

Oracle® X7 Series Servers Administration Guide

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Using This Documentation

- **Overview** – Describes how to use the single-server management tools for Oracle X7 Series servers
- **Audience** – Technicians, system administrators, and authorized service providers
- **Required knowledge** – Experience configuring and administering servers

Product Documentation Library

Documentation and resources for this product and related products are available at: <http://docs.oracle.com/en/servers/x86.html>

Feedback

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

Overview of System Administration Tools

This section describes the tools used to manage Oracle servers.

Task	Link
Review brief descriptions of the tools available to manage a single server.	“Single-System Management Tools” on page 13
Review brief descriptions of the tools available to manage multiple servers.	“Multiple-System Management Tools” on page 15
Read about the tasks you can perform with each tool and where you can find documentation.	“Oracle Integrated Lights Out Manager (ILOM)” on page 16 “Oracle Hardware Management Pack” on page 17 “BIOS Setup Utility” on page 19

Single-System Management Tools

The following table describes Oracle's single-system management tools, and provides links to an overview of each.

For an overview of multiple-system management tools, see [“Multiple-System Management Tools” on page 15](#).

Tool	Description	Function
“Oracle Integrated Lights Out Manager (ILOM)” on page 16	Preinstalled service processor (SP) with integrated firmware. No installation required. Some initial configuration is required. Operates independently of the host. Provides a web interface and a command-line interface (CLI).	Configure and manage server components locally or remotely. Connect to a dedicated network port, a sideband port, or a local serial port.

Tool	Description	Function
“Oracle Hardware Management Pack” on page 17	Provides commands and agents that operate at the operating system level, and can be used across multiple systems. Is included as part of the Oracle Solaris OS starting with Oracle Solaris 11.2, or available as a standalone product for other supported operating systems. Refer to the support matrix for specific information: http://www.oracle.com/goto/ohmp	Monitor hardware through the host operating system, either remotely using SNMP or locally using command-line interface tools.
“BIOS Setup Utility” on page 19	Graphical setup utility included with the BIOS firmware. Accessed by booting the system and interrupting the boot process.	View system information and configure boot-related properties.

Each system management tool has unique capabilities, but some of the functions of the tools overlap. The following table lists common system management tasks and the tools you can use to perform each task.

Task	Oracle ILOM	Oracle Hardware Management Pack	BIOS Setup Utility	Documentation
Power the server on and off remotely.	✓			“Controlling the Server Power State” on page 41
Configure the service processor.	✓	✓		“Configuring Oracle ILOM” on page 59
Configure RAID.		✓		Refer to the hardware installation guide for your server.
Download software and firmware.	✓	✓		“Getting Firmware and Software” on page 103
See how much power the server is consuming at any given time.	✓			“Monitor Server Power Consumption and Component Temperatures” on page 81
Monitor hardware components.	✓	✓		“Monitoring Server Inventory and Health” on page 71
Update BIOS or Oracle ILOM firmware.	✓	✓		“Getting Firmware and Software” on page 103
Update HBA and expander firmware.		✓		“Getting Firmware and Software” on page 103

Task	Oracle ILOM	Oracle Hardware Management Pack	BIOS Setup Utility	Documentation
Reset the server BIOS or Oracle ILOM to default values.	✓	✓	✓	“Resetting the Firmware to Default Settings” on page 98
Modify and configure boot properties	✓		✓	“Viewing and Modifying Boot Properties” on page 47

Related Information

- [“Accessing and Using System Administration Tools” on page 21](#)

Multiple-System Management Tools

To perform system management functions across *multiple* systems simultaneously, consider using Oracle Enterprise Manager Ops Center. Oracle Enterprise Manager Ops Center might be included with your server as part of a server support contract. You can also order Oracle Enterprise Manager Ops Center software from Oracle.

Oracle Enterprise Manager Ops Center is a highly scalable, unified management platform for physical and virtual environments. Use Oracle Enterprise Manager Ops Center to manage multiplatform x86 and SPARC systems that are distributed throughout a global data center and to integrate Oracle systems with existing tool sets. Oracle Enterprise Manager Ops Center facilitates many aspects of compliance reporting (ITIL) and data center automation, enabling you to manage thousands of systems simultaneously.

Refer to the Oracle Enterprise Manager Ops Center product information at: <http://www.oracle.com/technetwork/oem/ops-center/index.html>

Related Information

- [“Single-System Management Tools” on page 13](#)

Oracle Integrated Lights Out Manager (ILOM)

Oracle Integrated Lights Out Manager (ILOM) is system management firmware that is embedded on the server service processor (SP). Using Oracle ILOM, you can monitor the server health and performance and configure server settings independently of the operating system.

Oracle ILOM provides local or remote access through a serial management port and a network management port. By default, these ports offer a dedicated connection to Oracle ILOM. Any time power is applied to the server, you can log in to Oracle ILOM from a local terminal device or from a web browser or secure shell (SSH) session on a remote system. To access Oracle ILOM, see [“Accessing Oracle ILOM” on page 21](#).

Oracle ILOM provides a web interface and a command-line interface (CLI).

For more information about the firmware, see the following sections:

- [“Oracle ILOM Tasks” on page 16](#)
- [“Oracle ILOM Documentation” on page 17](#)

Oracle ILOM Tasks

The following table lists many of the tasks you can perform using the Oracle ILOM web or command-line interface.

Web Navigation	CLI Hierarchy	Description
System Information	/System	Review information about the server, including the serial number and BIOS version. View the overall health of the server and see a total problem count, or view subcomponent health and inventory details.
Remote Control	/HOST/console	Configure and launch a remote console session. Redirect storage devices.
Host Management	/HOST/diag /HOST boot_device	Run diagnostics on the server. Set the next boot device or control the server power state.
System Management	/System/BIOS /System/BIOS/Config /SP/policy	View BIOS settings. Backup or restore a BIOS configuration. Configure system policies such as the Enhanced PCIe Cooling Mode policy.
Power Management	/SP/powermgmt	View actual system power consumption.

Web Navigation	CLI Hierarchy	Description
		View system power requirements for capacity planning. View historical power usage data.
ILOM Administration	/SP/system_identifier /SP/logs /SP/clients /SP/users /SP/network /SP/network/ipv6 /SP/config /SP/alertmgmt /SP/clock	Configure system identification information. View system event and audit logs. Configure remote management access to the server; configure Oracle ILOM user accounts. Configure service processor connectivity settings. Back up or restore a service processor configuration. Reset the service processor to default settings. Configure alert notifications for system events and faults. Set the service processor clock. Reset the service processor. Take a snapshot of the service processor for troubleshooting purposes.

Oracle ILOM Documentation

Both the Oracle ILOM web interface and command-line interface feature an embedded help system.

- To access help from the web interface, click the More Details link on any page in the web interface.
- To access help in the command-line interface, type `help` followed by the path to the target or property for which you are requesting more details. For example, to view more information about the `/System` hierarchy, type `help /System`.

Oracle ILOM features are also described in the Oracle ILOM 4.0 Documentation Library at <http://www.oracle.com/goto/ilom/docs>.

Oracle Hardware Management Pack

Oracle Hardware Management Pack is a family of command-line interface tools and an SNMP monitoring agent that you can use to monitor and manage your server at the operating system level.

You can choose to install all or some of the following Oracle Hardware Management Pack components:

- **Oracle Server CLI Tools:** The Oracle Server CLI Tools enable you to configure server settings and retrieve information about the server hardware from the service processor. For a detailed description of Oracle Server CLI Tools, see [“Oracle Hardware Management Pack Utilities” on page 18](#).
- **Oracle Server Hardware Management Agent:** The Hardware Management Agent fetches and pushes information to and from Oracle ILOM.
- **Oracle Server Hardware SNMP Plugins:** You can use the SNMP plugins to monitor the server from the operating system using an industry-standard SNMP interface.
- **itpconfig:** The itpconfig tool enables you to configure a trap proxy to send traps between Oracle ILOM and the host server over the Host-to-ILOM Interconnect.

Oracle Hardware Management Pack allows you to enter commands from the operating system command-line application. This guide details some of the tasks you can perform using the Oracle Server CLI Tools included in Oracle Hardware Management Pack. For information about other components mentioned in this section, refer to the Oracle Hardware Management Pack Documentation Library at <http://www.oracle.com/goto/ohmp/docs>. To download and install Oracle Hardware Management Pack, see [“Accessing Oracle Hardware Management Pack” on page 32](#).

For more information about the software, see the following sections:

- [“Oracle Hardware Management Pack Utilities” on page 18](#)
- [“Oracle Hardware Management Pack Documentation” on page 19](#)

Oracle Hardware Management Pack Utilities

The following table lists and describes the Oracle Hardware Management Pack utilities. The utilities work with most supported operating systems. Additionally, utility commands can be scripted to support multiple servers, as long as the servers are of the same type.

Note - Oracle Hardware Management Pack includes components that are not included in this guide. Refer to the Oracle Hardware Management Pack documentation for more comprehensive information.

CLI Tool	Description
ubiosconfig	Preserve BIOS settings and some service processor settings.

CLI Tool	Description
fwupdate	Update Oracle ILOM and BIOS; or query, update, and validate firmware versions on supported SAS storage devices, embedded SAS storage controllers, SAS storage expanders, storage drives, InfiniBand controllers, and Fibre Channel controllers.
raidconfig	View or create RAID volumes on storage drives that are attached to RAID controllers.
ilomconfig	Restore, set, and view Oracle ILOM settings, such as network management, clock configuration, and user management settings.
hwtmgmtcli	Monitor system health.
ipmitool	After loading the requisite driver, use Oracle Hardware Management Pack to read sensor data repository (SDR) data and display other information about the server. You can also get and set LAN configuration parameters and perform chassis power control operations.
nvmeadm	Manage NVM Express (NVMe) devices. This includes viewing information about and updating NVMe controller and flash device configuration.
itpconfig	Configure Oracle ILOM to forward SNMP traps to the host or a configurable destination.

Oracle Hardware Management Pack Documentation

For detailed installation and usage information about Oracle Hardware Management Pack, refer to the Oracle Hardware Management Pack Documentation Library at <http://www.oracle.com/goto/ohmp/docs>.

BIOS Setup Utility

The BIOS Setup Utility is part of the BIOS firmware embedded on the system. Using the BIOS Setup Utility, you can view server settings and configure system functions, such as the boot order.

You can launch the utility locally or remotely by interrupting the server boot process. To access the BIOS Setup Utility, see “[Accessing the BIOS Setup Utility](#)” on page 34.

For more information about the utility, see the following sections:

- “[BIOS Setup Utility Tasks](#)” on page 20
- “[BIOS Setup Utility Documentation](#)” on page 20

BIOS Setup Utility Tasks

The following table details the tasks you can perform using the BIOS Setup Utility.

Menu	Description
Main	View general information about the server, including the system date and time, and information about USB devices, the CPUs, and DIMMs.
Advanced	Define an Administrator password for entering the BIOS Setup Utility.
	View and configure processor and memory. Enable or disable Trusted Computing, serial port console redirection, NVMe and USB configuration, and primary video selection.
	The Advanced menu also provides access to a RAID configuration utility.
IO	Configure PCIe subsystem and I/O virtualization settings.
Boot	Configure the Boot Option Priority list.
Exit	Exit the BIOS Setup Utility after optionally saving your changes; or restore the BIOS Setup Utility optimized default settings.

BIOS Setup Utility Documentation

The BIOS Setup Utility features a help panel that describes each property in the utility. To view help for a given property, navigate to that property in the utility and review the help panel in the top right corner of the screen.

The BIOS menus are also detailed in the server service manual.

Accessing and Using System Administration Tools

This section provides instructions for accessing and using the system administration tools.

Task	Link
Set up a management connection to the server, and then launch and log in to Oracle ILOM.	“Accessing Oracle ILOM” on page 21
Download, install, and access Oracle Hardware Management Pack.	“Accessing Oracle Hardware Management Pack” on page 32
Access the BIOS Setup Utility and review BIOS key mappings for serial terminals.	“Accessing the BIOS Setup Utility” on page 34

Accessing Oracle ILOM

Oracle ILOM can be used to configure the system and to monitor the health of the system. It is firmware embedded on the service processor, and does not need to be installed. You can access Oracle ILOM any time the system is connected to power, whether the host is operational or not.

You can access Oracle ILOM locally or remotely using a web interface or a command-line interface (CLI). To get started, see the following sections:

- [“Oracle ILOM Management Connection Options” on page 22](#)
- [“Cable the Server to Connect to Oracle ILOM” on page 23](#)
- [“Launch and Log In to Oracle ILOM Through a Remote Ethernet Connection” on page 24](#)
- [“Launching Remote KVMs Redirection Sessions” on page 27](#)

Oracle ILOM Management Connection Options

Before you can access Oracle ILOM, you must cable the server for a remote network management connection or a local serial management connection. You have the following options for establishing a management connection to the server service processor.

Management Connection	Management Port	Description
Dedicated Network Management Connection	NET MGT	<p>The NET MGT port on the chassis is a dedicated in-band Ethernet port that securely segregates management traffic away from the host. By attaching an active LAN connection to the network management port (NET MGT), you can log in to Oracle ILOM through the web or through an SSH connection from a remote system on the network.</p> <p>To maintain the most reliable and secure environment for Oracle ILOM, the dedicated network management port on the server must always be connected to an internal trusted network or dedicated secure management/private network.</p>
Dedicated Local Management Connection	SER MGT	<p>The SER MGT port on the chassis provides a secure local serial connection to the Oracle ILOM command-line interface using a serial terminal or terminal emulator.</p> <p>This connection is particularly useful when a local console is the only way to access and diagnose system failures, or when you need to modify the preconfigured Oracle ILOM network properties prior to establishing a LAN connection.</p>
Shared Sideband Network Management Connection	NET0–NET3 Note - The number of ports varies depending on the server model.	<p>You can optionally connect to Oracle ILOM and manage the server remotely through one of the NET ports on the chassis by configuring a sideband management connection to Oracle ILOM. This eliminates the need to support two separate network connections for host and management traffic. However, this approach might: (1) potentially decrease the connection performance to Oracle ILOM, and (2) potentially create security risks if Oracle ILOM traffic is transmitted over an untrusted network.</p> <p>To configure Oracle ILOM to transmit management traffic through a sideband management connection, you must change the default management port value from MGMT to one of the data ports on the server, NETN where N is the port number (0 through 3) depending on how your server is equipped.</p>
Host-to-ILOM Interconnect	Internal	<p>A communication channel known as the Host-to-ILOM Interconnect enables communication between the host OS and Oracle ILOM without the use of the network management port. The Host-to-ILOM Interconnect is particularly useful when you want to perform these Oracle ILOM tasks locally:</p> <p>Note - The Host-to-ILOM Interconnect is also known as the <i>Dedicated Interconnect SP Management Connection</i>. Use this name when searching for it in the Oracle ILOM documentation.</p> <ul style="list-style-type: none"> ■ All server management functions in Oracle ILOM that you typically perform from the command line, web, or IPMI interfaces through the network management (NET MGT) connection on the server. ■ All data transfers, such as firmware upgrades, to Oracle ILOM that you typically perform from the host over a Keyboard Controller Style (KCS) interface using IPMI flash tools. For these types of server management environments, the Host-to-ILOM Interconnect can provide a more reliable and potentially faster data transfer rate than traditional KCS interfaces.

Management Connection	Management Port	Description
		<ul style="list-style-type: none"> ■ All future server monitoring and fault detection operations that you typically perform from the host operating system through the use of Oracle enabled software tools and agents installed on the server.

▼ Cable the Server to Connect to Oracle ILOM

1. **Determine the type of connection to Oracle ILOM that best suits your environment.**

For information about management connections to Oracle ILOM, see [“Oracle ILOM Management Connection Options” on page 22](#).

2. **To establish a dedicated network management connection to Oracle ILOM:**

- a. **Connect an Ethernet cable between the NET MGT port on the server and the network switch.**

DHCP and IPv6 stateless auto-configuration are enabled by default, allowing a DHCP server on the network to automatically assign network settings to the service processor (SP).

