning the Server Module to Operation" on page 117.

Related Information

■ "Remove a FEM" on page 93

Servicing the SP Card

The server module has an SP card with firmware that provides Oracle ILOM.

- "Remove the SP Card" on page 97
- "Install the SP Card" on page 98

Related Information

- "Detecting and Managing Faults" on page 5
- "Preparing for Service" on page 51

▼ Remove the SP Card

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

   Refer to the related procedures using Oracle ILOM in the *SPARC and Netra SPARC T4 Series Servers Administration Guide*.

2. **Prepare for service.**

   See "Preparing for Service" on page 51.

3. **If a REM is installed in the server module, remove the REM.**

   See "Remove a REM" on page 89.

4. **Push down on the tab to eject the SP card (panel 1).**
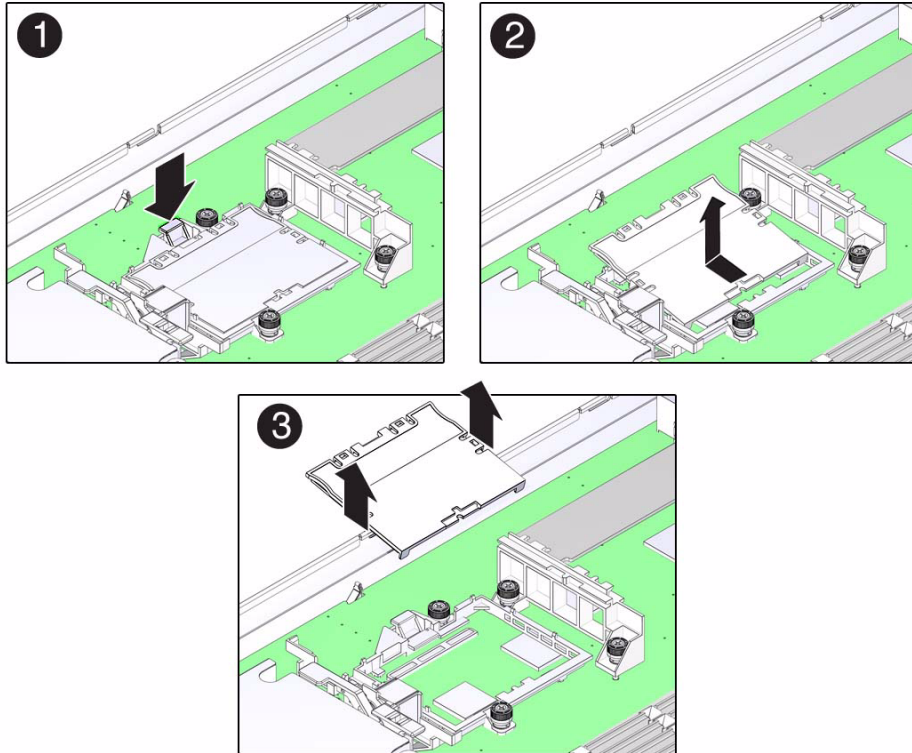
5. **Rotate the card up and off the retainer (panels 2 and 3).**

   Set the card on an antistatic mat.

6. **Install the new card.**

   See"Install the SP Card" on page 98.

   Related Information

   ■ "Install the SP Card" on page 98

▼ Install the SP Card

1. **(If needed) Remove the SP card.**

   See "Remove the SP Card" on page 97.

