

SPARC T8 Series Servers Administration Guide

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Using This Documentation

- **Overview** – Describes how to configure and administer the SPARC T8-series servers from Oracle.
- **Audience** – System administrators of SPARC T8-series servers.
- **Required knowledge** – Working knowledge of computer network concepts and terms, and advanced familiarity with the Oracle Solaris Operating System (Oracle Solaris OS).

Note - This document applies to several server products. Specific examples used in this document are based on one of these servers. Your output might vary from the examples based on your product.

Product Documentation Library

Documentation and resources for this product and related products are available at:

<http://www.oracle.com/goto/t8/docs>

Feedback

Provide feedback about this documentation at <http://www.oracle.com/goto/docfeedback>.

Understanding System Administration Resources

These topics provide a summary of common tools and features involved in administering the server.

- [“Oracle ILOM Overview” on page 13](#)
- [“OpenBoot Overview” on page 20](#)
- [“Oracle Solaris Overview” on page 21](#)
- [“Oracle VM Server for SPARC Overview” on page 21](#)
- [“Multipathing Software Overview” on page 23](#)
- [“Oracle Hardware Management Pack Overview” on page 22](#)
- [“Oracle Enterprise Manager Ops Center Overview” on page 24](#)
- [“Oracle Auto Service Request Software Overview” on page 25](#)
- [“DIMM Sparing Overview” on page 26](#)

Related Information

- [“Updating the System Firmware” on page 105](#)

Oracle ILOM Overview

Oracle Integrated Lights Out Management (ILOM) is system management firmware that is pre-installed on Oracle servers. This firmware enables you to actively manage and monitor components that are installed in the server. Oracle ILOM provides a web interface and a command-line interface (CLI), as well as Simple Network Management Protocol (SNMP) and Intelligent Platform Management Interface (IPMI) interfaces.

Oracle ILOM runs in the service processor (SP) independently of the server power-on state, while AC power is connected to the server. The SP immediately starts and begins monitoring

the server when you connect the server to AC power. All environmental monitoring and control are handled by Oracle ILOM.

You can log in to the SP from a serial console connected to the SER MGT port or using `ssh` through the network connected to the NET MGT port. In each case, you see the `->` prompt of the CLI for Oracle ILOM. This prompt enables you to interact with the SP through Oracle ILOM commands.

You can log into the Oracle ILOM web interface to the SP through the network connected to the NET MGT port using the address `http://ip-address-of-SP` in your web browser.

The SP supports concurrent Oracle ILOM sessions per server. Multiple SSH or web connections are available through the NET MGT port, and one connection is available through the SER MGT port.

Oracle ILOM operates on many platforms. Most features are common to all platforms, but some Oracle ILOM features belong to only a subset of platforms.

For more information about how to work with Oracle ILOM features that are common to all platforms managed by Oracle ILOM, refer to the [Oracle ILOM Getting Started Guide Firmware Release 4.0.x](#).

To perform some procedures documented in the Oracle ILOM core documentation, you must connect a terminal with a cable to the SER MGT port and activate the Locator button on the server. For information about connecting to the SER MGT port, refer to the installation guide for the server.

Related Information

- [SPARC T8-1 Server Installation Guide](#)
- [SPARC T8-2 Server Installation Guide](#)
- [SPARC T8-4 Server Installation Guide](#)
- [“Log In to Oracle ILOM” on page 29](#)
- [“Configuring Policy Settings” on page 71](#)
- [“OpenBoot Overview” on page 20](#)

User Accounts on the SP

The Oracle ILOM software that is pre-installed on the SP is preconfigured with two user accounts, `root` and `default`. The `root` user can create additional user accounts as needed. The

default user is limited to password recovery of the root account and requires proof of physical presence at the server.

The SPARC T8 series servers support up to 10 user accounts for logging into the SP.

Note - To verify the maximum number of user accounts supported, click the More details link in the ILOM Administration → User Management → User Account page in the web interface.

For a secure login method, enable an SSH service. Refer to the Oracle ILOM documentation for more information.

Related Information

- [“Oracle ILOM Overview” on page 13](#)
- [“User Roles on the SP” on page 16](#)
- [Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x](#)

User Authentication on the SP

Users or management agents can access the SP and its components only through authorized user interfaces. Users and agents cannot access any of the underlying operating system interfaces, and users cannot install individual software components on the SP.

Oracle ILOM can authenticate user accounts through local accounts that you configure, or against a remote user authentication database such as Active Directory or LDAP/SSL. With remote authentication, you can use a centralized user database rather than configuring local accounts on each Oracle ILOM instance.

You can also remotely authenticate and authorize user access based on a user's membership in a host group. A user can belong to more than one host group, and on these servers, you can configure up to 10 host groups using the Oracle ILOM web interface, the CLI, or SNMP.

You can use Active Directory or LDAP/SSL to configure host groups for remote user authentication.

The tasks involved in configuring host groups include managing certificates (LDAP/SSL), administrator groups, operator groups, custom groups, and user domains.

Related Information

- [“Oracle ILOM Overview” on page 13](#)
- [“Active Directory” on page 17](#)
- [“LDAP/SSL Security” on page 18](#)
- [Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x](#)

User Roles on the SP

User roles are configured for the server SP using Oracle ILOM. For a complete description of the available roles, refer to the Oracle ILOM documentation.

Each user account is assigned specific roles that allow a user to execute certain Oracle ILOM commands and perform certain actions on a specific set of components. By specifying roles for each user account, you can control which operations each user is allowed to perform.

Configure user roles from `/SP/users/user-ID/role=value` or using the web interface, as documented in the Oracle ILOM documentation.

Related Information

- [“Oracle ILOM Overview” on page 13](#)
- [“User Authentication on the SP” on page 15](#)
- [Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x](#)
- [Oracle ILOM 4.0 documentation \(https://docs.oracle.com/cd/E81115_01/\)](https://docs.oracle.com/cd/E81115_01/)

Time Synchronization and NTP Service

When the server is powered on, the clock synchronizes to the NTP server when the system is configured to listen to NTP multicast (the default). If the server and SP use the same NTP server, events logged in Oracle Solaris and on the SP can be correlated based on their time stamps. If the server and SP use different NTP servers, their times might drift, and correlating events in log files could become difficult. If you connect a domain to an NTP server other than

the one used by the SP, ensure that both are low-stratum NTP servers that provide the same degree of accuracy.

Related Information

- [“Oracle ILOM Overview” on page 13](#)
- [“SNMP Service” on page 17](#)
- [Oracle ILOM 4.0 documentation \(https://docs.oracle.com/cd/E81115_01/\)](https://docs.oracle.com/cd/E81115_01/)

SNMP Service

The SNMP agent is preinstalled on these servers and runs on the SP, so all SNMP management occurs through Oracle ILOM. To monitor and manage the server directly using SNMP commands, you can use an SNMP management application such as Oracle HMP or Net-SNMP.

The MIB file SUN-HW-CTRL-MIB allows control for Oracle Sun server platform devices, and SUN-PLATFORM-MIB provides extensions to the standard entity MIB objects. The MIB files containing the extensions are available under /SP/services/snmp/mibs in the Oracle ILOM CLI and also downloadable through the web interface.

The Oracle ILOM MIB file SUN-ILOM-CONTROL-MIB that provided objects for configuring and managing all Oracle ILOM resources has been removed in ILOM 4.0. You can use the REST API in Oracle ILOM 4.0 to perform these tasks. See [Oracle ILOM Web Service Rest API User Guide and Security Reference for Firmware Release 4.0.x](#).

Related Information

- [Oracle ILOM 4.0 documentation \(https://docs.oracle.com/cd/E81115_01/\)](https://docs.oracle.com/cd/E81115_01/)
- [“Oracle ILOM Overview” on page 13](#)

Active Directory

Oracle ILOM supports Active Directory, the distributed directory service included with Microsoft Windows Server operating systems. Like an LDAP directory service implementation,

Active Directory can be used to authenticate user credentials of users logging into Oracle ILOM.

Related Information

- [Oracle ILOM 4.0 documentation \(https://docs.oracle.com/cd/E81115_01/\)](https://docs.oracle.com/cd/E81115_01/)
- [“Log In to Oracle ILOM” on page 29](#)
- [“User Authentication on the SP” on page 15](#)
- [“LDAP/SSL Security” on page 18](#)

LDAP/SSL Security

LDAP over Secure Sockets Layer (LDAP/SSL) offers enhanced security to LDAP users by using SSL encryption for user credentials as they are transmitted across the network. LDAP/SSL provides both authentication of user credentials and authorization of user access levels. Authentication verifies the identity of a user before that user can access system resources. Authorization grants specific privileges to a user to control and access system resources.

To configure LDAP/SSL in an SP, you enter basic data such as the roles users are assigned, LDAP server address and port number, timeout limit, and certificate mode. You can also optionally create groups that are assigned roles and contain users who are granted privileges based on those roles of the group.

You can use the LDAP/SSL configuration page of the Oracle ILOM web interface, the CLI, or SNMP to enable and configure LDAP/SSL.

Related Information

- [Oracle ILOM 4.0 documentation \(https://docs.oracle.com/cd/E81115_01/\)](https://docs.oracle.com/cd/E81115_01/)
- [“Log In to Oracle ILOM” on page 29](#)
- [“Oracle ILOM Overview” on page 13](#)

Oracle ILOM Remote System Console Plus

Oracle ILOM Remote System Console Plus is a Java application that you launch from the Oracle ILOM web interface. The application enables you to work on your desktop system

or laptop and remotely redirect and control devices on the server, such as the keyboard, video console display, mouse, and serial console display. This group of devices is commonly abbreviated as KVMs.

SPARC T8 servers support serial line redirection only for Oracle ILOM Remote System Console Plus. You cannot redirect the video console display using this tool. Oracle ILOM provides Oracle ILOM Remote System VNC Console for redirecting the video console.

Note - SPARC T8 servers do not support the older Oracle ILOM Remote System Console and Oracle ILOM Storage Redirection CLI features. Oracle ILOM Remote System Console Plus does not support a CLI storage redirection client.

Oracle ILOM Remote System Console Plus is documented in [“Using the Oracle ILOM Remote System Console Plus”](#) in *Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x*.

Related Information

- [“Using the Oracle ILOM Remote System Console Plus”](#) in *Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x*
- [Oracle ILOM 4.0 documentation \(https://docs.oracle.com/cd/E81115_01/\)](https://docs.oracle.com/cd/E81115_01/)
- [“Oracle ILOM In-Band \(Sideband\) Management”](#) on page 80

Oracle ILOM Remote System VNC Console

Oracle ILOM Remote System VNC Console is an implementation of the Virtual Network Computing (VNC) system. The VNC Console enables you to work on your desktop system and remotely redirect the keyboard, video, and mouse (KVM) events of the server to your local graphical desktop display.

Note - Oracle ILOM also provides Oracle ILOM Remote System Console *Plus*, but the SPARC T8 servers only support this for serial line redirection. The servers do not support the older Oracle ILOM Remote System Console and Oracle ILOM Storage Redirection CLI features.

You can use a VNC client that supports TLS 1.1 such as Tiger VNC to connect to the SP of the server through port 5900.

For more information about requirements for using and connecting to the Oracle ILOM Remote System VNC Console, refer to [“Connecting to the Oracle ILOM Remote System VNC](#)

Console” in *Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x*.

Related Information

- “Connecting to the Oracle ILOM Remote System VNC Console” in *Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x*
- “Using Oracle ILOM Remote System VNC Console” on page 32

OpenBoot Overview

The OpenBoot firmware determines the hardware configuration of a system or virtual machine, provides interactive debugging facilities, prepares memory, and initializes I/O devices by executing their device drivers. OpenBoot also boots the operating system from a storage device or a network if configured to boot.

OpenBoot can be used for other server administration tasks below the OS level. Some devices contain firmware written in the FCode language that enables additional commands which you can enter at the OpenBoot prompt (ok).

The OpenBoot firmware is based on the specification *IEEE Standard 1275-1994 for Boot (Initialization Configuration) Firmware: Core Requirements and Practices*.

OpenBoot operating characteristics are controlled by configuration variables that are stored in nonvolatile memory (NVRAM). You can change the configuration variable values to tailor operating characteristics to your environment.

See “Boot Sequence” in *Oracle OpenBoot 4.x Administration Guide* for more information about booting and boot properties.

The boot process has been enhanced to enable booting from devices that are not directly accessible to OpenBoot. For more information see “Boot Pools and Fallback Boot Images” in *Oracle OpenBoot 4.x Administration Guide*.

Related Information

- *Oracle OpenBoot 4.x Administration Guide*
- “Oracle Solaris Overview” on page 21

Oracle Solaris Overview

The Oracle Solaris OS provides commands and utilities for administration of the operating system and server. Use the following links to find the documentation appropriate for your Oracle Solaris release.

Oracle Solaris 11 <http://www.oracle.com/pls/topic/lookup?ctx=solaris11>

Oracle Solaris 10 <http://www.oracle.com/pls/topic/lookup?ctx=solaris10>

Note - Oracle Solaris 10 can only be used in Oracle VM Server for SPARC guest domains on these servers.

Oracle Solaris software includes Oracle Validation Test Suite (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://www.oracle.com/goto/vts/docs>

Oracle Solaris 11.3 also includes Oracle VM Server for SPARC and the Oracle Hardware Management Pack.

Related Information

- [“OpenBoot Overview” on page 20](#)
- [“Oracle VM Server for SPARC Overview” on page 21](#)
- [“Oracle Hardware Management Pack Overview” on page 22](#)

Oracle VM Server for SPARC Overview

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

Oracle VM Server for SPARC software enables you to create and manage numerous logical domains on a server, depending on the hardware configuration of the server. 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 for SPARC configurations are stored on the SP. Use the Oracle VM Server for SPARC `ldm` command to add a configuration, list the configurations on the SP, and specify a configuration to be used. You can also specify an Oracle VM Server boot configuration with an Oracle ILOM command, as explained in [“Configure the Host Boot Mode \(Oracle VM Server for SPARC\)” on page 64](#).

Oracle VM Server for SPARC has been included in Oracle Solaris since Oracle Solaris 11.1. If you use Oracle Enterprise Manager Ops Center, you can provision that management environment with a version of Oracle VM Server for SPARC that is compatible with your hardware.