- b. **Determine the IP address assigned to the server SP.**

Establish a serial connection to Oracle ILOM, and then view the properties under the /network and /network/ipv6 hierarchies.

- c. **Type the IP address or host name into a browser address bar.**

The Oracle ILOM Login dialog box appears.

For further instructions, see [“Launch and Log In to Oracle ILOM Through a Remote Ethernet Connection” on page 24](#).

3. **To establish a dedicated local (serial) management connection to Oracle ILOM, perform the following steps:**

- a. **Connect a serial cable between the SER MGT port on the server and a terminal device.**

This connection provides your initial communication with the server service processor (SP). Configure the terminal device with the following settings: 9600 baud, 8 data bits, 1 stop bit, and no parity (9600/8-N-1).

b. To create a local connection to Oracle ILOM, press Enter.

The Oracle ILOM Login prompt appears. For further instructions, see [“Log In to Oracle ILOM Through a Dedicated Local \(Serial\) Management Connection”](#) on page 27.

4. **To establish a remote sideband management connection to Oracle ILOM, refer to Sideband Network Management Connection in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0*.**
5. **To enable the Host-to-ILOM interconnect refer to one of the following:**
 - Dedicated Interconnect SP Management Connection in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* in <http://www.oracle.com/goto/ilom/docs>.
 - Enabling the Host-to-ILOM Interconnect, *Oracle Hardware Management Pack Installation Guide* in <http://www.oracle.com/goto/ohmp/docs>.

▼ Launch and Log In to Oracle ILOM Through a Remote Ethernet Connection

Note - Oracle ILOM is shipped with a default administrator account and password that allows first-time login and access. The default account is root and the password is changeme. To build a secure environment and to enforce user authentication, you must change the default password for this account. If this default Administrator account has since been changed, contact your system administrator for an Oracle ILOM user account with Administrator privileges.

Note - To prevent unauthorized access to Oracle ILOM, create user accounts for each user. For details, see [“Adding Oracle ILOM User Accounts”](#) on page 68.

1. **Ensure that a physical management connection to Oracle ILOM has been established.**

To establish a physical management connection to Oracle ILOM, see [“Cable the Server to Connect to Oracle ILOM”](#) on page 23.
2. **To launch and log in to the Oracle ILOM web interface:**
 - a. **Open a web browser window.**

Ensure that the web browser is supported by Oracle ILOM. For more information, refer to the *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x* at <http://www.oracle.com/goto/x86admindiag/docs>.

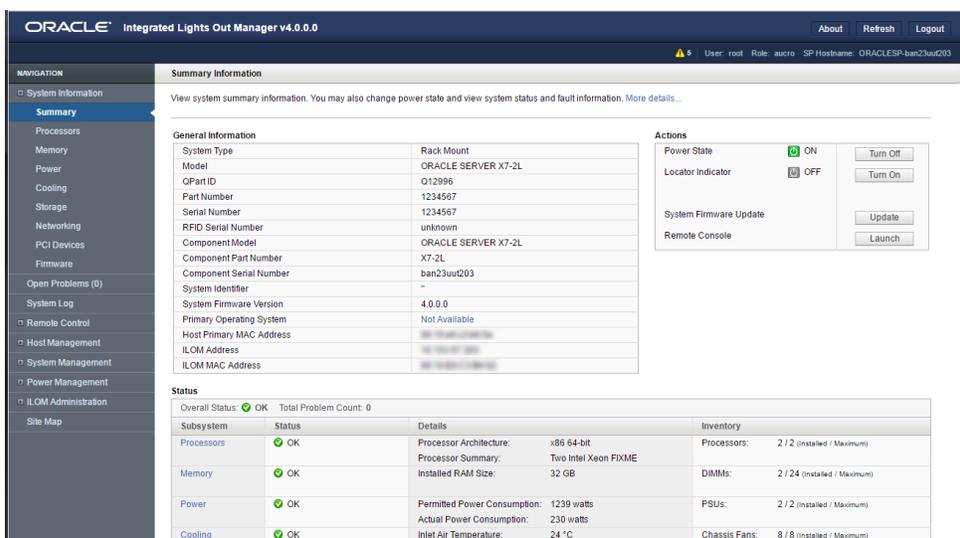
- b. **Type the IP address or host name of the server in the browser address bar, for example 192.0.2.22.**

The Oracle ILOM Login dialog box appears.

- c. **Type your user name and password, and then click Log In.**

If this is the first time you are accessing Oracle ILOM, use root for the user name and changeme for the password.

The Oracle ILOM Summary Information page appears.



- 3. **To launch and log in to Oracle ILOM from the command-line interface, perform the following steps:**

- a. **Open a terminal window.**
- b. **Type your Oracle ILOM user name and the IP address or host name of the server SP using the following syntax:**

- `ssh -l username host`

or

- `ssh username@host`

Where *host* is either the IP address or the host name of the server SP.

For example: `ssh root@192.0.2.23`

If this is the first time you are accessing Oracle ILOM, use `root` for the user name and `changeme` for the password.

The Oracle ILOM password prompt appears.

c. Type your password, and then press Enter.

Oracle ILOM displays a default command prompt (`->`), indicating that you have successfully logged in.

▼ Access the Oracle ILOM Diag Shell (CLI Only)

The Oracle ILOM diag shell is used to access the HWdiag diagnostic commands and to view diagnostic logs.

For detailed information about the diagnostic programs, refer to *Oracle x86 Servers Diagnostics and Troubleshooting Guide With Oracle ILOM 4.0.x* in <http://www.oracle.com/goto/x86admindiag/docs>.

1. Log in to the Oracle ILOM CLI.

The Oracle ILOM CLI prompt appears.

2. At the Oracle ILOM prompt, access the ILOM Diag shell. Type:

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

The `diag>` prompt appears.

▼ Log In to Oracle ILOM Through a Dedicated Local (Serial) Management Connection

Note - Oracle ILOM is shipped with a default administrator account and password that allows first-time login and access. The default account is `root` and the password is `changeme`. To build a secure environment and to enforce user authentication, you must change the default password for this account. If this default Administrator account has since been changed, contact your system administrator for an Oracle ILOM user account with Administrator privileges.

Note - To prevent unauthorized access to Oracle ILOM, create user accounts for each user. For details, see [“Adding Oracle ILOM User Accounts” on page 68](#).

1. **Connect a terminal or a terminal emulator to the serial management (SER MGT) port.**

For details, see [“Cable the Server to Connect to Oracle ILOM” on page 23](#).

2. **Set the terminal device to 9600 baud, 8 bit, no parity, 1 stop bit (9600/8-N-1).**
3. **At the Oracle ILOM login prompt, type your user name, and then press Enter.**
4. **At the password prompt, type the password associated with your user name, and then press Enter.**

Oracle ILOM displays a default command prompt (`->`).

Launching Remote KVMS Redirection Sessions

To help you manage the server remotely, Oracle ILOM enables you to redirect a server's keyboard, video, mouse, and storage (KVMS) devices through any of the following redirection methods:

- **Serial remote console redirection:** View a text-based version of the host console. You can use the serial remote console to interrupt the boot process and configure server settings in the BIOS Setup Utility, navigate the operating system file system, or enter commands from the operating system command-line application.
- **Graphical remote console redirection:** View a graphical version of the host console using the Oracle ILOM Remote System Console Plus application. You can use the graphical remote console to interrupt the boot process and configure server settings in the BIOS Setup Utility, view the operating system desktop, or enter commands from the operating system command-line application.

- **Host storage device redirection:** Mount an image file on the server service processor (SP) and redirect that image to the host. Host storage device redirection is useful when installing an operating system.

To launch a remote redirection session from Oracle ILOM, see the following procedures:

- [“Access the Host Console From the Oracle ILOM CLI” on page 28](#)
- [“Launch a Graphical Remote Console Redirection Session” on page 29](#)
- [“Configure a Host Storage Device Redirection Session” on page 30](#)

▼ Access the Host Console From the Oracle ILOM CLI

You can use the Oracle ILOM command-line interface (CLI) to access the system console.

You can launch multiple console sessions from the Oracle ILOM command-line interface. However, only the first current console session is granted read and write privileges. All other sessions are read-only. Read and write privileges are reassigned when a user with read and write privileges closes their session, and a new serial session is opened.

Before You Begin Ensure that you have Console (c) role privileges in Oracle ILOM.

1. **Log in to the Oracle ILOM command-line interface.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
2. **Type `start /HOST/console`.**
A confirmation prompt appears.
3. **Type `y` to confirm that you want to access the host console.**
You are now viewing the host console.
4. **If you are prompted for user credentials, enter the requested information to access the host server operating system.**
You are now logged in to the host server operating system through the serial console.

Note - To enter standard Oracle ILOM CLI commands, you must first exit the host serial console.

5. **To terminate the console session press the Esc key and the left parenthesis key (Shift+9).**

Note - To send a break to the host, press the Escape (Esc) key and type uppercase B.

Related Information

- Start Serial Host Console, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* in <http://www.oracle.com/goto/ilom/docs>.

▼ Launch a Graphical Remote Console Redirection Session

Use the Oracle ILOM web interface to launch a graphical remote console redirection session. Oracle ILOM includes the Oracle ILOM Remote System Console Plus application, which enables you to view the host console remotely.

The Oracle ILOM Remote System Console Plus provides support for launching a maximum of four graphical remote console sessions at a time. Full-redirection control privileges are granted to the first (primary) of all current redirection sessions. All other redirection sessions are view-only. A primary user can relinquish full-control privileges by exiting the Oracle ILOM Remote System Console Plus window, or by selecting *Relinquish Full-Control* in the KVMS menu of the application. A view-only user can take full-control by selecting *Take Full-Control* in the KVMS menu of the application, or by relaunching the application when a session with full-control privileges is terminated.

Before You Begin Ensure that the following prerequisites are met:

- Java Runtime Environment (JRE) 7, 1.3.1 or later is installed on the remote system from which you will launch the redirection.
- You set the KVMS State property to Enabled in the Oracle ILOM Remote Control → KVMS page.

In the Oracle ILOM KVMS page, you can also optionally change the Mouse Mode property or the Host Lock Settings. Use Absolute mouse mode if the remote host is running Windows, Oracle Solaris, or a version of Linux that includes driver support for Absolute Mouse mode. Otherwise, use Relative mouse mode. Change the Host Lock Settings to automatically lock the host operating system desktop upon disconnecting from a remote console session.

- You have Console (c) role privileges in Oracle ILOM.
- You have operating system user credentials for the host server.

1. Log in to the Oracle ILOM web interface.

For instructions, see [“Launch and Log In to Oracle ILOM Through a Remote Ethernet Connection” on page 24](#).

The Oracle ILOM Summary Information page appears.

2. In the Actions panel, click the Remote Console Launch button.

The Oracle ILOM Remote System Console Plus window appears.

Alternatively, you can launch the remote console application from the Remote Control → Redirection page.

Related Information

- Oracle ILOM Remote System Console Plus, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* in <http://www.oracle.com/goto/ilom/docs>.

▼ Configure a Host Storage Device Redirection Session

Use the Host Storage Device feature in Oracle ILOM to mount a remote image file on the server service processor (SP), and then redirect the file to the host server. The image appears to the host server as an attached storage device.

The Host Storage Device feature is useful in the following situations:

- You want to boot multiple Oracle servers from a single (ISO) image file that is stored on a remote server.
- You want to update multiple Oracle servers using a single (VFAT) image file that is stored on a remote server.

You can only redirect one image file at a time from any of the Oracle ILOM interfaces. Additionally, you cannot use the Host Storage Device feature while another type of redirection is in progress. If you attempt to redirect an image file when another storage redirection session is in progress on the SP, the storage redirection attempt will fail and an error message will appear.

Before You Begin Ensure that the following requirements are met:

- You have Admin (a) role privileges in Oracle ILOM.
- If required, you have user credentials on the NFS or SAMBA central repository server where the image file is located.

1. To configure a host storage device redirection in the Oracle ILOM web interface:

a. Log in to the Oracle ILOM web interface.

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. In the navigation pane, click Remote Control → Host Storage Device.

- c. **Select Remote from the Mode drop-down menu.**
 - d. **Enter the location of the image on the remote server using either the NFS or Samba protocol.**
 - **To enter a URI using NFS, use the format: `nfs://server:/path/file`**

For example:

```
nfs://192.0.2.22:/export/netadmin1/biosimage.img
```
 - **To enter a URI using Samba, use the format: `smb://server:/path/file` or `smb://server/path/file`.**

For example:

```
smb://192.0.2.22/netadmin1/biosimage.img
```
 - e. **Click Save.**

The status of the redirection appears in the Status field.
 - f. **When you are done, to disable redirection, select Disabled from the Mode drop-down menu and click Save.**
2. **To configure a host storage device redirection in the Oracle ILOM command-line interface (CLI):**
 - a. **Log in to the Oracle ILOM CLI.**

For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **Set the location of the image file by typing:**

```
set /SP/services/kvms/host_storage_device/remote/  
server_URI=NFS_or_Samba_URI_file_location [username=username]  
[password=password]
```
 - c. **Enable storage redirection by typing:**

```
set /SP/services/kvms/host_storage_device/ mode=remote
```
 - d. **To view the status of redirection, type the command:**

```
show /SP/services/kvms/host_storage_device/ status
```

Note - Redirection is active is the status if set to either *Operational* or *Connecting*.

e. When you are done, disable redirection by typing:

```
set /SP/services/kvms/host_storage_device/ mode=disabled
```

Related Information

- Redirecting a Remote Image File, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>.

Accessing Oracle Hardware Management Pack

Before using Oracle Hardware Management Pack, you must install it (unless you are running Solaris 11.2 or newer), and you must install an operating system. After that, you can run Oracle Hardware Management Pack commands from the operating system command line, and you can configure and use the management agents.

For installation instructions, see:

- [“Installing Oracle Hardware Management Pack” on page 32](#)
- *Oracle Hardware Management Pack Installation Guide*

To get started, see the following procedures:

- [“Use Oracle Hardware Management Pack Commands” on page 33](#)
- [“Use the Oracle Hardware Management Pack Management Agents” on page 34](#)

Installing Oracle Hardware Management Pack

To install Oracle Hardware Management Pack, you must download the installation files from My Oracle Support. Then, you can run a graphical installer or install Oracle Hardware Management Pack components manually.

Note - Oracle Hardware Management Pack is an integrated component of the Oracle Solaris operating system and is called Oracle Hardware Management Pack for Oracle Solaris. Do not download and use any version of Oracle Hardware Management Pack that is not specifically qualified for the Oracle Solaris operating system.

See the following sections:

- [“Download Oracle Hardware Management Pack Installation Files From My Oracle Support” on page 33](#)
- [“Install Oracle Hardware Management Pack” on page 33](#)

▼ Download Oracle Hardware Management Pack Installation Files From My Oracle Support

1. **Verify that the Oracle Hardware Management Pack tools you intend to install are supported on your server.** See <http://www.oracle.com/goto/ohmp>.
2. **Download Oracle Hardware Management Pack from the My Oracle Support web site.**

For instructions, see [“Download Firmware and Software Updates From My Oracle Support” on page 105](#).

▼ Install Oracle Hardware Management Pack

Before You Begin Remove any previous versions of Oracle Hardware Management Pack installed on the server as described in the *Oracle Hardware Management Pack Installation Guide* at <http://www.oracle.com/goto/ohmp/docs>.

1. **Ensure that you have access to the Oracle Hardware Management Pack installation files.**
2. **Follow the instructions in the *Oracle Hardware Management Pack Installation Guide* to complete the installation.**

▼ Use Oracle Hardware Management Pack Commands

Before You Begin

- Oracle Hardware Management Pack must be installed on the server as described in [“Installing Oracle Hardware Management Pack” on page 32](#).
- The operating system must be installed and booted.

1. **Access the host console or a command line with root privileges.**

For details, see “[Accessing the Host Console](#)” on page 38.

