

# SPARC T7 Series Servers Administration Guide

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## Using This Documentation

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- **Overview** – Describes how to configure and administer the SPARC T7-series servers from Oracle.
- **Audience** – System administrators of SPARC T7-series servers.
- **Required knowledge** – Working knowledge of computer network concepts and terms, and advanced familiarity with the Oracle Solaris Operating System (Oracle Solaris OS).

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**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.

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## Product Documentation Library

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

- <http://www.oracle.com/goto/t7-1/docs>
- <http://www.oracle.com/goto/t7-2/docs>
- <http://www.oracle.com/goto/t7-4/docs>

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# Understanding System Administration Resources

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

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**Note** - For an overview of your specific server, refer to the "Understanding The Server" section of the installation guide for that server.

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- [“Oracle ILOM Overview” on page 13](#)
- [“OpenBoot Overview” on page 19](#)
- [“Oracle Solaris OS Overview” on page 20](#)
- [“Oracle VM Server for SPARC Overview” on page 20](#)
- [“Multipathing Software Overview” on page 21](#)
- [“Oracle Hardware Management Pack Overview” on page 22](#)
- [“Oracle Enterprise Manager Ops Center Overview” on page 23](#)
- [“Oracle Auto Service Request Software Overview” on page 23](#)
- [“Trusted Platform Module Overview” on page 24](#)
- [“DIMM Sparing Overview” on page 25](#)

## Related Information

- [“Updating the System Firmware” on page 101](#)

## Oracle ILOM Overview

Oracle Integrated Lights Out Management (ILOM) is system management firmware that is preinstalled on all SPARC T7 series servers. This firmware enables you to actively manage and monitor components installed in the server. Oracle ILOM provides a web interface and

a 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, regardless of the server power 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 documentation at:

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

To perform some procedures documented in the Oracle ILOM core documentation, you must create a serial connection to the server and activate the Physical Presence switch on the server. For information about creating a serial connection, refer to the installation guide for the server.

### Related Information

- [“Log In to Oracle ILOM” on page 27](#)
- [“Configuring Policy Settings” on page 65](#)
- [“OpenBoot Overview” on page 19](#)

## 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.

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**Note** - The number of user accounts supported on the SP varies by platform. You can verify the platform-specific numbers in the Oracle ILOM web interface.

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

### Related Information

- *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x* in [Oracle ILOM 3.2 Documentation Library \(http://www.oracle.com/goto/ilon321/docs\)](http://www.oracle.com/goto/ilon321/docs)
- [“Oracle ILOM Overview” on page 13](#)
- [“User Roles on the SP” on page 15](#)

## 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, 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 Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x* in [Oracle ILOM 3.2 Documentation Library \(http://www.oracle.com/goto/ilon321/docs\)](http://www.oracle.com/goto/ilon321/docs)
- [“Oracle ILOM Overview” on page 13](#)
- [“User Authentication on the SP” on page 16](#)

## 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 Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x* in *Oracle ILOM 3.2 Documentation Library* (<http://www.oracle.com/goto/ilon321/docs>)
- “Oracle ILOM Overview” on page 13
- “Active Directory” on page 17
- “LDAP/SSL Security” on page 18

## 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 Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x* in [Oracle ILOM 3.2 Documentation Library \(http://www.oracle.com/goto/ilon321/docs\)](http://www.oracle.com/goto/ilon321/docs)
- “Oracle ILOM Overview” on page 13
- “SNMP Service” on page 17

## 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 Oracle ILOM MIB file SUN-ILOM-CONTROL-MIB provides objects for configuring and managing all Oracle ILOM functions. 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.

### Related Information

- *Oracle ILOM Protocol Management Reference for SNMP and IPMI Firmware Release 3.2.x* in [Oracle ILOM 3.2 Documentation Library \(http://www.oracle.com/goto/ilon321/docs\)](http://www.oracle.com/goto/ilon321/docs)
- “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.

You can also optionally create groups that are assigned roles and contain users who are granted privileges based on those roles of the group.

### Related Information

- *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x* in [Oracle ILOM 3.2 Documentation Library \(http://www.oracle.com/goto/ilon321/docs\)](http://www.oracle.com/goto/ilon321/docs)
- “Log In to Oracle ILOM” on page 27
- “User Authentication on the SP” on page 16
- “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 Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x* in [Oracle ILOM 3.2 Documentation Library \(http://www.oracle.com/goto/ilon321/docs\)](http://www.oracle.com/goto/ilon321/docs)
- “Log In to Oracle ILOM” on page 27
- “Oracle ILOM Overview” on page 13

## OpenBoot Overview

The OpenBoot firmware determines the hardware configuration of a system or virtual machine, 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 automatically 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). Some of those FCode-based commands are described in [“FCode-Based RAID Utility Commands” on page 88](#).

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

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.

New OpenBoot properties are available on this server to accommodate booting an iSCSI device over IB. Also, a new OpenBoot variable has been added.

<code>boot-pool-list</code>	Lists device paths to OpenBoot accessible storage devices that comprise a boot pool. These are the devices that Oracle Solaris will use when booting. You can view this property with the <code>.properties</code> command under the <code>/chosen</code> node at the OpenBoot prompt.
<code>tboot-list</code>	Lists storage devices that include fall back images. You can view this property with the <code>.properties</code> command under the <code>/chosen</code> node at the OpenBoot prompt.
<code>os-root-device</code>	Defines devices and root file systems for root pools. This is a nonvolatile variable that you can view using the <code>printenv</code> command at the OpenBoot prompt or using the <code>EEPROM</code> command at the Oracle Solaris prompt.

For more information about OpenBoot commands, refer to the OpenBoot documentation at:

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

### Related Information

- [“Oracle Solaris OS Overview” on page 20](#)

## Oracle Solaris OS 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>

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

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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 19](#)
- [“Oracle VM Server for SPARC Overview” on page 20](#)
- [“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 58.