Related Information

- [Oracle VM Server for SPARC documentation \(http://www.oracle.com/goto/vm-sparc/docs\)](http://www.oracle.com/goto/vm-sparc/docs)
- [“Oracle Enterprise Manager Ops Center Overview” on page 24](#)
- [“Power On a Server With Multiple Active Domains \(Oracle VM Server for SPARC\)” on page 42](#)
- [“Power Off a Server With Multiple Active Domains \(Oracle VM Server for SPARC\)” on page 43](#)
- [“Configuring Boot and Restart Behavior” on page 57](#)

Oracle Hardware Management Pack Overview

Oracle Hardware Management Pack (HMP) provides management agents and command line tools that enable you to manage and configure Oracle servers from the host OS. You can install HMP from the Oracle Solaris software package repository. After installing the software, you will be able to perform these tasks:

- Monitor Oracle hardware with the host IP address.
- Monitor storage devices.
- Query, update, and validate firmware versions on supported I/O devices.
- Restore, set, and view Oracle ILOM configuration settings.

- Use the IPMI tool to access and manage Oracle servers.

Find installation information and other HMP documentation in the [Oracle Hardware Management Pack for Oracle Solaris 11.3 Documentation Library \(https://docs.oracle.com/cd/E64576_01/\)](https://docs.oracle.com/cd/E64576_01/).

For more information about what you can do with HMP, see <http://www.oracle.com/technetwork/server-storage/servermgmt/tech/hardware-management-pack/index.html>.

Related Information

- [Oracle Hardware Management Pack for Oracle Solaris 11.3 Documentation Library \(https://docs.oracle.com/cd/E64576_01/\)](https://docs.oracle.com/cd/E64576_01/)
- [Oracle Solaris 11 documentation \(http://www.oracle.com/pls/topic/lookup?ctx=solaris11\)](http://www.oracle.com/pls/topic/lookup?ctx=solaris11)
- [“Oracle Solaris Overview” on page 21](#)

Multipathing Software Overview

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 servers, different types of multipathing software are available:

- Oracle Solaris IP Network Multipathing (IPMP) software provides multipathing and load-balancing capabilities for IP network interfaces. This software includes commands and other software resources for server administration. For information about Oracle Solaris IPMP, refer to [Administering TCP/IP Networks, IPMP, and IP Tunnels in Oracle Solaris 11.3](#).
- Oracle Solaris Multipathed I/O (MPxIO) enables I/O devices to be accessed through multiple host controller interfaces from a single instance of the I/O device. For information about Oracle Solaris I/O multipathing, refer to [Managing SAN Devices and Multipathing in Oracle Solaris 11.3](#).
- Oracle Solaris Datalink Multipathing (DLMP) is a type of network datalink aggregation that provides high availability across multiple switches without requiring switch configuration. DLMP aggregation supports link-based failure detection and probe-based failure detection

to ensure continuous availability of the network to send and receive traffic. For information about DLMP refer to [Managing Network Datalinks in Oracle Solaris 11.3](#).

Related Information

- [“Oracle Solaris Overview” on page 21](#)
- [“Oracle VM Server for SPARC Overview” on page 21](#)

Oracle Enterprise Manager Ops Center Overview

Oracle Enterprise Manager Ops Center is a comprehensive system management solution for managing physical and virtual systems and devices. Through a single user interface, use the Oracle Enterprise Manager Ops Center software to monitor, patch, provision, virtualize, and support assets, such as OSs, virtualization technologies, Oracle servers, storage, and networks.

Oracle Enterprise Manager Ops Center can discover a server, its SP, the OS, and logical domains already created by Oracle VM Server for SPARC. You can use the Oracle Enterprise Manager Ops Center to perform managing tasks on discovered assets, including creating logical domains and setting up RAIDs.

For more information about the software see the following locations:

- [Product page for Oracle Enterprise Manager Ops Center \(http://www.oracle.com/technetwork/oem/ops-center/index.html\)](http://www.oracle.com/technetwork/oem/ops-center/index.html)
- [Oracle Enterprise Manager Ops Center Documentation \(http://docs.oracle.com/en/enterprise-manager/?tab=2\)](http://docs.oracle.com/en/enterprise-manager/?tab=2)

Enterprise Manager Ops Center documentation includes How To guides to help you deploy and manage the server using this software. Select the How to Deploy link on the documentation library page and then find the document relevant to your server.

For example, see [How to Deploy \(http://docs.oracle.com/cd/E59957_01/nav/deploy.htm\)](http://docs.oracle.com/cd/E59957_01/nav/deploy.htm) for Oracle Enterprise Manager Ops Center 12c Release 3 documentation and find the document [Discover and Manage SPARC T5 Series Servers and SPARC T7 Series Servers](#) in the Hardware area.

Related Information

- [“Hardware RAID Support” on page 91](#)

Oracle Auto Service Request Software Overview

When you have completed initial installation and Oracle Solaris configuration, you can activate Oracle Auto Service Request (Oracle ASR) software for the server.

Oracle ASR software provides the ability to resolve problems faster by automatically opening service requests for Oracle's qualified server, storage, and Engineered Systems products when specific faults occur.

Parts are dispatched upon receipt of a service request sent by Oracle ASR. In many cases, Oracle engineers are already working to resolve an issue before you're even aware that a problem exists.

Oracle products with Oracle ASR securely transport electronic fault telemetry data to Oracle automatically to help expedite the diagnostic process. The one-way event notification requires no incoming Internet connections or remote access mechanism. Only the information needed to solve a problem is communicated to Oracle.

Oracle ASR is a feature of the Oracle hardware warranty, Oracle Premium Support for Systems, and Oracle Platinum Services.

- <https://www.oracle.com/support/premier/index.html>
- <https://www.oracle.com/support/premier/engineered-systems/platinum-services.html>

Oracle ASR is integrated with [My Oracle Support \(https://support.oracle.com\)](https://support.oracle.com). You must use My Oracle Support to activate your ASR assets, such as a new server.

To activate automated support for a server, download software and find additional information at <http://www.oracle.com/us/support/auto-service-request/index.html>

Some resources available for Oracle ASR through that site are:

- [Oracle Auto Service Request Documentation \(http://docs.oracle.com/cd/E37710_01/index.htm\)](http://docs.oracle.com/cd/E37710_01/index.htm)
- [How to Approve Pending ASR Assets In My Oracle Support \(https://support.oracle.com/rs?type=doc&id=1329200.1\)](https://support.oracle.com/rs?type=doc&id=1329200.1)

Related Information

- [Oracle Auto Service Request Documentation \(http://docs.oracle.com/cd/E37710_01/index.htm\)](http://docs.oracle.com/cd/E37710_01/index.htm)
- “Oracle Enterprise Manager Ops Center Overview” on page 24

DIMM Sparing Overview

DIMM sparing provides a mechanism on SPARC T8 servers to unconfigure a single failed DIMM with minimal performance loss. This feature allows deferred maintenance for DIMMs that are faulted. DIMM sparing is supported only on systems whose memory slots are fully-populated with DIMMs.

If a DIMM is diagnosed to be faulty during boot time or run time, the memory dynamically switches from 16-way to 15-way interleave by remapping all of the physical addresses to the remaining 15 DIMMs. To enable this remapping, the platform firmware must initially reserve space for the contents of one DIMM. Consequently, only 15 DIMMs worth of physical address space is made available to the system, even when 16 DIMMs are functioning.

Keep in mind that, due to the requirements of DIMM sparing, the amount of available memory reported might be less than the amount you had estimated based on the quantity and capacity of the server's DIMMs.

When DIMM sparing is enabled, if the server must unconfigure a DIMM, the associated fault is treated as a non-serviceable fault so a service notification is not issued. If one DIMM in a group of 16 is unconfigured, you do not need to replace that DIMM until another DIMM in that group is unconfigured.

DIMM sparing is enabled by default on CPU nodes that are fully populated with DIMMs.

SPARC T8-1 servers The DIMM sparing feature is enabled when the optional memory risers are installed and fully occupied.

See [“Memory Riser and DIMM Configuration” in SPARC T8-1 Server Service Manual](#).

SPARC T8-2 servers The DIMM sparing feature is enabled in fully-populated configurations.

See [“Memory Riser and DIMM Configuration” in SPARC T8-2 Server Service Manual](#)

SPARC T8-4 servers The DIMM sparing feature is enabled in fully-populated configurations.

See [“Understanding DIMM Configurations” in SPARC T8-4 Server Service Manual](#)

Related Information

- [“Monitoring the Server” on page 101](#)

- My Oracle Support article [SPARC T7 / M7 Servers : DIMM sparing FAQ \(Doc ID 2037793.1\)](#)

Accessing the Server

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

- [“Log In to Oracle ILOM” on page 29](#)
- [“Start the Host Console” on page 30](#)
- [“Access the OpenBoot CLI” on page 31](#)
- [“Display the Oracle ILOM Prompt” on page 32](#)
- [“Using Oracle ILOM Remote System VNC Console” on page 32](#)
- [“Enable Oracle Solaris Graphics Support” on page 33](#)
- [“Using a Local Graphics Monitor” on page 34](#)
- [“Enable a Local Graphics Monitor” on page 35](#)
- [“Host Console Options for a Local Graphics Monitor” on page 36](#)
- [“Disable Local Monitor and Enable VNC Console” on page 37](#)

Related Information

- [“Accessing the Server” on page 29](#)
- [“Booting and Shutting Down the OS” on page 49](#)

▼ Log In to Oracle ILOM

This procedure assumes the NET MGT port is connected to the network and the SP is in the default configuration as described in the server's installation guide.

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

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

```
% ssh root@xxx.xxx.xxx.xxx
Password: password (nothing displayed as you type)
...
```

```
Oracle(R) Integrated Lights Out Manager
Version 4.0.0.0 rxxxxxx
Copyright (c) 2017, Oracle and/or its affiliates. All rights reserved.
...
->
```

You are now logged in to Oracle ILOM. Perform tasks as needed by entering commands at the Oracle ILOM prompt.

Note - The server is provided with a default Administrator account (root) and a default password (changeme) to enable first-time login and access to Oracle ILOM. To build a secure environment, you must change the default password of the default Administrator account as soon as possible after your initial login to Oracle ILOM. If you find this default Administrator account has already been changed, contact your system administrator to obtain an Oracle ILOM user account with Administrator privileges.

Related Information

- [“Oracle ILOM Overview” on page 13](#)
- [“Start the Host Console” on page 30](#)
- [SPARC T8-1 Server Installation Guide](#)
- [SPARC T8-2 Server Installation Guide](#)
- [SPARC T8-4 Server Installation Guide](#)

▼ Start the Host Console

- **At the Oracle 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 control of the console from any current user and force that user into view mode. If you use this option, other users receive warnings that their connections have been forced into read-only mode. When a console session that used the force option exits, read-write status is restored to the next user in line, with the most recent user’s read-write status being restored first. |
| -script | Bypasses the confirmation prompt to start the console. |

After the host console has started you see system console output if Oracle Solaris is running. The OpenBoot prompt (ok) displays if Oracle Solaris is not running.

Related Information

- [“Display the Oracle ILOM Prompt” on page 32](#)
- [“Host Console Options for a Local Graphics Monitor” on page 36](#)
- [“Log In to Oracle ILOM” on page 29](#)

▼ Access the OpenBoot CLI

This procedure links to instructions in the OpenBoot documentation for several ways to reach the OpenBoot CLI. The method you use depends on the state of the OS at the time you attempt to access the OpenBoot CLI.



Caution - When possible, reach the OpenBoot CLI by performing a graceful shutdown of the OS. Any other method used might result in the loss of server state data.

1. Log in to Oracle ILOM.

See [“Log In to Oracle ILOM” on page 29](#).

2. Check the status of the host.

The status of the host determines the method used to get to OpenBoot.

For example:

```
-> show /HOST status
```

3. Based on the host status, perform one of these tasks:

- **OpenBoot Running**, go to [“Access the OpenBoot CLI \(OpenBoot Running\)” in Oracle OpenBoot 4.x Administration Guide](#)
- **Solaris Running**, go to [“Access the OpenBoot CLI \(Solaris Running\)” in Oracle OpenBoot 4.x Administration Guide](#)
- **Powered Off**, go to [“Access the OpenBoot CLI \(Powered Off\)” in Oracle OpenBoot 4.x Administration Guide](#)
- **If the host status is reported as being in any running state, but the host is not responding, it might be hung**, go to [“Access the OpenBoot CLI \(Hung System\)” in Oracle OpenBoot 4.x Administration Guide](#)

Related Information

- [Oracle OpenBoot 4.x Administration Guide](#)
- [“Monitoring the Server” on page 101](#)

▼ Display the Oracle ILOM Prompt

- **Display the Oracle ILOM prompt in one of these ways:**
 - From the system console, type the Oracle ILOM escape sequence #. (Hash-Dot).
 - Log in to Oracle ILOM directly from a device connected to the SER MGT port.
 - Log in to Oracle ILOM through an SSH connection. See [“Log In to Oracle ILOM” on page 29](#).

Related Information

- [“Oracle ILOM Overview” on page 13](#)
- [“Log In to Oracle ILOM” on page 29](#)

Using Oracle ILOM Remote System VNC Console

Oracle ILOM Remote System VNC Console is an implementation of the Virtual Network Computing (VNC) system which enables you to remotely redirect the host server keyboard, video, and mouse (KVM) events to a graphical desktop display. This is the default method of accessing the video console on SPARC T8 servers.

See [“Enable Oracle Solaris Graphics Support” on page 33](#) to ensure your server has the needed software running in Oracle Solaris to support using graphical applications.

To use Oracle ILOM Remote System VNC Console, start a VNC client such as Tiger VNC on your laptop or desktop computer and specify the SP's hostname or IP address as the target VNC server.

For more information about Oracle ILOM Remote System VNC Console, including requirements and troubleshooting, see [“Using the Oracle ILOM Remote System Console Plus” in Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x](#).

Note - Oracle ILOM also provides Oracle ILOM Remote System Console Plus, but the SPARC T8 servers can only use this application for serial line redirection. The servers do not support the older Oracle ILOM Remote System Console and Oracle ILOM Storage Redirection CLI features.