2. **Enter Oracle Hardware Management Pack commands from the operating system command-line interface.**

Related Information

- “[Oracle Hardware Management Pack](#)” on page 17

Use the Oracle Hardware Management Pack Management Agents

The Oracle Server Hardware Management Agent (Hardware Management Agent) and associated Oracle Server Hardware SNMP Plugins (Hardware SNMP Plugins) enable you to monitor and manage your server from the operating system (OS).

This in-band functionality enables you to use a single IP address (the host's IP) for monitoring your servers without having to connect the management port of the Oracle Integrated Lights Out Manager (ILOM) SP to the network.

For more information, refer to *Oracle Server Management Agents User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

Accessing the BIOS Setup Utility

The BIOS Setup Utility enables you to configure the system by interrupting the boot process. The utility is part of the Unified Extensible Firmware Interface (UEFI) embedded on the server, and does not need to be installed. For a detailed description of the BIOS Setup Utility screens, see the server service manual.

You can access the BIOS Setup Utility locally by connecting a monitor to the server or remotely by launching a remote console session from Oracle ILOM. To get started, see the following sections:

- “[Access the BIOS Setup Utility](#)” on page 35
- “[BIOS Setup Utility Key Mappings](#)” on page 37
- “[Exit the BIOS Setup Utility](#)” on page 38
- “[Common BIOS Setup Utility Tasks](#)” on page 37

▼ Access the BIOS Setup Utility

1. **(Optional) Use the Oracle ILOM web interface to select BIOS as the next boot device.**
 - a. **Log in to the Oracle ILOM web interface.**

For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **In the navigation pane, click Host Management → Host Console.**
 - c. **In the Next Boot Device drop-down list, select BIOS.**

If you select BIOS from the list, next time you boot you do not have to press F2 to access the BIOS Setup Utility (Step 6 below).
 - d. **Click Save.**
2. **Access the Oracle ILOM CLI using one of the following methods:**
 - Launch an Oracle ILOM Remote System Console Plus session.

For details, see [“Launching Remote KVMS Redirection Sessions” on page 27](#).
 - Establish a dedicated local (serial) management connection to Oracle ILOM.

For details, see [“Log In to Oracle ILOM Through a Dedicated Local \(Serial\) Management Connection” on page 27](#).
 - From a command line or console on another server, establish an SSH connection to the server SP. Type:

```
ssh root@hostname
```

Where *hostname* can be the DNS name or the IP address of the server SP.

The Oracle ILOM Login prompt appears.
3. **Type your Oracle ILOM user name and password.**

The default Oracle ILOM user name is `root` and the password is `changeme`.
The Oracle ILOM CLI prompt (`->`) appears.
4. **Enter the `start /HOST/console` command.**

The host console prompt appears.

Note - To terminate the console session and return to Oracle ILOM, press the Esc key and the left parenthesis key (Shift+9).

5. Reset the server.

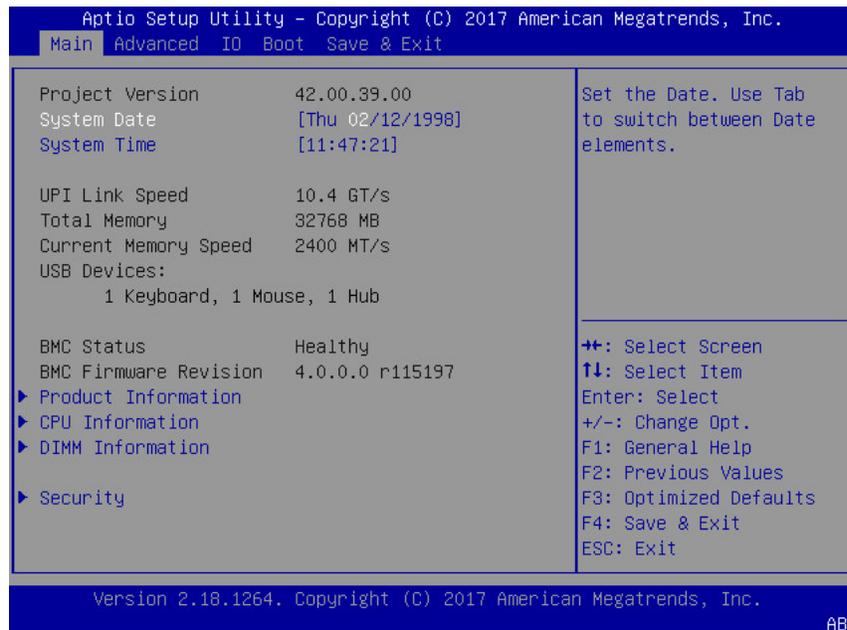
For instructions, see [“Controlling the Server Power State”](#) on page 41.

Boot messages appear on the screen.

6. When prompted, press the F2 function key (or CTRL + E on a serial keyboard) to access the BIOS Setup Utility.

Note - This step is not necessary if you selected BIOS as the next boot device using the Oracle ILOM web interface (Step 1 above).

The BIOS Setup Utility Main menu appears.



BIOS Setup Utility Key Mappings

When you view the BIOS Setup Utility from a terminal device using the Oracle ILOM remote console feature, the terminal device might not support function keys. The BIOS Setup Utility supports the mapping of function keys to Control key sequences when serial redirection is enabled. The following table provides a description of the function key to Control key mappings.

Function Key	Control Key Sequence	BIOS POST Function	BIOS Setup Function
F1	Ctrl+Q	Not applicable.	Activate the BIOS Setup Utility Help menu.
F2	Ctrl+E	Enter the BIOS Setup Utility while the system is performing the power-on self-test (POST).	Not applicable.
F7	Ctrl+D	Not applicable.	Discard changes. Not applicable to the Avago MegaRAID Configuration Utility.
F8	Ctrl+P	Activate the BIOS Boot menu.	Not applicable.
F10	Ctrl+S	Not applicable.	Activate the Exit dialog box menu. Not applicable to the Avago MegaRAID Configuration Utility.
F12	Ctrl+N	Activate Network boot.	Not applicable.

Common BIOS Setup Utility Tasks

Some of the common BIOS Setup Utility tasks in this guide include:

- Select the Boot Device: [“Modifying the Boot Order” on page 48](#)
- Reset the BIOS Firmware to Defaults: [“Reset BIOS Firmware to Default Settings \(BIOS\)” on page 98](#)
- Configure TPM Support: [“Configure BIOS Support for TPM \(BIOS\)” on page 50](#)
- Exit BIOS Setup Utility: [“Exit the BIOS Setup Utility” on page 38](#)

▼ Exit the BIOS Setup Utility

1. In the BIOS Setup Utility, use the arrow keys to navigate to the **Save and Exit** menu.
2. In the **Save and Exit** menu, select one of the following options:

- **Save Changes and Exit**
- **Discard Changes and Exit**

Depending on the selection you made in the Exit menu, the server is reset or the boot process continues.

Accessing the Host Console

Local Console: The server provides local console access through a terminal or terminal emulator connected to the serial management port (SER MGT).

Remote Console: You can access the console remotely using one of two methods:

- A web-based client connection using the Oracle ILOM Remote System Console Plus application
- A secure Shell (SSH) client connection to the network management port (NET MGT)

▼ Access the Host Console Locally

This procedure connects to the host console locally using the SER MGT port on the server.

By default, the SER MGT port connects to the Oracle ILOM CLI. Once you are connected to Oracle ILOM, you can enter a command to temporarily access the host console.

Using Oracle ILOM, you can also configure the SER MGT port so that it connects to the host console by default. See Oracle Integrated Lights Out Manager (ILOM) 4.0 Documentation Library at: <http://www.oracle.com/goto/ilom/docs>

1. **Connect a terminal or a terminal emulator to the serial management (SER MGT) port.**

For details, see “[Cable the Server to Connect to Oracle ILOM](#)” on page 23.

2. **Set the terminal device to 9600 baud, 8 bit, no parity, 1 stop bit (9600/8-N-1).**
3. **Press Enter on the terminal device.**
The Oracle ILOM Login prompt appears.
4. **Type your Oracle ILOM user name and password.**
The default Oracle ILOM user name is root and the password is changeme.
The Oracle ILOM CLI prompt (->) appears.
5. **Connect to the host console. At the CLI prompt, type:**
-> `start /HOST/console`
The serial management port output is automatically routed to the server's host serial local console.

Note - To send a break to the host, press the Escape (Esc) key and type uppercase B.

6. **To end the console session and return to the Oracle ILOM command line, press the Escape key and the left parenthesis key (Shift + 9).**

Related Information

- Oracle Integrated Lights Out Manager (ILOM) 4.0 Documentation Library at: <http://www.oracle.com/goto/ilom/docs>

▼ Access the Host Console Remotely

You can access the host console remotely through Oracle ILOM, using either the Oracle ILOM web interface, or a command line or console window.

Before You Begin You must have network access to Oracle ILOM, and you must know the server SP IP address or hostname. For details, see “[Accessing Oracle ILOM](#)” on page 21

1. **To use a web-based client connection, perform these steps; otherwise go to Step 2.**
 - a. **In the browser address bar, type the Oracle ILOM IP address, and then press Enter.**

The Oracle ILOM Login prompt appears.

b. Type your Oracle ILOM user name and password.

The default Oracle ILOM user name is `root` and the default password is `changeme`.

The Oracle ILOM Summary Information page appears.

c. In the Actions panel, click the Remote Console Launch button.

The Oracle ILOM Remote System Console Plus screen appears.

For more details, see “[Launch a Graphical Remote Console Redirection Session](#)” on page 29.

2. To use an SSH client connection:

a. From a serial console, establish an SSH connection to the server SP. Type:

```
ssh root@hostname
```

Where *hostname* can be the DNS name or the IP address for the server SP.

The Oracle ILOM Login prompt appears.

b. Type your Oracle ILOM user name and password.

The default Oracle ILOM user name is `root` and the password is `changeme`.

The Oracle ILOM CLI prompt (`->`) appears.

c. To connect to the host console, type:

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

d. To return to the Oracle ILOM CLI, press the Esc key and the left parenthesis key (Shift+9).

Related Information

- Oracle Integrated Lights Out Manager (ILOM) 4.0 Documentation Library at: <http://www.oracle.com/goto/ilom/docs>

Controlling the Server Power State

This section defines the server power states and power control options, provides procedures for powering the server on and off, and describes power-on policies in Oracle Integrated Lights Out Manager (ILOM).

Task	Link
Review the possible server power states.	“Server Power State Overview” on page 41
Review power control options.	“Power Control Options” on page 42
Power the server off or on.	“Powering the Server Off and On” on page 42
Set a power-on policy.	“Setting SP Policy for Host Power at Boot (Oracle ILOM)” on page 45

Server Power State Overview

The server has the following power states.

Power State	Description
Powered off	The server is completely powered off only when the power cords are disconnected.
Standby power	In Standby power mode, the host is powered off, while the service processor is powered on. The System OK LED on the front panel blinks.
Main power	When you power on the host, the server enters Main power mode. In Main power mode, the System OK LED is steady on. You can power the host off gracefully, or immediately. When you power off the server gracefully, Advanced Configuration and Power Interface (ACPI)-enabled operating systems prepare the operating system before shutting it down. When you power the server off immediately, no such attempt occurs.

Power State	Description
	Caution - Data loss: To prevent data loss, prepare the operating system for shutdown before performing an immediate power off.

Note - If you updated the system firmware and selected the Delay BIOS Upgrade option, when you reset or power cycle your server, Oracle ILOM installs the BIOS firmware upgrade. This causes a reset to take longer than normal and causes the server to power cycle during the reset. This is normal, expected behavior during a delayed BIOS upgrade. For more details, see [“Update the BIOS and Service Processor Firmware \(Oracle ILOM\)” on page 108](#).

Power Control Options

The server supports the following Oracle ILOM power control actions.

Web	CLI	Description
Reset	reset /System	Reboot the server while keeping power applied to system components (such as drives).
Immediate Power Off	stop -f /System	Directly shut down power to the server.
Graceful Shutdown and Power Off	stop /System	Gracefully shut down the operating system, and then shut down power to the server.
Power On	start /System	Apply main power to the server.
Power Cycle	stop /System start /System	Turn off system power to all system components, and then apply main power to all system components.

Powering the Server Off and On

You can power the server on and off locally or remotely. To power off the server locally, you need access to the recessed On/Standby button on the front panel of the server. To power off the server remotely, you need access to Oracle ILOM.

The following procedures describe how to power the server on and off:

- [“Power Off the Server Using the On/Standby button” on page 43](#)
- [“Power On the Server Using the On/Standby button” on page 43](#)

- [“Power the Server Off or On \(Oracle ILOM\)” on page 44](#)

▼ Power Off the Server Using the On/Standby button

1. **Locate the On/Standby button on the server front panel.**

Refer to the server installation guide for the location of the Power button.

Note - The On/Standby button is recessed on most systems.

2. **Use a stylus or other pointed, non-conducting object to press the Power button.**
 - **To perform a graceful shutdown, press and quickly release the On/Standby button.**
 - **To perform an immediate shutdown, press and hold the On/Standby button for at least 5 seconds.**



Caution - Data loss. An immediate shutdown abruptly closes all applications and files without saving changes.

The server enters Standby power mode.



Caution - To completely power off the server, you must disconnect the power cords from the back panel of the server.

▼ Power On the Server Using the On/Standby button

1. **Ensure that the power supplies are connected to a power source.**
2. **Verify that the server is in Standby power mode.**
See [“Server Power State Overview” on page 41](#).
3. **Locate the On/Standby button on the front panel of the server.**

Refer to the server installation guide for the location of the Power button.

Note - The On/Standby button is recessed on most systems.

4. **Use a stylus or other pointed, non-conducting object to press the Power button.**
The host boots and the server enters Main power mode.

▼ Power the Server Off or On (Oracle ILOM)

You can use Oracle Integrated Lights Out Manager (ILOM) to remotely power on or power off the server.



Caution - To completely power off the server, you must disconnect the power cords from the back panel of the server.



Caution - Data loss. An immediate shutdown abruptly closes all applications and files without saving changes.

Before You Begin Before you perform the following procedure, ensure that you have Admin (a) role privileges in Oracle ILOM.

1. **To change the server power state in the Oracle ILOM web interface, perform the following steps:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **In the navigation pane, click Host Management → Power Control.**
 - c. **In the Select Action drop-down menu, select a power control option.**
For descriptions of the power control options, see [“Power Control Options” on page 42](#).
2. **To change the server power state in the Oracle ILOM command-line interface (CLI):**
 - a. **Log in to the Oracle ILOM CLI.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **Use one of the following commands:**
 - **To reset the server, type `reset /System`.**

- To gracefully shut down the server, type `stop /System`.
 - To immediately shut down the server, type `stop -f /System`.
 - To power on the server, type `start /System`.
3. If you are prompted to confirm your choice, type `y`, and then press Enter.

Related Information

- Controlling Host Power, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x*

Setting SP Policy for Host Power at Boot (Oracle ILOM)

By default, when AC power is applied to the server, the server enters Standby power mode. However, it is possible to change this default power state by configuring a power-on policy in Oracle ILOM.

▼ Set SP Host Power Policy at Boot

Before You Begin Before you perform the following procedure, ensure that you have Admin (a) role privileges in Oracle ILOM.

1. To set a power-on policy in the Oracle ILOM web interface, perform the following steps:
 - a. Log in to the Oracle ILOM web interface.
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. In the navigation pane, click **System Management** → **Policy**.
 - c. In the **Service Processor Policies** table, select one of the following policies:
 - Auto power-on host on boot

- **Set host power to last power state on boot**

The power on policies are mutually exclusive, that is, only one can be enabled at a time. For more information about each policy, click the [More Details](#) link at the top of the page.

- d. **In the Actions drop-down list, select Enable.**

2. **To set a power-on policy in the Oracle ILOM command-line interface (CLI), perform the following steps:**

- a. **Log in to the Oracle ILOM CLI.**

For instructions, see [“Accessing Oracle ILOM”](#) on page 21.

