Netra SPARC T3-1 Server

Administration Guide

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Using This Document

This administration guide is for experienced system administrators of the Netra SPARC T3-1 server from Oracle (hereafter referred to as "the server"). The guide includes general descriptive information about the server, and detailed instructions for configuring and administering the server. To use the information in this document, you must have working knowledge of computer network concepts and terms, and advanced familiarity with the Oracle Solaris OS.

- "UNIX Commands" on page vii
- "Shell Prompts" on page viii
- "Related Documentation" on page viii
- "Documentation, Support, and Training" on page ix

UNIX Commands

This document might not contain information on basic UNIX commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Oracle Solaris OS documentation, which is at

  `(http://www.oracle.com/technetwork/indexes/documentation/index.html)`

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#
Oracle ILOM	->

Related Documentation

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

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

Application	Title	Format	Location
Installation, administration, service	*Netra SPARC T3-1 Server Topic Set*	HTML	Online
Late-breaking news	*Netra SPARC T3-1 Server Product Notes*	PDF	Online
Getting started	*Netra Rack Server Getting Started Guide*	Printed	Ships with system
Installation and planning	*Netra SPARC T3-1 Server Installation Guide*	PDF HTML	Online
Administration	*Netra SPARC T3-1 Server Administration Guide*	PDF HTML	Online
Service	*Netra SPARC T3-1 Server Service Manual*	PDF HTML	Online
Safety and compliance	*Netra SPARC T3-1 Server Safety and Compliance Guide*	PDF	Online

The Oracle ILOM 3.0 documentation is online at:

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

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

Documentation, Support, and Training

These web sites provide additional resources:

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

Understanding System Administration Resources

These topics provide a summary of common tools used to administer the server.

- "Oracle ILOM Overview" on page 1
- "Platform-Specific ILOM Features" on page 2
- "Oracle Solaris OS Overview" on page 3
- "OpenBoot Overview" on page 3
- "Oracle VM Server for SPARC Overview" on page 4
- "Multipathing Software" on page 4

Related Information

- "Accessing the Server" on page 7

Oracle ILOM Overview

Oracle ILOM is system management firmware that is preinstalled on some SPARC servers. ILOM enables you to actively manage and monitor components installed in your server. ILOM provides a browser-based interface and a command-line interface, as well as SNMP and IPMI interfaces.

The ILOM service processor runs independently of the server and regardless of the server power state as long as AC or DC power is connected to the server. When you connect your server to AC or DC power, the ILOM service processor immediately starts up and begins monitoring the server. All environmental monitoring and control is handled by ILOM.

The -> prompt indicates that you are interacting with the ILOM service processor directly. This prompt is the first prompt you see when you log in to the server. through the serial management port or network management port, regardless of the host's power state.

You can also access the ILOM service processor prompt (->) from the OpenBoot `ok` prompt, or from the Oracle Solaris `#` or `%` prompt, provided the system console is configured to be accessible through the serial management and network management ports.

The ILOM service processor supports a total of ten concurrent sessions per server: four SSH connections available through the network management port and one connection available through the serial management port.

For more information about how to work with ILOM features that are common to all platforms managed by ILOM, see "Related Documentation" on page viii.

Related Information

- "Platform-Specific ILOM Features" on page 2
- "Log In to ILOM" on page 7

Platform-Specific ILOM Features

ILOM operates on many platforms, supporting features that are common to all platforms. Some ILOM features belong to only a subset of platforms. This topic describes the difference between ILOM features supported on the server and the common set of features described in the ILOM 3.0 base documentation.

Note – To perform some procedures documented in Oracle's ILOM 3.0 base documentation, you must create a serial connection to the server and activate the Physical Presence switch on the server. The Physical Presence switch, which is the Locator button, is located on the front and rear of the server. For information about creating a serial connection, refer to the *Netra SPARC T3-1Server Installation Guide*.

Among the ILOM features supported on other platforms, ILOM does *not* support the following features on this server:

- POST diagnostics `user-reset` trigger is not available.

ILOM supports the following feature on this server, which may not be available on other platforms:

- POST diagnostics `hw-change` trigger. This new trigger (`hw-change error-reset`) is the *default setting* for the server, and causes POST to run each time the server is power-cycled. For more information on POST, refer to the *Netra SPARC T3-1 Server Service Manual*.

Related Information

- "Oracle ILOM Overview" on page 1
- "Related Documentation" on page viii

Oracle Solaris OS Overview

The Oracle Solaris OS includes commands and other software resources to use for server administration. For an introduction to management tools in your Oracle Solaris release, refer to the *System Administration Guide: Basic Administration* in the Oracle Solaris documentation collection.

Oracle Solaris software includes Oracle VTS software. Oracle VTS tests and validates Oracle hardware by verifying the connectivity and functionality of hardware devices, controllers and peripherals.

In addition to the Oracle VTS information in the Oracle Solaris documentation, Oracle VTS documentation collections are available at: `http://docs.sun.com/app/docs/prod/test.validate#hic`.

Related Information

- *Oracle Solaris 10 System Administration Guide: Basic Administration* (`http://docs.sun.com/doc/prod/817-1985`)
- "OpenBoot Overview" on page 3
- "Multipathing Software" on page 4

OpenBoot Overview

The OpenBoot firmware starts the OS, validates installed hardware, and can be used for other server administration tasks below the OS level. For more information about OpenBoot commands, see the *OpenBoot 4.x Command Reference Manual* in the Oracle Solaris documentation collection.

Related Information

- "Configuring Boot Mode" on page 39
- *OpenBoot 4.x Command Reference Manual*

■ "Oracle Solaris OS Overview" on page 3

Oracle VM Server for SPARC Overview

A *logical domain* is a discrete logical grouping with its own operating systems, resources, and identity within a single computer system. Applications software can run in logical domains. Each logical domain can be created, destroyed, reconfigured, and rebooted independently.

Oracle VM Server software enables you to create and manage as many as 128 logical domains, depending on the hardware configuration of the server on which the Oracle VM Server for SPARC Manager has been installed. You can virtualize resources and define network, storage, and other I/O devices as services that can be shared between domains.

The Oracle VM Server configurations are stored on the SP. Using Oracle VM Server for SPARC CLI commands, you can add a configuration, specify a configuration to be used, and list the configurations on the service processor. You can also use the ILOM `set /HOST/bootmode config=`*`configfile`* command to specify an Oracle VM Server boot configuration.

Related Information

- "Configuring Boot Mode" on page 39
- Oracle VM Server for SPARC documentation (`http://docs.sun.com/app/docs/prod/ldoms?l=en#hic`)

Multipathing Software

Multipathing software enables you to define and control redundant physical paths to I/O devices such as storage devices and network interfaces. If the active path to a device becomes unavailable, the software can automatically switch to an alternate path to maintain availability. This capability is known as *automatic failover*. To take advantage of multipathing capabilities, you must configure the server with redundant hardware, such as redundant network interfaces or two host bus adapters connected to the same dual-ported storage array.

For the server, three different types of multipathing software are available:

- Oracle Solaris IP Network Multipathing software provides multipathing and load-balancing capabilities for IP network interfaces. For instructions on how to configure and administer Oracle Solaris IP Network Multipathing, consult the *IP Network Multipathing Administration Guide* provided with your specific Oracle Solaris release.
- VVM software includes a feature called DMP, which provides disk multipathing as well as disk load balancing to optimize I/O throughput. For information about VVM and its DMP feature, refer to the documentation provided with the VERITAS Volume Manager software.
- StorageTek Traffic Manager is an architecture fully integrated within the Oracle Solaris OS (beginning with the Oracle Solaris 8 release) that enables I/O devices to be accessed through multiple host controller interfaces from a single instance of the I/O device. For information about StorageTek Traffic Manager, refer to your Oracle Solaris OS documentation.

Related Information

- "Oracle Solaris OS Overview" on page 3
- "Oracle VM Server for SPARC Overview" on page 4

Accessing the Server

These topics include information on establishing low-level communication with the server using the ILOM tool and the system console.

- "Log In to ILOM" on page 7
- "Log In to the System Console" on page 8
- "Display the `ok` Prompt" on page 9
- "Display the ILOM Prompt" on page 10
- "Use a Local Graphics Monitor" on page 11
- "ILOM Remote Console" on page 12

Related Information

- "Oracle ILOM Overview" on page 1

▼ Log In to ILOM

This procedure assumes the default configuration of the service processor as described in the *Netra SPARC T3-1Server Installation Guide*.

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

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

```
% ssh root@xxx.xxx.xxx.xxx
...
Are you sure you want to continue connecting (yes/no) ? yes

...
Password: password (nothing displayed)

Oracle(R) Integrated Lights Out Manager

Version 3.0.12.x rxxxxx

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->
```

You are now logged in to ILOM. Perform tasks as needed.