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 23
- [“Power On a Server With Multiple Active Domains \(Oracle VM Server for SPARC\)”](#) on page 36
- [“Power Off a Server With Multiple Active Domains \(Oracle VM Server for SPARC\)”](#) on page 37
- [“Configuring Boot and Restart Behavior”](#) on page 51

## 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 OS Overview” on page 20
- “Oracle VM Server for SPARC Overview” on page 20

## Oracle Hardware Management Pack Overview

Oracle Hardware Management Pack provides management agents and command line tools to manage and configure Oracle servers from the host OS. For example, you can use several CLI tools to configure RAID volumes, view hardware configuration and status information, and upgrade your server components' firmware. Oracle Solaris has included Oracle Hardware Management Pack since Oracle Solaris 11.2.

Find installation information and other 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, see <http://www.oracle.com/technetwork/server-storage/servermgmt/tech/hardware-management-pack/index.html>.

### Related Information

- “Hot-Spare Drives in RAID Volumes (sas3ircu Utility)” on page 91

## 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 85](#)

## 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 and Oracle Premium Support for Systems. See the following for more information:

- Oracle Hardware and Systems Support Policies at <https://www.oracle.com/support/policies.html>
- Oracle Premier Support for Systems at <https://www.oracle.com/support/premier/systems/index.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 Enterprise Manager Ops Center Overview” on page 23](#)

## Trusted Platform Module Overview

The server includes a Trusted Platform Module (TPM) as part of the SP. TPM refers to the hardware component and firmware that provides protected key storage and reliable measurements of software used to boot the operating system.



Oracle Solaris uses TPM to securely store encryption keys. TPM, together with the other measures that are described in the Oracle Solaris documentation, secures the system from unauthorized access by users of applications.

The platform owner must initialize TPM by setting an owner password that is used to authorize privileged operations. The platform owner, also called the TPM owner, differs from the traditional superuser.

### Related Information

- [Securing Systems and Attached Devices in Oracle Solaris 11.3](#)
- [tpmadm\(1M\) man page](#)

## DIMM Sparing Overview

On SPARC T7 servers, the physical address space that is provided by DIMMs is interleaved for performance reasons. When a group of 16 DIMMs is present on a server, both 16-way and 15-way interleaving are supported. This means that if there is an unusable DIMM, the CPU node can still provide 15 DIMMs worth of physical address space. With DIMM sparing, the CPU node doesn't have to drop to an 8-way interface, which would only provide 8 DIMMs worth of physical address space.

If a DIMM is diagnosed to be faulty while the system is running, the memory will dynamically switch from 16-way to 15-way interleave by distributing the contents of the faulty DIMM into the other 15 DIMMS. To enable this redistribution, the platform firmware must initially reserve space for the contents of one DIMM. Consequently, only 15 DIMMs worth of physical address space will be 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 at boot time or run time, the associated fault is treated as a nonserviceable 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 have 16 DIMMs installed. For example on a SPARC T7-1 server with only 8 DIMMs (and no memory risers), DIMM sparing is not available.

### **Related Information**

- [“Monitoring the Server” on page 97](#)

## 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 27](#)
- [“Start the Host Console” on page 28](#)
- [“Access the OpenBoot Prompt” on page 29](#)
- [“Display the Oracle ILOM Prompt” on page 29](#)
- [“Oracle ILOM Remote System Console Plus” on page 29](#)
- [“Enable Oracle Solaris Graphics Support” on page 30](#)
- [“Enable a Local Graphics Monitor” on page 31](#)
- [“Host Console Options for a Local Graphics Monitor” on page 32](#)

### Related Information

- [“Accessing the Server” on page 27](#)
- [“Booting and Shutting Down the OS” on page 41](#)

## ▼ Log In to Oracle ILOM

This procedure assumes 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 3.3.x.x
```

Copyright (c) 2015, 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 28](#)

## ▼ Start the Host Console

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

```
-> start /HOST/console [option]
```

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 user ends a console session that used the force option, 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 ok prompt displays if Oracle Solaris is not running.

### Related Information

- [“Display the Oracle ILOM Prompt” on page 29](#)

- [“Log In to Oracle ILOM” on page 27](#)

## Access the OpenBoot Prompt

You can access the OpenBoot CLI in several ways, and the method you use is determined by the state of the server.

See [“Obtaining the OpenBoot Prompt” on page 46](#) for instructions.

### ▼ 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 if a network is connected to the NET MGT port. See [“Log In to Oracle ILOM” on page 27](#).

#### Related Information

- [“Oracle ILOM Overview” on page 13](#)
- [“Log In to Oracle ILOM” on page 27](#)

## Oracle ILOM Remote System Console Plus

Oracle ILOM Remote System Console Plus is a Java application that enables you to remotely redirect and control the devices on the host server, such as keyboard, video console display, mouse, serial console display, and images (CD or DVD). This group of devices is commonly abbreviated as KVMS.

SPARC T7 servers support serial line and video redirections for Oracle ILOM Remote System Console Plus.

If you want to redirect video you must ensure the Oracle Solaris software for supporting the graphical UI is installed. See [“Enable Oracle Solaris Graphics Support” on page 30](#).

---

**Note** - SPARC T7 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 the *Configuration and Maintenance Guide* for the Oracle ILOM release.

### Related Information

- [“Enable Oracle Solaris Graphics Support” on page 30](#)
- [“Oracle ILOM In-Band \(Sideband\) Management” on page 74](#)

## ▼ Enable Oracle Solaris Graphics Support

To enable the use of graphical applications or Oracle ILOM Remote System Console Plus on the SPARC T7 servers, perform the following steps to install `solaris-desktop` and start the GNOME display manager.

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 27](#).
- 2. Start the host console.**  
See [“Start the Host Console” on page 28](#).
- 3. If necessary, boot the OS.**  
See [“Boot the OS \(Oracle ILOM\)” on page 43](#).
- 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
```

### Related Information

- [“Enable a Local Graphics Monitor” on page 31](#)
- [“Oracle Solaris OS Overview” on page 20](#)
- [Oracle Solaris 11.3 Desktop Administrator's Guide \(http://www.oracle.com/pls/topic/lookup?ctx=solaris11&id=SDSAG\)](http://www.oracle.com/pls/topic/lookup?ctx=solaris11&id=SDSAG)
- [Oracle Solaris 11.3 documentation \(http://www.oracle.com/pls/topic/lookup?ctx=solaris11\)](http://www.oracle.com/pls/topic/lookup?ctx=solaris11)

## ▼ Enable a Local Graphics Monitor

This procedure describes how to enable use of a graphics monitor connected to the video port on the server.