- b. **Use one of the following commands:**

- `set /SP/policy HOST_AUTO_POWER_ON=enabled`

- `set /SP/policy HOST_LAST_POWER_STATE=enabled`

The power-on policies are mutually exclusive, that is, only one can be enabled at a time.

Related Information

- Power-On and Cooling-Down Policies Configurable from the Server SP, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x*

Viewing and Modifying Boot Properties

This section provides instructions for modifying how the server boots. Using the system administration tools, you can change the boot order list, and you can enable features such as Trusted Platform Module.

Task	Link
Provide additional security for your system.	“Trusted Execution Technology and UEFI Secure Boot” on page 47
Make changes to the boot order list.	“Modifying the Boot Order” on page 48
Enable Trusted Platform Module (TPM) features.	“Configure BIOS Support for TPM (BIOS)” on page 50

Trusted Execution Technology and UEFI Secure Boot

Your server supports the following security features:

- **Trusted Execution Technology (TXT)** provides authenticity of a platform and its operating system.
When enabled, TXT ensures that the operating system (OS) starts in a trusted environment, and provides the OS with additional security capabilities not available to an untrusted OS. Using cryptographic techniques, TXT provides measurements of software and platform components so that system software as well as local and remote management applications may use those measurements to make trust decisions. Trusted Execution Technology defends against software-based attacks aimed at stealing sensitive information by corrupting system or BIOS code, or modifying a platform's configuration.
- **UEFI Secure Boot** defines how platform firmware can authenticate a digitally signed UEFI image, such as an operating system loader or a UEFI driver.
When enabled, UEFI Secure Boot provides a policy-based invocation of various UEFI executable images, using cryptographic signatures to identify the software publishers. UEFI Secure Boot also requires all third-party UEFI drivers and operating system boot loaders to be signed by Microsoft or with Key Exchange Key (KEK) by using BIOS Setup Utility.

Trusted Execution Technology and UEFI Secure Boot are disabled by default. For configuration information, refer to your server service manual.

Modifying the Boot Order

The boot order list determines which device the server boots from. You can modify the boot order in the BIOS Setup Utility, or you can specify a boot device that is only valid for one subsequent server boot in Oracle ILOM.

To change the order of devices in the boot order list, see the following procedures:

- [“Modify the Boot Order \(BIOS\)” on page 48](#)
- [“Set Temporary Next Boot Device \(Oracle ILOM\)” on page 49](#)

▼ Modify the Boot Order (BIOS)

1. Access the BIOS Setup Utility.

For instructions, see [“Accessing the BIOS Setup Utility” on page 34](#).

2. Navigate to the Boot menu.

The Boot Option Priority list shows the current boot order from top to bottom. For example, the first device in the list indicates the first boot option.

3. In the Boot Option Priority list, select the device in the boot option slot you want to modify.

For example, if you want to move a device to the second slot, select the second item in the list.

The Boot Option dialog box appears.

4. In the Boot Option dialog box, select the device that you want to move into the selected slot.

The device you selected is moved into the indicated slot, and BIOS reorders the remaining devices to accommodate the change.

5. Press the F10 function key to save your changes and exit the BIOS Setup Utility.

The utility prompts you to save your changes or discard your changes.

▼ Set Temporary Next Boot Device (Oracle ILOM)

You can use Oracle ILOM to set the next boot device on your server. Setting the next boot device in Oracle ILOM causes your server to boot from the selected device on the next power reset. For subsequent power resets, the server automatically reverts to booting from the boot order list.

Before You Begin Ensure that you have Reset and Host Control (r) role privileges in Oracle ILOM.

1. To set a boot device for the next power reset in the Oracle ILOM web interface:

a. Log in to the Oracle ILOM web interface.

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. In the navigation pane, click Host Management → Host Control.

c. In the Next Boot Device drop-down list, select a boot device.

d. Click Save.

Your selection is *only valid the next time the server is powered on*. To permanently modify the boot order, see [“Modify the Boot Order \(BIOS\)” on page 48](#).

Note - If you select BIOS from the list, next time you boot you do not have to press F2 to access the BIOS Setup Utility.

2. To set a once-only boot device for the next power reset in the Oracle ILOM command-line interface (CLI):

a. Log in to the Oracle ILOM CLI.

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. Use the `set /HOST boot_device` command:

```
set /HOST boot_device=bootDevice
```

Where *bootDevice* is one of the following: *default*, *pxe*, *disk*, *diagnostic*, *cdrom*, *bios*, or *floppy*

Related Information

- Setting Next Boot Device on x86 Host Server, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x*

▼ Configure BIOS Support for TPM (BIOS)

If you intend to use the Windows Server Trusted Platform Module (TPM) feature set, you must configure the server BIOS to support this feature.

TPM enables you to administer the TPM security hardware in your server. For additional information about implementing this feature, refer to the Windows Trusted Platform Module Management documentation provided by Microsoft.

- 1. Access the BIOS Setup Utility.**

For instructions, see [“Accessing the BIOS Setup Utility” on page 34](#).

- 2. Select *Advanced* → *Trusted Computing*.**

- 3. Select the *TPM Support* property, and then select *Enabled* or *Disabled*.**

- 4. Press the *F10* key to save your changes and exit the BIOS Setup Utility.**

Configuring Storage Resources

This section describes how to configure RAID and iSCSI virtual drives, and to prepare your server for installing an operating system.

Task	Link
Configure RAID arrays to improve performance and increase tolerance for disk failures.	“Configuring RAID on the Server” on page 51
To run a supported operating system that resides on an external server, you must configure iSCSI virtual drive parameters in the BIOS Setup Utility.	“Modifying iSCSI Virtual Drive Properties” on page 53
Use these steps to prepare your server for installing an operating system.	“Preparing to Install an Operating System” on page 57

Configuring RAID on the Server

Redundant array of independent disks (RAID) implementations provide increased performance and data integrity across the available disk space in the server. By mirroring data across drives, most RAID levels can tolerate disk failures. Additionally, RAID configurations enable you to designate one or more hot spares. A hot spare is an unused drive on which the data on a failed drive can be automatically duplicated.

RAID configuration can be done before installing the operating system, and after the operating system is installed.

- **Before you install the operating system**, you can use the BIOS utilities to configure RAID. This step must be completed before installing the operating system. For details, refer to your hardware installation guide.
- Other tools allow you to configure and modify arrays **from an operating system**. These tools should not be used to modify the disk or array where the operating system is installed.



Caution - Configuring or modifying a RAID array erases all data on the disk, including the operating system. If you change the RAID configuration on a boot drive, you must reinstall the OS.

The following table lists and describes the RAID configuration:

Tool	Description	Supported RAID Levels	Documentation
BIOS Setup Utility	The BIOS Setup Utility provides various RAID configuration options. These vary according to the type of drive or HBA, and the type of RAID being installed.	Depends on the type of drive, the HBA, and the type of RAID being installed.	Refer to your server installation guide for details.
Oracle Hardware Management Pack	See “ Oracle Hardware Management Pack ” on page 17. Command-line server management tool that can be used to configure drives (except boot drives) after the operating system has been installed.	Review the output of the <code>raidconfig list controller</code> subcommand.	“ Configure RAID (Oracle Hardware Management Pack) ” on page 52
MegaRAID Command Tools	Command-line RAID configuration application that must be installed on the server after the operating system has been installed.	<ul style="list-style-type: none"> ■ RAID 0 ■ RAID 1 ■ RAID 5 ■ RAID 6 ■ RAID 00 ■ RAID 10 ■ RAID 50 	<i>MegaRAID SAS Software User Guide</i> at: https://www.broadcom.com/support/oem/oracle/

▼ Configure RAID (Oracle Hardware Management Pack)

Before You Begin Ensure the following:

- The disk drives have been properly installed on the server.
For more information, review the server service manual.
- The host bus adapter (HBA) installed on the server is supported.
A list of supported HBAs is provided in the server product notes.
- If the server is running a UNIX-based platform, you have root permission.
- If the server is running the Oracle Solaris operating system, note the following:

- On Oracle Solaris, `raidconfig` is not compatible with the `raidctl` CLI tool. `raidconfig` supports SAS2, but the `raidctl` tool does not.
- For servers running Oracle Solaris, after hot-plugging any device, run the `devfsadm -C` command to reenumerate all of the system device nodes before running the `raidconfig` command.



Caution - Changing the RAID configuration erases all the data on the affected drives, including the OS. If you change the RAID configuration on a boot drive, you must reinstall the OS.

1. Access the operating system command-line with root privileges.

For more information, see “[Accessing the Host Console](#)” on page 38 or “[Accessing Oracle Hardware Management Pack](#)” on page 32.

2. Use the `raidconfig create raid` command:

```
raidconfig create raid [--level level] [--stripe-size stripeSize] [--subarrays
sizeOfRAIDcomponents] [--name volumeName] [--subdisk-size size] -disks disks
```

Related Information

- Configuring RAID (`raidconfig`), *Oracle Server CLI Tools User's Guide*
Oracle Hardware Management Pack Server CLI Tools User's Guide at <http://www.oracle.com/goto/ohmp/docs>.

Modifying iSCSI Virtual Drive Properties

This section describes how to configure iSCSI virtual drives using the BIOS Setup Utility. You can use iSCSI virtual drives to run supported operating systems that reside on an external server.

- “[Modify iSCSI Virtual Drive Properties \(BIOS\)](#)” on page 54

Required Information for iSCSI Configuration

Before you begin configuring iSCSI virtual drive properties in the BIOS Setup Utility, ensure that you have gathered the following information from the iSCSI server:

Parameter	Example
Target name	iqn.1988-12.com.oracle:platform-target
iSCSI initiator name	iqn.1988-12.com.oracle:0010E02E458F
Note - iSCSI requires iSCSI Qualified Names (iqn) formats for its initiator and target names.	
Logical Unit Number	LUN 0
IP address of iSCSI server	192.0.2.22 (IPv4)
Port number	3260

▼ Modify iSCSI Virtual Drive Properties (BIOS)

Use this procedure to configure iSCSI virtual drives using the iSCSI BIOS Setup Utility screens.

iSCSI virtual drives are used primarily to run supported operating systems that reside on an external server and that function as the local server host operating system.

iSCSI virtual drives must be configured in the UEFI BIOS Setup Utility iSCSI screens.

Before You Begin Ensure that the following prerequisites are met:

- You are familiar with iSCSI theory of operation and with iSCSI server setup procedures.
- You have verified that iSCSI targets can be mounted on a client. Review the operating system documentation for more information.
- You have access to an external iSCSI server running on a supported operating system.

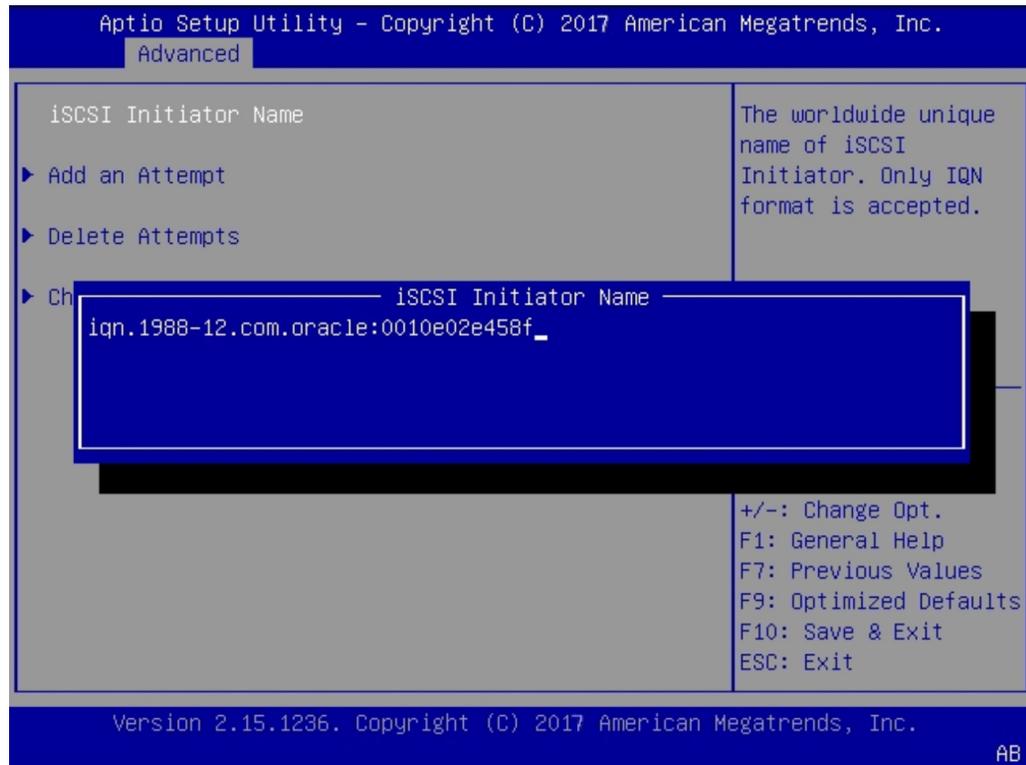
1. Access the BIOS Setup Utility.

For instructions, see [“Accessing the BIOS Setup Utility” on page 34](#).

2. Navigate to the Advanced menu.

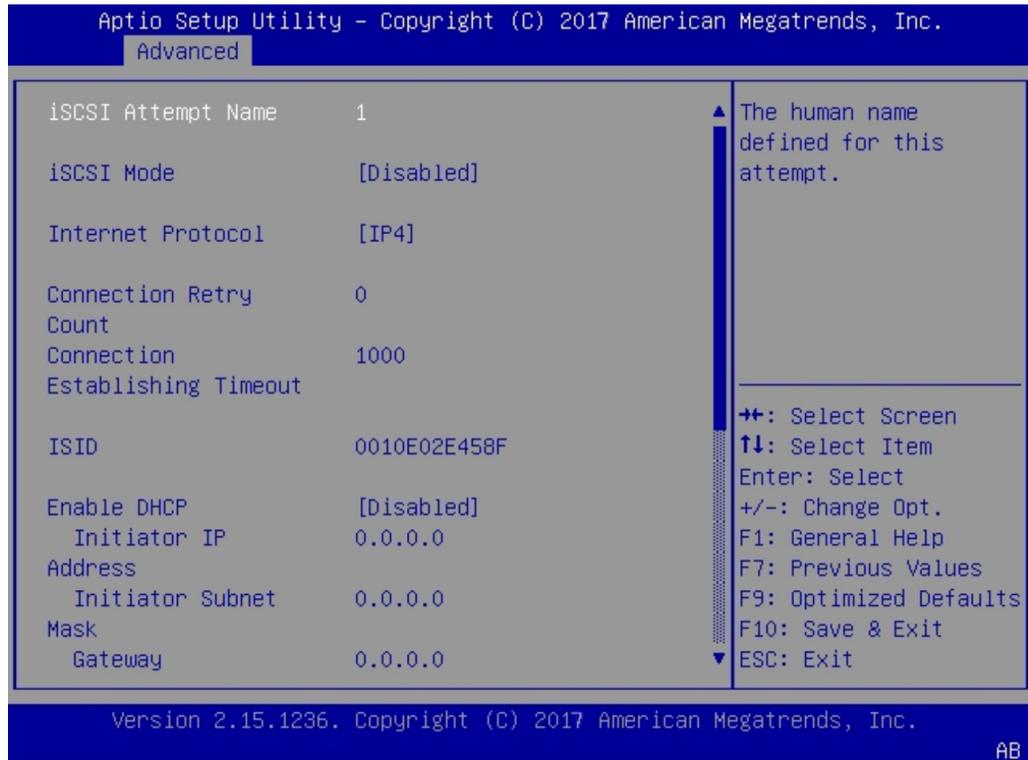
3. Select iSCSI Configuration.

4. **Select iSCSI Initiator Name, and then specify the iSCSI initiator name in iSCSI Qualified Name (iqn) format, for example `iqn.1988-12.com.oracle:0010e02e458f`.**



5. **Select Add an Attempt.**
6. **To connect to an iSCSI virtual drive, select the network adapter MAC address configured in the iSCSI server, for example `0010e02e458f`.**

The Port Configuration screen appears.