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

Related Information

- "Oracle ILOM Overview" on page 1
- "Log In to the System Console" on page 8

▼ Log In to the System Console

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

```
-> start /HOST/console [option]
Are you sure you want to start /HOST/console (y/n) ? y
Serial console started. To stop, type #.
.
.
.
```

where *option* can be:

- `-f|-force` – Enables a user with a Console (`c`) role to take the console from any current user and force that user into view mode.
- -script – Bypasses prompt for a yes or no confirmation.

Note – If the Oracle Solaris OS is not running, the server displays the `ok` prompt.

Related Information

- "Display the ILOM Prompt" on page 10
- "Use a Local Graphics Monitor" on page 11
- "Log In to the System Console" on page 8

▼ Display the `ok` Prompt

This procedure assumes the default system console configuration.

- **Choose the appropriate shutdown method from the following table to reach the `ok` prompt.**

Note – To ensure getting to the `ok` prompt, set the following ILOM property before performing the procedures in the table:

```
-> set /HOST/bootmode script="setenv auto-boot? false"
```

Caution – When possible, reach the `ok` prompt by performing a graceful shutdown of the OS. Any other method used might result in the loss of server state data.

Server State	What To Do
OS running and responsive	**Shut down the server using one of these methods:** • From a shell or command tool window, issue an appropriate command (for example, the shutdown or `init 0` command) as described in the Oracle Solaris system administration documentation. • At the ILOM -> prompt, type: -> **`stop /SYS`** • Use the server Power button. • From Oracle Solaris, execute the following command as `root` user: # **`uadmin 2 0`**
OS unresponsive	**Shut down the server from ILOM.** (Provided the operating system software is not running and the server is already under OpenBoot firmware control.) At the ILOM -> prompt, type: -> **`set /HOST send_break_action=break`** Press Enter. Then type: -> **`start /HOST/console`**
OS unresponsive and need to prevent auto-boot	**Shut down the server from ILOM and disable autoboot.** At the ILOM -> prompt, type: -> **`set /HOST/bootmode script="setenv auto-boot? false"`** Press Enter. Then type: -> **`reset /SYS`** -> **`start /HOST/console`**

Related Information

- "Monitoring Faults" on page 51

▼ Display the ILOM Prompt

- **Use one of the following ways to display the ILOM -> prompt:**
  - From the system console, type the ILOM escape sequence (#.).

- Log in to ILOM directly from a device connected to the serial management port or network management port.
- Log in to ILOM through an SSH connection. See "Log In to ILOM" on page 7.

Related Information

- "Oracle ILOM Overview" on page 1
- "Log In to ILOM" on page 7

▼ Use a Local Graphics Monitor

You can redirect the system console to a local graphic monitor. You *cannot* use a local graphics monitor to perform the initial server installation, nor can you use a local graphics monitor to view POST messages.

1. **Connect the monitor video cable to a video port on the server.**

   Tighten the thumbscrews to secure the connection. Refer to your system's documentation for any special connection instructions that might apply to your server.

2. **Connect the monitor power cord to an AC outlet.**
3. **Connect the USB keyboard cable to one USB port.**
4. **Connect the USB mouse cable to another USB port on the server.**
5. **Display the `ok` prompt.**

   See "Display the ok Prompt" on page 9

6. **At the `ok` prompt, set the following OpenBoot PROM configuration variables:**

```
ok setenv input-device keyboard
ok setenv output-device screen
```

7. **Make the changes take effect, type:**

```
ok reset-all
```

The server stores the parameter changes and boots automatically.

Note – Instead of using the `reset-all` command to store the parameter changes, you can also power cycle the server using the Power button.

You can now type system commands and view system messages using your local graphics monitor. To activate the GUI interface, continue to the next step.

8. **Activate the Oracle Solaris OS GUI interface.**

   Once the Oracle Solaris OS is installed and booted, type the following commands to display the GUI login screen.

```
# ln -s /dev/fbs/ast0 /dev/fb
```

```
# fbconfig -xserver Xorg
```

```
# reboot
```

Related Information

- "Display the `ok` Prompt" on page 9.

ILOM Remote Console

ILOM Remote Console is a Java application that enables you to remotely redirect and control the following devices on the host server. This group of devices is commonly abbreviated as KVMS.

- Keyboard
- Video console display
- Mouse
- Serial console display
- Storage devices or images (CD/DVD)

ILOM Remote Console is documented in the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide* ("Managing Remote Hosts Redirection and Securing the ILOM Remote Console").

Related Information

- "ILOM In-band (Sideband) Management" on page 34
- "Related Documentation" on page viii

Controlling the Server

These topics include procedures for controlling basic server operations.

- "Power On the Server" on page 13
- "Power Off the Server" on page 14
- "Reset the Server From the Oracle Solaris OS" on page 15
- "Reset the Server From ILOM" on page 15
- "Reset the SP to Default Values" on page 16

Related Information

- "Configuring Server Behavior at Restart" on page 45

▼ Power On the Server

1. **Log in to ILOM.**

   "Log In to ILOM" on page 7.

2. **At the ILOM `->` prompt, type:**

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

->
```

Note – To skip being prompted for confirmation, use the `start -script /SYS` command.

Related Information

- "Power Off the Server" on page 14

- “Reset the Server From the Oracle Solaris OS” on page 15
- “Reset the Server From ILOM” on page 15

▼ Power Off the Server

1. Shut down the Oracle Solaris OS.

At the Oracle Solaris prompt, type:

```
# shutdown -g0 -i0 -y
# svc.startd: The system is coming down. Please wait.
svc.startd: 91 system services are now being stopped.
Jun 12 19:46:57 wgs41-58 syslogd: going down on signal 15
svc.stard: The system is down.
syncing file systems...done
Program terminated
r)eboot o)k prompt, h)alt?
# o
```

2. Switch from the system console prompt to the service processor console prompt:

```
ok #.
->
```

3. From the ILOM `->` prompt, type:

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

->
```

Note – To perform an immediate shutdown, use the `stop -force -script /SYS` command. Ensure that all data is saved before typing this command.

Related Information

- “Power On the Server” on page 13
- “Reset the Server From the Oracle Solaris OS” on page 15
- “Reset the Server From ILOM” on page 15

▼ Reset the Server From the Oracle Solaris OS

It is not necessary to power the server off and on to perform a reset.

- **Reset the server from the Oracle Solaris prompt by typing one of the following commands:**

```
# shutdown -g0 -i6 -y
```

```
# reboot
```

Related Information

- "Power Off the Server" on page 14
- "Power On the Server" on page 13
- "Reset the Server From ILOM" on page 15

▼ Reset the Server From ILOM

The ILOM `reset` command generates a graceful or forced hardware reset of the server. By default, the reset command gracefully resets the server.

- **Type one of the following commands to reset the server.**
  - Perform a graceful reset from ILOM:

```
-> reset /SYS
```

  - If a graceful reset is not possible, perform a forced hardware reset from ILOM:

```
-> reset -force /SYS
```

Related Information

- "Power Off the Server" on page 14
- "Power On the Server" on page 13
- "Reset the Server From the Oracle Solaris OS" on page 15

■ "Override OBP Settings to Reset the Server" on page 43

▼ Reset the SP to Default Values

If your SP becomes corrupt, or you want to reset the SP to the factory default values, change the `/SP reset_to_defaults` setting then power off the host to implement the changes. This is new behavior. Previously you did not have to power off the host to reset default values to the SP. You need administrator permissions to perform this task.

1. **Reset the SP to the default values:**

```
-> set /SP reset_to_defaults=value
```

where *value* can be:

- `all` – Removes all of the SP configuration data
- `factory` – Removes all SP configuration data as well as all log files.

2. **Power off and restart the host to complete the setting change:**

```
-> reset /SYS
```

Related Information

- "Power Off the Server" on page 14

Configuring Hardware RAID

These topics describe how to configure and manage RAID disk volumes using the server's on-board SAS disk controller.

- "Hardware RAID Support" on page 17
- "Prepare to Use the FCode Utility" on page 18
- "FCode Utility Commands" on page 19
- "Create a Hardware RAID Volume" on page 19
- "Locate Device Paths" on page 20

Related Information

- "Multipathing Software" on page 4

Hardware RAID Support

RAID technology enables the construction of a logical volume, made up of several physical disks, in order to provide data redundancy, increased performance, or both. The server on-board disk controller supports RAID 0 (striping), RAID 1 (mirroring), and RAID 1e volumes using the Fcode utility.

The Fcode utility is accessible through the OBP environment. This utility consists of a set of special commands to display targets and manage logical volumes.

If you prefer, you can manage RAID from Oracle Solaris by downloading and installing the LSI RAID Management utility for your Netra SPARC T3-1 server from this location: http://www.lsi.com/support/sun. The documentation is also available at this web site.

Related Information

- "Create a Hardware RAID Volume" on page 19
- "Prepare to Use the FCode Utility" on page 18

▼ Prepare to Use the FCode Utility

1. **Open an `xterm` or `gnome` terminal window.**

   `FCode` commands produce large amounts of detailed output. The `xterm` or `gnome` terminal windows provide scroll bar functionality, which helps view such output.