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. **Enable support for graphics in Oracle Solaris if not done previously.**  
See [“Enable Oracle Solaris Graphics Support” on page 30.](#)
6. **Log in to the Oracle Solaris desktop using the local monitor and keyboard.**

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 32.](#)

#### **Related Information**

- [“Host Console Options for a Local Graphics Monitor” on page 32](#)
- [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**

- [“Enable a Local Graphics Monitor” on page 31](#)
- [“Oracle ILOM Remote System Console Plus” on page 29](#)



# Controlling the Server

---

These topics describe how to control basic server operations.

- [“Powering the Server On and Off” on page 33](#)
- [“Resetting the Server and SP” on page 38](#)

## Related Information

- [“Booting and Shutting Down the OS” on page 41](#)

## 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.	<a href="#">“Power On the Server (Oracle ILOM CLI)” on page 34</a> <a href="#">“Power Off the Server (Oracle ILOM CLI)” on page 34</a>
Power the server on or off using the Oracle ILOM web interface.	<a href="#">“Power On the Server (Oracle ILOM Web Interface)” on page 35</a> <a href="#">“Power Off the Server (Oracle ILOM Web Interface)” on page 36</a>
Power the server on or off when the server is running Oracle VM for SPARC.	<a href="#">“Power On a Server With Multiple Active Domains (Oracle VM Server for SPARC)” on page 36</a> <a href="#">“Power Off a Server With Multiple Active Domains (Oracle VM Server for SPARC)” on page 37</a>

## Related Information

- [“Resetting the Server and SP” on page 38](#)

## ▼ 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 51](#).

---

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

See [“Log In to Oracle ILOM” on page 27](#).

**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 34](#)
- [“Reset the Server \(Oracle Solaris\)” on page 39](#)
- [“Reset the Server \(Oracle ILOM\)” on page 39](#)

## ▼ Power Off the Server (Oracle ILOM CLI)

**1. Log in to Oracle Solaris as a user with root privileges.**

**2. Shut down Oracle Solaris.**

See one of these procedures:

- [“Shut Down the OS \(init Command\)” on page 44](#)
- [“Shut Down the OS \(shutdown Command\)” on page 45](#)

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 35](#)
- [“Reset the Server \(Oracle Solaris\)” on page 39](#)
- [“Reset the Server \(Oracle ILOM\)” on page 39](#)

## ▼ 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 51](#).

---

1. **Log in to the Oracle ILOM web interface.**  
See [“Log In to Oracle ILOM” on page 27](#).
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 34](#)
- [“Reset the Server \(Oracle Solaris\)” on page 39](#)
- [“Reset the Server \(Oracle ILOM\)” on page 39](#)

## ▼ Power Off the Server (Oracle ILOM Web Interface)

1. **Log in to Oracle Solaris as a user with root privileges.**
2. **Shut down Oracle Solaris in one of these ways:**
  - [“Shut Down the OS \(init Command\)” on page 44](#)
  - [“Shut Down the OS \(shutdown Command\)” on page 45](#)
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 34](#)
- [“Reset the Server \(Oracle Solaris\)” on page 39](#)
- [“Reset the Server \(Oracle ILOM\)” on page 39](#)

## ▼ 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 27](#).
2. **Power on the host.**  

```
-> 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 as a user with root privileges.**

**4. Start all of the nonprimary domains.**

Starting a domain automatically binds the domain.

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

**5. Boot all of the nonprimary domains.**

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 43](#).

**Related Information**

- [“Power Off a Server With Multiple Active Domains \(Oracle VM Server for SPARC\)” on page 37](#)

## ▼ 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 44](#) or [“Shut Down the OS \(shutdown Command\)” on page 45](#).

**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 44](#) or [“Shut Down the OS \(shutdown Command\)” on page 45](#).

**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 36](#)

## Resetting the Server and SP

Use these topics to reset the server or SP.

- [“Reset the Server \(Oracle Solaris\)” on page 39](#)

- [“Reset the Server \(Oracle ILOM\)” on page 39](#)
- [“Reset the SP” on page 40](#)

#### Related Information

- [“Powering the Server On and Off” on page 33](#)

## ▼ 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 51](#).

---

1. **Log in to Oracle Solaris as a user with root privileges.**
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 34](#)
- [“Power On the Server \(Oracle ILOM Web Interface\)” on page 35](#)
- [“Reset the Server \(Oracle ILOM\)” on page 39](#)

## ▼ 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 51](#).

---

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

See [“Log In to Oracle ILOM”](#) on page 27.

**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 34
- [“Power On the Server \(Oracle ILOM Web Interface\)”](#) on page 35
- [“Reset the Server \(Oracle Solaris\)”](#) on page 39
- [“Override OpenBoot Settings to Reset the Server”](#) on page 61

▼ **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 27.

**2. Reset the SP.**

```
-> reset /SP
```

**Related Information**

- [“Log In to Oracle ILOM”](#) on page 27



# 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 41](#)
- [“Obtaining the OpenBoot Prompt” on page 46](#)

## Related Information

- [“Controlling the Server” on page 33](#)

## Booting and Shutting Down Oracle Solaris

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

Description	Links
Learn about the boot sequence.	<a href="#">“Boot Sequence” on page 42</a>
Boot a server that is configured to boot at power-on (the default configuration) using Oracle ILOM.	<a href="#">“Boot the OS (Oracle ILOM)” on page 43</a>
Boot a server that is at the OpenBoot prompt.	<a href="#">“Boot the OS Manually (OpenBoot)” on page 44</a>
Shut down the OS using an Oracle Solaris command.	<a href="#">“Shut Down the OS (init Command)” on page 44</a> <a href="#">“Shut Down the OS (shutdown Command)” on page 45</a>

## Related Information

- [“Powering the Server On and Off” on page 33](#)

- [“Obtaining the OpenBoot Prompt” on page 46](#)

## 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 [“OpenBoot Prompt” on page 46](#).

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 43](#).

These steps describe the high-level boot sequence:

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

These are the primary OpenBoot parameters and default values that determine how the server boots (see [“View All OpenBoot Parameters” on page 55](#)):

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

---

These resources provide 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](#)  
1/13

---

**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 43](#)
- [“Boot the OS Manually \(OpenBoot\)” on page 44](#)

## ▼ 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 27](#).
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 44](#).

---

### Related Information

- [“Boot the OS Manually \(OpenBoot\)” on page 44](#)
- [“Boot Sequence” on page 42](#)

## ▼ 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 46](#).

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 55](#).

### Related Information

- [“Boot the OS \(Oracle ILOM\)” on page 43](#)
- [“Boot Sequence” on page 42](#)

## ▼ 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 as a user with root privileges.**
2. **Shut down the OS.**

---

**Note** - This document applies to several server products. The following example is based on the SPARC T7-1 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 T7-1, No Keyboard
...
{0} ok
```