7. In the Port Configuration screen, perform the following steps:
 - a. Set the iSCSI Mode property to Enabled.
 - b. Set the Internet Protocol property to IPv4.
 - c. Set the Connection Retry Count property to 1.
 - d. Set the Enable DHCP property to Enabled or Disabled to specify an addressing method for the iSCSI initiator.
 - e. If you set the Enable DHCP property to Disabled, specify the Initiator IP Address, Initiator Subnet Mask, and Gateway.

Note - Use the same subnet.

- f. **Set the Get Target Info Via DHCP property to Enabled or Disabled to specify an addressing method for the iSCSI target.**
- g. **If you set the Get Target Info Via DHCP property to Disabled, specify the Target IP Address, Target Port, and Boot LUN.**

Note - When iSCSI is enabled on a network port, PXE is disabled for that port.

- h. **Specify the Target Name in iSCSI Qualified Name (iqn) format, for example `iqn.1988-12.com.oracle:XX-N-target`.**
 - i. **Set the Authentication Type property to CHAP or None.**
CHAP refers to Challenge-Handshake Authentication Protocol.
 - j. **Select Save Changes.**
8. **Press the F10 function key to save your changes and exit the BIOS Setup Utility.**
The server reboots.

Note - The newly-configured iSCSI drive does not appear in the BIOS boot list until after you install an operating system.

Preparing to Install an Operating System

Before you install an operating system, prepare the server by performing the following actions:

1. Access the installation guide for the operating system you plan to install.
Go to one of the following libraries:
 - Oracle Server X7-2 Documentation Library: <http://www.oracle.com/goto/x7-2/docs>
 - Oracle Server X7-2L Documentation Library: <http://www.oracle.com/goto/x7-2l/docs>
2. Download and install updates of platform software, drivers, and firmware.
Go to [“Getting Firmware and Software” on page 103](#).

3. Configure RAID on the server.

Refer to the hardware installation guide for your server. For an overview of RAID, see [“Configuring RAID on the Server” on page 51](#).

4. Prepare the installation target and installation media. Refer to the operating system installation guide.

Configuring Oracle ILOM

This section provides instructions for configuring server-specific information for Oracle ILOM. Complete these tasks before you perform administrative tasks on the server.

Task	Link
Configure the service processor network connections.	“Modifying SP Network Settings” on page 59
Identify DNS servers in your network.	“Configuring DNS Server Information on the SP” on page 62
Assign identification information to the server.	“Assigning System Identification Information” on page 64
Configure the service processor clock.	“Setting the Service Processor Clock” on page 66
Add Oracle ILOM user accounts.	“Adding Oracle ILOM User Accounts” on page 68

Modifying SP Network Settings

The server has two connections to the network: a host connection and a management connection.

- The host connection accesses the Internet from the server operating system.
- The management connection accesses Oracle ILOM remotely.

The service processor (SP) management connection is configured when the system is shipped; however you can modify the settings using the following optional procedures:

- [“Modify SP Network Settings \(Oracle ILOM\)” on page 60](#)
- [“Modify SP Network Settings \(Oracle Hardware Management Pack\)” on page 61](#)

▼ Modify SP Network Settings (Oracle ILOM)

This section provides instructions for using the Oracle ILOM web or the command-line interface (CLI) to view and modify the SP network settings.

1. Log in to Oracle ILOM as an Administrator.

For instructions about how launch Oracle ILOM from the CLI or web interface, see: [“Accessing Oracle ILOM” on page 21](#).

2. To modify the SP network settings, perform one of the following:

■ **From the web interface:**

a. **Click ILOM Administration → Connectivity → Network.**

b. **Modify the settings on the Network Settings page as required.**

For further details about how to configure the properties on the Network Settings page, click the *More Details* link.

c. **Click Save to save your network property changes.**

Note - All user sessions on the SP are terminated when you save IP network property changes. To log back in to Oracle ILOM, use the newly assigned service processor IP address.

■ **From the CLI interface:**

a. **To view the assigned IPv4 and IPv6 network settings on the SP, type:**

For IPv4, type: `show /SP/network`

For IPv6, type: `show /SP/network/ipv6`

b. **To view the descriptions for each IPv4 and IPv6 network property, type:**

For IPv4, type: `help /SP/network`

For IPv6, type: `help /SP/network/ipv6`

c. **To modify the IPv4 and IPv6 network properties on the SP, use the set command.**

IPv4 Example:

```
set /SP/network state=enabled|disabled pendingipdiscovery=static|dhcp
pendingipaddress=value pendingipgateway=value pendingipnetmask=value
```

IPv6 Example:

```
set /SP/network/ipv6 state=enabled|disabled pending_static_ipaddress= value/
subnet_mask_value pending_static_ipgatewayaddress=value
```

Note - The command `/SP/network/ state=enabled` used on earlier versions of Oracle ILOM no longer enables IPv6.

d. To commit any pending network changes in Oracle ILOM:

Type: `set /SP/network commitpending=true`

Note - All user sessions on the SP are terminated when you save IP network property changes. To log back in to Oracle ILOM, use the newly assigned service processor IP address.

▼ Modify SP Network Settings (Oracle Hardware Management Pack)

Use this procedure to modify the default Oracle ILOM network settings.

1. Access the operating system command-line with root privileges.

For more information, see “[Accessing the Host Console](#)” on page 38 or “[Accessing Oracle Hardware Management Pack](#)” on page 32.

2. To modify IPv4 network settings, use the `ilomconfig modify network` command:

```
ilomconfig modify network --ipdiscovery=static|dhcp [--ipaddress=ipaddress] [--
netmask=netmask] [--gateway=gateway] [--state=enabled|disabled] [--mgmtport=port]
```

3. To modify IPv6 network settings, use the `ilomconfig modify network-ipv6` command:

```
ilomconfig modify network-ipv6 [--autoconfig=disabled|stateless dhcpv6_stateful|
dhcpv6_stateless] [--static-ipaddress=ipv6address] [--state=enabled|disabled]
```

Related Information

- Configuring Oracle ILOM (`ilomconfig`), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

Configuring DNS Server Information on the SP

Auto DNS via DHCP is enabled by default. However, you can manually configure DNS Name Servers and DNS Search Paths. To change DNS server information on the service processor, see the following procedures:

- [“Configure DNS Server Information on the SP \(Oracle ILOM\)” on page 62](#)
- [“Configure DNS Server Information on the SP \(Oracle Hardware Management Pack\)” on page 63](#)

▼ Configure DNS Server Information on the SP (Oracle ILOM)

1. To configure DNS server information from the Oracle ILOM web interface, perform the following steps:
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **In the navigation pane, click ILOM Administration → Connectivity, and then click the DNS tab.**
 - c. **To enable Oracle ILOM to automatically retrieve DNS information from a DHCP server on the network, select the Enabled check box.**
 - d. **If you did not enable Auto DNS via DHCP, enter one or more DNS server IP addresses and search paths.**
 - e. **Enter the DNS Timeout as an integer between 1 and 10.**
 - f. **Enter the DNS Retries as an integer between 0 and 4.**
 - g. **Click Save.**
2. To configure DNS server information from the Oracle ILOM command-line interface (CLI):
 - a. **Log in to the Oracle ILOM CLI.**

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

- b. **To enable Oracle ILOM to automatically retrieve DNS information from a DHCP server on the network, use the `set` command:**

```
set /SP/clients/dns auto_dns=enabled
```

- c. **If `auto_dns` is disabled, set one more name servers and search paths:**

```
set /SP/clients/dns nameserver=ip_address_1,ipaddress_2,ipaddress_3 searchpath=domain_1.com, domain_2.edu, and so on
```

You can specify up to three IP addresses and up to six search paths.

- d. **Set the DNS timeout and retries:**

```
set /SP/clients/dns timeout=timeoutInSeconds retries=retries
```

Where `timeout` is an integer between 1 and 10, and `retries` is an integer between 0 and 4.

Related Information

- Modifying Default Connectivity Configuration Properties, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ Configure DNS Server Information on the SP (Oracle Hardware Management Pack)

1. **Access the operating system command-line with root privileges.**

For more information, see [“Accessing the Host Console” on page 38](#) or [“Accessing Oracle Hardware Management Pack” on page 32](#).

2. **To enable Oracle ILOM to automatically retrieve DNS information from a DHCP server on the network, use the following command:**

```
ilomconfig modify dns --autodns enabled --retries retries --timeout timeout
```

Where `timeout` is an integer between 1 and 10, and `retries` is an integer between 0 and 4.

3. **If you prefer to disable `autodns`, use the following command:**

```
ilomconfig modify dns --nameservers nameserverlist --autodns disabled --retries retries --searchpath searchpathlist --timeout timeout
```

Related Information

- Configuring Oracle ILOM (ilomconfig), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

Assigning System Identification Information

System identification information is stored in Oracle ILOM, and includes the following items:

- **Hostname:** The hostname name assigned to the SP. This can be mapped by a DNS server and used to login to Oracle ILOM.
- **System Identifier:** Additional information about the server.
- **System Contact:** A person to contact for issues with the server.
- **System Location:** A string that describes the physical location of the server.

The following procedures describe how to assign system identification information:

- [“Assign System Identification Information \(Oracle ILOM\)” on page 64](#)
- [“Assign System Identification Information \(Oracle Hardware Management Pack\)” on page 65](#)

▼ Assign System Identification Information (Oracle ILOM)

Before You Begin Ensure that you have Admin (a) role privileges in Oracle ILOM.

1. **To assign system identification information from the Oracle ILOM web interface:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **In the navigation pane, click ILOM Administration → Identification.**
 - c. **Specify one or more of the following system identifiers:**
 - SP Hostname

- SP System Identifier
 - SP System Contact
 - SP System Location
- d. **Click Save.**
2. **To assign system identification information from the Oracle ILOM command-line interface (CLI):**
- a. **Log in to the Oracle ILOM CLI.**
For instructions, see [“Accessing Oracle ILOM” on page 21.](#)
 - b. **Use the `set` command to set one or more identifiers:**

```
set /SP [hostname=hostname] [system_identifier=id] [system_contact=name]
[system_location=building_floor_lab]
```

Related Information

- Setting Identification Labels for a Managed Device, *Oracle ILOM Getting Started Guide, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ Assign System Identification Information (Oracle Hardware Management Pack)

1. **Access the operating system command-line with root privileges.**
For more information, see [“Accessing the Host Console” on page 38](#) or [“Accessing Oracle Hardware Management Pack” on page 32.](#)
2. **Use the `ilomconfig modify` command to set one or more identifiers:**

```
ilomconfig modify identification [--hostname=hostname] [--system-contact=system_contact]
[--system-location=system_location] [--system-identifier=system_identifier]
```

Related Information

- Configuring Oracle ILOM (`ilomconfig`), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

Setting the Service Processor Clock

You can configure the Oracle ILOM clock by either synchronizing the clock with an NTP server or setting the date and time based on the local time zone.

- [“Set the SP Clock \(Oracle ILOM\)” on page 66](#)
- [“Set the SP Clock \(Oracle Hardware Management Pack\)” on page 67](#)

Refer to the Oracle server documentation to determine whether:

- The current time in Oracle ILOM can persist across SP reboots.
- The current time in Oracle ILOM can be synchronized with the host at host boot time.
- The system supports a real-time clock element that stores the time.

▼ Set the SP Clock (Oracle ILOM)

Before You Begin Ensure that you have Admin (a) role privileges in Oracle ILOM.

- 1. To set the service processor clock from the Oracle ILOM web interface, perform the following steps:**
 - a. Log in to the Oracle ILOM web interface.**

For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. In the navigation pane, click ILOM Administration → Date and Time.**
 - c. Configure the service processor clock manually, or enable the clock to synchronize with an NTP server:**
 - **To set the service processor clock manually, do the following:**
 - i Specify a Date and Time, and then click Save.**
 - ii Click the Timezone tab.**
 - iii Select a Timezone from the drop-down list.**
 - iv Click Save.**

- To synchronize the service processor clock with an NTP server, do the following:
 - i Select the Enabled check box in the Synchronize Time Using NTP field.
 - ii Enter the IP address or hostname of one or more NTP servers.
 - iii Click Save.
- 2. To set the service processor clock from the Oracle ILOM command-line interface (CLI):
 - a. Log in to the Oracle ILOM CLI.
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. Configure the service processor clock manually, or enable the clock to synchronize with an NTP server:
 - To set the service processor clock manually, use the `set` command:

```
set /SP/clock datetime= MMDDhhmmYYYY timezone=3_to_4_characters
```
 - To synchronize the service processor clock with an NTP server, use the `set` command:

```
set /SP/clock usntpserver=enabled
```



```
set /SP/clients/ntp/server/[1|2] address=address
```

Related Information

- Setting ILOM Clock Properties, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at: <http://www.oracle.com/goto/ilom/docs>

▼ Set the SP Clock (Oracle Hardware Management Pack)

1. Access the operating system command-line with root privileges.

For more information, see [“Accessing the Host Console” on page 38](#) or [“Accessing Oracle Hardware Management Pack” on page 32](#).

2. Use the `ilomconfig modify clock` command:

■ **To set the service processor clock manually, type:**

```
ilomconfig modify clock [--datetime=MMDDhhmmYYYY] [--timezone=timezone]
```

■ **To synchronize the service processor clock with an NTP server, type:**

```
ilomconfig modify clock --usntp=enabled|disabled -ntp-server1=ntpserver1 [--ntp-server2=ntpserver2]
```

Related Information

- Configuring Oracle ILOM (`ilomconfig`), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

Adding Oracle ILOM User Accounts

Use Oracle ILOM user accounts to authenticate users logging in to the system and to authorize user access to discrete Oracle ILOM features. You can configure up to 10 user accounts locally, and you can configure additional user accounts remotely using a separate authentication server.

Creating a local Oracle ILOM user account involves assigning a user name and password and assigning one or more user roles. For more details, see the following procedures:

- [“Add an Oracle ILOM User Account \(Oracle ILOM\)” on page 68](#)
- [“Add an Oracle ILOM User Account \(Oracle Hardware Management Pack\)” on page 69](#)

▼ **Add an Oracle ILOM User Account (Oracle ILOM)**

Before You Begin Ensure that you have User Management (u) role privileges in Oracle ILOM.

- 1. To create an Oracle ILOM user account using the Oracle ILOM web interface:**
 - a. Log in to the Oracle ILOM web interface.**

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

- b. **In the navigation pane, click ILOM Administration → User Management, and then click the User Accounts tab.**
 - c. **In the Users table, click Add.**
The User Account dialog box appears.
 - d. **Specify a User Name, Password, and User Role.**
 - e. **Click Save.**
2. **To create an Oracle ILOM user account using the Oracle ILOM command-line interface (CLI):**
 - a. **Log in to the Oracle ILOM CLI.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).

- b. **Use the `set` command:**

```
set /SP/users/username password=password [role=a|u|c|r|o|s|Operator|Administrator]
```

Related Information

- Managing User Credentials and Managing Password Policy Restrictions for Local Users
Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x at <http://www.oracle.com/goto/ilom/docs>
- Add New Users to Oracle ILOM, *Oracle ILOM Quick Start Guide, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ Add an Oracle ILOM User Account (Oracle Hardware Management Pack)

1. **Access the operating system command-line with root privileges.**
For more information, see [“Accessing the Host Console” on page 38](#) or [“Accessing Oracle Hardware Management Pack” on page 32](#).
2. **Use the `ilomconfig create user` command:**
`ilomconfig create user username [--role=role]`

Related Information

- *Configuring Oracle ILOM (ilomconfig), Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

Monitoring Server Inventory and Health

This section provides instructions for viewing general information about the server, including a component inventory. In addition, this section includes an overview of hardware fault management and diagnostics on the server.