2. **Disable auto-boot in OBP and enter the OBP environment after a power on or reset.**

3. **List the device paths on the server:**

```
{0} ok show-devs
...
/pci@400/pci@2/pci@0/pci@4/scsi@0
...
/pci@400/pci@1/pci@0/pci@4/scsi@0
...
```

4. **Choose the controller where you want to create a hardware RAID volume:**

```
{0} ok select /pci@400/pci@2/pci@0/pci@4/scsi@0
```

   Instead of using the entire device path for the controller, you can use a preconfigured alias for a controller. For example:

```
{0} ok select scsi0
```

   To view the preconfigured aliases on your server, use the `devalias` command. See "Locate Device Paths" on page 20.

   You can display the SAS addresses of any connected drives using the `FCode` utility `show-children` command.

Related Information

- "`FCode` Utility Commands" on page 19
- "Display the `ok` Prompt" on page 9

FCode Utility Commands

FCode Command	Description
show-children	Lists all connected physical drives and logical volumes.
show-volumes	Lists all connected logical volumes in detail.
create-raid0-volume	Creates a RAID 0 volume (minimum two targets).
create-raid1-volume	Creates a RAID 1 volume (exactly two targets).
create-raid1e-volume	Creates a RAID 1e volume (minimum three targets).
delete-volume	Deletes a RAID volume.
activate-volume	Re-activate a RAID volume after disks have been replaced.

Related Information

- "Create a Hardware RAID Volume" on page 19
- "Prepare to Use the FCode Utility" on page 18

▼ Create a Hardware RAID Volume

1. **Prepare to create a RAID volume.**

   See "Prepare to Use the FCode Utility" on page 18.

2. **List the physical drives on the selected controller:**

```
{0} ok show-children

FCode Version 1.00.54, MPT Version 2.00, Firmware Version 5.00.17.00

Target 9
  Unit 0   Disk   SEAGATE  ST930003SSUN300G 0B70    585937500 Blocks, 300 GB
  SASDeviceName 5000c5001771776f  SASAddress 5000c5001771776d  PhyNum 0
Target a
  Unit 0   Disk   SEAGATE  ST930003SSUN300G 0B70    585937500 Blocks, 300 GB
  SASDeviceName 5000c5001d0c38c7  SASAddress 5000c5001d0c38c5  PhyNum 1
Target b
  Unit 0   Disk   SEAGATE  ST930003SSUN300G 0B70    585937500 Blocks, 300 GB
```

```
  SASDeviceName 5000c5001d097407  SASAddress 5000c5001d097405  PhyNum 2
Target c
  Unit 0   Disk   SEAGATE  ST930003SSUN300G 0B70    585937500 Blocks, 300 GB
  SASDeviceName 5000c5001d09a51f  SASAddress 5000c5001d09a51d  PhyNum 3
{0} ok
```

3. **Use the** `create-raid0-volume`**,** `create-raid1-volume` **or** `create-raid1e-volume` **command to create a logical drive from the physical disks.**

   For example, to create a RAID 0 volume with targets 9 and a, type:

```
{0} ok 9 a create-raid0-volume
```

   For example, to create a RAID 1e volume with targets a, b, and c, type:

```
{0} ok a b c create-raid1e-volume
```

4. **Verify creation of the volume:**

```
{0} ok show-volumes
```

Related Information

- "Prepare to Use the `FCode` Utility" on page 18
- "`FCode` Utility Commands" on page 19
- "Display the `ok` Prompt" on page 9

▼ Locate Device Paths

Use this procedure to locate device paths specific to your server.

1. **Display the** `ok` **prompt.**

   See "Display the `ok` Prompt" on page 9.

2. **From the** `ok` **prompt, type:**

```
{0} ok devalias
screen                   /pci@400/pci@2/pci@0/pci@0/pci@0/display@0
mouse            /pci@400/pci@2/pci@0/pci@f/pci@0/usb@0,2/hub@2/device@4/mouse@1
rcdrom    /pci@400/pci@2/pci@0/pci@f/pci@0/usb@0,2/hub@2/hub@3/storage@2/disk@0
```

```
rkeyboard    /pci@400/pci@2/pci@0/pci@f/pci@0/usb@0,2/hub@2/device@4/keyboard@0
rscreen                  /pci@400/pci@2/pci@0/pci@0/pci@0/display@0:r1280x1024x60
net3                      /pci@400/pci@2/pci@0/pci@7/network@0,1
net2                      /pci@400/pci@2/pci@0/pci@7/network@0
net1                      /pci@400/pci@2/pci@0/pci@6/network@0,1
net0                      /pci@400/pci@2/pci@0/pci@6/network@0
net                       /pci@400/pci@2/pci@0/pci@6/network@0
disk3                     /pci@400/pci@2/pci@0/pci@4/scsi@0/disk@p3
disk2                     /pci@400/pci@2/pci@0/pci@4/scsi@0/disk@p2
disk1                     /pci@400/pci@2/pci@0/pci@4/scsi@0/disk@p1
disk0                     /pci@400/pci@2/pci@0/pci@4/scsi@0/disk@p0
disk                      /pci@400/pci@2/pci@0/pci@4/scsi@0/disk@p0
cdrom                     /pci@400/pci@2/pci@0/pci@4/scsi@0/disk@p6
scsi1                     /pci@400/pci@2/pci@0/pci@4/scsi@0
scsi0                     /pci@400/pci@1/pci@0/pci@4/scsi@0
scsi                      /pci@400/pci@1/pci@0/pci@4/scsi@0
virtual-console           /virtual-devices@100/console@1
name                      aliases
{0} ok
```

Related Information

- "Display the `ok` Prompt" on page 9
- "Prepare to Use the `FCode` Utility" on page 18

Changing Server Identification Information

These topics describe how to store information (for purposes such as inventory control or site resource management) on the SP and FRU PROMs using the ILOM CLI interface.

- "Change Customer FRU Data Information" on page 23
- "Change System Identifier Information" on page 24

Related Information

- "Configuring Policy Settings" on page 25

▼ Change Customer FRU Data Information

Use the `/SP customer_frudata` property to store information in all FRU PROMs. This field can be used to identify a particular system to a third-party application, or for any other identification needs in your environment.

- **At the ILOM `->` prompt, type:**

```
-> set /SP customer_frudata="data"
```

Note – You must enclose the data string (*data*) in quote marks.

Related Information

- "Log In to ILOM" on page 7
- "Change System Identifier Information" on page 24

▼ Change System Identifier Information

Use the `/SP system_identifier` property to store customer identification information. This string is encoded in all trap messages generated by SNMP. Assigning a unique system identifier can be useful in distinguishing which system generates which SNMP message.

- **At the ILOM `->` prompt, type:**

```
-> set /SP system_identifier="data"
```

Note – You must enclose the data string (*data*) in quote marks.

Related Information

- "Log In to ILOM" on page 7
- "Change Customer FRU Data Information" on page 23

Configuring Policy Settings

These topics describe managing configuration policies using ILOM.

- "Specify Cooldown Mode" on page 25
- "Restore Host Power State at Restart" on page 26
- "Specify Host Power State at Restart" on page 27
- "Disable or Re-Enable Power-On Delay" on page 27
- "Specify Parallel Boot of the SP and Host" on page 28
- "Configure Host Behavior With the Keyswitch State" on page 28

Related Information

- "Power On the Server" on page 13
- "Power Off the Server" on page 14

▼ Specify Cooldown Mode

The `HOST_COOLDOWN` property, when set to enabled, will cause the server to enter cooldown mode when the host is powering off. Upon server poweroff, cooldown mode directs ILOM to monitor certain components to ensure that they are below a minimum temperature so as not to cause harm to the user. Once the components are below the minimum temperature, then the power is removed from the server, or if it takes longer then 4 minutes then the host will turn off.

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

```
-> set /SP/policy HOST_COOLDOWN=value
```

where *value* can be:

- `enabled` – Server cools certain components before powering off.
- `disabled` – Component temperatures are not monitored during power off.

Related Information

- "Power Off the Server" on page 14

▼ Restore Host Power State at Restart

Use the /SP/policy HOST_LAST_POWER_STATE property to control the behavior of the server after an unexpected power outage. When external power is restored, the ILOM service processor starts to run automatically. Normally, the host power is not turned on until you use ILOM to turn it on.

ILOM records the current power state of the server in nonvolatile storage. If the HOST_LAST_POWER_STATE policy is enabled, ILOM can restore the host to the previous power state. This policy is useful in the event of a power failure, or if you physically move the server to a different location.

For example, if the host server is running when power is lost and the /SP/policy HOST_LAST_POWER_STATE property is set to disabled, the host server remains off when power is restored. If the /SP/policy HOST_LAST_POWER_STATE property is set to enabled, the host server restarts when the power is restored.