Related Information

- [Oracle ILOM 4.0 documentation \(https://docs.oracle.com/cd/E81115_01/\)](https://docs.oracle.com/cd/E81115_01/)
- [“Oracle ILOM In-Band \(Sideband\) Management” on page 80](#)

▼ Enable Oracle Solaris Graphics Support

To enable the use of graphical applications and Oracle ILOM Remote System VNC Console on the SPARC T8 servers, perform the following steps to install `solaris-desktop` and start the GNOME display manager.

This procedure enables the system to support either Oracle ILOM Remote System VNC Console or a local graphics monitor.

You must have the console role (c) and the admin role (a) in Oracle ILOM to complete this task. You must also have access to the root role or other administrator role that has Oracle Solaris privileges that enable you to install software and control services.

1. **Log in to Oracle ILOM.**
See [“Log In to Oracle ILOM” on page 29](#).
2. **Start the host console.**
See [“Start the Host Console” on page 30](#).
3. **If necessary, boot the OS.**
See [“Boot the OS \(Oracle ILOM\)” on page 51](#).
4. **Log in to Oracle Solaris and switch to the root role or other System Administrator role by using the `su` command.**

```
$ su - role
```
5. **From the Oracle Solaris shell prompt, install the `solaris-desktop` packages, which includes the X server.**

```
# pkg install group/system/solaris-desktop
```

See [Adding and Updating Software in Oracle Solaris 11.3](#) for more about installing software.

6. Reboot the OS to start the GNOME display manager server.

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

After the system reboots, the GNOME display manager service `gdm` starts and runs in the background.

In general, use these `svcadm` commands to control the GNOME display manager service when needed:

- Disable the `gdm` service:

```
# svcadm disable gdm
```

- Enable the `gdm` service:

```
# svcadm enable gdm
```

- Restart the `gdm` service:

```
# svcadm restart gdm
```

7. Use one of the following methods to access the console:

- [“Oracle ILOM Remote System Console Plus” on page 18](#)
- [“Oracle ILOM Remote System VNC Console” on page 19](#)
- Terminal device attached to the SER MGT port

Related Information

- [“Using a Local Graphics Monitor” on page 34](#)
- [“Oracle Solaris Overview” on page 21](#)
- [Oracle Solaris 11.3 documentation \(http://www.oracle.com/pls/topic/lookup?ctx=solaris11\)](http://www.oracle.com/pls/topic/lookup?ctx=solaris11)

Using a Local Graphics Monitor

The SPARC T8 servers are set up to use VNC for X Windows input/output by default. You can connect a graphics monitor if VNC does not suit your needs. The server must be running at least Oracle Solaris 11.3 SRU23 to support a local graphics monitor.

See the following to enable the monitor to be used for interacting with the host and viewing the host console.

- [“Enable a Local Graphics Monitor” on page 35](#)
- [“Host Console Options for a Local Graphics Monitor” on page 36](#)

▼ Enable a Local Graphics Monitor

Perform the following procedure to enable the X server to provide display services to a local graphics monitor. By default, the SPARC T8 servers are configured to use Xvnc as the X server. This procedure shows how to set an Oracle Solaris service management property to override the Xvnc server to enable the Xorg server which must be used to display to a monitor.

Note - This procedure prevents use of Oracle ILOM Remote System VNC Console.

- 1. Connect the monitor video cable to the video port.**
Tighten the thumbscrews to secure the connection.
- 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.**
- 5. Log in to Oracle ILOM using ssh.**
See [“Log In to Oracle ILOM” on page 29](#).
- 6. Start the host console.**
See [“Start the Host Console” on page 30](#).
- 7. If necessary, boot the OS.**
See [“Boot the OS \(Oracle ILOM\)” on page 51](#).
- 8. Log in to Oracle Solaris and switch to the root role or other administrator role by using the su command.**


```
$ su - role
```
- 9. Enable support for graphics in Oracle Solaris if not done previously.**

See [“Enable Oracle Solaris Graphics Support” on page 33](#).

10. **Use the following command to disable the Xvnc server and enable the Xorg server.**

```
# svccfg -s svc:/application/x11/x11-server setprop \  
options/vncplatform_override = boolean: true
```

11. **(Optional) List the value of the property.**

```
# svcprop -p options/vncplatform_override svc:/application/x11/x11-server
```

12. **Restart the display manager service.**

```
# svcadm restart gdm
```

The monitor should display the Oracle Solaris desktop login screen.

13. **Log in to the Oracle Solaris desktop.**

Note that you cannot view the host console directly in the Oracle Solaris desktop. See [“Host Console Options for a Local Graphics Monitor” on page 36](#).

Related Information

- [“Host Console Options for a Local Graphics Monitor” on page 36](#)
- [“Disable Local Monitor and Enable VNC Console” on page 37](#)
- [Oracle Solaris 11.3 documentation \(http://www.oracle.com/pls/topic/lookup?ctx=solaris11\)](http://www.oracle.com/pls/topic/lookup?ctx=solaris11)

Host Console Options for a Local Graphics Monitor

Using a monitor and keyboard connected to the server, you can use the OpenBoot CLI to boot Oracle Solaris. If you have installed the `solaris-desktop` software, when the OS boots, the monitor displays the graphical Oracle Solaris login screen which enables you to log in to the server and the GNOME desktop. However, it is not possible to see the host console messages on the desktop.

To see host console messages after Oracle Solaris is booted, use one of the following methods:

- Oracle ILOM Remote System Console Plus
- Terminal device attached to the SER MGT port

Related Information

- [“Oracle ILOM Remote System Console Plus” on page 18](#)
- [“Disable Local Monitor and Enable VNC Console” on page 37](#)

▼ Disable Local Monitor and Enable VNC Console

This procedure shows how to re-enable the default Oracle ILOM Remote System VNC Console. It assumes you have performed the steps in [“Enable a Local Graphics Monitor” on page 35](#) and now want to reverse them.

1. **Log in to Oracle ILOM.**
See [“Log In to Oracle ILOM” on page 29](#).
2. **Go to the OpenBoot CLI.**
See [“Access the OpenBoot CLI” on page 31](#).
3. **Start the host console.**
See [“Start the Host Console” on page 30](#).
4. **If necessary, boot the OS.**
See [“Boot the OS \(Oracle ILOM\)” on page 51](#).
5. **Log in to Oracle Solaris and switch to the root role or other administrator role by using the `su` command.**

```
$ su - role
```

6. **Use the following command to disable the Xorg server and enable the Xvnc server.**

```
# svccfg -s svc:/application/x11/x11-server setprop \
  options/vncplatform_override = boolean: false
```

7. **(Optional) List the value of the property.**

```
# svcprop -p options/vncplatform_override svc:/application/x11/x11-server
```

8. **Restart the display manager service.**

```
# svcadm restart gdm
```

You should now be able to use the Oracle ILOM Remote System VNC Console.

Related Information

- [“Oracle ILOM Remote System VNC Console” on page 19](#)
- [“Enable a Local Graphics Monitor” on page 35](#)
- [“Host Console Options for a Local Graphics Monitor” on page 36](#)

Controlling the Server

These topics describe how to control basic server operations.

- [“Powering the Server On and Off” on page 39](#)
- [“Resetting the Server and SP” on page 45](#)

Related Information

- [“Booting and Shutting Down the OS” on page 49](#)
- [Booting and Shutting Down Oracle Solaris 11.3 Systems](#)

Powering the Server On and Off

There are several ways to power the server on and off. Use the tasks that best suit your situation.

Description	Links
Power the server on or off using the Oracle ILOM CLI.	“Power On the Server (Oracle ILOM CLI)” on page 40 “Power Off the Server (Oracle ILOM CLI)” on page 40
Power the server on or off using the Oracle ILOM web interface.	“Power On the Server (Oracle ILOM Web Interface)” on page 41 “Power Off the Server (Oracle ILOM Web Interface)” on page 42
Power the server on or off when the server is running Oracle VM for SPARC.	“Power On a Server With Multiple Active Domains (Oracle VM Server for SPARC)” on page 42 “Power Off a Server With Multiple Active Domains (Oracle VM Server for SPARC)” on page 43

Related Information

- [“Resetting the Server and SP” on page 45](#)

▼ Power On the Server (Oracle ILOM CLI)

Note - By default, the host automatically attempts to boot when the host is reset or powered on. To learn about the parameters that control this action, see [“Configuring Boot Parameters” on page 57](#).

1. Log in to Oracle ILOM.

See [“Log In to Oracle ILOM” on page 29](#).

2. At the Oracle ILOM prompt, type:

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

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

3. Start the host console to view host output.

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

Related Information

- [“Power On the Server \(Oracle ILOM CLI\)” on page 40](#)
- [“Reset the Server \(Oracle Solaris\)” on page 45](#)
- [“Reset the Server \(Oracle ILOM\)” on page 46](#)

▼ Power Off the Server (Oracle ILOM CLI)

1. Log in to Oracle Solaris and assume the root role.

2. Shut down Oracle Solaris.

See one of these procedures:

- [“Shut Down the OS \(init Command\)” on page 52](#)
- [“Shut Down the OS \(shutdown Command\)” on page 53](#)

3. **If the host console is running, escape to the ILOM prompt by typing #. (Hash-Dot escape sequence)**
4. **From the Oracle ILOM prompt, type:**

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

->
```

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

Related Information

- [“Power On the Server \(Oracle ILOM Web Interface\)” on page 41](#)
- [“Reset the Server \(Oracle Solaris\)” on page 45](#)
- [“Reset the Server \(Oracle ILOM\)” on page 46](#)

▼ Power On the Server (Oracle ILOM Web Interface)

Note - By default, the host automatically attempts to boot when the host is reset or powered on. To learn about the parameters that control this action, see [“Configuring Boot Parameters” on page 57](#).

1. **Log in to the Oracle ILOM web interface.**
See [“Log In to Oracle ILOM” on page 29](#).
2. **On the Summary page, in the Actions panel, click the Power State Turn On button.**
3. **When prompted, click OK to confirm the action.**

Related Information

- [“Power On the Server \(Oracle ILOM CLI\)” on page 40](#)
- [“Reset the Server \(Oracle Solaris\)” on page 45](#)

- [“Reset the Server \(Oracle ILOM\)” on page 46](#)

▼ Power Off the Server (Oracle ILOM Web Interface)

1. Log in to Oracle Solaris and assume the root role.
2. **Shut down Oracle Solaris in one of these ways:**
 - [“Shut Down the OS \(init Command\)” on page 52](#)
 - [“Shut Down the OS \(shutdown Command\)” on page 53](#)
3. **Log in to the Oracle ILOM web interface.**
4. **On the Summary page, in the Actions panel, click the Power State Turn Off button.**
5. **When prompted, click OK to confirm the action.**

Related Information

- [“Power On the Server \(Oracle ILOM CLI\)” on page 40](#)
- [“Reset the Server \(Oracle Solaris\)” on page 45](#)
- [“Reset the Server \(Oracle ILOM\)” on page 46](#)

▼ Power On a Server With Multiple Active Domains (Oracle VM Server for SPARC)

If the server is configured with multiple Oracle VM Server for SPARC domains, use this procedure to power on the server and restart the domains.

1. **Log in to Oracle ILOM.**
See [“Log In to Oracle ILOM” on page 29](#).
2. **Power on the host and start the host console.**

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

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

3. Log in to Oracle Solaris and assume the root role.

4. Start all of the nonprimary domains.

Starting a domain automatically binds the domain.

```
# ldm start-domain domain-name  
< . . . >
```

If a domain's `auto-boot?` property is set to `true`, the domain boots the OS after it is started. Domains that do not automatically boot are stopped at the OpenBoot prompt and must be manually booted in the next step.

5. Boot all of the nonprimary domains that do not automatically boot.

The method you use to access a domain depends on how you have configured the consoles for your domains.

Boot each domain the same way you boot a server. See [“Boot the OS \(Oracle ILOM\)” on page 51](#).

Related Information

- [“Power Off a Server With Multiple Active Domains \(Oracle VM Server for SPARC\)” on page 43](#)

▼ Power Off a Server With Multiple Active Domains (Oracle VM Server for SPARC)

If the server is configured with multiple Oracle VM for SPARC domains, use this procedure to shut down the domains and power off the server.

1. If needed, ensure that the domain configurations are saved to the SP.

```
# ldm add-spconfig config-name
```

2. Access and shut down the OS in all of the nonprimary domains.

The method you use to access a domain depends on how you have configured the consoles for your domains.

To shut down the OS, see [“Shut Down the OS \(init Command\)” on page 52](#) or [“Shut Down the OS \(shutdown Command\)” on page 53](#).

- a. **From the primary domain, list the domains and their states.**

```
# ldm list
```

Note which domains are non-I/O domains or active I/O domains.

- b. **Stop and unbind all the non-I/O domains.**

```
# ldm stop-domain domain-name
. . .
# ldm unbind-domain domain-name
```

- c. **Stop and unbind any active I/O domains.**

```
# ldm stop-domain domain-name
. . .
# ldm unbind-domain domain-name
```

- d. **Verify that the nonprimary domains are inactive.**

```
# ldm list
```

3. **Shut down the primary domain.**

To shut down the OS, see [“Shut Down the OS \(init Command\)”](#) on page 52 or [“Shut Down the OS \(shutdown Command\)”](#) on page 53.

4. **Switch from the system console prompt to the Oracle ILOM prompt by typing the #. (Hash-Dot) escape sequence.**

5. **From the Oracle ILOM prompt, type:**

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

->
```

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

Related Information

- [“Power On a Server With Multiple Active Domains \(Oracle VM Server for SPARC\)”](#) on page 42

- [Oracle VM Server for SPARC documentation \(https://www.oracle.com/goto/vm-sparc/docs\)](https://www.oracle.com/goto/vm-sparc/docs)

Resetting the Server and SP

Use these topics to reset the server or SP.

- [“Reset the Server \(Oracle Solaris\)” on page 45](#)
- [“Reset the Server \(Oracle ILOM\)” on page 46](#)
- [“Reset the SP” on page 46](#)

Related Information

- [“Powering the Server On and Off” on page 39](#)
- [Booting and Shutting Down Oracle Solaris 11.3 Systems](#)

▼ Reset the Server (Oracle Solaris)

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

Note - By default, the host automatically attempts to boot when the host is reset or powered on. To learn about the parameters that control this action, see [“Configuring Boot Parameters” on page 57](#).