Task	Link
View general information about the server, including a component inventory.	“Viewing System Information and Inventory” on page 71
Check system hardware components with HWdiag.	“Check System Components With HWdiag” on page 73
Learn about fault detection on the server.	“Fault Detection and Diagnostics Overview” on page 74
View a list of faulty components.	“Monitoring Hardware Faults” on page 75
Manually clear hardware faults.	“Manually Clearing Hardware Faults” on page 79

Viewing System Information and Inventory

You can view the system information and inventory using Oracle ILOM or Oracle Hardware Management Pack:

- [“View System Information and Inventory \(Oracle ILOM\)” on page 71](#)
- [“View System Information and Inventory \(Oracle Hardware Management Pack\)” on page 72](#)

▼ View System Information and Inventory (Oracle ILOM)

1. To view information about server subsystems from the Oracle ILOM web interface:

- a. **Log in to the Oracle ILOM web interface.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **In the Summary Information page, review the General Information and Status panels.**
The General Information panel provides details such as the system type and host primary MAC address. The Status panel provides details about server subsystems, and a high-level component inventory.
 - c. **In the navigation pane, click on the name of a subsystem to view information about that subsystem.**
Subsystem options include Processors, Memory, Power, Cooling, Storage, Networking, PCI Devices, and Firmware.
2. **To view information about server subsystems from the Oracle ILOM command-line interface (CLI):**
- a. **Log in to the Oracle ILOM CLI.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **Type `show / System` to view general information about the server.**
Oracle ILOM displays details such as the system type and host primary MAC address.
 - c. **Type `show / System/subsystem` to view information about a particular subsystem:**
`show /System/[Processors|Memory|Power|Cooling|Storage|PCI_Devices|Firmware]`

Related Information

- Collecting System Information, *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>
- [“View and Resolve Open Problems \(Oracle ILOM\)” on page 76](#)

▼ View System Information and Inventory (Oracle Hardware Management Pack)

This procedure describes how to view basic information about the server using the Oracle Hardware Management Pack command-line tools.

If you prefer to use the SNMP agents included with Oracle Hardware Management Pack to monitor the server, refer to the *Oracle Server Management Agents User's Guide* at <http://www.oracle.com/goto/ohmp/docs>.

1. **Access the operating system command-line with root privileges.**
For more information, see “[Accessing the Host Console](#)” on page 38 or “[Accessing Oracle Hardware Management Pack](#)” on page 32.

2. **Use the `hwmgmtcli list` command:**

```
hwmgmtcli list subsystem
```

Where *subsystem* is one of the following: *all, server, cooling, processor, memory, power, storage, network, firmware, device, bios, or iomodule*

Related Information

- [Displaying Hardware Information \(hwmgmtcli\)](#), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

▼ Check System Components With HWdiag

HWdiag is a command-line utility used to check the status of system components. It is run from the Oracle ILOM command line interface (CLI) using the Diag Shell.

Note - The Oracle ILOM Diag shell is available only in Oracle ILOM 4.0.x and later releases.

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

The Oracle ILOM prompt appears.

2. **Access the Diag Shell. Type:**

```
->start /SP/diag/shell
```

```
Are you sure you want to start /SP/diag/shell (y/n)? y
```

The `diag>` prompt appears.

3. **Enter the command.**

HWdiag commands use the form `hwdiag main command [subcommand ...]`.

For details, refer to *Oracle x86 Servers Diagnostics and Troubleshooting Guide With Oracle ILOM 4.0.x* in <http://www.oracle.com/goto/x86admindiag/docs>.

4. To display HWdiag help, type:

- **hwdiag** to display a list of options and main commands.
- **hwdiag -h** to display a list of main commands and their subcommands.
- **hwdiag -h *main command*** to display help specific to *main command*.

Fault Detection and Diagnostics Overview

The server supports multiple fault detection and diagnostics tools. Fault detection tools, such as the Oracle ILOM Fault Manager, automatically poll the system to detect hardware faults and adverse environmental conditions. Diagnostics tools, such as Oracle VTS must be run manually and can assist you in troubleshooting server issues. The following table provides an overview of the fault detection and diagnostics tools supported by the server.

Tool	Description	Documentation
Oracle ILOM Fault Manager	<p>The fault manager automatically detects system hardware faults and environmental conditions on the server. If a problem occurs on the server, Oracle ILOM identifies the problem in the Open Problems table and logs information about the fault in the Event log.</p> <p>The Oracle ILOM Fault Manager is part of the Oracle ILOM firmware embedded on the server service processor (SP).</p>	<p>Refer to Protecting Against Hardware Faults: Oracle ILOM Fault Manager, <i>Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x</i> at:</p> <p>http://www.oracle.com/goto/ilom/docs</p>
Oracle Linux Fault Management Architecture (FMA)	<p>Oracle Linux FMA can be used to manage faults detected at the operating system (OS) level in much the same way that you manage faults in Oracle ILOM. Fault diagnosis messages from Linux FMA are maintained on a fault management database, which is shared with Oracle ILOM.</p> <p>Oracle Linux FMA software can be optionally installed on the server through Oracle Hardware Management Pack.</p>	<p>Refer to the <i>Oracle Hardware Management Pack Linux Fault Management Architecture User's Guide</i> at:</p> <p>http://www.oracle.com/goto/ohmp/docs</p>
Oracle Solaris Fault Management Architecture (FMA)	<p>The fault manager receives data related to hardware and software errors, automatically diagnoses the underlying problem, and responds by trying to take faulty components offline.</p> <p>Oracle Solaris FMA is included with the Oracle Solaris operating system (OS).</p>	<p>Refer to <i>Oracle Solaris Administration: Common Tasks</i> at:</p> <p>http://docs.oracle.com/cd/E23824_01/index.html</p>
Auto Service Request (ASR)	<p>ASR is an optional support service for Oracle hardware. ASR collects hardware telemetry data from telemetry sources (such as Oracle ILOM) on ASR-enabled systems in your data center. ASR filters this telemetry data and forwards what it determines to be potential faults directly to Oracle, and then automatically initiates a service request. You can configure features of the ASR service from Oracle ILOM.</p>	<p>Go to:</p> <p>http://www.oracle.com/us/support/auto-service-request/index.html</p>

Tool	Description	Documentation
HWdiag	HWdiag is a command-line utility used to check the status of system components. It is run from the Oracle ILOM command line interface (CLI) using the Diag Shell.	See “ Check System Components With HWdiag ” on page 73.
BIOS POST	At system startup, the system BIOS performs a power-on self-test (POST) that checks the hardware on your server to ensure that all components are present and functioning properly. It displays the results of this test on the system console. To launch the power-on self-test and view the test output, reset the power on the server.	Refer to the BIOS POST section in the <i>Oracle x86 Servers Diagnostics Guide for Oracle ILOM 4.0.x</i> at: http://www.oracle.com/goto/x86adminddiag/docs
Oracle VTS	Oracle VTS is a comprehensive diagnostic tool that verifies the connectivity and functionality of most hardware controllers and devices. Oracle VTS is the preferred test for diagnosing I/O and host bus adapter (HBA) problems. Launch Oracle VTS on a system running the Oracle Solaris operating system. Alternatively, you can download the Oracle VTS ISO image to your Oracle server or to a CD/DVD and then use Oracle ILOM redirection to boot the image.	Refer to the Oracle VTS section in the <i>Oracle x86 Servers Diagnostics Guide for Oracle ILOM 4.0.x</i> at: http://www.oracle.com/goto/x86adminddiag/docs
UEFI Diagnostics	UEFI Diagnostics is a suite of diagnostics tests that enable you to detect problems on motherboard components, drives, ports, and slots. Launch these tests from the Oracle Integrated Lights Out Manager (ILOM) web interface or command-line interface (CLI).	Refer to one of the following resources: <ul style="list-style-type: none"> ■ The UEFI Diagnostics section in the <i>Oracle x86 Servers Diagnostics Guide for Oracle 4.0</i> at: http://www.oracle.com/goto/x86adminddiag/docs ■ The x86 diagnostics section in the <i>Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x</i> at: http://www.oracle.com/goto/ilom/docs

Monitoring Hardware Faults

Oracle's server management tools enable you to proactively monitor the health of your system and can be configured to notify you when hardware faults occur. The following procedures describe how to view a list of problems diagnosed on the system and view log information to help troubleshoot the issue:

- “[View and Resolve Open Problems \(Oracle ILOM\)](#)” on page 76
- “[View and Resolve Open Problems \(Oracle Hardware Management Pack\)](#)” on page 77
- “[View the Event Log \(Oracle ILOM\)](#)” on page 78

▼ View and Resolve Open Problems (Oracle ILOM)

1. To view open problems on the server from the Oracle ILOM web interface:

a. Log in to the Oracle ILOM web interface.

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. In the navigation pane, click Open Problems.

A list of faults diagnosed on the server appears. Each entry includes a link to an Oracle Knowledge Article, which describes a corrective action.

2. To view open problems on the server from the Oracle ILOM command-line interface (CLI):

a. Log in the the Oracle ILOM CLI.

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. Use the `show /System/Open_Problems` command.

A list of faults diagnosed on the server appears, for example:

```
Open Problems (7)
Date/Time          Subsystems          Component
-----
Wed Apr  2 20:03:19 2014 System              MB (Motherboard)
  fault.io.pciex.bus-linkbw-down (Probability:50,
  UUID:d8b3b979-1e73-c846-a071-f47c09213ae7, Part Number:7066886, Serial
  Number:489089M+13494B004E, Reference
  Document:http://support.oracle.com/msg/PCIEX-8000-V2)
Wed Apr  2 20:03:19 2014 System              MB (Motherboard)
  fault.io.pciex.bus-linkbw-down (Probability:50,
  UUID:44984fde-b0bc-cb6f-a77f-cc32c0955abb, Part Number:7066886, Serial
  Number:489089M+13494B004E, Reference
  Document:http://support.oracle.com/msg/PCIEX-8000-V2)
Wed Apr  2 20:03:19 2014 PCI Devices          PCIE1 (PCIe Slot 1)
  fault.io.pciex.bus-linkbw-down (Probability:50,
  UUID:d8b3b979-1e73-c846-a071-f47c09213ae7, Part Number:N/A, Serial
  Number:N/A, Reference
  Document:http://support.oracle.com/msg/PCIEX-8000-V2)
Wed Apr  2 20:08:08 2014 System              MB (Motherboard)
  fault.io.intel.iio.pcie-link-degraded-speed (Probability:33,
  UUID:1c4ddb85-0825-673c-bac4-ce9c9849474b, Part Number:7066886, Serial
  Number:489089M+13494B004E, Reference
  Document:http://support.oracle.com/msg/---)
Paused: press any key to continue, or 'q' to quit
```

Each entry includes a link to an Oracle Knowledge Article, which describes a corrective action.

Related Information

- Administering Open Problems, *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>
- Set up Alert Notifications, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ View and Resolve Open Problems (Oracle Hardware Management Pack)

1. Access the operating system command-line interface.

For more information, see “[Accessing Oracle Hardware Management Pack](#)” on page 32.

2. Use the `hwmgmtcli list open_problems` command.

A list of faults diagnosed on the server appears, for example:

```
=== open_problems report ===
Open Problem 1
Problem time       : Thu Feb 14 22:38:19 2013
Problem subsystem  : System
Problem location   : /SYS (Host System)
Problem description : The top cover of server was opened while AC
input was still applied to the power supplies. (Probability: 100, UUID:
8bb87e70-d210-632b-d553-fc1450105bc4, Part Number: 31112054+1+1, Serial
Number: 1242FML0UV, Reference Document: http://www.sun.com/msg/SPX86-8003-8C).
Open Problem 2
Problem time       : Fri Feb 15 10:37:48 2013
Problem subsystem  : Storage
Problem location   : /SYS/DBP0/HDD2
Problem description : The disk temperature has exceeded the critical
limit. (Probability: 100, UUID: N/A, Part Number: H106030SDSUN300G, Serial
Number: 001234NTR1KD          PWGTR1KD, Reference Document: N/A)
```

Each entry includes a link to an Oracle Knowledge Article, which describes a corrective action.

▼ View the Event Log (Oracle ILOM)

The Oracle ILOM event log tracks informational, warning, or error messages generated on the server. Events can include server reboots and power ons, sensor threshold events, and BIOS updates. The event log is helpful for troubleshooting the system and monitoring the server performance.

1. To view the event log from the Oracle ILOM web interface:

a. Log in to the Oracle ILOM web interface.

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. In the navigation pane, click ILOM Administration → Logs, and then select the Event tab.

2. To view the event log from the Oracle ILOM command-line interface (CLI):

a. Log in to the Oracle ILOM CLI.

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. Type `show /SP/Logs/event/list`.

A list of hardware-related events appears, for example:

```
Event
ID      Date/Time                Class    Type    Severity
-----
937     Fri Apr 4 13:49:14 2017 IPMI     Log     minor
      ID = da : 04/04/2014 : 13:49:14 : System Firmware Progress : BIOS :
      System boot initiated : Asserted
936     Fri Apr 4 13:49:14 2017 IPMI     Log     minor
      ID = d9 : 04/04/2017 : 13:49:14 : System Firmware Progress : BIOS :
      System boot initiated : Asserted
935     Fri Apr 4 13:49:03 2017 IPMI     Log     minor
      ID = d8 : 04/04/2017 : 13:49:03 : System Firmware Progress : BIOS :
      Option ROM initialization : Asserted
934     Fri Apr 4 13:48:55 2017 IPMI     Log     minor
Paused: press any key to continue, or 'q' to quit
```

Related Information

- Managing Oracle ILOM Log Entries, *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

- Configuring Alert Notifications, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

Manually Clearing Hardware Faults

Typically, when a faulted component is replaced or removed, Oracle ILOM and Hardware Management Pack stop reporting the component as faulted. However, certain field-replaceable units (FRUs) require an explicit repair. For these you must manually clear the fault in the Oracle ILOM Fault Management shell to stop it from appearing in the open problems output.

For instructions to manually clear a fault, see: “[Manually Clear a Hardware Fault \(Oracle ILOM\)](#)” on page 79

▼ Manually Clear a Hardware Fault (Oracle ILOM)

Before You Begin Ensure that you have Admin (a) role privileges in Oracle ILOM.

1. **Log in to the Oracle ILOM command-line interface.**
For instructions, see “[Accessing Oracle ILOM](#)” on page 21.
2. **Type `start /SP/faultmgmt/shell` to launch the Oracle ILOM Fault Management shell.**
A confirmation prompt appears.
3. **Type `y` to confirm that you want to start the Oracle ILOM Fault Management shell.**
The `faultmgmtsp>` prompt appears.
4. **Use the `fmadm` utility to indicate that a component should not be considered faulted.**

For more information, refer to Using the Oracle ILOM Fault Management Shell, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at: <http://www.oracle.com/goto/ilom/docs>.

Monitor Server Power Consumption and Component Temperatures

This section describes how to monitor the amount of power the server consumes and the temperature of the air entering and leaving the system.

Task	Link
View current server power consumption and historical power consumption data.	“Monitoring Server Power Consumption” on page 81
View server inlet and exhaust temperatures, and enable the Enhanced PCIe Cooling Policy.	“Monitoring Server Inlet and Exhaust Temperature” on page 84

Monitoring Server Power Consumption

Oracle ILOM provides the following power metrics for the server:

- **Power Supply Maximum:** The maximum amount of power the power supply units (PSU) can draw.
- **Allocated Power:** The power allocated for installed and hot-pluggable components.
- **Actual Power:** The amount of power the server is currently consuming.
- **Peak Permitted:** The maximum power the server can consume at any time.

In addition, you can view historical power consumption data from the Oracle ILOM web interface.