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

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

where *value* can be:

- enabled – When power is restored, returns the server to the state it was in before the power was removed.
- disabled – Keeps the server off when power is applied (the default).

  If you enable HOST_LAST_POWER_STATE, you should also configure /SP/policy HOST_POWER_ON_DELAY. For further information, see "Disable or Re-Enable Power-On Delay" on page 27.

Related Information

- "Disable or Re-Enable Power-On Delay" on page 27
- "Specify Host Power State at Restart" on page 27

▼ Specify Host Power State at Restart

Use /SP/policy HOST_AUTO_POWER_ON to power on the host when external power is applied to the server. If this policy is set to enabled, the service processor sets HOST_LAST_POWER_STATE to disabled.

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

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

where *value* can be:

- enabled – When power is applied, automatically powers on the host when the SP has been booted.
- disabled – Keeps the host power off when power is applied (the default).

Related Information

- "Restore Host Power State at Restart" on page 26
- "Disable or Re-Enable Power-On Delay" on page 27

▼ Disable or Re-Enable Power-On Delay

Use the /SP/policy HOST_POWER_ON_DELAY property to cause the server to wait for a short time before powering on automatically. The delay is a random interval of one to five seconds. Delaying the server power on helps minimize current surges on the main power source. This power-on delay is important when multiple servers in racks power on after a power outage.

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

```
-> set /SP/policy HOST_POWER_ON_DELAY=value
```

where *value* can be:

- enabled – Causes the server to wait for a short time before powering on automatically.
- disabled – Server powers on automatically without a delay (the default).

Related Information

- "Specify Host Power State at Restart" on page 27
- "Restore Host Power State at Restart" on page 26

▼ Specify Parallel Boot of the SP and Host

The `/SP/policy PARALLEL_BOOT` property, when enabled, allows the host to boot and power on in parallel with the SP if an auto-power policy (`HOST_AUTO_POWER_ON` or `HOST_LAST_POWER_STATE`) was on or a user presses the power button while the SP is in the process of booting. ILOM has to be running in order to enable the host to power on when the power button is pressed or the auto-power policies are set. When this property is set to disabled, the SP boots first, then the host boots.

- **At the ILOM `->` prompt, type:**

```
-> set /SP/policy PARALLEL_BOOT=value
```

where *value* can be:

- `enabled` – SP and host boot concurrently.
- `disabled` – SP and host boot serially.

Related Information

- "Power On the Server" on page 13
- "Power Off the Server" on page 14

▼ Configure Host Behavior With the Keyswitch State

Use the `/SYS keyswitch_state` property to control the position of the virtual keyswitch.

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

```
-> set /SYS keyswitch_state=value
```

where *value* can be:

- `normal` – The server can power itself on and start the boot process (the default).
- `standby` – Powers off host, disables power on.
- `diag` – Host power on is allowed, it overrides the settings of `/HOST/diag` *target*, resulting in Max POST being executed.
- `locked` – Host power on is allowed, however, you are prohibited from updating any of the flash devices or setting `/HOST send_break_action=break`.

Related Information

- "Power On the Server" on page 13
- "Power Off the Server" on page 14

Configuring Network Addresses

These topics describe managing network addresses with ILOM.

- "SP Network Address Options" on page 31
- "Disable or Re-Enable Network Access to the SP" on page 32
- "Display the DHCP Server IP Address" on page 32
- "Display the Host MAC Address" on page 34
- "Using an In-band Connection to the SP" on page 34

Related Information

- "Multipathing Software" on page 4

SP Network Address Options

You can access the SP on your system in multiple ways. Consider the following options and choose the access method that is best for your environment.

You can physically connect to the SP using a serial connection or a network connection. The network connection can be configured to use a static IP address or DHCP (the default). Optionally, the Netra SPARC T3-1 server can use an in-band network connection to the SP, rather than the default out-of-band network management port.

For more information on each option, see the following documentation:

- To use a serial connection to the SP, see:

  "Connect a Terminal or Emulator to the SER MGT Port" in the *Netra SPARC T3-1Server Installation Guide*

- To assign a static IP address to the SP, see:

  "Assign a Static IP Address to the SP" in the *Netra SPARC T3-1Server Installation Guide*

- To use an In-band connection to the SP, see:

  "ILOM In-band (Sideband) Management" on page 34

Related Information

- Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation
- "Related Documentation" on page viii

▼ Disable or Re-Enable Network Access to the SP

Use the `/SP/network state` property to enable or disable the service processor's network interface.

- **At the ILOM `->` prompt, type:**

```
-> set /SP/network state=value
```

where *value* can be:

- `enabled` (the default)
- `disabled`

Related Information

- "SP Network Address Options" on page 31

▼ Display the DHCP Server IP Address

To display the IP address of the DHCP server that provided the dynamic IP address requested by the service processor, view the `dhcp_server_ip` property. To see the `dhcp_server_ip` property, use the following procedure.

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

```
-> show /SP/network

 /SP/network
    Targets:
        interconnect
        ipv6
        test

    Properties:
        commitpending = (Cannot show property)
        dhcp_server_ip = 10.8.31.5
        ipaddress = 10.8.31.188
        ipdiscovery = dhcp
        ipgateway = 10.8.31.248
        ipnetmask = 255.255.252.0
        macaddress = 00:14:4F:7E:83:4F
        managementport = /SYS/MB/SP/NETMGMT
        outofbandmacaddress = 00:21:28:8F:13:5F
        pendingipaddress = 10.8.31.188
        pendingipdiscovery = dhcp
        pendingipgateway = 10.8.31.248
        pendingipnetmask = 255.255.252.0
        sidebandmacaddress = 00:21:28:8F:13:5E
        state = enabled

    Commands:
        cd
        set
        show
```

Note – The list of properties might vary based on your server.

Related Information

- "Display the Host MAC Address" on page 34
- "SP Network Address Options" on page 31

▼ Display the Host MAC Address

The /HOST macaddress property is automatically configured by the server software, so you cannot set or change the property. The value is read and determined from the server's removable SCC PROM and then stored as a property in ILOM.

/HOST macaddress is the MAC address for the net0 port. The MAC addresses for each additional port increments from the /HOST macaddress. For example, net1 is equal to the value of /HOST macaddress plus one (1).

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

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

Related Information

- "Display the DHCP Server IP Address" on page 32
- "SP Network Address Options" on page 31

Using an In-band Connection to the SP

These topics describe how to use an in-band, or sideband connection, to the SP.

- "ILOM In-band (Sideband) Management" on page 34
- "Configure SP In-band (Sideband) Access" on page 35

Related Information

- "ILOM Remote Console" on page 12

ILOM In-band (Sideband) Management

By default, you connect to the server's SP using the out-of-band NET MGT port. The ILOM sideband management feature enables you to select either the NET MGT port or one of the server's Gigabit Ethernet ports (NET 0, 1, 2, 3), which are in-band ports, to send and receive ILOM commands to and from the server SP. In-band ports are also called sideband ports.

The advantage of using a sideband management port to manage the server's SP is that one fewer cable connection and one fewer network switch port are needed. In configurations where numerous servers are being managed, such as data centers, sideband management can represent a significant savings in hardware and network utilization.

When sideband management is enabled in ILOM, the following conditions might occur:

- Connectivity to the server SP might be lost when the SP management port configuration is changed while you are connected to the SP using a network connection, such as SSH, web, or ILOM Remote Console.
- In-chip connectivity between the SP and the host operating system might not be supported by the on-board host Gigabit Ethernet controller. If this condition occurs, use a different port or route to transmit traffic between the source and destination targets instead of using L2 bridging/switching.
- Server host power cycles might cause a brief interruption of network connectivity for server Gigabit Ethernet ports (NET 0, 1, 2, 3) that are configured for sideband management. If this condition occurs, configure the adjacent switch/bridge ports as host ports.

Related Information

- "Configure SP In-band (Sideband) Access" on page 35
- "SP Network Address Options" on page 31

▼ Configure SP In-band (Sideband) Access

This procedure describes how to access the SP from an in-band (or sideband) management using a host network port.

If you perform this procedure using a network connection, you might lose connectivity to the server. Using a serial connection for this procedure eliminates the possibility of losing connectivity during sideband management configuration changes.

1. **Log into ILOM.**

   "Log In to ILOM" on page 7.

2. **If you logged in using the serial port, you can assign a static IP address.**

   For instructions, see the information about assigning an IP address in the *Netra SPARC T3-1Server Installation Guide*.