1. **Log in to Oracle Solaris and assume the root role.**
2. **To reset the server from the Oracle Solaris prompt, type one of the following commands:**
 - `# shutdown -g0 -i6 -y`
 - `# reboot`

Related Information

- [“Power Off the Server \(Oracle ILOM CLI\)” on page 40](#)
- [“Power On the Server \(Oracle ILOM Web Interface\)” on page 41](#)

- [“Reset the Server \(Oracle ILOM\)” on page 46](#)
- [Booting and Shutting Down Oracle Solaris 11.3 Systems](#)

▼ Reset the Server (Oracle ILOM)

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

Note - By default, the host automatically attempts to boot when the host is reset or powered on. To learn about the parameters that control this action, see [“Configuring Boot Parameters” on page 57](#).

1. **Log in to Oracle ILOM.**
See [“Log In to Oracle ILOM” on page 29](#).
2. **Type one of the following commands to reset the server:**
 - **Perform a graceful reset.**

```
-> reset /System
```
 - **If a graceful reset is not possible, perform a forced hardware reset.**

```
-> reset -force /System
```

Related Information

- [“Power On the Server \(Oracle ILOM CLI\)” on page 40](#)
- [“Power On the Server \(Oracle ILOM Web Interface\)” on page 41](#)
- [“Reset the Server \(Oracle Solaris\)” on page 45](#)
- [“Override OpenBoot Settings to Reset the Server” on page 67](#)

▼ Reset the SP

After the reset, your login session to the SP is terminated.

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

See [“Log In to Oracle ILOM” on page 29](#).

2. Reset the SP.

-> `reset /SP`

Related Information

- [“Log In to Oracle ILOM” on page 29](#)

Booting and Shutting Down the OS

These topics include instructions for booting and shutting down the OS. Instructions for obtaining the OpenBoot prompt are included, because some of these procedures are performed at that prompt.

- [“Booting and Shutting Down Oracle Solaris” on page 49](#)
- [“Obtaining the OpenBoot Prompt” on page 54](#)

Related Information

- [“Controlling the Server” on page 39](#)

Booting and Shutting Down Oracle Solaris

There are several ways to boot and shut down the OS.

Description	Links
Learn about the boot sequence.	“Boot Sequence” on page 50
Boot a server that is configured to boot at power-on (the default configuration) using Oracle ILOM.	“Boot the OS (Oracle ILOM)” on page 51
Boot a server that is at the OpenBoot prompt.	“Boot the OS Manually (OpenBoot)” on page 52
Shut down the OS using an Oracle Solaris command.	“Shut Down the OS (init Command)” on page 52 “Shut Down the OS (shutdown Command)” on page 53

Related Information

- [“Powering the Server On and Off” on page 39](#)
- [“Obtaining the OpenBoot Prompt” on page 54](#)

Boot Sequence

In addition to controlling the power state of the host, you can also control how and when the OS is booted.

When the host is powered on, it can be in one of these states:

- **Booted** – The OS is running in one of these levels:
 - **3** – The OS is running in multiuser mode with all resources enabled.
 - **S** – The OS is running in single-user mode, and some resources are not enabled.
- **At the OpenBoot prompt** – The OS is not running. You communicate with the OpenBoot firmware on the host. See [“Obtaining the OpenBoot Prompt” on page 54](#).

By default, the host automatically attempts to boot when the host is reset or powered on. The host first seeks a local boot drive. If the host cannot boot from the drive, the host attempts to boot from the network. See [“Boot the OS \(Oracle ILOM\)” on page 51](#).

These steps describe the high-level boot sequence:

1. A host reset is initiated.
2. OpenBoot runs and OpenBoot parameters are read.

The primary OpenBoot parameters and default values that determine how the server boots are:

 - `diag-switch? false`
 - `auto-boot? true`
 - `boot-device disk net`

See [“View All OpenBoot Parameters” on page 61](#) for more information.
3. A boot block is read from the boot device to locate a boot program.
4. The boot program loads the kernel into memory.
5. The kernel is executed and takes control.

You can configure booting parameters from the OS or at the ok prompt. You can also affect the boot behavior through Oracle ILOM.

Note - Each logical domain provides a virtualized form of OpenBoot commands.

For more detailed information about OpenBoot startup and boot sequences, see [“Start-up Sequence” in *Oracle OpenBoot 4.x Administration Guide*](#).

For more information about the boot process and how to configure booting in Oracle Solaris:

Oracle Solaris 11 [Booting and Shutting Down Oracle® Solaris 11.3 Systems](#)

Oracle Solaris 10 [Oracle Solaris Administration: Basic Administration](#)

Note - Oracle Solaris 10 can only be used in Oracle VM Server for SPARC guest domains on these servers.

Related Information

- [“Boot the OS \(Oracle ILOM\)” on page 51](#)
- [“Boot the OS Manually \(OpenBoot\)” on page 52](#)

▼ Boot the OS (Oracle ILOM)

By default, the host automatically attempts to boot when the host is reset or powered on.

1. **Log in to Oracle ILOM.**
See [“Log In to Oracle ILOM” on page 29](#).
2. **If the OpenBoot parameters are configured with default values, boot the host using one of these methods:**
 - **Oracle ILOM web interface – In Host Management > Power Control, select any of the reset, power on, or power cycle actions, and click Save.**
 - **Oracle ILOM CLI – Type:**

```
-> reset /System
```

Note - If the OpenBoot parameters are not configured with default values, when you reset the host, the host might stop at the OpenBoot prompt. To boot from the OpenBoot prompt, see [“Boot the OS Manually \(OpenBoot\)” on page 52](#).

Related Information

- [“Boot the OS Manually \(OpenBoot\)” on page 52](#)
- [“Boot Sequence” on page 50](#)

▼ Boot the OS Manually (OpenBoot)

Use this procedure when you are at the OpenBoot prompt, and you want to boot the OS.

1. **Obtain the OpenBoot prompt.**

See [“Obtaining the OpenBoot Prompt” on page 54.](#)

2. **Boot the host using one of these methods:**

- **Boot from the devices specified in the OpenBoot `boot-device` parameter.**

```
ok boot
```

- **Specify a device to boot from.**

```
ok boot boot_device
```

where *boot_device* is a valid device from which to boot. For a list of valid devices, see [“OpenBoot Configuration Parameters” on page 61.](#)

Related Information

- [“Boot the OS \(Oracle ILOM\)” on page 51](#)
- [“Boot Sequence” on page 50](#)

▼ Shut Down the OS (`init` Command)

The `init` command is an executable shell script that terminates all active processes on a system and then synchronizes the disks before changing run levels. Specifying run level `0` shuts down the OS and displays the OpenBoot prompt.

1. **Log in to Oracle Solaris and assume the root role.**
2. **Shut down the OS.**

Note - This document applies to several server products. The following example is based on the SPARC T8-1 server. Your output might vary from the examples based on your product.

```
# init 0
```

```
# svc.startd: The system is coming down. Please wait.
svc.startd: 126 system services are now being stopped.
Sep 21 13:31:31 systemA.xxxxx.com syslogd: going down on signal 15
svc.startd: Killing user processes.
Sep 21 13:31:37 The system is down. Shutdown took 23 seconds.
syncing file systems... done
Program terminated
SPARC T8-1, No Keyboard
...
{0} ok
```

Related Information

- [“Shut Down the OS \(shutdown Command\)” on page 53](#)

▼ Shut Down the OS (shutdown Command)

The shutdown command sends a warning message, then terminates active processes on a system to reach a specified run level. Specifying run level 0 shuts down the OS and displays the OpenBoot prompt.

1. **Log in to Oracle Solaris and assume the root role.**
2. **Shut down the OS.**

In this example, these command options shut down the OS to the OpenBoot prompt:

- `-g0` – Specifies a grace period of 0 seconds.
- `-i0` – Specifies the run level 0, which is equivalent to the `init 0` command.
- `-y` – Pre-answers the confirmation question so that the command runs without user intervention.

Note - This document applies to several server products. The following example is based on the SPARC T8-1 server. Your output might vary from the examples based on your product.

```
# shutdown -g0 -i0 -y
# svc.startd: The system is coming down. Please wait.
svc.startd: 106 system services are now being stopped.
Sep 12 17:52:11 systemA syslogd: going down on signal 15
svc.startd: The system is down.
syncing file systems...done
Program terminated
```

```
SPARC T8-1, No Keyboard
...
{0} ok
```

Related Information

- [“Shut Down the OS \(init Command\)” on page 52](#)

Obtaining the OpenBoot Prompt

The server provides several ways to reach the OpenBoot prompt (ok).

Host Status	More Information
Host powered on but Oracle Solaris is not running. ILOM status shows OpenBoot running	“Access the OpenBoot CLI (OpenBoot Running)” in <i>Oracle OpenBoot 4.x Administration Guide</i>
ILOM status shows Solaris running	“Access the OpenBoot CLI (Solaris Running)” in <i>Oracle OpenBoot 4.x Administration Guide</i>
ILOM status shows Powered off	“Access the OpenBoot CLI (Powered Off)” in <i>Oracle OpenBoot 4.x Administration Guide</i>
Host not responding	“Access the OpenBoot CLI (Hung System)” in <i>Oracle OpenBoot 4.x Administration Guide</i>

Related Information

- [“Log In to Oracle ILOM” on page 29](#)
- [“Booting and Shutting Down Oracle Solaris” on page 49](#)
- [“Accessing the OpenBoot CLI and Getting Help” in *Oracle OpenBoot 4.x Administration Guide*](#)

OpenBoot Common Tasks

When the host is powered on but the OS is not booted, you communicate with the OpenBoot firmware. OpenBoot firmware displays ok as its prompt.

This table lists the common tasks that are performed at the ok prompt.

Task	For More Information
Boot the host.	“Boot the OS Manually (OpenBoot)” on page 52
Configure OpenBoot parameters.	“View All OpenBoot Parameters” on page 61 “Change the Default Boot Device (OpenBoot)” on page 58
Run diagnostics.	Refer to Detecting and Managing Faults in the service manual for your server
Reset and power off the host.	At the OpenBoot prompt, type help reset to display details about the reset command.
Eject media.	At the OpenBoot prompt, type help eject to display details about the eject command.

Related Information

- [Oracle OpenBoot 4.x Administration Guide](#)
- [SPARC T8-1 Server Service Manual](#)
- [SPARC T8-2 Server Service Manual](#)
- [SPARC T8-4 Server Service Manual](#)

Configuring Boot and Restart Behavior

Use OpenBoot and Oracle Solaris commands to reconfigure the server's boot and restart behavior permanently or temporarily. Oracle ILOM boot mode properties can help specify how the host boots, enabling you to correct a problem with the current settings in OpenBoot or Oracle VM Server for SPARC.

- [“Configuring Boot Parameters” on page 57](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 64](#)
- [“Configure the Host Boot Mode \(Oracle VM Server for SPARC\)” on page 64](#)
- [“Change the Host Boot Mode Behavior at Reset \(Oracle ILOM\)” on page 65](#)
- [“Manage the Host Boot Mode Script \(Oracle ILOM\)” on page 66](#)
- [“Display the Host Boot Mode Expiration Date \(Oracle ILOM\)” on page 67](#)
- [“Override OpenBoot Settings to Reset the Server” on page 67](#)
- [“Server Restart Behavior Configuration \(Oracle ILOM\)” on page 68](#)

Related Information

- [“Booting and Shutting Down the OS” on page 49](#)

Configuring Boot Parameters

These topics describe how to change the default boot configuration.

For more comprehensive information about customizing how the server boots, refer to the Oracle Solaris documentation for your release.

- [“Change the Default Boot Device \(OpenBoot\)” on page 58](#)
- [“Enable or Disable Automatic Booting \(OpenBoot\)” on page 59](#)
- [“Enable or Disable Automatic Booting \(Oracle Solaris\)” on page 60](#)

- [“View All OpenBoot Parameters” on page 61](#)
- [“OpenBoot Configuration Parameters” on page 61](#)
- [“printenv Output” on page 62](#)

Related Information

- [“Booting and Shutting Down the OS” on page 49](#)

▼ Change the Default Boot Device (OpenBoot)

Use this procedure to configure OpenBoot to boot from a specific device. This change is permanent but only takes effect after a reset.

1. Obtain the ok prompt.

See [“Obtaining the OpenBoot Prompt” on page 54](#).

2. Determine the name of the desired boot device.

To see names of devices, type:

```
ok devalias
```

You should see the names of storage and other devices including the boot device you want to use. See [“Matching Devices to Device Names” on page 83](#) for more information.

3. Configure the boot-device parameter with your desired boot device.

```
ok setenv boot-device boot_device
```

where *boot_device* is a valid device from which to boot, shown with the previous `devalias` command.

For example, to boot from the device with the alias `disk1`:

```
ok setenv boot-device disk1
```

4. Verify the change.

```
ok printenv boot-device
```

5. Reset the host.

```
ok reset-all
```

Related Information

- [“printenv Output” on page 62](#)

▼ Enable or Disable Automatic Booting (OpenBoot)

Use this procedure to configure OpenBoot so that a host reset or power on either attempts to boot automatically, or not. This change is permanent but only takes effect after a host reset.

Note - To enable automatic booting of the OS, the Oracle ILOM auto-boot property also must be enabled. You can change the Oracle ILOM auto-boot property at `/HOST/domain/control`.

1. **Obtain the ok prompt.**
See [“Obtaining the OpenBoot Prompt” on page 54](#).
2. **Set the OpenBoot auto-boot? parameter to true or false.**

```
true
```

(Default) The host automatically attempts to boot from the devices specified in boot-device.

```
false
```

The host does not automatically boot. You can boot manually.

For example:

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

3. **Verify the change.**

```
ok printenv auto-boot?
auto-boot? =                false
```

4. **Reset the host.**

```
ok reset-all
```

The host resets. After initialization the host attempts to boot or not, based on your configuration.