### Related Information

- [“Shut Down the OS \(shutdown Command\)” on page 45](#)

## ▼ 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 as a user with root privileges.**
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 T7-1 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 T7-1, No Keyboard
...
{0} ok
```

### Related Information

- [“Shut Down the OS \(init Command\)” on page 44](#)

## Obtaining the OpenBoot Prompt

There are several ways to reach the OpenBoot prompt (ok).

---

**Note** - If you have any problems reaching the OpenBoot Prompt by your chosen method, see [“Accessing the OpenBoot CLI and Getting Help” in \*Oracle OpenBoot 4.x Administration Guide\*](#).

---

- [“OpenBoot Prompt” on page 46](#)
- [“Obtain the OpenBoot Prompt \(Oracle Solaris\)” on page 47](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM CLI\)” on page 48](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM Web Interface\)” on page 49](#)

### Related Information

- [“Log In to Oracle ILOM” on page 27](#)
- [“Booting and Shutting Down Oracle Solaris” on page 41](#)

## OpenBoot Prompt

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.	<a href="#">“Boot the OS Manually (OpenBoot)” on page 44</a>

---

Task	For More Information
Configure OpenBoot parameters.	<a href="#">“View All OpenBoot Parameters” on page 55</a> <a href="#">“Change the Default Boot Device (OpenBoot)” on page 52</a>
Run diagnostics.	Refer to the service manual for your server, Detecting and Managing Faults.
Reset and power off the host.	At the OpenBoot prompt, type <b>help reset</b> to display details about the reset command.
Eject media.	At the OpenBoot prompt, type <b>help eject</b> to display details about the eject command.

For more details about OpenBoot, refer to the [Oracle OpenBoot 4.x Administration Guide](#).

### Related Information

- [“Obtain the OpenBoot Prompt \(Oracle Solaris\)” on page 47](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM CLI\)” on page 48](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM Web Interface\)” on page 49](#)

## ▼ Obtain the OpenBoot Prompt (Oracle Solaris)

Use this procedure when you want to shut down the OS and reach the ok prompt.

1. **Log in to Oracle Solaris as a user with root privileges.**
2. **Shut down the OS.**

```
# shutdown -g0 -i0 -y
```

```
Shutdown started.    Wed Sep 19 15:17:45 PDT 2012
```

```
Changing to init state 0 - please wait
Broadcast Message from root (console) on systemA.com Wed Sep 19 15:17:45...
THE SYSTEM systemA.com IS BEING SHUT DOWN NOW !!!
Log off now or risk your files being damaged
```

```
root@systemA:~# svc.startd: The system is coming down. Please wait.
svc.startd: 126 system services are now being stopped.
Sep 19 15:18:01 systemA.com syslogd: going down on signal 15
svc.startd: Killing user processes.
Sep 19 15:18:07 The system is down.  Shutdown took 22 seconds.
```

```
syncing file systems... done
Program terminated
...
{0} ok
```

The OS is shut down and the OpenBoot prompt (ok) is displayed.

### Related Information

- [“OpenBoot Overview” on page 19](#)
- [“Configuring Boot and Restart Behavior” on page 51](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM CLI\)” on page 48](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM Web Interface\)” on page 49](#)
- [“Accessing the OpenBoot CLI and Getting Help” in \*Oracle OpenBoot 4.x Administration Guide\*](#)

## ▼ Obtain the OpenBoot Prompt (Oracle ILOM CLI)

Use this procedure when the host is powered down and you are logged into Oracle ILOM.

### 1. Log in to Oracle ILOM.

See [“Log In to Oracle ILOM” on page 27](#).

### 2. Change the auto-boot? parameter to false.

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

This command temporarily prevents the OS from booting before you obtain the OpenBoot prompt. This change applies only to a single reset.

### 3. Reset the host.