3. **View the current network settings:**

```
-> show /SP/network

/SP/network
   Targets:
       interconnect
       ipv6
       test

   Properties:
       commitpending = (Cannot show property)
       dhcp_server_ip = none
       ipaddress = 129.148.62.55
       ipdiscovery = static
       ipgateway = 129.148.62.225
       ipnetmask = 255.255.255.0
       macaddress = 00:11:3T:8O:44:B7
       managementport= /SYS/MB/SP/NETMGMT
       outofbandmacaddress = 00:11:3T:8O:44:B7
       pendingipaddress = 129.148.62.55
       pendingipdiscovery = static
       pendingipgateway = 129.148.62.225
       pendingipnetmask = 255.255.255.0
       pendingmanagementport = /SYS/MB/SP/NETMGMT
       sidebandmacaddress = 00:11:3T:8O:44:B7
       state = enabled

   Commands:
       cd
       set
       show
```

4. **Set the SP management port to a sideband port (where *n* is 0-3):**

```
-> set /SP/network pendingmanagementport=/SYS/MB/NETn

-> set commitpending=true
```

5. **Verify the change:**

```
-> show /SP/network

/SP/network
   Targets:
       interconnect
```

```
        ipv6
        test

    Properties:
        commitpending = (Cannot show property)
        dhcp_server_ip = none
        ipaddress = 129.148.62.55
        ipdiscovery = static
        ipgateway = 129.148.62.225
        ipnetmask = 255.255.255.0
        macaddress = 00:11:3T:8O:44:B7
        managementport= /SYS/MB/SP/NET0
        outofbandmacaddress = 00:11:3T:8O:44:B7
        pendingipaddress = 129.148.62.55
        pendingipdiscovery = static
        pendingipgateway = 129.148.62.225
        pendingipnetmask = 255.255.255.0
        pendingmanagementport = /SYS/MB/SP/NET0
        sidebandmacaddress = 00:11:3T:8O:44:B7
        state = enabled

    Commands:
        cd
        set
        show
```

Related Information

- "ILOM In-band (Sideband) Management" on page 34
- "SP Network Address Options" on page 31

Configuring Boot Mode

Use the ILOM boot mode properties to specify how the host boots when correcting a problem with OpenBoot or Oracle VM Server for SPARC settings.

- "Boot Mode Overview" on page 39
- "Configure the Host Boot Mode of Oracle VM Server for SPARC" on page 40
- "Change the Host Boot Mode Behavior at Reset" on page 41
- "Manage the Host Boot Mode Script" on page 42
- "Display Host Boot Mode Expiration Date" on page 43
- "Override OBP Settings to Reset the Server" on page 43

Related Information

- "OpenBoot Overview" on page 3
- "Oracle VM Server for SPARC Overview" on page 4

Boot Mode Overview

Boot mode (`bootmode`) properties enable you to override the default method the server uses when it boots. This ability is useful to override particular OpenBoot or Oracle VM Server settings that might be incorrect, to set up OpenBoot variables using a script, or to perform similar tasks.

For example, if the OpenBoot settings have become corrupt, you can set the `bootmode` state property to `reset_nvram` then reset the server to its factory default OpenBoot settings.

Service personnel might instruct you to use the `bootmode` script property for problem resolution. The full extent of script capabilities are not documented and exist primarily for debugging.

Because `bootmode` is intended to be used to correct a problem with the OpenBoot or Oracle VM Server settings, the `bootmode` takes effect for a single boot only. Additionally, to prevent an administrator from setting a `bootmode` state property and forgetting about it, a `bootmode` state property expires if the host is not reset within 10 minutes of the `bootmode` state property being set.

Related Information

- "Reset the Server From the Oracle Solaris OS" on page 15
- "Reset the Server From ILOM" on page 15
- "OpenBoot Overview" on page 3
- "Oracle VM Server for SPARC Overview" on page 4

▼ Configure the Host Boot Mode of Oracle VM Server for SPARC

Note – You must use a valid Oracle VM Server configuration name for this task.

1. **Determine the valid Oracle VM Server configurations on your SP. At the ILOM -> prompt, type:**

```
-> show /HOST/domain/configs
```

2. **Set the boot mode configuration. At the ILOM -> prompt, type:**

```
-> set /HOST/bootmode config=configname
```

where the `config` property takes a *configname* value that is a valid named logical domain configuration.

For example, if you created a Oracle VM Server configuration called `ldm-set1`:

```
-> set bootmode config=ldm-set1
```

To return the boot mode `config` to the factory default configuration, specify `factory-default`.

For example:

```
-> set bootmode config=factory-default
```

Related Information

- "Reset the Server From ILOM" on page 15
- "Boot Mode Overview" on page 39
- "Oracle VM Server for SPARC Overview" on page 4

▼ Change the Host Boot Mode Behavior at Reset

The `/HOST/bootmode` state property controls how OpenBoot NVRAM variables are used. Normally the current settings of these variables are retained. Setting `/HOST/bootmode state=reset_nvram` changes the OpenBoot NVRAM variables to their default settings at the next reset.

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

```
-> set /HOST/bootmode state=value
```

where *value* is one of the following:

- `normal` – At next reset, retains current NVRAM variable settings.
- `reset_nvram` – At next reset, returns OpenBoot variables to default settings.

Note – `state=reset_nvram` returns to normal after the next server reset or 10 minutes (see `expires` property in "Display Host Boot Mode Expiration Date" on page 43). The `config` and `script` properties do not expire and will be cleared upon the next server reset or manually by setting *value* to "".

Related Information

- "Reset the Server From ILOM" on page 15
- "Boot Mode Overview" on page 39
- "Oracle VM Server for SPARC Overview" on page 4

▼ Manage the Host Boot Mode Script

- **At the ILOM `->` prompt, type:**

```
-> set /HOST/bootmode script=value
```

where `script` controls the host server OBP firmware method of booting.

`script` does not affect the current `/HOST/bootmode` setting.

value can be up to 64 bytes in length.

You can specify a `/HOST/bootmode` setting and set the script within the same command. For example:

```
-> set /HOST/bootmode state=reset_nvram script="setenv diag-switch? true"
```

After the server resets and OBP reads the values stored in the script, the OBP sets the OBP variable `diag-switch?` to the user-requested value of `true`.

Note – If you set `/HOST/bootmode script=""`, ILOM sets the `script` to empty.

Related Information

- "Reset the Server From ILOM" on page 15
- "Boot Mode Overview" on page 39
- "Oracle VM Server for SPARC Overview" on page 4

▼ Display Host Boot Mode Expiration Date

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

```
-> show /HOST/bootmode expires
     Properties:
        expires = Thu Oct 14 18:24:16 2010
```

where `expires` is the date and time when the current boot mode will expire.

Related Information

- "Reset the Server From ILOM" on page 15
- "Boot Mode Overview" on page 39
- "Oracle VM Server for SPARC Overview" on page 4

▼ Override OBP Settings to Reset the Server

Use this procedure to override the OBP settings and initiate reboot of the control domain, which results in the host booting to the `ok` prompt.

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

```
-> set /HOST/domain/control auto-boot=disabled
-> reset /HOST/domain/control [-force] [-script]
```

The host reboots and stops at the `ok` prompt.

Related Information

- "Change the Host Boot Mode Behavior at Reset" on page 41
- "Boot Mode Overview" on page 39
- "Oracle VM Server for SPARC Overview" on page 4

Configuring Server Behavior at Restart

Use the following procedures to configure how ILOM should behave during the following restart scenarios.

- "Specify Behavior When the Host Resets" on page 45
- "Specify Behavior When the Host Stops Running" on page 46
- "Set the Boot Timeout Interval" on page 46
- "Specify Behavior at Boot Timeout" on page 47
- "Specify Behavior if Restart Fails" on page 47
- "Specify Maximum Restart Attempts" on page 48

Related Information

- "Power Off the Server" on page 14
- "Power On the Server" on page 13

▼ Specify Behavior When the Host Resets

Specify if the host should continue to boot if an error is encountered.

- **Set this property:**

```
-> set /HOST autorunonerror=value
```

where *value* can be:

- `false` – The host continues to boot if an error is encountered.
- `true` – The host *does not* continue to boot if an error is encountered.

Related Information

- "Configuring Policy Settings" on page 25

▼ Specify Behavior When the Host Stops Running

Specify what ILOM should do when the host leaves the `RUNNING` state (when the watchdog timer expires).

- **Set this property:**

```
-> set /HOST autorestart=value
```

where *value* can be:

- `none` – ILOM takes no action other than to issue a warning.
- `reset` – ILOM attempts to reset the server when the Oracle Solaris watchdog timer expires (the default).
- `dumpcore` – ILOM attempts to force a core dump of the OS when the watchdog timer expires.

Related Information

- "Display Console History" on page 55

▼ Set the Boot Timeout Interval

- **Set the time delay between a request to boot the host and booting the host:**

```
-> set /HOST boottimeout=seconds
```

The default value of `boottimeout` is `0` (zero seconds) or no timeout. Possible values are in the range from `0` to `36000` seconds.

Related Information

- "Specify Behavior at Boot Timeout" on page 47

- "Specify Behavior When the Host Stops Running" on page 46

▼ Specify Behavior at Boot Timeout

Specify what ILOM should do if the host fails to boot before the boot timeout interval.