Related Information

- [“printenv Output” on page 62](#)
- [“Enable or Disable Automatic Booting \(Oracle Solaris\)” on page 60](#)

▼ Enable or Disable Automatic Booting (Oracle Solaris)

While running Oracle Solaris, use this procedure to configure OpenBoot so that a host reset or power on either attempts to boot automatically, or not. This change is permanent but only takes effect after a host reset.

Note - To enable automatic booting of the OS, the Oracle ILOM auto-boot property also must be enabled. You can change the Oracle ILOM auto-boot property at `/HOST/domain/control`.

1. **Log in to Oracle Solaris and assume the root role.**
2. **Set the OpenBoot `auto-boot?` parameter to `true` or `false` using the `eeprom` command.**

`true`

(Default) The host automatically attempts to boot from the devices specified in `boot-device`.

`false`

The host does not automatically boot. You can boot manually.
For example:

```
# eeprom auto-boot?=false
```

3. **Verify the change.**

```
# eeprom auto-boot?  
auto-boot?=false
```

4. **Reset the host.**

```
# init 6
```

The host resets. After initialization the host attempts to boot or not, based on your configuration.

Related Information

- [“Enable or Disable Automatic Booting \(OpenBoot\)” on page 59](#)

▼ View All OpenBoot Parameters

1. View all of the OpenBoot parameters.

- From the OpenBoot prompt, type:

```
ok printenv
```

- From Oracle Solaris, type:

```
$ eeprom
```

2. View the value for an individual OpenBoot parameter.

- From the OpenBoot prompt, type:

```
ok printenv parameter
```

where *parameter* is a valid OpenBoot parameter.

- From Oracle Solaris, type:

```
$ eeprom parameter
```

where *parameter* is a valid OpenBoot parameter.

Related Information

- [“OpenBoot Configuration Parameters” on page 61](#)
- [“printenv Output” on page 62](#)

OpenBoot Configuration Parameters

Parameter	Default Value	Description
auto-boot?	true	Controls whether or not the host automatically boots after a system reset or when the power is turned on.

Parameter	Default Value	Description
boot-command	boot	<ul style="list-style-type: none"> ■ <code>true</code> – Host automatically attempts to boot from the devices specified in <code>boot-device</code>. ■ <code>false</code> – Host does not attempt to boot and stops at the <code>ok</code> prompt. <p>Specifies the command to be executed when <code>auto-boot?</code> is <code>true</code>. Valid boot commands:</p> <ul style="list-style-type: none"> ■ <code>boot</code> – Boots kernel from devices specified in <code>boot-device</code>. ■ <code>boot net</code> – Boots kernel from the network. ■ <code>boot cdrom</code> – Boots kernel from the CD-ROM. ■ <code>boot disk1:h</code> – Boots from disk 1 partition <code>h</code>. ■ <code>boot tape</code> – Boots default file from tape. ■ <code>boot device-path</code> – Boots from the device specified as <code>device-path</code>. See “Locate Device Paths (OpenBoot)” on page 86.
boot-device	disk net	Contains the name of the default boot device that is used when OpenBoot is not in diagnostic mode.
boot-file		An optional parameter that provides boot arguments that are used when OpenBoot is not in diagnostic mode.
diag-switch?	false	If the value is <code>true</code> , runs in the Diagnostic mode.
network-boot-arguments		An optional parameter that enables you to set configuration parameters to be used by OpenBoot when you perform a WAN boot. Setting this parameter takes precedence over any default boot parameter values. Refer to the <code>eeeprom(1M)</code> man page for details.

Related Information

- [“printenv Output” on page 62](#)

printenv Output

This output is a sample from the OpenBoot command `printenv`. The output for each server might be different.

```
{0} ok printenv
Variable Name      Value      Default Value
-----
ttya-rts-dtr-off  false     false
ttya-ignore-cd    true      true
keyboard-layout
reboot-command
security-mode      none      No default
security-password  No default
```

security-#badlogins	0	No default
verbosity	min	min
diag-switch?	false	false
local-mac-address?	true	true
fcode-debug?	false	false
scsi-initiator-id	7	7
oem-logo		No default
oem-logo?	false	false
oem-banner		No default
oem-banner?	false	false
ansi-terminal?	true	true
screen-#columns	80	80
screen-#rows	34	34
ttya-mode	9600,8,n,1,-	9600,8,n,1,-
output-device	virtual-console	virtual-console
input-device	virtual-console	virtual-console
auto-boot-on-error?	false	false
load-base	16384	16384
auto-boot?	true	true
os-root-device		
network-boot-arguments		
boot-command	boot	boot
boot-file		
boot-device	/pci@301/pci@2/scsi@0/di ...	disk net
multipath-boot?	false	false
boot-device-index	0	0
use-nvramrc?	false	false
nvramrc		
error-reset-recovery	boot	boot

If any value in the printenv output is truncated, you can see the full entry by typing printenv followed by the variable name. For example:

```
{0} ok printenv boot-device
boot-device = /pci@301/pci@2/scsi@0/disk@w5000cca0566c32b5,0:a disk net
```

Related Information

- [“OpenBoot Configuration Parameters” on page 61](#)

Boot Mode Overview (Oracle ILOM)

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 for SPARC 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.

The bootmode command is intended only to correct a problem with the OpenBoot or Oracle VM Server for SPARC settings, so the new properties specified in this command take 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 \(Oracle Solaris\)” on page 45](#)
- [“Reset the Server \(Oracle ILOM\)” on page 46](#)
- [“OpenBoot Overview” on page 20](#)
- [“Oracle VM Server for SPARC Overview” on page 21](#)

▼ Configure the Host Boot Mode (Oracle VM Server for SPARC)

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

1. **Log in to Oracle ILOM.**
See [“Log In to Oracle ILOM” on page 29](#).
2. **Determine the valid Oracle VM Server configurations on your SP.**


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

3. Set the boot mode configuration at the Oracle ILOM prompt.

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

where *configname* is a valid named logical domain configuration.

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

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

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

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

4. Stop and start the system for the configuration change to take effect.

```
-> stop /System
```

```
-> start /System
```

Related Information

- [“Reset the Server \(Oracle ILOM\)” on page 46](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 64](#)
- [“Oracle VM Server for SPARC Overview” on page 21](#)

▼ Change the Host Boot Mode Behavior at Reset (Oracle ILOM)

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 Oracle ILOM prompt, type:

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

where *value* is one of the following:

<code>normal</code>	At next reset, retains current NVRAM variable settings.
---------------------	---

`reset_nvram` At next reset, returns OpenBoot variables to default settings.

Note - The `state=reset_nvram` property returns to normal after the next server reset or 10 minutes. (See [“Display the Host Boot Mode Expiration Date \(Oracle ILOM\)” on page 67.](#)) The `config` and `script` properties do not expire. Those two properties are cleared when the server resets or when you clear them manually by setting `value` to "" (empty quotes which indicates an empty script).

Related Information

- [“Reset the Server \(Oracle ILOM\)” on page 46](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 64](#)
- [“Oracle VM Server for SPARC Overview” on page 21](#)

▼ Manage the Host Boot Mode Script (Oracle ILOM)

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

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

where `script` controls the host server's firmware OpenBoot method of booting. The `script` does not affect the current `/HOST/bootmode` setting.

`value` can be up to 255 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 OpenBoot reads the values stored in the script, OpenBoot sets the `diag-switch?` variable to the user-requested value of `true`.

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

Related Information

- [“Reset the Server \(Oracle ILOM\)” on page 46](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 64](#)
- [“Oracle VM Server for SPARC Overview” on page 21](#)

▼ Display the Host Boot Mode Expiration Date (Oracle ILOM)

- At the Oracle ILOM prompt, type:

```
-> show /HOST/bootmode expires
    Properties:
        expires = Tue Oct 14 18:24:16 2014
```

The value shown for expires is the date and time when the current boot mode will expire. The expires property is not set unless bootmode state was changed to reset_nvram.

Related Information

- [“Reset the Server \(Oracle ILOM\)” on page 46](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 64](#)
- [“Oracle VM Server for SPARC Overview” on page 21](#)

▼ Override OpenBoot Settings to Reset the Server

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

- At the Oracle ILOM prompt, type:

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

The host reboots and stops at the OpenBoot prompt.

Related Information

- [“Change the Host Boot Mode Behavior at Reset \(Oracle ILOM\)” on page 65](#)
- [“Configuring Boot and Restart Behavior” on page 57](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 64](#)
- [“Oracle VM Server for SPARC Overview” on page 21](#)

Server Restart Behavior Configuration (Oracle ILOM)

In addition to making temporary changes in boot behavior, you can also use Oracle ILOM to set how the host behaves when an error is encountered. For details on these options, refer to [“Setting Host Control and Boot Properties on SPARC Host Server” in *Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x*](#).

Related Information

- [“Resetting the Server and SP” on page 45](#)

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 Oracle ILOM CLI interface.

- [“Change Customer Data on FRU PROMs” on page 69](#)
- [“Change Server Identifier Information” on page 70](#)

Related Information

- [“Turn On the Locate Indicator” on page 101](#)

▼ Change Customer Data on FRU PROMs

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

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

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

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

Related Information

- [“Log In to Oracle ILOM” on page 29](#)
- [“Change Server Identifier Information” on page 70](#)

▼ Change Server Identifier Information

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

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

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

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

Related Information

- [“Log In to Oracle ILOM” on page 29](#)
- [“Change Customer Data on FRU PROMs” on page 69](#)

Configuring Policy Settings

These topics describe managing configuration policies using Oracle ILOM.

- [“Specify Cooldown Mode” on page 71](#)
- [“Restore the Host Power State at Restart” on page 72](#)
- [“Specify the Host Power State at Restart” on page 73](#)
- [“Disable or Enable the Host Power-On Delay” on page 73](#)
- [“Specify Parallel Boot of the SP and Host” on page 74](#)
- [“Specify Host Virtual Keyswitch Behavior” on page 74](#)
- [“Reset the Values in the SP to Default Values” on page 75](#)

Related Information

- [“Configuring Boot and Restart Behavior” on page 57](#)

▼ Specify Cooldown Mode

Some servers support the host cooldown mode, but not all. Setting the `HOST_COOLDOWN` property to `enabled` causes the server to enter cooldown mode while the host is powering off. The cooldown mode directs Oracle ILOM to monitor certain components to ensure that they are below a minimum temperature, to prevent harm to the user if internal components are accessed.

Once the components are below the threshold temperature, power is removed from the server, which enables the cover interlock switch to release. If the monitored temperatures take longer than four minutes to reach the threshold, the host turns off.

● At the Oracle ILOM prompt, type:

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

where *value* can be:

<code>enabled</code>	Server cools certain components before powering off.
----------------------	--

disabled

Component temperatures are not monitored during power off.

Related Information

- [“Power Off the Server \(Oracle ILOM Web Interface\)” on page 42](#)
- [“Power Off the Server \(Oracle ILOM CLI\)” on page 40](#)

▼ Restore the 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, Oracle ILOM starts to run automatically. Normally, the host power is not turned on until you use Oracle ILOM to turn it on.

Oracle ILOM records the current power state of the server in nonvolatile storage. If the `HOST_LAST_POWER_STATE` policy is enabled, Oracle 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 Oracle ILOM prompt, type:

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

where *value* can be:

enabled

When power is restored, returns the server to the state it was in before the power was removed.

disabled

(Default) Keeps the server off when power is applied.

If you enable `HOST_LAST_POWER_STATE`, you should also configure `/SP/policy HOST_POWER_ON_DELAY`. See [“Disable or Enable the Host Power-On Delay” on page 73](#).

Related Information

- [“Disable or Enable the Host Power-On Delay” on page 73](#)

- [“Specify the Host Power State at Restart” on page 73](#)

▼ Specify the Host Power State at Restart

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

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

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

where *value* can be:

enabled	When power is applied, automatically powers on the server when the SP has been booted.
disabled	(Default) Keeps the server powered off when power is applied.

Related Information

- [“Restore the Host Power State at Restart” on page 72](#)
- [“Disable or Enable the Host Power-On Delay” on page 73](#)

▼ Disable or Enable the Host 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 Oracle 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	(Default) Server powers on automatically without a delay.

Related Information

- [“Specify the Host Power State at Restart” on page 73](#)

▼ Specify Parallel Boot of the SP and Host

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

- **At the Oracle 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 \(Oracle ILOM Web Interface\)” on page 41](#)
- [“Power On the Server \(Oracle ILOM CLI\)” on page 40](#)
- [“Power Off the Server \(Oracle ILOM Web Interface\)” on page 42](#)
- [“Power Off the Server \(Oracle ILOM CLI\)” on page 40](#)

▼ Specify Host Virtual Keyswitch Behavior

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

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

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

where *value* can be:

normal (Default) The server can power itself on and start the boot process.

standby	Powers off the host and disables power on.
diag	Host power-on is allowed. This value overrides the settings of /HOST/diag <i>target</i> , resulting in Max POST being executed.
locked	Host power-on is allowed but you are prohibited from updating flash devices or setting /HOST send_break_action=break.

Related Information

- [“Power On the Server \(Oracle ILOM Web Interface\)” on page 41](#)
- [“Power On the Server \(Oracle ILOM CLI\)” on page 40](#)
- [“Power Off the Server \(Oracle ILOM Web Interface\)” on page 42](#)
- [“Power Off the Server \(Oracle ILOM CLI\)” on page 40](#)

▼ Reset the Values in the SP to Default Values

If your SP becomes corrupt, or you want to reset the SP to the factory default values, you must change the /SP reset_to_defaults setting, then power off the host to implement the changes. This behavior is different than in some past products, where 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. Log in to Oracle ILOM.

See [“Log In to Oracle ILOM” on page 29](#).

2. 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

Changes SP and OpenBoot to factory default configuration and clears all SP log files.

3. Power off the system and reset the SP to complete the setting change.

```
-> stop /System  
-> reset /SP
```

Related Information

- [“Power Off the Server \(Oracle ILOM CLI\)” on page 40](#)

Configuring SP and Host Network Addresses

These topics describe managing network addresses with Oracle ILOM.

- [“SP Network Address Options” on page 77](#)
- [“Disable or Enable Network Access to the SP” on page 78](#)
- [“Display the SP Network Parameters” on page 78](#)
- [“Display the Host MAC Address” on page 79](#)
- [“Connecting to the SP \(In-Band\)” on page 80](#)

Related Information

- [“Matching Devices to Device Names” on page 83](#)

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 servers can use an in-band network connection to the SP, rather than the default out-of-band NET MGT port.