```
-> reset /System
```

### 4. Switch communication to the host.

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

The server might take several minutes to complete POST and then displays the OpenBoot prompt.



### Related Information

- [“OpenBoot Overview” on page 19](#)
- [“Configuring Boot and Restart Behavior” on page 51](#)
- [“Obtain the OpenBoot Prompt \(Oracle Solaris\)” on page 47](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM Web Interface\)” on page 49](#)

## ▼ Obtain the OpenBoot Prompt (Oracle ILOM Web Interface)

Use this procedure when the host is powered down, and you want to get to the ok prompt when the host is powered on.

1. **Log in to Oracle ILOM.**  
See [“Log In to Oracle ILOM” on page 27](#).
  2. **In the Oracle ILOM web interface, in the left navigation pane, select Host Management → Host Boot Mode.**  
The Host Boot Mode page is displayed.
  3. **Apply these changes to the Host Boot Mode Settings:**
    - a. **For State, select: Reset NVRAM**  
This setting applies a one-time NVRAM (OpenBoot) change based on the script setting, then resets the NVRAM to default settings on the next host reset.
    - b. **For Script, type: `setenv auto-boot? false`**  
This setting configures the host to stop at the OpenBoot prompt instead of automatically booting the preinstalled OS.
    - c. **Click Save.**
- 
- Note** - You have 10 minutes to perform the next step. After 10 minutes, the state automatically returns to normal.
- 
4. **In the left navigation panel, click Host Management → Power Control.**
  5. **Select Reset from the pull-down menu, and click Save.**

**6. In the left navigation panel, click Remote Control → Redirection.**

**7. Select Use Serial Redirection, and click Launch Remote Console.**

As the host resets, messages are displayed in the serial console. The OpenBoot prompt is displayed when the reset activity completes.

### **Related Information**

- [“OpenBoot Overview” on page 19](#)
- [“Configuring Boot and Restart Behavior” on page 51](#)
- [“Obtain the OpenBoot Prompt \(Oracle Solaris\)” on page 47](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM CLI\)” on page 48](#)

# 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 51](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 58](#)
- [“Configure the Host Boot Mode \(Oracle VM Server for SPARC\)” on page 58](#)
- [“Change the Host Boot Mode Behavior at Reset \(Oracle ILOM\)” on page 59](#)
- [“Manage the Host Boot Mode Script \(Oracle ILOM\)” on page 60](#)
- [“Display the Host Boot Mode Expiration Date \(Oracle ILOM\)” on page 61](#)
- [“Override OpenBoot Settings to Reset the Server” on page 61](#)
- [“Server Restart Behavior Configuration \(Oracle ILOM\)” on page 62](#)

## Related Information

- [“Booting and Shutting Down the OS” on page 41](#)

## 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 52](#)
- [“Enable or Disable Automatic Booting \(OpenBoot\)” on page 53](#)

- [“Enable or Disable Automatic Booting \(Oracle Solaris\)” on page 54](#)
- [“View All OpenBoot Parameters” on page 55](#)
- [“OpenBoot Configuration Parameters” on page 55](#)
- [“printenv Output” on page 56](#)

### Related Information

- [“Booting and Shutting Down the OS” on page 41](#)

## ▼ 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 one of these tasks:

- [“Obtain the OpenBoot Prompt \(Oracle Solaris\)” on page 47](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM Web Interface\)” on page 49](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM CLI\)” on page 48](#)

### 2. Determine the name of the desired boot device.

To see names of devices, type:

```
ok devalias
```

### 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.

### 4. Verify the change.

```
ok printenv boot-device
```

### 5. Reset the host.

```
ok reset-all
```

## Related Information

- [“printenv Output” on page 56](#)

## ▼ 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 one of these tasks:

- [“Obtain the OpenBoot Prompt \(Oracle Solaris\)” on page 47](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM Web Interface\)” on page 49](#)
- [“Obtain the OpenBoot Prompt \(Oracle ILOM CLI\)” on page 48](#)

### 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 56](#)
- [“Enable or Disable Automatic Booting \(Oracle Solaris\)” on page 54](#)

## ▼ 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 `eeeprom` 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:

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

3. **Verify the change.**

```
# eeeprom 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 53](#)

## ▼ 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 55](#)
- [“printenv Output” on page 56](#)

## OpenBoot Configuration Parameters

Parameter	Default Value	Description
auto-boot-on-error?	false	Controls whether or not the host attempts to boot after POST detects a nonrecoverable error.

Parameter	Default Value	Description
auto-boot?	true	<ul style="list-style-type: none"> <li>■ false – Host does not attempt to boot and stops at the ok prompt.</li> <li>■ true – Host automatically attempts to boot.</li> </ul> Controls whether or not the host automatically boots after a system reset or when the power is turned on.
boot-command	boot	<ul style="list-style-type: none"> <li>■ true – Host automatically attempts to boot from the devices specified in boot-device.</li> <li>■ false – Host does not attempt to boot and stops at the ok prompt.</li> </ul> Specifies the command to be executed when auto-boot? is true. Valid boot commands: <ul style="list-style-type: none"> <li>■ boot – Boots kernel from devices specified in boot-device.</li> <li>■ boot net – Boots kernel from the network.</li> <li>■ boot cdrom – Boots kernel from the CD-ROM.</li> <li>■ boot disk1:h – Boots from disk 1 partition h.</li> <li>■ boot tape – Boots default file from tape.</li> <li>■ boot device-path – Boots from the device specified as device-path. See <a href="#">“Locate Device Paths (OpenBoot)” on page 80</a>.</li> </ul>
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 true, 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 eeprom(1M) man page for details.

## Related Information

- [“printenv Output” on page 56](#)

## 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 55](#)

## 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 39](#)
- [“Reset the Server \(Oracle ILOM\)” on page 39](#)
- [“OpenBoot Overview” on page 19](#)
- [“Oracle VM Server for SPARC Overview” on page 20](#)

## ▼ 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 27](#).
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 39](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 58](#)
- [“Oracle VM Server for SPARC Overview” on page 20](#)

## ▼ 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:

`normal`                      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 61.](#)) 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 39](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 58](#)
- [“Oracle VM Server for SPARC Overview” on page 20](#)

## ▼ 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. Note that `script` does not affect the current `/HOST/bootmode` setting.

`value` can be up to 64 bytes in length.

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

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

After the server resets and OpenBoot reads the value of the `state` property, all OpenBoot variables are set to the default values. Then OpenBoot reads the value of the `script` property and 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 39](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 58](#)
- [“Oracle VM Server for SPARC Overview” on page 20](#)

## ▼ 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 39](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 58](#)
- [“Oracle VM Server for SPARC Overview” on page 20](#)

## ▼ 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 59](#)
- [“Configuring Boot and Restart Behavior” on page 51](#)
- [“Boot Mode Overview \(Oracle ILOM\)” on page 58](#)
- [“Oracle VM Server for SPARC Overview” on page 20](#)

## 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 about these options, refer to the section on setting boot behavior on a SPARC server in the *Configuration and Maintenance Guide* for your Oracle ILOM release.

### Related Information

- [“Resetting the Server and SP” on page 38](#)

# 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 63](#)
- [“Change Server Identifier Information” on page 64](#)

## Related Information

- [“Turn On the Locator LED” on page 97](#)

## ▼ 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 27](#)
- [“Change Server Identifier Information” on page 64](#)

## ▼ 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 27](#)
- [“Change Customer Data on FRU PROMs” on page 63](#)



# Configuring Policy Settings

---

These topics describe managing configuration policies using Oracle ILOM.