2. **Insert the replacement SP card into the retainer (panel 1).**

   Ensure that the tab is aligned with the key (panel 2).
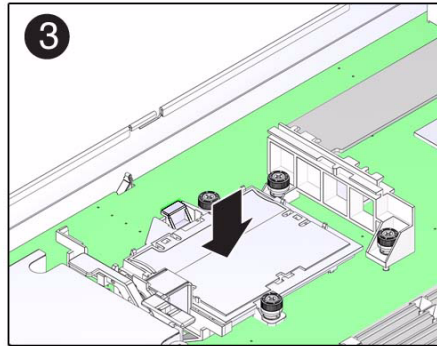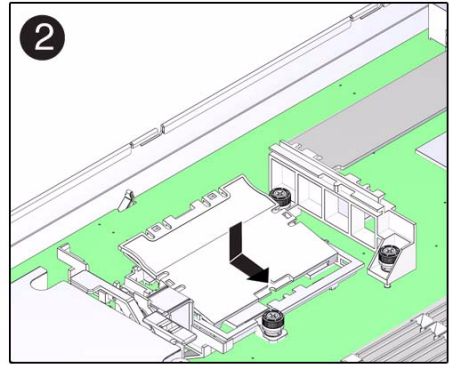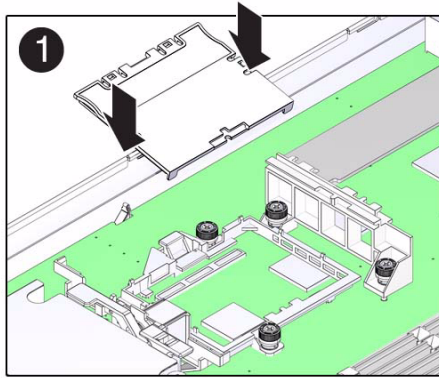
3. **Seat the SP card into the connector by pressing the card toward the tabs while pressing down (panel 3).**

   When the SP card is in place, the lever will close.

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

   See "Returning the Server Module to Operation" on page 117

Related Information

■ "Remove the SP Card" on page 97

Servicing the ID PROM

The 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 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 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 101
- "Install the ID PROM" on page 102
- "Verify the ID PROM" on page 103

Related Information

- "Detecting and Managing Faults" on page 5
- "Preparing for Service" on page 51

▼ Remove the ID PROM

1. **Prepare for service.**

   See "Preparing for Service" on page 51.

2. **Locate the ID PROM on the motherboard (panel 1).**
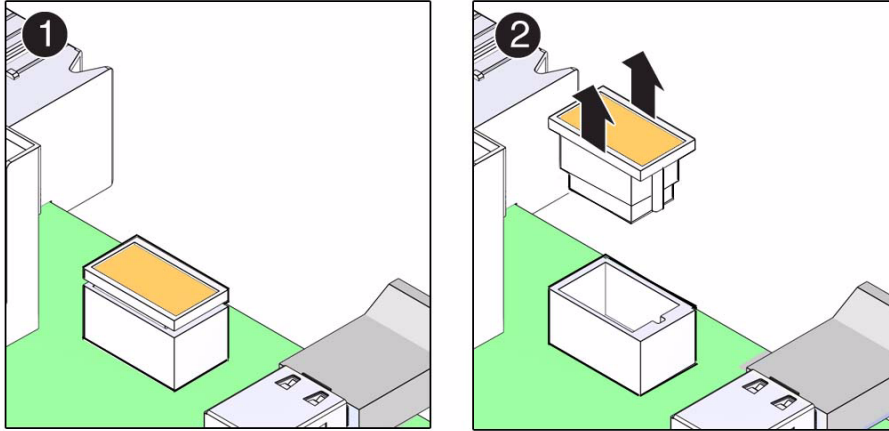
3. **Lift the ID PROM (panel 1) straight up from its socket (panel 2).**

   Place the ID PROM on an antistatic mat.

4. **Install the ID PROM.**

   See "Install the ID PROM" on page 102.

Related Information

- "Install the ID PROM" on page 102
- "Verify the ID PROM" on page 103

▼ Install the ID PROM

1. **(If needed) Remove the ID PROM.**

   See "Remove the ID PROM" on page 101.

2. **Locate the ID PROM socket on the motherboard (panel 1).**
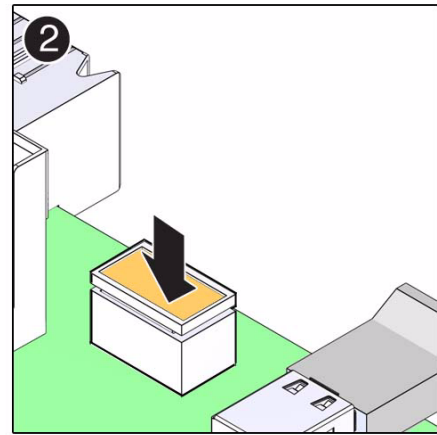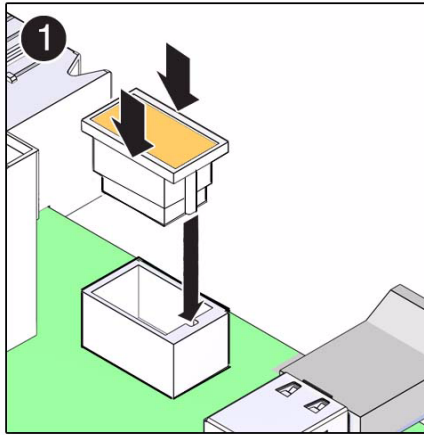
3. **Align the ID PROM notched end with the notched end on the motherboard socket and press in place (panel 2).**

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

   See "Returning the Server Module to Operation" on page 117.