For more information on each option, refer to the following documentation:

- To use a serial connection to the SP, refer to the information about connecting a terminal or emulator to the SER MGT port in the installation guide for a server.
- To assign a static IP address to the SP, refer to the information about assigning a static IP address to the NET MGT port in the installation guide for the server.
- To use an in-band connection to the SP, see [“Oracle ILOM In-Band \(Sideband\) Management” on page 80](#).

Related Information

- [Oracle ILOM 4.0.x Documentation \(https://docs.oracle.com/cd/E81115_01/\)](https://docs.oracle.com/cd/E81115_01/)
- “Oracle ILOM Overview” on page 13
- “Log In to Oracle ILOM” on page 29

▼ Disable or Enable Network Access to the SP

By default, network access to the SP is enabled and DHCP is used to obtain an IP address for the SP. You can disable or enable network access.

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

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

where *value* can be:

enabled	(Default) The SP can be accessed from the network.
disabled	The SP cannot be accessed from the network. You can only use the SER MGT serial connection.

Related Information

- “Log In to Oracle ILOM” on page 29
- “SP Network Address Options” on page 77

▼ Display the SP Network Parameters

This procedure displays information such as the network address for the SP.

1. **At the Oracle ILOM prompt, type:**

```
-> show /SP/network
```

To display IPv6 properties:

```
-> show /SP/network/ipv6
```

2. **Find the relevant property in the output.**

- For the IP address of the SP, find the `ipaddress` property in the output. For example:

```
ipaddress = 10.15.153.17
```

- For the IP address of the DHCP server that provided the dynamic IP address requested by the SP, find the `dhcp_server_ip` property in the output. For example:

```
dhcp_server_ip = 10.15.117.2
```

3. (Optional) Display the value of a single property:

```
-> show /SP/network property-name
```

For example:

```
-> show /SP/network ipgateway
```

```
/SP/network
  Properties:
    ipgateway = 10.15.153.1
```

Related Information

- [“Log In to Oracle ILOM” on page 29](#)
- [“Display the Host MAC Address” on page 79](#)

▼ 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 system configuration card (SCC PROM) and then stored as a property in Oracle ILOM.

The value displayed for `/HOST macaddress` is for the server's NET 0 port. For each additional port, the MAC addresses increments from that NET 0 value. For example, the MAC address for NET 1 is the NET 0 MAC address plus one (1).

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

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

Related Information

- [“Log In to Oracle ILOM” on page 29](#)
- [“Display the SP Network Parameters” on page 78](#)

Connecting to the SP (In-Band)

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

- [“Oracle ILOM In-Band \(Sideband\) Management” on page 80](#)
- [“Configure SP In-Band \(Sideband\) Access” on page 81](#)

Related Information

- [“Accessing the Server” on page 29](#)

Oracle ILOM In-Band (Sideband) Management

By default, you connect to the server's SP from the network using the dedicated out-of-band NET MGT port. The Oracle ILOM sideband management feature enables you to select either the NET MGT port or one of the server's Gigabit Ethernet ports (named NET *n*), which are in-band ports, to send and receive Oracle 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 connect to 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 Oracle 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 Oracle ILOM Remote Console.
- In-chip connectivity between the SP and the host OS 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 or switching.
- Server host power cycles might cause a brief interruption of network connectivity for server Gigabit Ethernet ports that are configured for sideband management. If this condition occurs, configure the adjacent switch or bridge ports as host ports.

Related Information

- [“Configure SP In-Band \(Sideband\) Access” on page 81](#)

- [“SP Network Address Options” on page 77](#)

▼ Configure SP In-Band (Sideband) Access

This procedure describes how to change the SP management port to an in-band (or sideband) 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 in to Oracle ILOM.

See [“Log In to Oracle ILOM” on page 29](#).

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

For instructions, refer to the information about assigning a static IP address in the installation guide for the server.

3. View the current network settings.

```
-> show /SP/network
```

For example, in the output, you might find these properties:

```
managementport = MGMT
...
pendingmanagementport = MGMT
...
```

4. Set the SP management port to a sideband port.

```
-> set /SP/network pendingmanagementport=port
-> set /SP/network commitpending=true
```

where *port* can be NET0, NET1, NET2, or NET3 for a sideband port.

5. Verify the change.

```
-> show /SP/network
```

For example, in the output, you might find these new properties:

```
managementport = NET0
```

```
...  
pendingmanagementport = NET0
```

Related Information

- [“Oracle ILOM In-Band \(Sideband\) Management” on page 80](#)
- [“SP Network Address Options” on page 77](#)

Matching Devices to Device Names

These topics explain how to identify drives and other devices on the server with names that are recognized by or displayed by software and firmware. The same physical device is known by different types of names in different contexts.

- [“Importance of Matching a Physical Device to a Name” on page 83](#)
- [“WWN Syntax” on page 84](#)
- [“Display Server Components \(Oracle ILOM\)” on page 84](#)
- [“Locate Device Paths \(OpenBoot\)” on page 86](#)
- [“probe-scsi-all Device Naming \(OpenBoot\)” on page 87](#)
- [“Correlate WWN Device Names With Physical Locations \(probe-scsi-all Command\)” on page 88](#)

Related Information

- [“Configuring SP and Host Network Addresses” on page 77](#)
- [“Configuring Hardware RAID” on page 91](#)

Importance of Matching a Physical Device to a Name

You must correlate a logical device name with the device's physical location in the following situations:

- When downloading the OS over a network, you must specify the logical device name of the drive in slot 0 (the default boot device).
- When you run the Oracle Solaris `format` command, you must select one of the logical device names presented in the output. To ensure that you select the correct drive for an operation, you must correlate these logical device names with the physical drives.
- When you see a system message that lists a drive's logical device name, you might need to identify the physical slot in which the drive is installed.

Related Information

- [“WWN Syntax” on page 84](#)

WWN Syntax

Oracle Solaris uses the WWN (World Wide Name) syntax in place of the locally unique *tn* (target ID) field in logical device names. This change affects how device names can be mapped to specific SCSI devices. The following points are key to understanding the impact of this change:

- Before the change to WWN nomenclature, Oracle Solaris identified the default boot device as `c0t0d0`.
- With the change, the device identifier for the default boot device is now referred to as `c0tWWNd0`, where *WWN* is a hexadecimal value that is unique to this device throughout the world.
- This WWN value is assigned by the manufacturer of the device and, therefore, has a random relationship to the server's device tree structure.

Because WWN values do not conform to the traditional logical device name structure, you cannot directly identify a target device from its `cntWWNd n` value. Instead, you can use one of the following alternative methods to map WWN-based device names to physical devices.

- When the OS is not running, you can analyze the output of the OpenBoot command `probe-scsi-all`.
For example, you would analyze `probe-scsi-all` output when you want to identify a boot device.
- When the OS is running, you can analyze the output of the command `prtconf -v`.

Related Information

- [“probe-scsi-all Device Naming \(OpenBoot\)” on page 87](#)

▼ Display Server Components (Oracle ILOM)

The Oracle ILOM `show components` command displays real-time information about the components installed in the server. This information includes the target name for each component.

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

```
-> show components
```

Note - This document applies to several server products. The following example is based on the SPARC T8-1 server. Your output might vary from the examples based on your product.

```
-> show components
```

Target	Property	Value
/SYS/MB/CM/CMP	current_config_state	Enabled
/SYS/MB/CM/CMP/ BOB01	current_config_state	Enabled
/SYS/MB/CM/CMP/ BOB01/CH0	current_config_state	Enabled
...		
/SYS/MB/IOH	current_config_state	Enabled
/SYS/MB/IOH/ ILINK0	current_config_state	Enabled
/SYS/MB/IOH/ ILINK1	current_config_state	Enabled
/SYS/MB/IOH/ ILINK2	current_config_state	Enabled
/SYS/MB/IOH/ ILINK3	current_config_state	Enabled
/SYS/MB/IOH/IOS0	current_config_state	Enabled
/SYS/MB/IOH/IOS1	current_config_state	Enabled
/SYS/MB/IOH/IOS2	current_config_state	Enabled
/SYS/MB/IOH/IOS3	current_config_state	Enabled
/SYS/MB/IOH/IOS4	current_config_state	Enabled
/SYS/MB/PCIE1	current_config_state	Enabled
/SYS/MB/PCIE2	current_config_state	Enabled
/SYS/MB/PCIE3	current_config_state	Enabled
/SYS/MB/PCIE4	current_config_state	Enabled
/SYS/MB/PCIE5	current_config_state	Enabled
/SYS/MB/PCIE6	current_config_state	Enabled
/SYS/MB/SASHBA	current_config_state	Enabled
/SYS/MB/USB_CTRL	current_config_state	Enabled
/SYS/MB/XGBE0	current_config_state	Enabled
/SYS/MB/XGBE1	current_config_state	Enabled
/SYS/RIO/VIDEO	current_config_state	Enabled

```
->
```

Related Information

- [“Locate Device Paths \(OpenBoot\)” on page 86](#)

▼ Locate Device Paths (OpenBoot)

1. **Display the OpenBoot prompt.**
See [“Obtaining the OpenBoot Prompt”](#) on page 54.
2. **From the OpenBoot prompt, type:**

```
ok devalias
```

Note - This document applies to several server products. The following example is based on the SPARC T8-1 server. Your output might vary from the examples based on your product.

```
ok devalias
screen                /pci@300/pci@4/display@0
rcdrom                /pci@300/pci@2/usb@0/hub@3/storage@1/disk@0
net3                  /pci@300/pci@3/network@0,1
net2                  /pci@300/pci@3/network@0
cdrom                 /pci@300/pci@2/usb@0/hub@8/device@1/storage@0/disk@0
net1                  /pci@300/pci@1/network@0,1
net                   /pci@300/pci@1/network@0
net0                  /pci@300/pci@1/network@0
disk7                 /pci@301/pci@2/scsi@0/disk@p7
disk6                 /pci@301/pci@2/scsi@0/disk@p6
disk5                 /pci@301/pci@2/scsi@0/disk@p5
disk4                 /pci@301/pci@2/scsi@0/disk@p4
disk3                 /pci@301/pci@2/scsi@0/disk@p3
disk2                 /pci@301/pci@2/scsi@0/disk@p2
disk1                 /pci@301/pci@2/scsi@0/disk@p1
disk                  /pci@301/pci@2/scsi@0/disk@p0
disk0                 /pci@301/pci@2/scsi@0/disk@p0
scsi                  /pci@301/pci@2/scsi@0
scsi0                 /pci@301/pci@2/scsi@0
virtual-console       /virtual-devices/console@1
name                  aliases
```

Related Information

- [“Access the OpenBoot CLI”](#) on page 31
- [“Prepare to Create a RAID Hardware Volume \(FCode-based RAID Utility\)”](#) on page 94

probe-scsi-all Device Naming (OpenBoot)

The output displayed by `probe-scsi-all` lists all SCSI devices in the server and provides a basic set of information about each device. When analyzing the `probe-scsi-all` output, look for the following data fields that are different names for the same device. You must use a specific type of name in different commands.

Entity Name	Definition
Target	Each SAS drive is assigned a unique target ID.
SASDeviceName	WWN value assigned to a SAS drive by the manufacturer. Oracle Solaris recognizes this name.
SASAddress	WWN value assigned to a SCSI device that is recognized by the OpenBoot firmware.
PhyNum	Hexadecimal ID of the controller port that is attached to the target drive.
VolumeDeviceName (when a RAID volume is configured)	WWN value assigned to a RAID volume that is recognized by Oracle Solaris. The <code>VolumeDeviceName</code> replaces the <code>SASDeviceName</code> of every SCSI device contained in the RAID volume.
VolumeWWID (when a RAID volume is configured)	Use the <code>VolumeDeviceName</code> entity to determine the correct target in a RAID volume, or when the server is configured with an optional internal RAID HBA controller. WWN-based value assigned to a RAID volume that is recognized by the OpenBoot firmware. <code>VolumeWWID</code> replaces the <code>SASAddress</code> of every SCSI device contained in the RAID volume.

At a high level, the WWN mapping process consists of the following stages:

1. Identify the physical location of the hard drive that is to be the target of the operation.
2. Identify the controller port that is attached to that physical location.
3. Find the WWN-based device name of the drive attached to that controller port.

Note - Refer to the server's service manual for a description of the physical drive slot organization.

Related Information

- [“WWN Syntax” on page 84](#)

- [SPARC T8-1 Server Service Manual](#)
- [SPARC T8-2 Server Service Manual](#)
- [SPARC T8-4 Server Service Manual](#)

▼ Correlate WWN Device Names With Physical Locations (probe-scsi-all Command)

1. At the OpenBoot prompt, type:

```
ok probe-scsi-all
```

The following example output is for a SPARC T8-2 server:

```
ok probe-scsi-all
/pci@308/pci@1/usb@0/hub@1/storage@3
  Unit 0   Disk      smiMICRON  eUSB DISK      1112

/pci@308/pci@1/usb@0/hub@1/storage@1
  Unit 0   Removable Read Only device  SUNRemote ISO CDROM1.01

/pci@303/pci@1/scsi@0

FCode Version 1.00.64, MPT Version 2.05, Firmware Version 14.00.01.00

/pci@301/pci@1/scsi@0

FCode Version 1.00.64, MPT Version 2.05, Firmware Version 14.00.01.00

Target 9
  Unit 0   Disk  HGST      H101812SFSUN1.2T A990    2344225968 Blocks, 1200 GB
  SASDeviceName 5000cca02d1036b4 SASAddress 5000cca02d1036b5 PhyNum 0
Target a
  Unit 0   Disk  HGST      H101812SFSUN1.2T A990    2344225968 Blocks, 1200 GB
  SASDeviceName 5000cca02d1021b8 SASAddress 5000cca02d1021b9 PhyNum 1
```

2. In the probe-scsi-all output, find the following disk identifiers:

- /pci@301/pci@1/scsi@0 – Disk controller, followed by its associated target drives with their Target IDs. If the server has more than one disk controller, the target drives associated with each controller are listed following that controller's information.
- SASDeviceName – WWN that Oracle Solaris recognizes.
- SASAddress – WWN that OpenBoot references.