- **Specify behavior at the completion of boot timeout:**

```
-> set /HOST bootrestart=value
```

where *value* can be:

- `none` (the default)
- `reset`

Related Information

- "Set the Boot Timeout Interval" on page 46
- "Specify Behavior When the Host Stops Running" on page 46

▼ Specify Behavior if Restart Fails

Specify what ILOM should do if the host fails to reach the Oracle Solaris `running` state.

- **At the ILOM `->` prompt, type:**

```
-> set /HOST bootfailrecovery=value
```

where *value* can be:

- `powercycle`
- `poweroff` (the default)

Related Information

- "Specify Maximum Restart Attempts" on page 48

■ "Specify Behavior When the Host Stops Running" on page 46

▼ Specify Maximum Restart Attempts

Specify how many times ILOM should attempt to restart the host.

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

```
-> set /HOST maxbootfail=attempts
```

The default value of `maxbootfail` is `3` (three attempts).

If the host does not boot successfully within the number of tries indicated by `maxbootfail`, the host is powered off or power cycled (depending upon the setting of `bootfailrecovery`). In either case, `boottimeout` is set to `0` (zero seconds), disabling further attempts to restart the host.

Related Information

■ "Specify Behavior if Restart Fails" on page 47
■ "Specify Behavior When the Host Stops Running" on page 46

Configuring Devices

These topics contain information about configuring devices in the server.

- "Unconfigure a Device Manually" on page 49
- "Reconfigure a Device Manually" on page 50

Related Information

- "Display Server Components" on page 62

▼ Unconfigure a Device Manually

The ILOM firmware provides a `component_state=disabled` command, which enables you to unconfigure server devices manually. This command marks the specified device as `disabled`. Any device marked `disabled`, whether manually or by the system firmware, is removed from the server's machine description prior to transfer of control to other layers of system firmware, such as OBP.

1. **Log into ILOM.**

   See "Log In to ILOM" on page 7.

2. **At the ILOM `->` prompt, type:**

```
-> set component-name component_state=disabled
```

Related Information

- "Reconfigure a Device Manually" on page 50
- "Display Server Components" on page 62

▼ Reconfigure a Device Manually

The ILOM firmware provides a `component_state=enabled` command, which enables you to reconfigure server devices manually. Use this command to mark the specified device as `enabled`.

1. **Log into ILOM.**

   See "Log In to ILOM" on page 7.

2. **At the ILOM `->` prompt, type:**

```
-> set component-name component_state=enabled
```

Related Information

- "Unconfigure a Device Manually" on page 49
- "Display Server Components" on page 62

Monitoring the Server

The server provides many ways to find faults, including LEDs, ILOM, and POST. For specific information about LEDs, and for complete troubleshooting information, refer to the *Netra SPARC T3-1 Server Service Manual*.

- "Monitoring Faults" on page 51
- "Enabling ASR" on page 59
- "Display Server Components" on page 62
- "Locate the Server" on page 62

Related Information

- "Display the `ok` Prompt" on page 9

Monitoring Faults

These topics contain a summary of diagnostic tools and basic information about finding server faults using pre-OS tools, including ILOM and POST. For complete troubleshooting information, see the *Netra SPARC T3-1 Server Service Manual*.

- "Diagnostics Overview" on page 52
- "Discover Faults (ILOM)" on page 53
- "Discover Faults (ILOM Fault Management Shell)" on page 53
- "Discover Faults (POST)" on page 55
- "Display Console History" on page 55
- "Repair a Fault (ILOM Fault Management Shell)" on page 57
- "Clear a Fault" on page 58

Related Information

- "Display the `ok` Prompt" on page 9

Diagnostics Overview

You can use a variety of diagnostic tools, commands, and indicators to monitor and troubleshoot a server. See the service manual for your server for complete information about these diagnostic tools:

- **LEDs** – These provide a quick visual notification of the status of the server and of some of the FRUs.
- **ILOM** – This firmware runs on the service processor. In addition to providing the interface between the hardware and OS, ILOM also tracks and reports the health of key server components. ILOM works closely with POST and Oracle Solaris Predictive Self-Healing technology to keep the server running even when there is a faulty component.
- **POST** – This utility performs diagnostics on server components upon server reset to ensure the integrity of those components. POST is configureable and works with ILOM to take faulty components offline if needed.
- **Oracle Solaris OS Predictive Self-Healing** – This technology continuously monitors the health of the CPU, memory, and other components, and works with ILOM to take a faulty component offline if needed. The PSH technology enables servers to accurately predict component failures and mitigate many serious problems before they occur.
- **Log files and command interface** – These 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 – This application exercises the server, provides hardware validation, and discloses possible faulty components with recommendations for repair.

The LEDs, ILOM, PSH, and many of the log files and console messages are integrated. For example, when the Oracle Solaris software detects a fault, it displays the fault, logs the fault, and passes information to ILOM, where the fault is logged.

Related Information

- "Discover Faults (ILOM)" on page 53
- "Discover Faults (POST)" on page 55
- "Discover Faults (ILOM Fault Management Shell)" on page 53
- See the *Netra SPARC T3-1 Server Service Manual*, detecting and managing faults

▼ Discover Faults (ILOM)

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

```
-> show faulty
```

This command displays the target, the property and the value of the fault.

For example:

```
-> show faulty
Target            | Property             | Value
------------------+----------------------+-------------------------
/SP/faultmgmt/0   | fru                  | /SYS
/SP/faultmgmt/1   | fru                  | /SYS/MB/CMP0/BOBO/CH1/D0
/SP/faultmgmt/1/  | fru_part_number      | 18JS25672PDZ1G1F1
 faults/0         |                      |

->
```

Related Information

- "Discover Faults (POST)" on page 55
- "Log In to ILOM" on page 7
- "Locate the Server" on page 62
- "Clear a Fault" on page 58
- "Enabling ASR" on page 59
- "Discover Faults (ILOM Fault Management Shell)" on page 53

▼ Discover Faults (ILOM Fault Management Shell)

The ILOM Fault Management shell provides a way to use the Oracle Solaris Fault Manager commands (`fmadm` and `fmstat`) from within ILOM, and to view both host and ILOM faults.

1. **To start the captive shell, at the ILOM -> prompt, type:**

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

faultmgmtsp>
```

2. **For a list of current server faults, type:**

```
faultmgmtsp> fmadm faulty
---------------- ------------------------------------ -------------- --------
Time             UUID                                 msgid          Severity
---------------- ------------------------------------ -------------- --------
2010-09-03/20:46:23 fa4a2f86-5156-4243-8e88-d6516db12970 SPT-8000-DH   Critical

Fault class : fault.chassis.voltage.fail

FRU         : /SYS/MB
              (Part Number: 541-4197-04)
              (Serial Number: 1005LCB-1025D40059)

Description : A chassis voltage supply is operating outside of the
              allowable range.

Response    : The system will be powered off.  The chassis-wide service
              required LED will be illuminated.

Impact      : The system is not usable until repaired.  ILOM will not allow
              the system to be powered on until repaired.

Action      : The administrator should review the ILOM event log for
              additional information pertaining to this diagnosis.  Please
              refer to the Details section of the Knowledge Article for
              additional information.
```

Note – If the server detects the replacement of the faulty FRU, the repair does not require a user command, and the fault will be cleared automatically.

3. **Discover more information about a specific fault.**

   Find the fault MSG-ID (SPT-8000-42 in the preceding example), and enter it in the search box at http://www.sun.com/msg.

4. **Repair the fault.**

   See "Repair a Fault (ILOM Fault Management Shell)" on page 57.

5. **To leave the Fault Management shell and return to ILOM, type:**

```
faultmgmtsp> exit
->
```

Related Information

- Oracle Solaris 10 OS Feature Spotlight: Predictive Self Healing
- "Log In to ILOM" on page 7
- "Discover Faults (ILOM)" on page 53
- "Repair a Fault (ILOM Fault Management Shell)" on page 57

▼ Discover Faults (POST)

The virtual keyswitch can be used to run full POST diagnostics without having to modify the diagnostic property settings. Note that POST diagnostics can take a significant amount of time to run at server reset.

1. **Log in to ILOM.**

   See "Log In to ILOM" on page 7.

2. **At the ILOM -> prompt, type:**

```
-> set /SYS keyswitch_state=diag
```

   The server is set to run full POST diagnostics on server reset.

3. **To return to your normal diagnostic settings *after* running POST, type:**

```
-> set /SYS keyswitch_state=normal
```

Related Information

- "Discover Faults (ILOM)" on page 53
- "Locate the Server" on page 62
- "Clear a Fault" on page 58

▼ Display Console History

This topic describes displaying the host server console output buffers.

There are two console history buffers that can contain up to 1 Mbyte of information. The `/HOST/console/history` target writes all types of log information. The `/HOST/console/bootlog` target writes boot information and initialization data into the console buffer until ILOM is notified by the server that the Oracle Solaris OS is up and running. This buffer is kept until the host is booted again.

Note – You must have ILOM Administrator level user permission to use this command.

---

1. To manage the `/HOST/console/history` log, at the ILOM `->` prompt, type:

```
-> set /HOST/console property=value [...]
-> show /HOST/console/history
```

where *property* can be:

- `line_count` – This property accepts a *value* within the range of 1 to 2048 lines. Specify " " for an unlimited number of lines. The default is all lines.
- `pause_count` – This property accepts a *value* of 1 to any valid integer or " " for infinite number of lines. The default is not to pause.
- `start_from` – The *value*s for this property are:
  - `end` – The last line (most recent) in the buffer (the default).
  - `beginning` – The first line in the buffer.

    If you type the `show /HOST/console/history` command without first setting any arguments with the `set` command, ILOM displays all lines of the console log, starting from the end.

Note – Timestamps recorded in the console log reflect server time. These timestamps reflect local time, and the ILOM console log uses UTC (Coordinated Universal Time). The Oracle Solaris OS system time is independent of the ILOM time.

---

2. View the `/HOST/console/bootlog`:

```
-> show /HOST/console/bootlog
```

where *property* can be:

- `line_count` – This option accepts a value within the range of 0 to 2048 lines. Specify "0" for an unlimited number of lines. The default is all lines.
- `pause_count` – This option accepts a value of within the range of 0 to 2048 lines. Specify "0" for an unlimited number of lines. The default is not to pause.
- `start_from` – The options are:

- `end` – The last line (most recent) in the buffer (the default).
- `beginning` – The first line in the buffer.

Note – Timestamps recorded in the console log reflect server time. These timestamps reflect local time, and the ILOM console log uses UTC (Coordinated Universal Time). The Oracle Solaris OS system time is independent of the ILOM time.

Related Information

- "Diagnostics Overview" on page 52
- "Specify Behavior When the Host Stops Running" on page 46

▼ Repair a Fault (ILOM Fault Management Shell)

You can use the `fmadm repair` command to fix faults diagnosed by ILOM. (Faults diagnosed by ILOM, rather than the host, have message IDs starting with "SPT".)

The only time you should use the `fmadm repair` command in the ILOM Fault Management shell for a host-diagnosed fault is when the fault is repaired and ILOM is unaware of the repair. For example, ILOM might be down when the fault is repaired. In that case, the host would no longer display the fault, yet the fault is still displayed in ILOM. Use the `fmadm repair` command to clear the fault.

1. Locate the fault:

```
faultmgmtsp> fmadm faulty
---------------- ------------------------------------ -------------- --------
Time             UUID                                 msgid          Severity
---------------- ------------------------------------ -------------- --------
2010-09-03/20:46:23 fa4a2f86-5156-4243-8e88-d6516db12970 SPT-8000-DH   Critical

Fault class : fault.chassis.voltage.fail

FRU         : /SYS/MB
              (Part Number: 541-4197-04)
              (Serial Number: 1005LCB-1025D40059)

Description : A chassis voltage supply is operating outside of the
              allowable range.

Response    : The system will be powered off.  The chassis-wide service
              required LED will be illuminated.

Impact      : The system is not usable until repaired.  ILOM will not allow
```

```
                the system to be powered on until repaired.

Action      : The administrator should review the ILOM event log for
              additional information pertaining to this diagnosis.  Please
              refer to the Details section of the Knowledge Article for
              additional information.

faultmgmtsp> fmadm repair fa4a2f86-5156-4243-8e88-d6516db12970
faultmgmtsp>
```

2. **Repair an ILOM-detected fault using the** `fmadm repair` **command:**

```
faultmgmtsp> fmadm repair fa4a2f86-5156-4243-8e88-d6516db12970
faultmgmtsp>
```

Note – You can use either the NAC name (for instance, `/SYS/MB`) or the UUID (for instance, `fa4a2f86-5156-4243-8e88-d6516db12970`) of the fault with the `fmadm repair` command.

---

3. **To leave the Fault Management shell and return to ILOM, type:**

```
faultmgmtsp> exit
->
```

Related Information

- "Discover Faults (ILOM Fault Management Shell)" on page 53

▼ Clear a Fault

- **At the ILOM** `->` **prompt, type:**

```
-> set /SYS/component clear_fault_action=true
```

Setting `clear_fault_action` to `true` clears the fault at the component and all levels below it in the `/SYS` tree.

Related Information

- "Discover Faults (ILOM)" on page 53
- "Discover Faults (POST)" on page 55
- "Display Server Components" on page 62

Enabling ASR

These topics include information about configuring your server to automatically recover from minor faults.

Note – This section refers to the ASR feature, not the similarly named auto service request feature.

- "ASR Overview" on page 59
- "Enable ASR" on page 60
- "Disable ASR" on page 60
- "View Information on Components Affected by ASR" on page 61

Related Information

- "Configuring Devices" on page 49

ASR Overview

The server provides for ASR from failures in memory modules or PCI cards.

ASR functionality enables the server to resume operation after experiencing certain nonfatal hardware faults or failures. When ASR is enabled, the system's firmware diagnostics automatically detect failed hardware components. An autoconfiguring capability designed into the system firmware enables the system to unconfigure failed components and to restore server operation. As long as the server is capable of operating without the failed component, the ASR features enable the server to reboot automatically, without operator intervention.

Note – ASR is not activated until you enable it. See "Enable ASR" on page 60.

For more information about ASR, refer to the *Netra SPARC T3-1 Server Service Manual*.

Related Information

- "Enable ASR" on page 60
- "Disable ASR" on page 60
- "View Information on Components Affected by ASR" on page 61

▼ Enable ASR

1. **At the ILOM `->` prompt, type:**

```
-> set /HOST/diag mode=normal
-> set /HOST/diag level=max
-> set /HOST/diag trigger=power-on-reset
```

2. **At the `ok` prompt, type:**

```
ok setenv auto-boot? true
ok setenv auto-boot-on-error? true
```

Note – For more information about OpenBoot configuration variables, refer to the service manual for your server.

---

3. **Cause the parameter changes to take effect:**

```
ok reset-all
```

The server permanently stores the parameter changes and boots automatically when the OpenBoot configuration variable `auto-boot?` is set to `true` (its default value).

Related Information

- "ASR Overview" on page 59
- "Disable ASR" on page 60
- "View Information on Components Affected by ASR" on page 61

▼ Disable ASR

1. **At the `ok` prompt, type:**

```
ok setenv auto-boot-on-error? false
```

2. **Cause the parameter changes to take effect:**

```
ok reset-all
```

The server permanently stores the parameter change.

After you disable the ASR feature, it is not activated again until you re-enable it.

Related Information

- "Enable ASR" on page 60
- "View Information on Components Affected by ASR" on page 61
- "ASR Overview" on page 59

▼ View Information on Components Affected by ASR

1. **Log in to ILOM.**

   See "Log In to ILOM" on page 7.

2. **At the ILOM -> prompt, type:**

```
-> show /SYS/component component_state
```

In the `show /SYS/`*component* `component_state` command output, any devices marked `disabled` have been manually unconfigured using the system firmware. The command output also shows devices that have failed firmware diagnostics and have been automatically unconfigured by the system firmware.

Related Information

- "ASR Overview" on page 59
- "Enable ASR" on page 60
- "Disable ASR" on page 60
- "Unconfigure a Device Manually" on page 49
- "Reconfigure a Device Manually" on page 50

▼ Display Server Components

View real-time information about the components installed in your server using the ILOM `show components` command.

1. **Log in to ILOM.**

   See "Log In to ILOM" on page 7.

2. **At the ILOM `->` prompt, type:**

```
-> show components
Target               | Property               | Value
---------------------+------------------------+-------------------
/SYS/MB/RISER0/      | component_state        | Enabled
PCIE0                |                        |
/SYS/MB/RISER0/      | component_state        | Disabled
PCIE3
/SYS/MB/RISER1/      | component_state        | Enabled
PCIE1                |                        |
/SYS/MB/RISER1/      | component_state        | Enabled
/SYS/MB/NET0         | component_state        | Enabled
/SYS/MB/NET1         | component_state        | Enabled
/SYS/MB/NET2         | component_state        | Enabled
```

Note – Components will vary based on your server.

Related Information

- *Netra SPARC T3-1Server Installation Guide,* device path names
- "Locate Device Paths" on page 20
- "Configuring Devices" on page 49

▼ Locate the Server

In case you need to service a component, lighting the system locator LED assists in easily identifying the correct server. You do not need administrator permissions to use the `set /SYS/LOCATE` and `show /SYS/LOCATE` commands.

1. **Log in to ILOM.**

   See "Log In to ILOM" on page 7.

2. **At the ILOM -> prompt, turn on the Locator LED:**

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

   The white Locator LED blinks on the located system.

3. **After locating the system, turn off the Locator LED:**

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

   Alternately, press the blinking Locator LED button to turn off the LED.

4. **Display the state of the Locator LED:**

```
-> show /SYS/LOCATE
```

Related Information

- "Monitoring Faults" on page 51
- "Configuring Devices" on page 49

Updating the Firmware

These topics describe how to update the system firmware and view current versions of firmware for the Netra SPARC T3-1 server from Oracle.

- "Display the System Firmware Version" on page 65
- "Update the Firmware" on page 66
- "Display the OBP Version" on page 68
- "Display the POST Version" on page 69
- "Display the Hypervisor Version" on page 69

Related Information

- "Oracle ILOM Overview" on page 1
- *Server Product Notes*, firmware versions

▼ Display the System Firmware Version

The `/HOST sysfw_version` property displays information about the system firmware version on the host.

- **View the current setting for this property.**

```
-> show /HOST sysfw_version
/HOST
 Properties:
   sysfw_version = Sun System Firmware 8.0.3.a 2010/12/04 17:5
```

Related Information

- "Update the Firmware" on page 66

▼ Update the Firmware

1. **Ensure that the ILOM service processor network management port is configured.**

   Refer to the *Netra SPARC T3-1Server Installation Guide* for your server for instructions.

2. **Open an SSH session to connect to the service processor:**

```
% ssh root@xxx.xxx.xxx.xxx
...
Are you sure you want to continue connecting (yes/no) ? yes

...
Password: password (nothing displayed)
Waiting for daemons to initialize...