5. **Verify the ID PROM.**

   See "Verify the ID PROM" on page 103.

Related Information

- "Remove the ID PROM" on page 101
- "Verify the ID PROM" on page 103

▼ 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 Oracle Solaris `hostid` command:

   ```
   # hostid
   85c1bd7c
   ```

3. **Display the Ethernet address.**

   Example using the Oracle 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 101
- "Install the ID PROM" on page 102

Servicing a USB Flash Drive

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

Description	Links
Replace a USB flash drive.	"Remove a USB Flash Drive" on page 105 "Install a USB Flash Drive" on page 106
Add a USB flash drive.	"Install a USB Flash Drive" on page 106

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 "Preparing for Service" on page 51.

2. **Locate the USB flash drive at the rear of the server module (panel 1).**
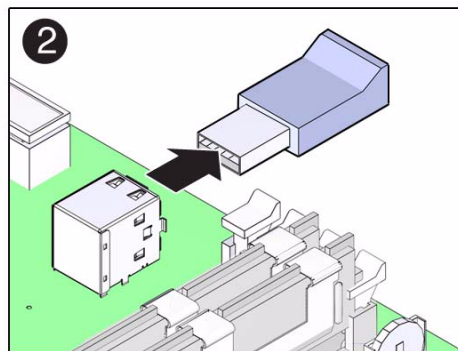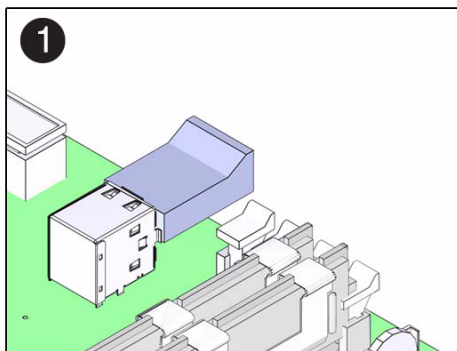
3. **Pull the drive out (panel 2).**

4. **(If needed) Install a USB flash drive.**

   See "Install a USB Flash Drive" on page 106.

   Related Information

   ■ "Install a USB Flash Drive" on page 106

▼ 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 "Preparing for Service" on page 51.

2. **(If needed) Remove a USB flash drive.**

   See "Remove a USB Flash Drive" on page 105.

3. **Locate the USB connector on the motherboard.**
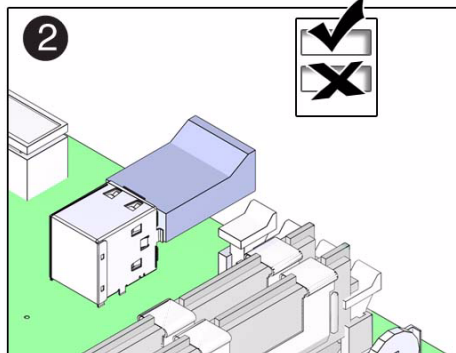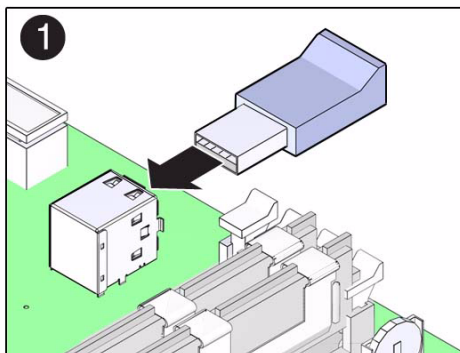
4. **Plug your USB flash drive into the upper port of the USB connector (panels 1 and 2).**

   Do not use the lower port of this connector.

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

   See "Returning the Server Module to Operation" on page 117.

Related Information

■ "Remove a USB Flash Drive" on page 105

Servicing the Battery

The battery operates the clock for the server module.