- [“Specify Cooldown Mode” on page 65](#)
- [“Restore the Host Power State at Restart” on page 66](#)
- [“Specify the Host Power State at Restart” on page 67](#)
- [“Disable or Enable the Host Power-On Delay” on page 67](#)
- [“Specify Parallel Boot of the SP and Host” on page 68](#)
- [“Specify Host Virtual Keyswitch Behavior” on page 68](#)
- [“Reset the Values in the SP to Default Values” on page 69](#)

## Related Information

- [“Configuring Boot and Restart Behavior” on page 51](#)

## ▼ 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 36](#)
- [“Power Off the Server \(Oracle ILOM CLI\)” on page 34](#)

## ▼ 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 67](#).

### Related Information

- [“Disable or Enable the Host Power-On Delay” on page 67](#)

- [“Specify the Host Power State at Restart” on page 67](#)

## ▼ 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 66](#)
- [“Disable or Enable the Host Power-On Delay” on page 67](#)

## ▼ 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 67](#)

## ▼ 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 35](#)
- [“Power On the Server \(Oracle ILOM CLI\)” on page 34](#)
- [“Power Off the Server \(Oracle ILOM Web Interface\)” on page 36](#)
- [“Power Off the Server \(Oracle ILOM CLI\)” on page 34](#)

## ▼ 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 35](#)
- [“Power On the Server \(Oracle ILOM CLI\)” on page 34](#)
- [“Power Off the Server \(Oracle ILOM Web Interface\)” on page 36](#)
- [“Power Off the Server \(Oracle ILOM CLI\)” on page 34](#)

## ▼ 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 27](#).

### 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 and restart the host to complete the setting change.

```
-> stop /System
```

-> `reset /SP`

### **Related Information**

- [“Power Off the Server \(Oracle ILOM CLI\)” on page 34](#)

# Configuring SP and Host Network Addresses

---

These topics describe managing network addresses with Oracle ILOM.

- [“SP Network Address Options” on page 71](#)
- [“Disable or Enable Network Access to the SP” on page 72](#)
- [“Display the SP Network Parameters” on page 72](#)
- [“Display the Host MAC Address” on page 73](#)
- [“Connecting to the SP \(In-Band\)” on page 74](#)

## Related Information

- [“Matching Devices to Device Names” on page 77](#)

## 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 74](#).

### Related Information

- [Oracle ILOM Documentation \(http://www.oracle.com/goto/iloem/docs\)](http://www.oracle.com/goto/iloem/docs)
- “Oracle ILOM Overview” on page 13
- “Log In to Oracle ILOM” on page 27

## ▼ 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 27
- “SP Network Address Options” on page 71

## ▼ 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 27](#)
- [“Display the Host MAC Address” on page 73](#)

## ▼ 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 27](#)
- [“Display the SP Network Parameters” on page 72](#)

## 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 74](#)
- [“Configure SP In-Band \(Sideband\) Access” on page 75](#)

### Related Information

- [“Accessing the Server” on page 27](#)

## 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 one of the server's Gigabit Ethernet ports to send and receive Oracle ILOM commands to and from the server SP. These in-band ports, also called sideband ports, are named NET 0, NET 1, NET 2, and NET 3.

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 75](#)

- [“SP Network Address Options” on page 71](#)

## ▼ 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.

**1. Connect to Oracle ILOM through the SER MGT port.**

Refer to the installation guide for your server to connect to the SER MGT port.

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

See [“Log In to Oracle ILOM” on page 27](#).

**3. If you logged in using the serial port, assign a static IP address to the SP.**

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

**4. View the current network settings.**

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

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

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

MGMT indicates the NET MGT port is the current port for the SP.

**5. Set the SP management port to a sideband port.**

Specify a sideband port that has an active LAN connection.

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

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

**6. Commit the network configuration change.**

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

**7. 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 74](#)
- [“SP Network Address Options” on page 71](#)

## 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 77](#)
- [“WWN Syntax” on page 78](#)
- [“Display Server Components \(Oracle ILOM\)” on page 78](#)
- [“Locate Device Paths \(OpenBoot\)” on page 80](#)
- [“probe-scsi-all Device Naming \(OpenBoot\)” on page 81](#)
- [“Correlate WWN Device Names With Physical Locations \(probe-scsi-all Command\)” on page 82](#)

### Related Information

- [“Configuring SP and Host Network Addresses” on page 71](#)
- [“Configuring Hardware RAID” on page 85](#)

## 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 78](#)

## 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 `cmtWWNd $n$`  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 81](#)

## ▼ 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:**

**Note** - This document applies to several server products. The following example is based on the SPARC T7-1 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/ | current_config_state | Enabled
BOB01          |                    |
/SYS/MB/CM/CMP/ | current_config_state | Enabled
BOB01/CH0     |                    |
...
/SYS/MB/IOH    | current_config_state | Enabled
/SYS/MB/IOH/   | current_config_state | Enabled
ILINK0        |                    |
/SYS/MB/IOH/   | current_config_state | Enabled
ILINK1        |                    |
/SYS/MB/IOH/   | current_config_state | Enabled
ILINK2        |                    |
/SYS/MB/IOH/   | current_config_state | Enabled
ILINK3        |                    |
/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 80](#)

## ▼ Locate Device Paths (OpenBoot)

1. **Display the OpenBoot prompt.**  
See [“Obtaining the OpenBoot Prompt” on page 46.](#)
2. **From the OpenBoot prompt, type:**

---

**Note** - This document applies to several server products. The following example is based on the SPARC T7-1 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

- [“Obtaining the OpenBoot Prompt” on page 46](#)
- [“Prepare to Create a RAID Hardware Volume \(FCode-based RAID Utility\)” on page 89](#)



## 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 78](#)

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

### 1. At the OpenBoot prompt, type:

```
ok probe-scsi-all
/pci@400/pci@1/pci@0/pci@LSI,sas@0
FCode Version 1.00.54, MPT Version 2.00, Firmware Version 5.00.17.00

Target 9
Unit 0 Disk SEAGATE ST9300003SSUN3006 0B70 585937500 Blocks, 300 GB
SASDeviceName 5000c50033438dbb SASAddress 5000c50033438db9 PhyNum 0
Target b
Unit 0 Dusb SEAGATE ST9300003SSUN300G 0468 585937500 Blocks, 300 GB
SASDeviceName 5000c50005c15803 SASAddress 5000c50005c15801 PhyNum 1
Target c
Unit 0 Elcl Serv device SUN NEM Hydra II SOL 0308
SASAddress 5080020000bb193d PhyNum 24

/pci@400/pci@1/pci@0/pci@0/usb@0,2/hub@3/storage@2
Unit 0 Removable Read Only device AMI Virtual CDROM 1.00
```

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

- LSI, sas@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 `cnWWNdn` 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.
- $tWWN = t5000c50033438dbb$   
 $WWN$  is the SASDeviceName value.
- $dn = d0$

$n$  is 0 for all embedded SCSI devices.