To view server power metrics, see the following procedures:

- [“View Current Server Power Consumption \(Oracle ILOM\)” on page 82](#)
- [“View Power Allocated to Server Components \(Oracle ILOM\)” on page 82](#)
- [“View Historical Power Consumption Data \(Oracle ILOM\)” on page 83](#)

▼ View Current Server Power Consumption (Oracle ILOM)

1. **To view current server power consumption in the Oracle ILOM web interface:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **In the navigation pane, click Power Management → Consumption.**
The Power Consumption page appears.
 - c. **Review the Actual Power property in the Power Consumption page.**
2. **To view current server power consumption in the Oracle ILOM command-line interface (CLI):**
 - a. **Log in to the Oracle ILOM CLI.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
 - b. **Type:** `show /System/Power`
 - c. **Review the `actual_power_consumption` property.**

Related Information

- Monitoring Power Consumption, *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ View Power Allocated to Server Components (Oracle ILOM)

1. **To view the power allocated to server components in the Oracle ILOM web interface:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).

Related Information

- Analyzing Power Usage Statistics, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

Monitoring Server Inlet and Exhaust Temperature

In Oracle ILOM, you can view the server inlet and exhaust temperatures. In addition, if one or more of the PCIe cards in the server require a cooler operating environment, you can enable the Enhanced PCIe Cooling Policy. The policy lowers the chassis outlet temperature sensor thresholds, which are used by the chassis fans to keep the PCIe cards operating within their required temperature range. For instructions, see the following procedures:

- “[View the Server Inlet and Exhaust Temperature \(Oracle ILOM\)](#)” on page 84
- “[Set Enhanced PCIe Cooling Policy \(Oracle ILOM\)](#)” on page 85

▼ View the Server Inlet and Exhaust Temperature (Oracle ILOM)

1. **To view the temperatures in the Oracle ILOM web interface:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see “[Accessing Oracle ILOM](#)” on page 21.
 - b. **In the navigation pane, click System Information → Cooling.**
The Cooling page appears.
 - c. **Review the Inlet Temperature and Exhaust Temperature fields.**
2. **To view the temperatures in the Oracle ILOM command-line interface (CLI):**
 - a. **Log in to the Oracle ILOM CLI.**
For instructions, see “[Accessing Oracle ILOM](#)” on page 21.
 - b. **Type: `show /System/Cooling`**
 - c. **Review the `inlet_temp` and `outlet_temp` properties.**

▼ Set Enhanced PCIe Cooling Policy (Oracle ILOM)

Before You Begin Ensure that you have Admin (a) role privileges in Oracle ILOM.

1. **To set the Enhanced PCIe Cooling Policy in the Oracle ILOM web interface:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see “[Accessing Oracle ILOM](#)” on page 21.
 - b. **In the navigation pane, click System Management → Policy.**
The Policy Configuration page appears.
 - c. **In the Service Processor Policies table, select Set Enhanced PCIe Cooling Mode Policy.**
 - d. **Select Enable or Disable in the Actions drop-down list.**
The policy takes effect at the next server reset.
2. **To set the Enhanced PCIe Cooling Policy in the Oracle ILOM command-line interface:**
 - a. **Log in to the Oracle ILOM CLI.**
For instructions, see “[Accessing Oracle ILOM](#)” on page 21.
 - b. **Use the `set /SP/policy ENHANCED_PCIE_COOLING_MODE=enabled|disabled` command.**
The policy takes effect at the next server reset.

Related Information

- Power On and Cooling Down Policies Configurable from SP, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at: <http://www.oracle.com/goto/ilom/docs>

Backing Up and Restoring Hardware and Firmware Configurations

This section provides procedures for backing up, restoring, and replicating system firmware configurations.

Task	Link
Back up the current BIOS, Oracle ILOM, or RAID configuration.	“Backing Up Current Firmware and Hardware Configurations” on page 87
Restore a saved BIOS, Oracle ILOM, or RAID configuration.	“Restoring Saved Firmware Configurations” on page 92
Reset the BIOS firmware to factory defaults.	“Resetting the Firmware to Default Settings” on page 98

Backing Up Current Firmware and Hardware Configurations

To prevent the loss of functioning firmware settings, back up BIOS, Oracle ILOM, or RAID configurations to an XML file. Backed up configurations can be restored on the server or on another server in your data center.

To restore firmware settings from a backed-up XML file, see [“Restoring Saved Firmware Configurations” on page 92](#).

The following procedures describe how to back up firmware configurations to an XML file using the system administration tools:

- [“Back Up the Current BIOS Firmware Configuration \(Oracle ILOM\)” on page 88](#)
- [“Back Up the Current Oracle ILOM Firmware Configuration \(Oracle ILOM\)” on page 89](#)
- [“Back Up the Current BIOS Firmware Configuration \(Oracle Hardware Management Pack\)” on page 91](#)
- [“Back Up the Current Oracle ILOM Firmware Configuration \(Oracle Hardware Management Pack\)” on page 91](#)

- [“Back Up RAID Controller Configuration \(Oracle Hardware Management Pack\)” on page 92](#)

▼ Back Up the Current BIOS Firmware Configuration (Oracle ILOM)

Before You Begin Ensure that you have Reset and Host Control (r) and Admin (a) role privileges in Oracle ILOM.

1. To back up the current BIOS configuration in the Oracle ILOM web interface:

- a. Log in to the Oracle ILOM web interface.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).
- b. In the navigation pane, click System Management → BIOS.**
- c. In the Backup section of the page, select a Transfer Method from the drop-down list.**
- d. Specify the destination of the exported configuration.**
- e. Click Start Backup.**

2. To back up the current BIOS configuration in the Oracle ILOM command-line interface (CLI):

- a. Log in to the Oracle ILOM CLI.**
For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. Use the following command:

```
set /System/BIOS/Config/dump_uri=transfer_method://username:password@host/filepath
```

Where:

- `transfer_method` is one of the following protocols: `tftp`, `ftp`, `sftp`, `scp`, `http`, or `https`
- `username` and `password` are your credentials on the remote system where the backup file will be saved.
- `host` is the IP address or hostname of the system where the backup file will be saved.
- `filepath` is the relative path to the backup file.

Note - If you transfer the backup file using TFTP, you do not need to provide a username or password.

Related Information

- Back Up the BIOS Configuration, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ Back Up the Current Oracle ILOM Firmware Configuration (Oracle ILOM)

Before You Begin Ensure that you have the privileges associated with the following roles in Oracle ILOM: Admin (a), User Management (u), Console (c), and Reset and Host Control (r).

1. **To back up the current Oracle ILOM configuration in the Oracle ILOM web interface:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see “[Accessing Oracle ILOM](#)” on page 21.
 - b. **In the navigation pane, click ILOM Administration → Configuration Management.**
 - c. **Select Backup in the Operation drop-down list.**
 - d. **In the Transfer Method drop-down list, select a transfer method.**
 - e. **Specify the destination of the exported configuration.**
 - f. **If you want to include sensitive information in the backup file, specify and confirm a Passphrase to encrypt the sensitive data.**
If you specify a Passphrase, the Passphrase is required to restore the backed up configuration.
If you do not specify a Passphrase, sensitive data will not be included in the backup file.

Note - Oracle ILOM 3.2.6 or newer provides a selection to include fault data in the backup. It is reserved for Oracle Service personnel when they replace the SP. It requires a passphrase.

▼ Back Up the Current BIOS Firmware Configuration (Oracle Hardware Management Pack)

Before You Begin Ensure that you have root privileges.

1. Access the operating system command-line interface.

For more information, see “[Accessing the Host Console](#)” on page 38 or “[Accessing Oracle Hardware Management Pack](#)” on page 32.

2. Use the `ubiosconfig export` command:

```
ubiosconfig export all --xmlfile=filename.xml
```

Related Information

- Updating the UEFI BIOS (`ubiosconfig`), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

▼ Back Up the Current Oracle ILOM Firmware Configuration (Oracle Hardware Management Pack)

Before You Begin Ensure that you have root privileges.

1. Access the operating system command line interface.

For more information, see “[Accessing the Host Console](#)” on page 38 or “[Accessing Oracle Hardware Management Pack](#)” on page 32.

2. Use the `ilomconfig export` command:

```
ilomconfig export config --xmlfile=filename.xml
```

A prompt appears asking whether you want to specify a passphrase. The passphrase is used to encrypt sensitive data in the backup file. If you specify a passphrase, the passphrase is required to restore the backed up configuration. If you do not specify a passphrase, sensitive data will not be included in the backup file.

3. Specify your passphrase choices:

- If you choose to encrypt sensitive data in the file, type `y`, and then specify a passphrase.
- If you choose not to include sensitive data in the backup file, type `n`.

Related Information

- Configuring Oracle ILOM (`ilomconfig`), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

▼ Back Up RAID Controller Configuration (Oracle Hardware Management Pack)

You can export the configuration for RAID controllers to an XML file, which can then be used to import (restore) that information, for example if the controller needs to be replaced.

This command creates a single XML file containing configuration information for all the RAID controllers in the system.

Note - When you import the file, it detects any RAID controllers that are unconfigured, and updates only those.

1. **Access the operating system command-line with root privileges.**

For more information, see “[Accessing the Host Console](#)” on page 38 or “[Accessing Oracle Hardware Management Pack](#)” on page 32.

2. **To export a configuration and write it to a file, type:**

```
raidconfig export config filename.xml
```

Oracle Hardware Management Pack creates an XML file containing the RAID controller configuration information. Unless you specify a path name, it places the file in your current location.

Related Information

- Exporting or Importing a RAID Controller Configuration (`raidconfig`), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>.

Restoring Saved Firmware Configurations

To recover from unwanted configuration changes, you can revert the server BIOS, Oracle ILOM firmware, or RAID settings to a configuration that was previously saved in an XML file.

To back up a configuration to an XML file, see [“Backing Up Current Firmware and Hardware Configurations”](#) on page 87.

- [“Restore a Saved BIOS Firmware Configuration \(Oracle ILOM\)”](#) on page 93
- [“Restore a Saved Oracle ILOM Firmware Configuration \(Oracle ILOM\)”](#) on page 94
- [“Restore a Saved BIOS Firmware Configuration \(Oracle Hardware Management Pack\)”](#) on page 96
- [“Restore a Saved Oracle ILOM Firmware Configuration \(Oracle Hardware Management Pack\)”](#) on page 96
- [“Restore RAID Controller Configuration \(Oracle Hardware Management Pack\)”](#) on page 97

▼ Restore a Saved BIOS Firmware Configuration (Oracle ILOM)

Before You Begin Ensure that you have Reset and Host Control (r) and Admin (a) role privileges in Oracle ILOM.

1. **To restore a saved BIOS configuration in the Oracle ILOM web interface, perform the following steps:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see [“Accessing Oracle ILOM”](#) on page 21.
 - b. **In the navigation pane, click System Management → BIOS.**
 - c. **In the Restore section of the page, select a restore option from the Restore Options drop-down list.**
 - d. **In the Transfer Method drop down list, select a transfer method.**
 - e. **Specify the location of the XML file.**
 - f. **Click Start Restore.**
2. **To restore a saved BIOS configuration in the Oracle ILOM command-line interface (CLI):**
 - a. **Log in to the Oracle ILOM CLI.**
For instruction, see [“Accessing Oracle ILOM”](#) on page 21.

b. Use the `set` command:

```
set System/BIOS/Config restore_options=[all|config_only|bootlist_only]
load_uri=transfer_method://username:password@host/filepath
```

Where:

- `transfer_method` is one of the following protocols: `tftp`, `ftp`, `sftp`, `scp`, `http`, or `https`.
- `username` and `password` are your credentials on the remote system where the backup file is saved.
- `host` is the IP address or hostname of the system where the backup file is saved.
- `filepath` is the relative path to the backup file.

Note - If you transfer the backup file using TFTP, you do not need to provide a username or password.

Related Information

- Restore BIOS Configuration, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ Restore a Saved Oracle ILOM Firmware Configuration (Oracle ILOM)

Before You Begin Ensure that you have the privileges associated with the following roles in Oracle ILOM: Admin (a), User Management (u), Console (c), and Reset and Host Control (r).

1. **To restore a saved Oracle ILOM configuration from the Oracle ILOM web interface:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see “[Accessing Oracle ILOM](#)” on page 21.
 - b. **In the navigation pane, click ILOM Administration → Configuration Management.**
 - c. **Select Restore in the Operation drop-down list.**

- d. In the Transfer Method drop-down list, select a transfer method.
- e. Specify the location of the XML file.
- f. If you specified a Passphrase when you exported the XML file, enter and confirm the Passphrase.

If you included fault data in the backup, you can select Include Fault Data to restore it. This selection is reserved for Oracle Service personnel when they replace the SP. It requires a passphrase.

- g. Click Run.

Note - While the Restore operation is taking place, Oracle ILOM sessions are suspended. The sessions resume after the Restore operation is complete.

2. To restore a saved Oracle ILOM configuration in the Oracle ILOM command-line interface (CLI):

- a. Log in to the Oracle ILOM CLI.

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

- b. Use the `set` command:

```
set /SP/Config passphrase=passphrase include_faultdata=[true|false]
load_uri=transfer_method://username:password@host/filepath
```

Where:

- `passphrase` is the passphrase you specified when you exported the XML file. If you did not specify a passphrase, do not set the `passphrase` property.
- `include_faultdata=true` includes fault data in the restore, if fault data was included in the backup. This selection requires a passphrase and is available with Oracle ILOM 3.2.6 or newer.

Note - The fault data backup and restore is reserved for Oracle Service personnel when they replace the SP.

- `transfer_method` is one of the following protocols: `tftp`, `ftp`, `sftp`, `scp`, `http`, or `https`.

- username and password are your credentials on the remote system where the backup file is saved.
- host is the IP address or hostname of the system where the backup file is saved.
- filepath is the relative path to the backup file.

Note - If you transfer the backup file using TFTP, you do not need to provide a username or password.

Related Information

- Restore the Oracle ILOM Backup XML File, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ Restore a Saved BIOS Firmware Configuration (Oracle Hardware Management Pack)

Before You Begin Ensure that you have root privileges.

1. **Access the operating system command-line interface.**

For more information, see “[Accessing Oracle Hardware Management Pack](#)” on page 32 or “[Accessing the Host Console](#)” on page 38.

2. **Use the `ubiosconfig import` command:**

```
ubiosconfig import all --xmlfile=filename.xml
```

Related Information

- Updating the UEFI BIOS (`ubiosconfig`), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

▼ Restore a Saved Oracle ILOM Firmware Configuration (Oracle Hardware Management Pack)

Before You Begin Ensure that you have root privileges.

1. Access the operating system command-line interface.

For more information, see [“Accessing the Host Console” on page 38](#) or [“Accessing Oracle Hardware Management Pack” on page 32](#).

2. Use the `ilomconfig import` command:

```
ilomconfig import config --xmlfile=filename.xml
```

A prompt appears asking you to confirm that you want to import the settings from the XML file you specified.

3. Type `y` to confirm that you want to proceed.

A second prompt appears asking whether you want to specify a passphrase. If a passphrase was used to encrypt sensitive data in the backup file, the passphrase is required to restore the sensitive data.

4. If you included sensitive data in the XML file, and you want to restore the sensitive information, enter the passphrase.**Related Information**

- [Configuring Oracle ILOM \(ilomconfig\), Oracle Hardware Management Pack Server CLI Tools User's Guide](#) at <http://www.oracle.com/goto/ohmp/docs>

▼ Restore RAID Controller Configuration (Oracle Hardware Management Pack)

You can restore the configuration of a RAID controller using an XML file that was exported as described in [“Back Up RAID Controller Configuration \(Oracle Hardware Management Pack\)” on page 92](#).

The exported XML file contains configuration information for all the RAID controllers in the system. When you import the RAID controller configuration, Oracle Hardware Management Pack detects any RAID controllers that are unconfigured, and updates only those.

1. Access the operating system command-line with root privileges.

For more information, see [“Accessing the Host Console” on page 38](#) or [“Accessing Oracle Hardware Management Pack” on page 32](#).

2. To import a configuration and update any unconfigured RAID controllers, type:

```
raidconfig import config filename.xml
```

Oracle Hardware Management Pack updates any unconfigured RAID controllers with the information in the XML file.