- "Replace the Battery" on page 109

Related Information

- "Detecting and Managing Faults" on page 5
- "Preparing for Service" on page 51

▼ Replace the Battery

The battery maintains server module 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.

Use a CR2032 replacement battery.

1. **Prepare for service.**

   See "Preparing for Service" on page 51.

2. **Push the top of the battery forward, then lift the battery from the holder (panel 1 and 2).**

   If you need more clearance, remove the DIMM in slot CMP0/BOB3/CH1/D0 (nearest the battery). See "DIMM Configuration" on page 77 and "Remove a DIMM" on page 80.
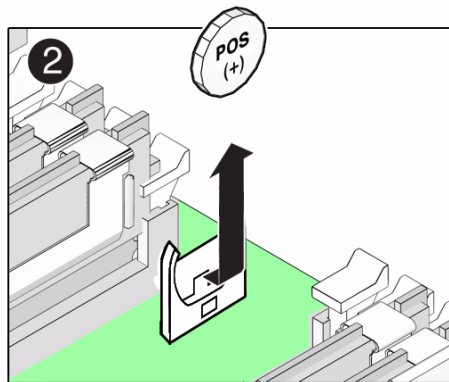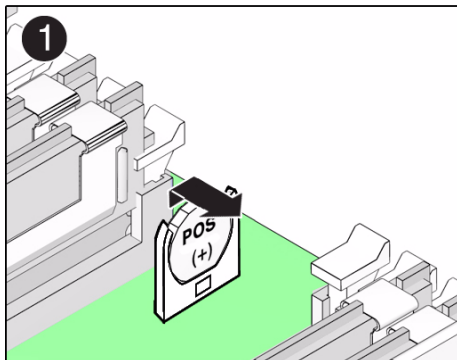
3. **Install the replacement battery with the negative (-) side facing the nearby DIMM slot** `CMP0/BOB3/CH1/D0`**.**
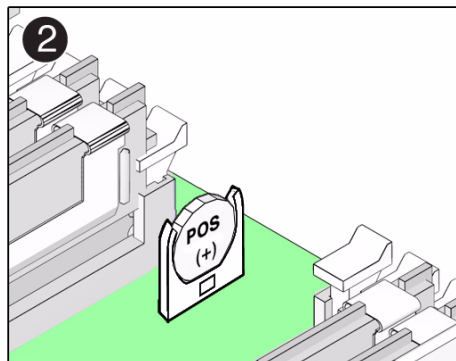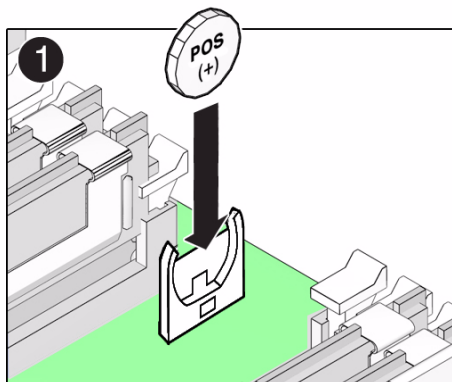
4. **(If removed) Replace the DIMM in** `CMP0/BOB3/CH1/D0`**.**

   See "Install a DIMM" on page 81.

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

   See "Returning the Server Module to Operation" on page 117

6. **Access the Oracle ILOM prompt.**

   See "Access the SP (Oracle ILOM)" on page 15.

7. **Set the clock's day and time.**

   For example:

```
-> set /SP/clock datetime=061716192011
-> show /SP/clock
```

```
/SP/clock
  Targets:
  Properties:
    datetime = Fri JUN 17 16:19:56 2011
    timezone = GMT (GMT)
    usentpserver = disabled
```

Related Information

- "Servicing the FEM" on page 93
- "Returning the Server Module to Operation" on page 117

Replacing the Server Module Enclosure Assembly (Motherboard)

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 document, the enclosure assembly must be replaced.

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

- "Transfer Components to Another Enclosure Assembly" on page 113

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

When you replace an enclosure assembly, you must move a number of FRUs from the original server module to the same locations in the replacement 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 63.

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

   See "Servicing Drives" on page 65.

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

   See "Remove a Drive Filler" on page 70 and "Install a Drive Filler" on page 73.

5. **Transfer the FEM (if present) from the original server module to the enclosure assembly.**

   Install the FEM in the same connectors in the enclosure assembly. See "Servicing the FEM" on page 93.