- PhyNum – Physical slot that the drive occupies (the value 0 indicates a drive in HDD slot 0).

3. Use the values in the probe-scsi-all output to construct a logical device name in the *cntWWN**dn* format that is recognized by Oracle Solaris.**

For the example output, you can construct an Oracle Solaris device name for the drive in slot 0, indicated with PhyNum 0, as follows:

- *cn* = *c0*
n is the SAS disk controller number.
- *tWWN* = *t5000cca02d1036b4*
WWN is the SASDeviceName value.
- *dn* = *d0*
n is 0 for all embedded SCSI devices.

The completed logical device name is *c0t5000cca02d1036b4d0*.

Related Information

- [“probe-scsi-all Device Naming \(OpenBoot\)” on page 87](#)

Configuring Hardware RAID

These topics describe how to configure and manage RAID disk volumes using the server's on-board SAS3 disk controller.

- [“Hardware RAID Support” on page 91](#)
- [“Hardware RAID Guidelines” on page 93](#)
- [“FCCode-Based RAID Utility Commands” on page 93](#)
- [“Prepare to Create a RAID Hardware Volume \(FCCode-based RAID Utility\)” on page 94](#)
- [“Create a Hardware RAID Volume \(FCCode-based RAID Utility\)” on page 96](#)
- [“Determining if a Drive Has Failed” on page 97](#)
- [“RAID Drive Replacement Strategies” on page 99](#)

Related Information

- [“Matching Devices to Device Names” on page 83](#)

Hardware RAID Support

The servers provide hardware RAID support through on-board SAS3 RAID controllers. Each controller enables you to create up to two logical disk volumes consisting of two or more redundant disk drives. The following table identifies the hardware RAID controllers built into each server.

Server	Controller Description	Supported RAID Levels
SPARC T8-1	One on-board SAS3 controller	0, 1, 1e, 10
SPARC T8-2	Two on-board SAS3 controllers	0, 1, 1e, 10
SPARC T8-4	Two on-board SAS3 controllers	0, 1, 1e, 10

Note - RAID 1e and RAID 10 are functionally equivalent. RAID 1e requires an odd number of drives (minimum three). RAID 10 requires an even number of drives (minimum four).

You can use the RAID management utilities described here with the on-board SAS3 controllers provided in these servers.

FCode-Based RAID Utility

You can use FCode-based commands provided with the on-board controller to display targets and manage logical volumes on the server. You enter these commands at the OpenBoot ok prompt.

The examples of RAID shown in this document rely on the controller's FCode-based commands, unless otherwise specified.

raidconfig Commands

You can use the `raidconfig` commands contained in the Oracle Hardware Management Pack. Use the Oracle Server CLI Tools component to create and manage RAID volumes on the server. See the [Oracle Server CLI Tools for Oracle Solaris 11.3 User's Guide](#) for more information about `raidconfig`.

If `raidconfig` is not available on your server, see [Oracle Hardware Management Pack for Oracle Solaris 11.3 Installation Guide](#) for installation information.

RAID Capabilities in Oracle Enterprise Manager Ops Center

You can create RAID's and manage existing RAID's with Oracle Enterprise Manager Ops Center. If you reconfigure an existing RAID with Oracle Enterprise Manager Ops Center, the contents of the disks in the original RAID will be lost.

For more about Oracle Enterprise Manager Ops Center, see [“Oracle Enterprise Manager Ops Center Overview” on page 24](#).

Related Information

- [“Create a Hardware RAID Volume \(FCode-based RAID Utility\)” on page 96](#)
- [“Prepare to Create a RAID Hardware Volume \(FCode-based RAID Utility\)” on page 94](#)
- [“Oracle Hardware Management Pack Overview” on page 22](#)
- [“Oracle Enterprise Manager Ops Center Overview” on page 24](#)

Hardware RAID Guidelines



Caution - When you create a RAID volume using the on-board disk controllers, all data currently on the disks you include in the volume will be lost.

The following points are important to understand when configuring RAID volumes on a server:

- Before configuring and using RAID disk volumes on a server, ensure that you have installed the latest SRU or patches available for your OS. Review the most recent product notes provided for your server for further guidance in keeping your OS up to date.
- Volume migration (that is, relocating all RAID volume disk members from one server to another) is not supported. If you must perform this operation, contact your authorized Oracle service provider.

Related Information

- [“Updating the System Firmware” on page 105](#)

FCode-Based RAID Utility Commands

These commands are provided through an FCode-based RAID utility provided with the on-board controllers. You can enter these commands at the OpenBoot prompt. For details on preparing to enter these commands to affect a specific controller, see [“Prepare to Create a RAID Hardware Volume \(FCode-based RAID Utility\)” on page 94](#).

FCode Command	Description
show-children	Lists all connected physical drives and logical volumes.

FCode Command	Description
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 for an odd number of target drives (minimum three). Note - If you specify an even number of target drives (minimum four) with this command, those drives will be configured and identified as RAID 10. For an even number of drives, RAID 1e is the functional equivalent of RAID 10.
create-raid10-volume	Creates a RAID 10 volume for an even number of target drives (minimum four). For any other number of target drives, this command fails.
delete-volume	Deletes a RAID volume.
activate-volume	Reactivates a RAID volume after the motherboard has been replaced.

Related Information

- [“Create a Hardware RAID Volume \(FCode-based RAID Utility\)” on page 96](#)
- [“Prepare to Create a RAID Hardware Volume \(FCode-based RAID Utility\)” on page 94](#)
- [“Obtaining the OpenBoot Prompt” on page 54](#)

▼ Prepare to Create a RAID Hardware Volume (FCode-based RAID Utility)

Perform this procedure to be ready to create a RAID volume using the FCode-based RAID utility. This procedure also enables you to use other FCode-based RAID utility commands on a specific controller.

1. **Perform the following procedure from an Xterm or an equivalent terminal window that supports scrolling.**

Note - OpenBoot commands and FCode-based commands produce large amounts of detailed output. An Xterm or Gnome terminal window provides scroll bar functionality, which helps you view such output.

2. **Either apply power to the server or reset the server if power is already present, and disable auto-boot in the OpenBoot environment.**

See [“Obtaining the OpenBoot Prompt”](#) on page 54.

3. Enter the OpenBoot environment.

4. List the device paths on the server.

For example, the output from the command might include this line for a SPARC T8-1:

```
ok show-devs
...
/pci@301/pci@2/scsi@0
...
```

5. Use the OpenBoot `select` command to specify the controller where you want to create a hardware RAID volume.

```
ok select /pci@301/pci@2/scsi@0
```

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

```
ok select scsi_alias
```

where `scsi_alias` corresponds to a preconfigured alias you had previously created for your path.

Note - To view the preconfigured aliases on the server, use the OpenBoot `devalias` command. See [“Locate Device Paths \(OpenBoot\)”](#) on page 86.

6. If you decide to select a different controller after performing the previous step, you must unselect the current controller.

```
ok unselect-dev
```

Now you can select a different controller, as described in the previous step. You can then run other FCode-based RAID commands that apply to the selected controller.

7. Continue to create a hardware RAID volume on the selected controller.

See [“Create a Hardware RAID Volume \(FCode-based RAID Utility\)”](#) on page 96.

Related Information

- [“Obtaining the OpenBoot Prompt”](#) on page 54
- [“FCode-Based RAID Utility Commands”](#) on page 93
- [“Locate Device Paths \(OpenBoot\)”](#) on page 86

▼ Create a Hardware RAID Volume (FCode-based RAID Utility)

1. Select the controller that will handle a new RAID volume.

See [“Prepare to Create a RAID Hardware Volume \(FCode-based RAID Utility\)” on page 94](#). At this point you have obtained the OpenBoot prompt and have selected an on-board disk controller.

2. List the physical drives on the selected controller.

Note the target name of each disk you will use in the RAID. In this example, the targets are named 9, a, b, and c.

```
ok show-children
...
Target 9
  Unit 0   Disk   HITACHI  H109060SESUN600G A690   1172123568 Blocks, 600 GB
  SASDeviceName 5000cca0566c32b4 SASAddress 5000cca0566c32b5 PhyNum 0
Target a
  Unit 0   Disk   HITACHI  H109060SESUN600G A690   1172123568 Blocks, 600 GB
  SASDeviceName 5000cca0566cfac4 SASAddress 5000cca0566cfac5 PhyNum 1
ok
```

3. Type one of these commands to create a logical drive from several physical disks:

- create-raid0-volume
- create-raid1-volume
- create-raid1e-volume
- create-raid10-volume

For example, to create a RAID 0 volume with targets 9 and a, type the targets first then type the command name:

```
ok 9 a create-raid0-volume
```

To create a RAID 1e volume with three targets (a, b, and c), type:

```
ok a b c create-raid1e-volume
```

To create a RAID 10 volume with four targets (9, a, b, and c), type:

```
ok 9 a b c create-raid10-volume
```

4. Verify creation of the RAID volume.


```
ok show-volumes
```

5. **(Optional) Create a second RAID volume to be handled by the present controller.**
To do so, enter another command as described in [Step 3](#).
6. **Unselect the controller.**

```
ok unselect-dev
```

Related Information

- [“FCode-Based RAID Utility Commands” on page 93](#)
- [“Obtaining the OpenBoot Prompt” on page 54](#)

Determining if a Drive Has Failed

These topics explain various ways to determine if a drive contained in a RAID volume has failed:

- [“Service Required Drive Indicators” on page 97](#)
- [“Locate Error Messages Related to Drives in a RAID Volume” on page 98](#)
- [“Display Status \(FCode-Based RAID Utility\)” on page 98](#)

Related Information

- [“Monitoring the Server” on page 101](#)

Service Required Drive Indicators

When a fault occurs on a drive in a server, the amber Service Required indicator lights on the front of the drive. This amber indicator enables you to locate the faulted drive in the system. Additionally, the front and rear panel Service Action Required indicators also light when the server detects a hard drive fault. Refer to the Detecting and Managing Faults section of the service manual for the server for the locations and descriptions of these indicators.

Related Information

- [“Turn On the Locate Indicator” on page 101](#)

▼ Locate Error Messages Related to Drives in a RAID Volume

When a fault occurs on a drive, error messages are displayed on the system console about the drive and the RAID volume that includes that drive. For example, these messages on a system console display indicate that volume 905 has been degraded with the loss of PhysDiskNum 1:

```
Mar 16 16:28:26 hostname scsi: /pci@400/pci@2/pci@0/pci@e/scsi@0 (mpt_sas0):
Mar 16 16:28:26 hostname      PhysDiskNum 1 with DevHandle 0xc in slot 0 for
enclosure with handle 0x0 is now offline
Mar 16 16:28:26 hostname scsi: /pci@400/pci@2/pci@0/pci@e/scsi@0 (mpt_sas0):
Mar 16 16:28:26 hostname      PhysDiskNum 1 with DevHandle 0xc in slot 0 for
enclosure with handle 0x0 is now , active, out of sync
Mar 16 16:28:26 hostname scsi: WARNING: /pci@400/pci@2/pci@0/pci@e/scsi@0
(mpt_sas0):
Mar 16 16:28:26 hostname      Volume 905 is degraded
Mar 16 16:28:26 hostname scsi: /pci@400/pci@2/pci@0/pci@e/scsi@0 (mpt_sas0):
Mar 16 16:28:26 hostname      Volume 0 is now degraded
Mar 16 16:28:26 hostname scsi: WARNING: /pci@400/pci@2/pci@0/pci@e/scsi@0
(mpt_sas0):
Mar 16 16:28:26 hostname      Volume 905 is degraded
```

- **Display recent system console messages in the `/var/adm/messages` files.**

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

Refer to the information about these messages and others in the service manual for the server.

Related Information

- [“Monitoring the Server” on page 101](#)
- [“Determining if a Drive Has Failed” on page 97](#)

▼ Display Status (FCode-Based RAID Utility)

You can halt the system and then use the `show-volumes` command at the OpenBoot prompt to determine if a drive has failed.

1. **Halt the system and display the OpenBoot prompt.**

See [“Obtaining the OpenBoot Prompt” on page 54](#).

2. Select the SAS controller device for the RAID volume you think has failed.

For example:

```
ok select /pci@300/pci@1/pci@0/pci@e/scsi@0
```

See [“Prepare to Create a RAID Hardware Volume \(FCode-based RAID Utility\)”](#) on page 94 for more information.

3. Display details about the RAID volumes and their associated disks that are handled by this controller.

In the following example, the secondary disk in a RAID 1 volume is offline.

```
ok show-volumes
Volume 0 Target 389 Type RAID1 (Mirroring)
  Name raid1test WWID 04eec3557b137f31
  Degraded Enabled
  2 Members 2048 Blocks, 1048 KB
  Disk 1
    Primary Optimal
    Target c HITACHI H101414SCSUN146G SA25
  Disk 0
    Secondary Offline Out Of Sync
    Target 0 HITACHI
```

4. After you finish typing commands that apply to this controller, unselect it.

```
ok unselect-dev
```

Related Info

- [“Locate Device Paths \(OpenBoot\)”](#) on page 86
- [“Determining if a Drive Has Failed”](#) on page 97

RAID Drive Replacement Strategies

When you replace a drive that has been included in a RAID volume, follow the drive replacement instructions in the service manual for the server. Keep in mind these differences if a RAID volume is involved.

- The `cfgadm` instructions in the service manual are for individual drives that are not part of RAID volumes. When a drive is part of a RAID volume, you do not need to unconfigure it before hot-swapping it with a new drive.

- If the failed drive was in a RAID 0 volume, you lose all data on that volume. Replace the failed drive with a new drive of the same capacity. Then recreate the RAID 0 volume (see [“Create a Hardware RAID Volume \(FCode-based RAID Utility\)” on page 96](#)) and restore data from a backup.
- If the failed drive was in a RAID 1, RAID 1e, or RAID 10 volume, the new drive is automatically configured and synced with the RAID volume. Remove the failed drive and replace it with a new drive of the same capacity. Then allow the RAID volume to automatically incorporate the new drive.