Related Information

- Exporting or Importing a RAID Controller Configuration (raidconfig), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

Resetting the Firmware to Default Settings

Recover from unwarranted configuration changes by resetting the BIOS or Oracle ILOM configuration to its factory default configuration. For instructions, see the following procedures:

- “Reset BIOS Firmware to Default Settings (BIOS)” on page 98
- “Reset BIOS Firmware to Default Settings (Oracle ILOM)” on page 99
- “Reset BIOS Firmware to Default Settings (Oracle Hardware Management Pack)” on page 100
- “Reset Oracle ILOM Firmware to Default Settings (Oracle ILOM)” on page 100
- “Reset Oracle ILOM Firmware to Default Settings (Oracle Hardware Management Pack)” on page 101

▼ Reset BIOS Firmware to Default Settings (BIOS)

Setting defaults ensures that the server is operating with a configuration that is known to be good.

Note - If the server is newly installed and this is the first time an operating system is being installed, then BIOS is probably already configured to its default settings.

Any changes you make in the BIOS Setup Utility using the F2 key are permanent until the next time you change them.

Before You Begin Ensure that your server is equipped with a properly installed hard disk drive (HDD) or solid state drive (SSD).

For instructions, refer to your service manual.

1. **Access the BIOS Setup Utility.**

For instructions, see [“Accessing the BIOS Setup Utility” on page 34](#).

2. **Press the F9 key to automatically load the optimal default settings.**

A message appears prompting you to continue this operation by selecting OK or to cancel this operation by selecting CANCEL.

3. **In the message, highlight OK, and then press Enter.**

4. **To save your changes and exit the BIOS Setup Utility, press the F10 key.**

Alternatively, you can select Save and Exit from the Exit menu.

▼ Reset BIOS Firmware to Default Settings (Oracle ILOM)

Before You Begin Ensure that you have Admin (a) role privileges in Oracle ILOM.

1. **To reset the BIOS firmware to default settings in the Oracle ILOM web interface:**

- a. **Log in to the Oracle ILOM web interface.**

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

- b. **In the navigation pane, click System Management → BIOS.**

- c. **In the Reset to Defaults drop-down list, select Factory.**

- d. **Click Save.**

2. **To reset the BIOS firmware to default settings in the Oracle ILOM command-line interface (CLI):**

- a. **Log in to the Oracle ILOM CLI.**

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

- b. **Type: set /System/BIOS reset_to_defaults=factory**

Related Information

- Reset BIOS Configuration to Factory Defaults, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ Reset BIOS Firmware to Default Settings (Oracle Hardware Management Pack)

1. **Access the operating system command-line with root privileges.**

For more information, see “[Accessing the Host Console](#)” on page 38 or “[Accessing Oracle Hardware Management Pack](#)” on page 32.

2. **Type:** `ubiosconfig reset config`

Related Information

- Updating the UEFI BIOS (ubiosconfig), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at <http://www.oracle.com/goto/ohmp/docs>

▼ Reset Oracle ILOM Firmware to Default Settings (Oracle ILOM)

Before You Begin Ensure that you have Admin (a) role privileges in Oracle ILOM.

1. **To reset the Oracle ILOM firmware to default settings in the Oracle ILOM web interface:**
 - a. **Log in to the Oracle ILOM web interface.**
For instructions, see “[Accessing Oracle ILOM](#)” on page 21.
 - b. **In the navigation pane, click ILOM Administration → Configuration Management, and then click the Reset Defaults tab.**
 - c. **In the Reset Defaults drop-down list, select Factory.**
 - d. **Click Reset Defaults.**

2. **To reset the Oracle ILOM firmware to default settings in the Oracle ILOM command-line interface (CLI):**

a. **Log in to the Oracle ILOM CLI.**

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. **Type:** `set /SP reset_to_defaults=factoryset`

Related Information

- Reset the Oracle ILOM Configuration to Factory Defaults, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at <http://www.oracle.com/goto/ilom/docs>

▼ **Reset Oracle ILOM Firmware to Default Settings (Oracle Hardware Management Pack)**

1. **Access the operating system command-line with root privileges.**

For more information, see [“Accessing the Host Console” on page 38](#) or [“Accessing Oracle Hardware Management Pack” on page 32](#).

2. **Type:** `ilomconfig reset config`

A prompt appears asking you to confirm that you want reset the Oracle ILOM configuration.

3. **Type `y` to confirm that you want to proceed.**

Related Information

- Configuring Oracle ILOM (`ilomconfig`), *Oracle Hardware Management Pack Server CLI Tools User's Guide* at: <http://www.oracle.com/goto/ilom/docs>

Getting Firmware and Software

This section explains the options for accessing server firmware and software updates using My Oracle Support. It also describes how to use the Oracle Software Delivery Cloud to download complete software applications.

Customers are required to install the latest available operating system (OS), patches, and firmware versions for optimal system performance, security, and stability.

- [“Firmware and Software Updates” on page 103](#)
- [“Options for Accessing Firmware and Software Updates” on page 104](#)
- [“Software Releases” on page 104](#)
- [“Download Firmware and Software Updates From My Oracle Support” on page 105](#)
- [“Download Software Using Oracle Software Delivery Cloud” on page 106](#)
- [“Installing Software and Firmware Updates” on page 107](#)
- [“Oracle Support” on page 111](#)

Firmware and Software Updates

Firmware and software for your server are updated periodically. These updates are made available in software releases. Each software releases contains a set of downloadable files (patches) that include firmware, software, hardware drivers, tools, and utilities for the server. All of these files are tested together and verified to work with your server.

You must update your server firmware and software as soon as possible after a new software release becomes available. Software releases often include bug fixes, and updating your server ensures that you have the latest firmware and software. These updates increase your system performance, security, and stability.

The server Product Notes list the current server software release and firmware version that are available. To determine which firmware version is installed on your server, use either the Oracle ILOM web interface or the command-line interface (CLI).

- For the web interface, click **System Information** → **Summary**, and in the **General Information** table, for **System Firmware Version**, view the property value.

- For the CLI, at the command prompt, type: `show /System`

The ReadMe that is included with each patch in a software release describes components that have been changed since the last software release, and bugs that are fixed in the current release.

The Product Notes in the server documentation identify the latest server software release supported on your server.

Options for Accessing Firmware and Software Updates

Use one of the following options to obtain the latest firmware and software updates for your server:

- **My Oracle Support** – All system software releases are available from the My Oracle Support web site at <https://support.oracle.com>.
For information about what is available on the My Oracle Support web site, see “[Software Releases](#)” on page 104.
- **Other Methods** – You can use Oracle Enterprise Manager Ops Center, Oracle Hardware Management Pack, or Oracle ILOM to update your server software and firmware.

Software Releases

Software releases on My Oracle Support are grouped by product family (such as Oracle Server), product (specific server), and software release version. A software release contains all the updated software and firmware for your server as a set of downloadable files (patches), including firmware, drivers, tools, or utilities, all tested together to be compatible with your server. Each patch is a zip file that contains a ReadMe file and a set of subdirectories containing firmware or software files.

My Oracle Support provides the set of software releases for your server, as described in the following table. You can obtain these software releases by downloading the files from My Oracle Support.

Package Name	Description	When to Download This Package
X7-N SW release – Firmware Pack	Contains system firmware, including Oracle ILOM, BIOS, and option card firmware.	You need the latest firmware.

Package Name	Description	When to Download This Package
X7-N SW <i>release</i> – OS Pack	Includes a package of tools, drivers, and utilities for an OS. An OS Pack is available for each supported operating system version. Software includes Oracle Hardware Management Pack, MegaRAID software, and any optional software that Oracle recommends. For the Windows OS, the OS Pack also includes the Intel Network Teaming and Install Pack.	You need to update OS-specific tools, drivers, or utilities.
X7-N SW <i>release</i> – All Packs	Includes the Firmware Pack, all OS Packs, and all documents. This pack excludes Oracle VTS image.	You need to update a combination of system firmware and OS-specific software.
X7-N SW <i>release</i> – Diagnostics	Includes Oracle VTS diagnostics image.	You need the Oracle VTS diagnostics image.

▼ Download Firmware and Software Updates From My Oracle Support

You can obtain updated firmware and software from the My Oracle Support web site.

- Go to the My Oracle Support web site:** <https://support.oracle.com>.
- Sign in to My Oracle Support.**
- At the top of the page, click the Patches & Updates tab.**
The Patch Search pane appears at the right of the screen.
- In the Search tab area, click Product or Family (Advanced).**
The Search tab area appears.
- In the Product field, select the product from the drop-down list.**
Alternatively, type a full or partial product name (for example, Oracle Server X7-2) until a match appears.
- In the Release field, select a software release from the drop-down list.**
Expand the list to see all available software releases.

7. Click Search.

The Patch Advanced Search Results screen appears with a list of the patches for the software release.

See “[Software Releases](#)” on page 104 for a description of the available software releases.

8. To select a patch for a software release, click the patch number next to the software release version.

Use the Shift key to select more than one patch.

A pop-up action panel appears. The panel contains several action options, including the ReadMe, Download, and Add to Plan options. For information about the Add to Plan option, on the Add to Plan button, click the down arrow and select Why use a plan?.

9. To review the ReadMe file for this patch, click ReadMe.

10. To download the patch for the software release, click Download and in the File Download Dialog box click the patch zip file name.

The patch for the software release downloads.

▼ Download Software Using Oracle Software Delivery Cloud

Oracle Software Delivery Cloud allows you to download copies of Oracle software products, including operating systems and related training products for your Oracle server.

Before You Begin You must have a valid user account.

1. Navigate to the Oracle Software Delivery Cloud home page: <https://edelivery.oracle.com/osdc/faces/Home.jspx>

A Sign In screen appears.

2. Sign in.

3. Fill out the search information.

For example, to search for a copy of Oracle Linux:

a. Select Product from the Search By drop down list.

b. Type a product name in the search field.

For example, type **Oracle Linux**.

c. Select a platform.

For example, click the check box next to x86 64-bit, and then click Select.

Your selection appears in the Download Queue.

d. Repeat Step a through Step c to add additional items to the Download Queue.

e. When your Download Queue is complete, click Continue.

A list of downloadable items appears.

4. Select the check box adjacent to the item(s) you want to download, and then select Continue.

A list of terms and restrictions appears.

5. Select the check box to accept the terms and restrictions, then select Continue.

A list of downloadable files appears.

6. Select the files you wish to download, then click Download All.

7. Follow the prompts to complete the download.

Installing Software and Firmware Updates

Use the following procedures to install software and firmware updates.

- [“Update the BIOS and Service Processor Firmware \(Oracle ILOM\)” on page 108](#)
- [“Update the Hardware Device Firmware \(Oracle Hardware Management Pack\)” on page 110](#)

To obtain updated software and firmware, see [“Options for Accessing Firmware and Software Updates” on page 104](#).

Note - In addition to using Oracle ILOM and Oracle Hardware Management Pack to install software and firmware updates, you can use Oracle Enterprise Manager Ops Center to automatically download the latest firmware from Oracle and then install the firmware onto one or more servers.

▼ Update the BIOS and Service Processor Firmware (Oracle ILOM)

Before you begin, ensure that you have Admin (a) role privileges in Oracle ILOM.

Note - The firmware update process takes several minutes to complete. During this time, do not perform any operations on the target server.

1. **Obtain the FIRMWARE PACK patch as described in “[Download Firmware and Software Updates From My Oracle Support](#)” on page 105.**

The FIRMWARE PACK contains the .pkg update file for the BIOS and service processor (SP) firmware.

2. **To update the BIOS and SP firmware image using the Oracle ILOM web interface, perform the following steps:**

- a. **Log in to the Oracle ILOM web interface.**

For instructions, see “[Accessing Oracle ILOM](#)” on page 21.

- b. **In the navigation pane, click ILOM Administration → Maintenance → , and then click the Firmware Upgrade tab.**

- c. **Click the Enter Upgrade Mode button.**

The Firmware Update page appears.

- d. **Select from the following options:**

- **Preserve Configuration:** Enable this option to save and restore the existing Oracle ILOM firmware settings.
- **Preserve BIOS Configuration:** Enable this option to save and restore existing BIOS configurations. This option is not supported on all servers.
- **Delay BIOS Upgrade:** Postpone the BIOS upgrade until after the next time the system is reset or power-cycled.

- e. **Follow the prompts until the upgrade is complete.**

What happens next depends on whether you selected Delay BIOS Upgrade or not:

- If you did not select Delay BIOS Upgrade, an update status display appears. The system power cycles and applies the updates when the update status display reaches 100%.

- If you selected Delay BIOS Upgrade, the system updates Oracle ILOM, but does not upgrade BIOS, and does not power cycle. Instead, it upgrades BIOS the next time you reset or power cycle the server.

Note - When the Oracle ILOM update takes place, your Oracle ILOM session ends. You can access Oracle ILOM again when the update is complete.

Note - If you reset your server when there is a pending BIOS upgrade, Oracle ILOM executes the BIOS upgrade. This power cycles the server and causes the reset to take longer than usual (as much as 26 minutes). This is normal behavior when a delayed BIOS upgrade is applied during a reset.

3. **To update the BIOS and SP firmware image in the Oracle ILOM command-line interface (CLI):**

a. **Log in to the Oracle ILOM CLI.**

For instructions, see [“Accessing Oracle ILOM” on page 21](#).

b. **Type the `load source` command:**

```
load -source/[protocol]://[username]:[password@server_ip]/[path_to_image]/[.pkg]
```

Where *protocol* can be http, https, ftp, tftp, sftp, or scp.

c. **Type `y` to load the firmware image, and then type responses to the following prompts: `y` for Yes and `n` for No.**

- **Preserve Configuration:** Enable this option to save and restore the existing Oracle ILOM firmware settings.
- **Preserve BIOS Configuration:** Enable this option to save and restore existing BIOS configurations. This option is not supported on all servers.
- **Delay BIOS Upgrade:** Postpone the BIOS upgrade until after the next time the system is reset or power-cycled.

Note - These options are enabled by default when using a script.

What happens next depends on whether you selected Delay BIOS Upgrade or not:

- If you did not select Delay BIOS Upgrade, an update status display appears. The system power cycles and applies the updates when the update status display reaches 100%.
- If you selected Delay BIOS Upgrade, the system updates Oracle ILOM but does not upgrade BIOS, and does not power cycle. Instead, it upgrades BIOS the next time you reset or power cycle the server.

Note - When the Oracle ILOM update takes place, your Oracle ILOM session ends. You can access Oracle ILOM again when the update is complete.

Note - If you reset your server when there is a pending BIOS upgrade, Oracle ILOM executes the BIOS upgrade. This power cycles the server and causes the reset to take longer than usual (as much as 26 minutes). This is normal behavior when a delayed BIOS upgrade is applied during a reset.

Related Information

- Update the Server SP or CMM Firmware Image, *Oracle ILOM Administrator's Guide for Configuration and Maintenance Guide, Firmware Release 4.0.x* at: <http://www.oracle.com/goto/ilom/docs>

▼ Update the Hardware Device Firmware (Oracle Hardware Management Pack)

The `fwupdate` CLI tool in Oracle Hardware Management Pack enables you to query, update, and validate the firmware of storage devices such as host bus adapters (HBAs), expanders, and disks on the server. `fwupdate` is supported on Linux and Solaris operating systems.

1. **Obtain the FIRMWARE PACK patch as described in “[Download Firmware and Software Updates From My Oracle Support](#)” on page 105.**
2. **Ensure that the update files are accessible from the server operating system.**
3. **Access the operating system command-line with root privileges.**

For more information, see “[Accessing the Host Console](#)” on page 38 or “[Accessing Oracle Hardware Management Pack](#)” on page 32.

4. Type the fwupdate command.

The fwupdate command enables you to update the firmware in automatic mode or manual mode. For details, refer to the Related Information section.

Related Information

- Using the fwupdate Tool, *Oracle Hardware Management Pack User's Guide* at: <http://www.oracle.com/goto/ohmp/docs>

Oracle Support

If you need help getting firmware or software updates, call Oracle Support. Refer to Oracle Support Contacts Global Directory at:

<http://www.oracle.com/us/support/contact-068555.html>

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