6. **Remove the REM (if present) from the original server module.**

   See "Servicing the REM" on page 89.

   Before installing the REM in the enclosure assembly, move the SP card to the enclosure assembly. See Step 7.

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

   See "Servicing the SP Card" on page 97.

8. **Install the REM (if present) into the enclosure assembly.**

   See "Servicing the REM" on page 89.

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

   See "Servicing the ID PROM" on page 101.

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 105.

11. **(If needed) Transfer the battery to the enclosure assembly.**

    If a battery is present in the new enclosure assembly, do not transfer the original battery.

    See "Servicing the Battery" on page 109.

12. **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 75.

13. **Attach the original cover to the enclosure assembly.**

    See "Replace the Cover" on page 117.

14. **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 118.

15. **Start the server module host.**

    See "Power On the Host (Oracle ILOM)" on page 120.

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

    See "Detecting and Managing Faults" on page 5.

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

    This must be done in a special service mode by trained service personnel.

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

---

18. **Update any customer database that contains RFID data.**

    Use the values 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

These topics describe how to return Oracle's Netra SPARC T4-1B server module to operation after removing it from the modular system for service.

Step	Description	Links
1.	Replace the server module cover.	"Replace the Cover" on page 117
2.	Install the server module into the modular system.	"Install the Server Module Into the Modular System" on page 118
3.	Power on the server module host using Oracle ILOM or the power button.	"Power On the Host (Oracle ILOM)" on page 120 "Power On the Host (Power Button)" on page 120

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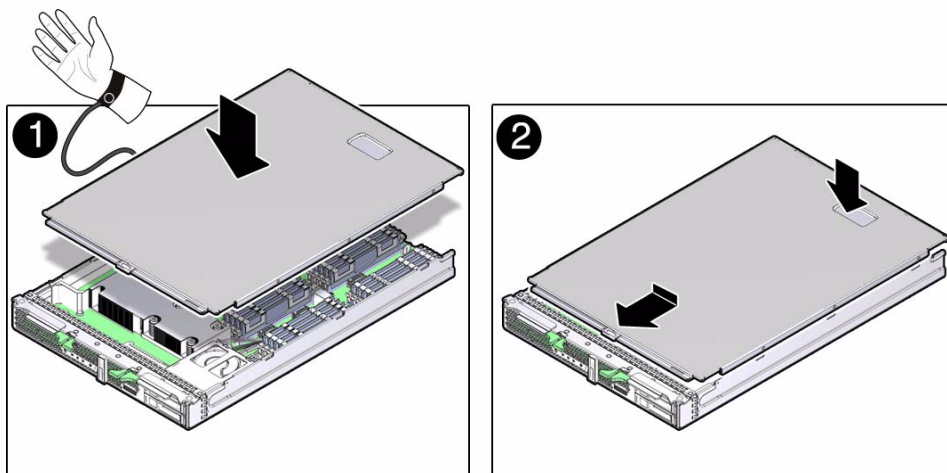
2. **Slide the cover forward until it latches into place (panel 2).**

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

   See "Install the Server Module Into the Modular System" on page 118.

Related Information

- "Install the Server Module Into the Modular System" on page 118
- "Remove the Cover" on page 63

▼ 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 can weighs as much as 20 pounds (9.0 kg).

1. **(If needed) Replace the cover.**

   See "Replace the Cover" on page 117.

2. **(If needed) Remove the rear connector cover from the server module before inserting it in the modular system.**

3. **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.