The completed logical device name is `c0t5000c50033438dbbd0`.

### **Related Information**

- [“probe-scsi-all Device Naming \(OpenBoot\)” on page 81](#)



# 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 85](#)
- [“Hardware RAID Guidelines” on page 87](#)
- [“FCCode-Based RAID Utility Commands” on page 88](#)
- [“Prepare to Create a RAID Hardware Volume \(FCCode-based RAID Utility\)” on page 89](#)
- [“Create a Hardware RAID Volume \(FCCode-based RAID Utility\)” on page 90](#)
- [“Hot-Spare Drives in RAID Volumes \(sas3ircu Utility\)” on page 91](#)
- [“Determining if a Drive Has Failed” on page 92](#)
- [“RAID Drive Replacement Strategies” on page 95](#)

## Related Information

- [“Matching Devices to Device Names” on page 77](#)

## 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 T7-1	One on-board SAS3 controller	0, 1, 1e, 10
SPARC T7-2	Two on-board SAS3 controllers	0, 1, 1e, 10

Server	Controller Description	Supported RAID Levels
SPARC T7-4	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. 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.

## sas3ircu Utility

You can use the SAS3 RAID Management Utility `sas3ircu` at the Oracle Solaris command prompt to manage RAID functionality for the on-board SAS3 controllers. The `sas3ircu` utility can configure RAID 0, RAID 1, RAID 1e, and RAID 10.

---

**Note** - When you specify RAID 1e, the `sas3ircu` utility requires an odd number of target drives with a minimum of three. When you specify RAID 10, the utility requires an even number of target drives with a minimum of four.

---

The `sas3ircu` utility for Oracle servers and its user documentation were developed by LSI, which later became Avago Technologies/Broadcom. Download the utility and documentation from the Broadcom website at:

<https://www.broadcom.com/support/oem/oracle/sparc-t/sparc-t7-series>



---

**Caution** - When you update firmware for the on-board SAS controllers, you *must* acquire the firmware from [Oracle's support site \(https://support.oracle.com\)](https://support.oracle.com). Firmware for the SAS controllers that is obtained from any other location or vendor is not supported.

---

## 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 volumes and manage existing RAID volumes with Oracle Enterprise Manager Ops Center. If you reconfigure an existing RAID volume with Oracle Enterprise Manager Ops Center, the contents of the disks in the original RAID volume will be lost.

For more about Oracle Enterprise Manager Ops Center, see [“Oracle Enterprise Manager Ops Center Overview” on page 23](#).

### Related Information

- [“Create a Hardware RAID Volume \(FCode-based RAID Utility\)” on page 90](#)
- [“Prepare to Create a RAID Hardware Volume \(FCode-based RAID Utility\)” on page 89](#)
- [“Oracle Hardware Management Pack Overview” on page 22](#)
- [“Oracle Enterprise Manager Ops Center Overview” on page 23](#)

## 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 101](#)

## 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 89](#).

FCode Command	Description
show-children	Lists all connected physical drives and logical volumes.
show-volumes	Lists all connected logical volumes in detail.
create-raid0-volume	Creates a RAID 0 volume (minimum two targets).
create-raid1-volume	Creates a RAID 1 volume (exactly two targets).
create-raid1e-volume	Creates a RAID 1e volume for an odd number of target drives (minimum three). <b>Note</b> - 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 90](#)
- [“Prepare to Create a RAID Hardware Volume \(FCode-based RAID Utility\)” on page 89](#)



- [“Obtaining the OpenBoot Prompt” on page 46](#)