Related Information

- [“Determining if a Drive Has Failed” on page 97](#)

Monitoring the Server

The servers provide many ways to monitor system activity and faulty behavior, including lighted indicators, Oracle ILOM, POST, and Oracle Solaris utilities. Log files, including system console activity, are maintained by Oracle Solaris and Oracle ILOM. For specific information about indicators, fault reports, and log files, refer to the topics on Detecting and Managing Faults in the service manual for the server.

Note - You can use Oracle Enterprise Manager Ops Center to monitor this server along with other servers and assets. For more information, see [“Oracle Enterprise Manager Ops Center Overview” on page 24](#).

When a problem is detected on a server, you can use the locator button and indicator to identify the server that needs service attention at its physical location.

- [“Turn On the Locate Indicator” on page 101](#)
- [“Turn Off the Locate Indicator” on page 102](#)
- [“Display the Locate Indicator State of the Server” on page 102](#)

Related Information

- Detecting and Managing Faults, in the service manual for your server
- [“Matching Devices to Device Names” on page 83](#)

▼ Turn On the Locate Indicator

When a server must be serviced, lighting the system Locate indicator assists in easily identifying the correct server. You do not need administrator permissions to use the `set /System locator_indicator` and `show /System locator_indicator` commands.

You can also turn on the Locate indicator by physically pressing the Locate button on the server.

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

See [“Log In to Oracle ILOM” on page 29](#).

2. Illuminate the Locate indicator.

```
-> set /System locator_indicator=on
```

Related Information

- [“Turn Off the Locate Indicator” on page 102](#)
- [“Display the Locate Indicator State of the Server” on page 102](#)

▼ Turn Off the Locate Indicator

After service of a server is completed, the Locate indicator can be turned off. You do not need administrator permissions to use the `set /System locator_indicator` command.

You can also turn off the Locate indicator by physically pressing the Locate button on the server.

1. Log in to Oracle ILOM.

See [“Log In to Oracle ILOM” on page 29](#).

2. Turn off the Locate indicator.

```
-> set /System locator_indicator=off
```

Related Information

- [“Turn On the Locate Indicator” on page 101](#)
- [“Display the Locate Indicator State of the Server” on page 102](#)

▼ Display the Locate Indicator State of the Server

You do not need administrator permissions to use the `show /System locator_indicator` command.

1. Log in to Oracle ILOM.

See [“Log In to Oracle ILOM” on page 29](#).

2. Display the state of the Locate indicator:

```
-> show /System locator_indicator
```

Related Information

- [“Turn On the Locate Indicator” on page 101](#)
- [“Turn Off the Locate Indicator” on page 102](#)

Updating the System Firmware

Firmware for the T8 servers is contained in a downloadable package, and includes firmware for the system and the SP.

These topics describe how to view current versions of firmware, download firmware, and update the firmware for Oracle's SPARC T8 series servers.

- [“Display the System Firmware Versions” on page 105](#)
- [“Downloading System Firmware Updates” on page 106](#)
- [“Update the System Firmware from Oracle ILOM” on page 108](#)

Related Information

- [“Understanding System Administration Resources” on page 13](#)

▼ Display the System Firmware Versions

The `/HOST` property displays information about the firmware versions on the host. The output includes the overall system firmware version and the versions of firmware components, such as Oracle ILOM, OpenBoot, and POST.

1. Display the current host property values.

```
-> show /HOST
```

Refer to the [Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x](#) for more information about the `show /HOST` command.

2. Examine the output to determine the firmware version reported by the SP for the system or component.

The property `sysfw_version` shows the system firmware version.

Related Information

- [“Downloading System Firmware Updates” on page 106](#)
- [“Update the System Firmware from Oracle ILOM” on page 108](#)

Downloading System Firmware Updates

The system firmware is available for download in two ways. You can use the method that is most convenient.

The firmware downloaded in each case is the same. With any method you use to obtain the firmware updates, you must then apply them to the system.

- [“Download Firmware From My Oracle Support” on page 106](#)
- [“Download Firmware With Oracle Solaris pkg Command” on page 107](#)

▼ Download Firmware From My Oracle Support

This procedure shows how to obtain firmware updates from the support.oracle.com.

1. Download the latest available system firmware version from My Oracle Support.

See the web page [Firmware Downloads and Release History for Oracle Systems \(http://www.oracle.com/technetwork/systems/patches/firmware/release-history-jsp-138416.html\)](http://www.oracle.com/technetwork/systems/patches/firmware/release-history-jsp-138416.html) for links to firmware downloads for each server type.

The download is an archive file such as a zip file which you must extract to find the Sun_System_Firmware directory containing the firmware pkg file.

2. Place the firmware in a shared location that the host can access.

For example, unzip it on a local or network share or on a TFTP, FTP, HTTP or HTTPS server.

3. Apply the firmware updates to the server.

See the instructions in [“Update the System Firmware from Oracle ILOM” on page 108](#) or [“Update the System Firmware From the Host” on page 110](#).

Related Information

- [“Display the System Firmware Versions” on page 105](#)

- [SPARC T8 Series Servers Product Notes](#)

▼ Download Firmware With Oracle Solaris pkg Command

This procedure shows how to obtain firmware packages from the Oracle Solaris image packaging system (IPS).

The firmware packages are available in the Oracle Solaris support repository. The publisher URI for Oracle's support repository is <https://pkg.oracle.com/solaris/support/>.

1. **In a terminal window, list the newest firmware packages applicable to the SPARC T8 servers.**

```
# pkg list -n 'firmware/system/*T8*'

```

Note - You do not need to install older updates. You can install just the newest update, and then continue to update from there.

2. **Use the Oracle Solaris pkg command to install and update packages containing system firmware.**

The first time you install firmware packages from the support repository, you must use the `pkg install` command. Subsequently, when you need to update firmware packages that were installed from the repository, use the `pkg update` command.

To download the latest firmware updates using `pkg` for the first time for a T8-1 system:

```
pkg install firmware/system/T8-1

```

To update previously installed firmware packages using `pkg` for a T8-1 system:

```
pkg update firmware/system/T8-1

```

If you need a specific firmware version rather than the latest firmware in the repository, you must specify an FMRI that includes the version number. This would have a form similar to `firmware/system/T8-1/sysfw9-8@9.8.x.x`.

The firmware package delivers the files to a directory with a name similar to `/var/firmware/system/T8-n/sysfw9-8/pnnnnnnn_nnnx/Firmware/Sun_System_Firmware`.

See "[Platform Firmware Updates for SPARC Systems](#)" in *Adding and Updating Software in Oracle Solaris 11.3* for more information.

Proceed to apply the firmware updates using instructions in [“Update the System Firmware from Oracle ILOM” on page 108](#) or [“Update the System Firmware From the Host” on page 110](#).

▼ Update the System Firmware from Oracle ILOM

The Live Firmware update feature of the SPARC T8 series servers supports updating the Sun System Firmware while the SPARC host is powered on. Sun System Firmware is an image that includes firmware for the SP and Oracle ILOM, and the server's host components. The SP and Oracle ILOM firmware update goes into immediate effect. However, the host components update is delayed until the affected host is power cycled. Because Oracle ILOM can be updated while the host is powered on, this feature reduces the total system down time.

Before You Begin See [“Display the System Firmware Versions” on page 105](#) to determine firmware versions you have currently.

See [“Downloading System Firmware Updates” on page 106](#) to obtain the firmware updates.

- 1. Navigate to the directory where you saved the firmware update.**

If you used the Oracle Solaris `pkg` command, the firmware update is located in `/var/firmware/system/T8-n/sysfw9-8/pnnnnnnn_nnnx/Firmware/Sun_System_Firmware` where the string of characters and numbers varies according to the firmware update.

- 2. Read the README file that accompanies the firmware image to be aware of any special release notes or instructions.**

- 3. Notify SP users of the scheduled firmware update and ask them to close all client sessions until after the firmware update is complete. Do not perform any other Oracle ILOM tasks during the firmware update.**

- 4. Update the firmware through the Oracle ILOM CLI.**

For information about performing firmware updates using the web interface, see [“Update the Server SP or CMM Firmware Image” in *Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x*](#).

- a. Log in to Oracle ILOM using an account with Admin privileges.**

See [“Log In to Oracle ILOM” on page 29](#).

- b. Load the firmware image from the shared location. Type:**

```
-> load -source protocol://username:password@server_ip/path_to_image/image.pkg
```

The value for *protocol* can be: http, https, ftp, tftp, sftp, or scp.

For some protocols, you can specify the username and password of the user account to access the server where the firmware image is located. See [“Supported File Transfer Methods” in Oracle ILOM Administrator’s Guide for Configuration and Maintenance Firmware Release 4.0.x.](#)

For example, if the Sun System Firmware image can be accessed through an http server with IP address 198.51.100.123 in a directory called fw-downloads:

```
-> load -source http://198.51.100.123/fw-downloads/Sun_System_Firmware-x_x_x.pkg
```

NOTE: The host is powered on; HOST firmware will be updated automatically when the host is restarted.

If the host is powered off you will not see this note.

The following prompts display.

```
Are you sure you want to load the specified file (y/n)? y
Preserve existing configuration (y/n)? y
```

- c. **Type y to load the image file, then type y to preserve the existing configuration, which saves the existing Oracle ILOM firmware settings and restores them after the firmware update is complete.**

Note - All firmware update options for your server are enabled (y) by default when using a script (-script) to perform the firmware update.

- d. **Oracle ILOM displays a status message when the firmware process is complete. The SP reboots to apply the new Oracle ILOM firmware image.**

The host does *not* reboot if it was powered on when the firmware updates were applied. Host component updates are deferred until the next time the host is powered off and on.

If the host was powered off when firmware was updated, the firmware updates are put in effect the next time you power on the host.

Related Information

- [“Display the System Firmware Versions” on page 105](#)
- [SPARC T8 Series Servers Product Notes](#)

▼ Update the System Firmware From the Host

Before You Begin See [“Display the System Firmware Versions” on page 105](#) to determine firmware versions you have currently.

See [“Downloading System Firmware Updates” on page 106](#) to obtain the firmware updates.

1. **Log in to the host and use `su` to switch to an administrator role such as `root`.**

```
$ su - role
```

2. **Navigate to the directory where you saved the firmware update files.**

```
# cd firmware-location
```

If you used the Oracle Solaris `pkg` command, the firmware update is located in `/var/firmware/system/T8-n/sysfw9-8/pnnnnnnn_nnnx/Firmware/Sun_System_Firmware` where the string of characters and numbers varies according to the firmware update.

The directory should contain a `Sun_System_Firmware-9_8_x-SPARC_T8-n.pkg` file, a `metadata.xml` and `powercycle_metadata.xml`, and a `README.html` file.

3. **Read the `README` file that accompanies the firmware to be aware of any special release notes or instructions.**
4. **Use one of the following commands to update firmware.**

- **To perform a Live Firmware Upgrade where the host component update is delayed until the next power off and on:**

```
# fwupdate update sysfw -x metadata.xml
```

- **To perform a Live Firmware Upgrade followed immediately by a host power off and on to update the host components:**

```
# fwupdate update sysfw -x powercycle_metadata.xml
```

Related Information

- [“Downloading System Firmware Updates” on page 106](#)
- [“Update the System Firmware from Oracle ILOM” on page 108](#)
- [SPARC T8 Series Servers Product Notes](#)

- ["Using fwupdate to Update Firmware" in Oracle® Server CLI Tools for Oracle Solaris 11.3 User's Guide](#)

Glossary

A

ASR Auto Service Request.

B

BOB Memory buffer on board.

C

CMP Chip multiprocessor.

D

DHCP Dynamic Host Configuration Protocol.

E

eUSB drive Embedded universal serial bus drive.

F

FRU Field-replaceable unit.

H**HBA** Host bus adapter.**host** The part of the server or server module with the CPU and other hardware that runs the Oracle Solaris OS and other applications. The term *host* is used to distinguish the primary computer from the SP. See [SP](#).**I****ID PROM** Chip that contains system information for the server or server module.**IP** Internet Protocol.**IPMI** Intelligent Platform Management Interface.**K****KVM** Keyboard, video, and mouse. Refers to using a switch to enable sharing of one keyboard, one display, and one mouse with more than one computer.**L****LDom** Logical domain managed by Oracle VM Server for SPARC. See [Oracle VM Server for SPARC](#).**M****MAC** Machine access code.**MAC address** Media access controller address.**MSGID** Message identifier.**N****NAC name** Network device container name. Physical device address used for remote access, configuration, management. See [Oracle ILOM](#) and [SDM name](#).

name space	Top-level Oracle ILOM target.
NET MGT	Network management port. An Ethernet port on the server SP.
NIC	Network interface card or controller.
NVMe	Nonvolatile memory express controller. The optional NVMe switch card provides NVMe services in the server.

O

OBP	OpenBoot PROM. Sometimes OBP is used in file names and messages to indicate a relationship to OpenBoot.
Oracle ILOM	Oracle Integrated Lights Out Manager. Oracle ILOM firmware is preinstalled on a variety of Oracle systems. Oracle ILOM enables you to remotely manage your Oracle servers regardless of the state of the host system.
Oracle Solaris OS	Oracle Solaris operating system.
Oracle VM Server for SPARC	Virtualization software to create logical domains for SPARC platforms.

P

PCI	Peripheral component interconnect.
PCIe	PCI Express, an industry-standard bus architecture that supports high-bandwidth peripherals and I/O devices.
POST	Power-on self-test.
PROM	Programmable read-only memory.

S

SAS	Serial attached SCSI.
------------	-----------------------

SCC	System configuration chip.
SCC PROM	System configuration chip on programmable read-only memory. Removable module containing system configuration data.
SDM name	Simplified data model name. A way of providing device information on Oracle ILOM consistently across different types of servers. See NAC name .
SER MGT port	Serial management port. A serial port on the server SP.
SP	Service processor. In the server, the SP is a card with its own OS that is operating and accessible whenever the server power cords are connected and energized, regardless of host power state. The SP processes Oracle ILOM commands providing lights out management control of the host. See host .
SPM	Service processor module. This is the physical component that contains the service processor firmware.
SSD	Solid-state drive.
SSH	Secure shell.
 U	
UI	User interface.
UUID	Universal unique identifier.
 W	
WWN	World wide name. A unique number that identifies a SAS target.

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