4. **Hold the server module in a vertical position so that both ejector levers are on the right (panel 1).**
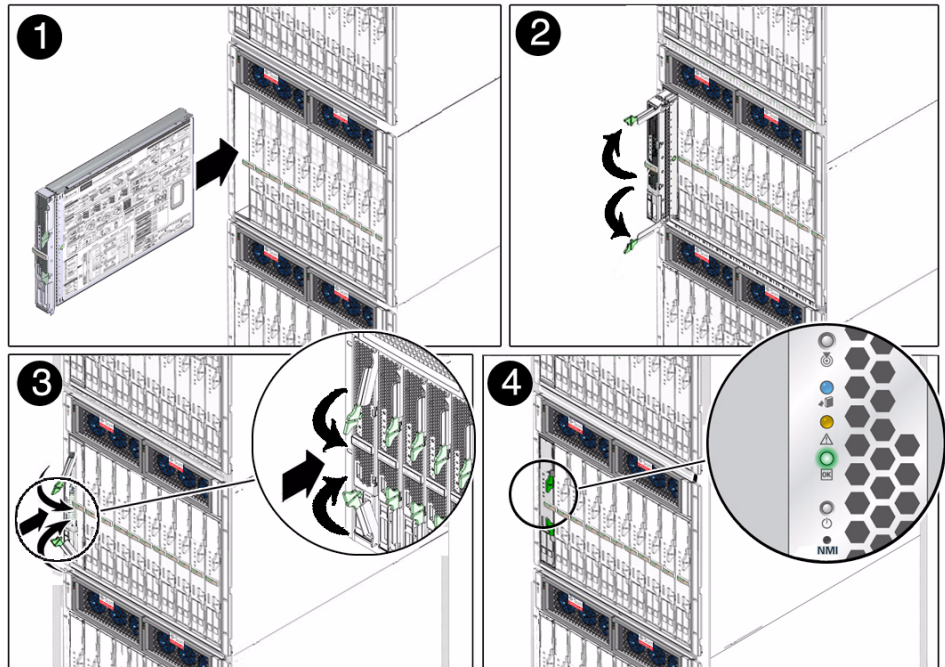
5. **Slide the server module into the chassis (panel 2).**

6. **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.

7. **Start the server module host.**

   See "Power On the Host (Oracle ILOM)" on page 120.

Related Information

- "Power On the Host (Oracle ILOM)" on page 120
- "Remove the Server Module From the Modular System" on page 61

▼ Power On the Host (Oracle ILOM)

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

1. Install the server module into the modular system.

See "Install the Server Module Into the Modular System" on page 118.

2. Access Oracle ILOM on the SP and run the start /SYS **command.**

See "Access the SP (Oracle ILOM)" on page 15.

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.

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

Related Information

- "Detecting and Managing Faults" on page 5
- "Power On the Host (Power Button)" on page 120

▼ Power On the Host (Power Button)

Perform this step after Oracle's Netra SPARC T4-1B server module is installed in a powered modular system.

1. Press the Power button on the front of the server module.

See "Front and Rear Panel Components" on page 3 to locate the Power button.

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
- "Power On the Host (Oracle ILOM)" on page 120

Glossary

A

ANSI SIS   American National Standards Institute Status Indicator Standard.

ASF   Alert standard format (Netra products only).

ASR   Automatic system recovery.

AWG   American wire gauge.

B

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

blade server   Server module. See *server module*.

BMC   Baseboard management controller.

BOB   Memory buffer on board.

C

chassis   For servers, refers to the server enclosure. For server modules, refers to the modular system enclosure.

CMA   Cable management arm.

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

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

D

DHCP Dynamic Host Configuration Protocol.

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

DTE Data terminal equipment.

E

EIA Electronics Industries Alliance.

ESD Electrostatic discharge.

F

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

FRU Field-replaceable unit.

H

HBA Host bus adapter.

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

I

ID PROM   Chip that contains system information for the server or server module.

IP   Internet Protocol.

K

KVM   Keyboard, video, mouse. Refers to using a switch to enable sharing of one keyboard, one display, and one mouse with more than one computer.

L

LwA   Sound power level.

M

MAC   Machine access code.

MAC address   Media access controller address.

Modular system   The rackmountable chassis that holds server modules, storage modules, NEMs, and PCI EMs. The modular system provides Oracle ILOM through its CMM.

MSGID   Message identifier.

N

name space   Top-level Oracle ILOM CMM target.

NEBS   Network Equipment-Building System (Netra products only).

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

O

OBP	OpenBoot PROM.
Oracle ILOM	Oracle Integrated Lights Out Manager. Oracle ILOM firmware is preinstalled on a variety of Oracle systems. Oracle ILOM enables you to remotely manage your Oracle servers regardless of the state of the host system.
Oracle Solaris OS	Oracle Solaris operating system.

P

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

Q

QSFP	Quad small form-factor pluggable.

R

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

S

SAS Serial attached SCSI.

SCC System configuration chip.

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

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

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

SSD Solid-state drive.

SSH Secure shell.

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

T

TIA Telecommunications Industry Association (Netra products only).

Tma Maximum ambient temperature.

U

UCP Universal connector port.

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

W

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

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