Daemons ready

Oracle Integrated Lights Out Manager

Version 3.0.12.5.a r60682

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->
```

3. **Power off the host:**

```
-> stop /SYS
```

4. **Set the** `keyswitch_state` **parameter to** `normal`**:**

```
-> set /SYS keyswitch_state=normal
```

5. **Type the** `load` **command with the path to the new flash image.**

   The `load` command updates the service processor flash image and the host firmware. The `load` command requires the following information:

   - IP address of a TFTP server on the network that can access the flash image.
   - Full path name to the flash image that the IP address can access.

     The command usage is as follows:

`load [-script] -source tftp://`*xxx.xxx.xx.xxx/pathname*

where:

- `-script` – Does not prompt for confirmation and acts as if `yes` was specified
- `-source` – Specifies the IP address and full path name (URL) to the flash image

```
-> load -source tftp://129.99.99.99/pathname
NOTE: A firmware upgrade will cause the server and ILOM to be reset.
It is recommended that a clean shutdown of the server be done prior
to the upgrade procedure.
An upgrade takes about 6 minutes to complete. ILOM will enter a
special mode to load new firmware.
No other tasks can be performed in ILOM until the firmware upgrade
is complete and ILOM is reset.
Are you sure you want to load the specified file (y/n)?y
Do you want to preserve the configuration (y/n)? y
.............................................................
Firmware update is complete.
ILOM will now be restarted with the new firmware.
Update Complete. Reset device to use new image.
->
```

After the flash image has been updated, the server automatically resets, runs diagnostics, and returns to the login prompt on the serial console.

```
U-Boot 1.x.x

Custom AST2100 U-Boot 3.0 (Aug 21 2010 - 10:46:54) r58174
***
Net:   faradaynic#0, faradaynic#1
Enter Diagnostics Mode
['q'uick/'n'ormal(default)/e'x'tended(manufacturing mode)] .....
0
Diagnostics Mode - NORMAL
<DIAGS> Memory Data Bus Test ... PASSED
<DIAGS> Memory Address Bus Test ... PASSED
I2C Probe Test - SP
      Bus     Device                          Address Result
      ===     ============================    ======= ======
       6                  SP FRUID (U1101)    0xA0    PASSED
       6               DS1338(RTC) (U1102)    0xD0    PASSED

<DIAGS> PHY #0 R/W Test ... PASSED
<DIAGS> PHY #0 Link Status ... PASSED
<DIAGS> ETHERNET PHY #0, Internal Loopback Test ... PASSED
## Booting image at 110a2000 ... ***
```

```
Mounting local filesystems...
Mounted all disk partitions.

Configuring network interfaces...FTGMAC100: eth0:ftgmac100_open
Starting system log daemon: syslogd and klogd.
Starting capidirect daemon: capidirectd . Done
Starting Event Manager: eventmgr  . Done
Starting ipmi log manager daemon: logmgr . Done
Starting IPMI Stack: . Done
Starting sshd.
Starting SP fishwrap cache daemon: fishwrapd . Done
Starting Host deamon: hostd . Done
Starting Network Controller Sideband Interface Daemon: ncsid . Done
Starting Platform Obfuscation Daemon: pod . Done
Starting lu main daemon: lumain . Done
Starting Detection/Diagnosis After System Boot: dasboot  Done
Starting Servicetags discoverer: stdiscoverer.
Starting Servicetags listener: stlistener.
Starting Dynamic FRUID Daemon: dynafrud  Done

hostname login:
```

Related Information

- "Display the System Firmware Version" on page 65
- "OpenBoot Overview" on page 3
- "Display the POST Version" on page 69
- "Display the Hypervisor Version" on page 69

▼ Display the OBP Version

The `/HOST obp_version` property displays information about the version of OBP on the host.

- **View the current setting for this property:**

```
-> show /HOST obp_version
```

Related Information

- "OpenBoot Overview" on page 3
- "Update the Firmware" on page 66

▼ Display the POST Version

The /HOST post_version property displays information about the version of POST on the host.

- **View the current setting for this property:**

```
-> show /HOST post_version
```

Related Information

- "Discover Faults (POST)" on page 55
- "Update the Firmware" on page 66

▼ Display the Hypervisor Version

The /HOST hypervisor_version property displays information about the version of the hypervisor on the host.

- **View the current setting for this property:**

```
-> show /HOST hypervisor_version
```

Related Information

- "Update the Firmware" on page 66

Glossary

A

ACPI Advanced configuration and power interface.

ASR Automatic system recovery.

AWG American wire gauge.

B

BIOS Basic input/output system.

BMC Baseboard management controller.

C

CLI Command-line interface.

CMA Cable management arm, used to route and secure cables extending from the rear of the system.

CTS Clear To Send.

D

DB-15 15-pin D-subminiature connector.

DDR3 Double-data rate three.

DHCP Dynamic Host Configuration Protocol.

DIMM Dual in-line memory module.

DR Dual-rank DIMM.

E

ECC Error correction code.

EMI Electromagnetic interference.

ESD Electrostatic discharge.

F

G

GRUB GNU grand unified bootloader. An open source boot loader.

H

HBA Host bus adapter.

I

IME Integrated mirror enhanced array.

IPMI Intelligent platform management interface.

IS Integrated striping array.

K

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

L

LED Light- emitting diode.

M

MAC or MAC address Media access controller address.

N

NEBS Network Equipment-Building Standards. Defined standards for equipment to be installed in a telecommunications central office. Telecordia maintains these standards and tests equipment for NEBS certification.

NET MGT Network management port. After connecting a network cable to this NET MGT port, you can configure the system Oracle ILOM SP through this port.

NIC Network interface card.

NTP Network Time Protocol.

NVRAM Nonvolatile random access memory.

O

OBP OpenBoot Prom.

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

Oracle VTS Oracle Validation Test Suite. Oracle VTS software is an Oracle hardware validation test based on the Solaris Operating System. The suite's multiple hardware diagnostic tests verify the functionality of most hardware controllers and devices for SPARC and x86 architecture based systems. Oracle VTS 7.0 is the first version of this software and supersedes the SunVTS suites.

OSP Outside plant

OS Operating system.

OVM Oracle VM Server for SPARC.

P

PCIe2 Peripheral Component Interconnect Express 2.0. Refers to cards or slots that support the PCI Express 2.0 specification.

PDB Power distribution board.

POST Power-on self-test.

PSH Predictive self-healing.

PSU Power supply unit.

PXE Preboot execution environment.

Q

QSFP Quad small form-factor pluggable.

R

RAID Redundant array of independent disks.

RAS Reliability, availability, and serviceability.

RIS Remote installation services.

RPM Rotations per minute.

RTS Request To Send.

S

SAS Serial-attached SCSI.

SATA Serial advanced technology attachment.

SCC System configuration card.

SCSI Small computer system interface.

SER MGT Serial management port. The default port for system management, especially during the initial system configuration.

SFF Small form factor.

S.M.A.R.T. Self-monitoring, analysis, and reporting technology.

SP Service processor.

SR DIMM Single-rank DIMM.

SSD Solid-state drive.

SSH Secure shell.

STP Shielded twisted pair.

SunVTS Sun Validation Test Suite. SunVTS software runs through version 6.*x*. The SunVTS software is superseded by the Oracle VTS 7.0 software.

T

TCG Trusted Computing Group.

TPM Trusted platform module. For more information, refer to the Microsoft Windows Trusted Platform Module Management documentation.

U

UI User interface.

UUID Universal unique identifier.

USB Universal serial bus.

US NEC United States National Electrical Code. A United States standard for the installation of electrical wiring and equipment.

V

VAC Volts of alternating current.

VDC Volts of direct (continuous) current.

VGA Video graphics array.

VT-d Virtualization technology for directed I/O.

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