## ▼ 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 46](#).

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 T7-1:

```
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 80](#).

---

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 90](#).

#### Related Information

- [“Obtaining the OpenBoot Prompt” on page 46](#)
- [“FCode-Based RAID Utility Commands” on page 88](#)
- [“Locate Device Paths \(OpenBoot\)” on page 80](#)

## ▼ 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 89](#). 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**

- [“FCCode-Based RAID Utility Commands” on page 88](#)
- [“Obtaining the OpenBoot Prompt” on page 46](#)

## Hot-Spare Drives in RAID Volumes (sas3ircu Utility)

You can configure two global hot-spare drives to protect data on mirrored RAID volumes. If one of the drives in a RAID 1, RAID 1e, or RAID 10 mirrored volume fails, the on-board

RAID controller will replace the failed drive automatically with a hot-spare drive and then resynchronize the mirrored data.

Use the `sas3ircu` utility to add global hot spare drives. For instructions, see the *12Gb/s SAS Integrated RAID Configuration Utility User Guide* available from <https://www.broadcom.com/support/oem/oracle/sparc-t/sparc-t7-series>.

You can also use the `raidconfig` utility included in the Oracle Hardware Management Pack to create hot-spare drives.

### Related Information

- “Hardware RAID Support” on page 85
- “Oracle Hardware Management Pack Overview” on page 22

## 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 LEDs” on page 92
- “Locate Error Messages Related to Drives in a RAID Volume” on page 93
- “Display Status (FCODE-Based RAID Utility)” on page 93
- “Display Status (`sas3ircu` Utility)” on page 94

### Related Information

- “Monitoring the Server” on page 97

## Service Required Drive LEDs

When a fault occurs on a drive in a server, the amber Service Required LED lights on the front of the drive. This amber LED enables you to locate the faulted drive in the system. Additionally, the front and rear panel Service Action Required LEDs 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 LEDs.

**Related Information**

- [“Turn On the Locator LED” on page 97](#)

## ▼ 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 97](#)
- [“Determining if a Drive Has Failed” on page 92](#)

## ▼ 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 46.

**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 89 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 80
- “Determining if a Drive Has Failed” on page 92

▼ **Display Status (sas3ircu Utility)**

● **Use the sas3ircu utility to display the status of the RAID volume and its associated drives.**

For information about displaying and interpreting device status using the sas3ircu utility, see the *12Gb/s SAS Integrated RAID Configuration Utility User Guide* available from <https://www.broadcom.com/support/oem/oracle/sparc-t/sparc-t7-series>.

**Related Information**

- [“Locate Device Paths \(OpenBoot\)” on page 80](#)
- [“Determining if a Drive Has Failed” on page 92](#)

## 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 90](#)) 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 92](#)





## Monitoring the Server

---

The servers provide many ways to monitor system activity and faulty behavior, including LEDs, Oracle ILOM, and POST. Log files, including system console activity, are maintained by Oracle Solaris and Oracle ILOM. For specific information about LEDs, fault reports, and log files, refer to the topics for 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 23](#).

---

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

- [“Turn On the Locator LED” on page 97](#)
- [“Turn Off the Locator LED” on page 98](#)
- [“Display the Locator LED State of the Server” on page 98](#)

### Related Information

- Detecting and Managing Faults, in the service manual for your server
- [“Matching Devices to Device Names” on page 77](#)

## ▼ Turn On the Locator LED

When a server must be serviced, lighting the system locator LED 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 Locator LED by physically pressing the Locator button on the server.

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

See [“Log In to Oracle ILOM” on page 27](#).

**2. Illuminate the Locator LED.**

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

**Related Information**

- [“Turn Off the Locator LED” on page 98](#)
- [“Display the Locator LED State of the Server” on page 98](#)

## ▼ Turn Off the Locator LED

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

You can also turn off the Locator LED by physically pressing the Locator button on the server.

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

See [“Log In to Oracle ILOM” on page 27](#).

**2. Turn off the Locator LED.**

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

**Related Information**

- [“Turn On the Locator LED” on page 97](#)
- [“Display the Locator LED State of the Server” on page 98](#)

## ▼ Display the Locator LED 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 27](#).

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

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

### **Related Information**

- [“Turn On the Locator LED” on page 97](#)
- [“Turn Off the Locator LED” on page 98](#)



# Updating the System Firmware

---

These topics describe how to update the system firmware and view current versions of firmware for Oracle's SPARC T7 series servers.

- [“Display the System Firmware Versions” on page 101](#)
- [“Update the System Firmware” on page 102](#)

## 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.

---

**Note** - You also can determine the versions of firmware in the server and of specific components, such as a drive controller, with the `fwupdate` command. The `fwupdate` command is provided in the Oracle Hardware Management Pack, which is included in Oracle Solaris 11.3. For information about using `fwupdate`, refer to the [Oracle Server CLI Tools for Oracle Solaris 11.3 User's Guide](#).

---

- 1. Display the current host property values.**

```
-> show /HOST
```

Refer to the *Oracle ILOM Administrator's Guide for Configuration and Maintenance* for more information about the `show /HOST` command.

- 2. Examine the output to find the version listed for the system firmware or firmware component you wanted.**

### Related Information

- [“Update the System Firmware” on page 102](#)

## ▼ Update the System Firmware

The Live Firmware update feature of the SPARC M7, T7, and S7 series servers supports updating Sun System firmware while the SPARC host is powered on. The 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.

---

**Note** - For SPARC T7 servers the Live Firmware Update feature requires a minimum Sun System Firmware version of 9.5.2.g.

---

1. **Check the current system firmware version. From the Oracle ILOM command prompt, type:**

```
-> show /HOST
```

2. **Download the latest available system firmware version from My Oracle Support at:**

<https://support.oracle.com>

Then place the SysFW image in a shared location the host can access, for example, a local or network share or on a TFTP, FTP, HTTP or HTTPS server.

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 the *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x*.

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

See [“Log In to Oracle ILOM” on page 27](#).

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

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

A series of prompts display.

- c. **Type `y` to load the image file, then type `y` to enable the Preserve Configuration option, 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 system will reboot to apply the new firmware image.**

#### Related Information

- [“Display the System Firmware Versions” on page 101](#)

## ▼ Update the SP Firmware from the Host

To update SP firmware from the host, use the `fwupdate` utility, included in Oracle Solaris 11.3 as part of the Oracle Hardware Management Pack (OHMP).

---

**Note** - Starting with Oracle SPARC T7-series servers, the `sysfwdownload` utility no longer ships with SP firmware releases, and is no longer supported.

---

For more information on using the `fwupdate` utility, refer to ["Using fwupdate to Update Firmware" in the Oracle Server CLI Tools for Oracle Solaris 11.3 User Guide](#)

- **After obtaining a desired SP firmware package, update the SP from the HOST:**

```
# fwupdate update sysfw-firmware -n sp -f firmware-package-file.pkg
```

where *firmware-package-file.pkg* is the path to the firmware package for your server's SP.





# 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](#).

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

## O

<b>OBP</b>	OpenBoot PROM. Sometimes OBP is used in file names and messages to indicate a relationship to OpenBoot.
<b>Oracle ILOM</b>	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.
<b>Oracle Solaris OS</b>	Oracle Solaris operating system.
<b>Oracle VM Server for SPARC</b>	Virtualization server for SPARC platforms.

## P

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

## S

<b>SAS</b>	Serial attached SCSI.
------------	-----------------------

<b>SCC</b>	System configuration chip.
<b>SCC PROM</b>	System configuration chip on programmable read-only memory. Removable module containing system configuration data.
<b>SDM name</b>	Simplified data model name. A way of providing device information on Oracle ILOM consistently across different types of servers. See <a href="#">NAC name</a> .
<b>SER MGT port</b>	Serial management port. A serial port on the server SP.
<b>SP</b>	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 <a href="#">host</a> .
<b>SPM</b>	Service processor module. This is the physical component that contains the service processor firmware.
<b>SSD</b>	Solid-state drive.
<b>SSH</b>	Secure shell.
 <b>U</b>	
<b>UI</b>	User interface.
<b>UUID</b>	Universal unique identifier.
 <b>W</b>	
<b>WWN</b>	World wide name. A unique number that identifies a SAS target.

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