Oracle® X8 Series Servers Administration Guide

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Using This Documentation

- **Overview** – Describes how to manage Oracle X8 Series servers using system administration tools
- **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: https://www.oracle.com/goto/x86admindiag/docs

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Overview of System Administration Tools

This section describes the tools used to manage Oracle servers.

- "Single-System Management Tools" on page 13
- "Multiple-System Management Tools" on page 15
- "Oracle Integrated Lights Out Manager (ILOM)" on page 15
- "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 15	■ Preinstalled service processor (SP) with integrated firmware. No installation is required but 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, sideband port, or local serial port.
"Oracle Hardware Management Pack" on page 17	■ Provides commands and agents that run at the operating system level, across multiple systems. ■ Is included as part of the Oracle Solaris OS starting with Oracle Solaris 11.2, or as	Monitor hardware through the host operating system, either remotely using SNMP or locally using command-line interface tools.

Tool	Description	Function
	a standalone product for other supported operating systems. See the support matrix at https://www.oracle.com/goto/ohmp.	
"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 Server Power" on page 43
Configure the service processor.	✓	✓		"Monitoring Server Information" on page 57
Modify and configure boot properties	✓		✓	"Modifying Boot Properties" on page 65
Monitor hardware components.	✓	✓		"Monitoring Server Information" on page 57
Configure RAID.		✓		"Configuring RAID and Storage Resources" on page 103
See how much power the server is consuming at any given time.	✓			"Monitor Server Power Consumption and Component Temperatures" on page 69
Update BIOS or Oracle ILOM firmware.	✓	✓		"Getting Firmware and Software" on page 113
Update HBA and expander firmware.		✓		"Getting Firmware and Software" on page 113
Reset the server BIOS or Oracle ILOM to default values.	✓	✓	✓	"Resetting BIOS to Default Values" on page 94
Download software and firmware.	✓	✓		"Getting Firmware and Software" on page 113

Related Information

- "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 also can 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 access through a serial management port or remote access through a network management port. By default, these ports offer a dedicated connection to Oracle ILOM. When 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 “Using 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`	Run diagnostics on the server.
	`/HOST boot_device`	Set the next boot device or control the server power state.
System Management	`/System/BIOS`	View BIOS settings.
	`/System/BIOS/Config`	Back up or restore a BIOS configuration.
	`/SP/policy`	Configure system policies such as the Enhanced PCIe Cooling Mode policy.
Power Management	`/SP/powermgmt`	View actual system power consumption. View system power requirements for capacity planning. View historical power usage data.
ILOM Administration	`/SP system_identifier`	Configure system identification information.
	`/SP/logs`	View system event and audit logs.
	`/SP/clients`	Configure remote management access to the server.
	`/SP/users`	Configure Oracle ILOM user accounts.
	`/SP/network`	Configure service processor connectivity settings.

Web Navigation	CLI Hierarchy	Description
	/SP/network/ipv6	
	/SP/config	Back up or restore a service processor configuration.
	/SP reset_to_defaults=factory	Reset the service processor to default settings.
	/SP/alertmgmt	Configure alert notifications for system events and faults.
	/SP/clock	Set the service processor clock.
	/SP/diag/snapshot	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 https://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.

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 `https://www.oracle.com/goto/ohmp/docs`. To download and install Oracle Hardware Management Pack, see "Using Oracle Hardware Management Pack" on page 35.

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

Component	Description
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	Fetches and pushes information to and from Oracle ILOM.
Oracle Server Hardware SNMP Plugins	Monitor the server from the operating system using an industry-standard SNMP interface.
itpconfig	Enables you to configure a trap proxy to send traps between Oracle ILOM and the host server over the Host-to-ILOM Interconnect.

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. You can script the utility commands to support multiple servers, only if the servers are of the same type.

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

CLI Tool	Description
`ubiosconfig`	Preserve BIOS settings and some service processor settings.
`fwupdate`	Update Oracle ILOM and BIOS; or query, update, and validate firmware versions on supported SAS storage devices, embedded SAS

CLI Tool	Description
	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 also can 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 `https://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 “Using UEFI and the BIOS Setup Utility” on page 37.

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.

Component	Description
Main	View general information about the server, including the system date and time, and information about USB devices, the CPUs, and DIMMs. Define an Administrator password for entering the BIOS Setup Utility.
Advanced	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.

Using System Administration Tools

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

- “Using Oracle ILOM” on page 21
- “Establishing User Accounts and Roles” on page 26
- “Launching Remote KVMS Redirection Sessions” on page 28
- “Accessing the Host Console” on page 33
- “Using Oracle Hardware Management Pack” on page 35
- “Using UEFI and the BIOS Setup Utility” on page 37

Using 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 Connection Options” on page 21
- “Logging In to Oracle ILOM” on page 23

Oracle ILOM 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 Local Management Connection	SER MGT	■ 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. ■ This connection is 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.
Dedicated Network Management Connection	NET MGT	■ 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. ■ 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.
Shared Sideband Network Management Connection	NET0–NET3 **Note -** The number of ports varies depending on the server model.	■ 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. ■ 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, `NET`*N*, where *N* is the port number (for example, 0, 1, 2, or 3) depending on how your server is equipped. ■ To establish a remote sideband management connection to Oracle ILOM, see "Configuring SP Sideband Management" on page 52 or refer to Sideband Network Management Connection in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0*.
Host-to-ILOM Interconnect	Internal	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: ■ 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. ■ All 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. **Note -** The Host-to-ILOM Interconnect is also known as the *Dedicated Interconnect SP Management Connection*. Use this name when searching for it in the Oracle ILOM documentation. ■ 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* at `https://www.oracle.com/goto/ilom/docs`.

Management Connection	Management Port	Description
		■ Enabling the Host-to-ILOM Interconnect, *Oracle Hardware Management Pack Installation Guide* at https://www.oracle.com/goto/ohmp/docs.

Logging In to Oracle ILOM

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

You can log in to the Oracle ILOM command-line interface (CLI) locally using the RJ-45 serial management port (SER MGT). You also can log in to the Oracle ILOM web interface or CLI remotely using one of the network ports on the server.

To log in to Oracle ILOM, follow these procedures:

- "Log In to Oracle ILOM Using a Local Serial Connection" on page 23
- "Log In to Oracle ILOM Using a Remote Ethernet Connection" on page 24

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 "Establishing User Accounts and Roles" on page 26.

▼ Log In to Oracle ILOM Using a Local Serial Connection

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

4. **At the password prompt, type the password associated with your user name, and press Enter.**

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

▼ Log In to Oracle ILOM Using 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 "Establishing User Accounts and Roles" on page 26.

1. **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).

2. **To launch and log in to the Oracle ILOM web interface:**

   a. **Open a web browser window.**

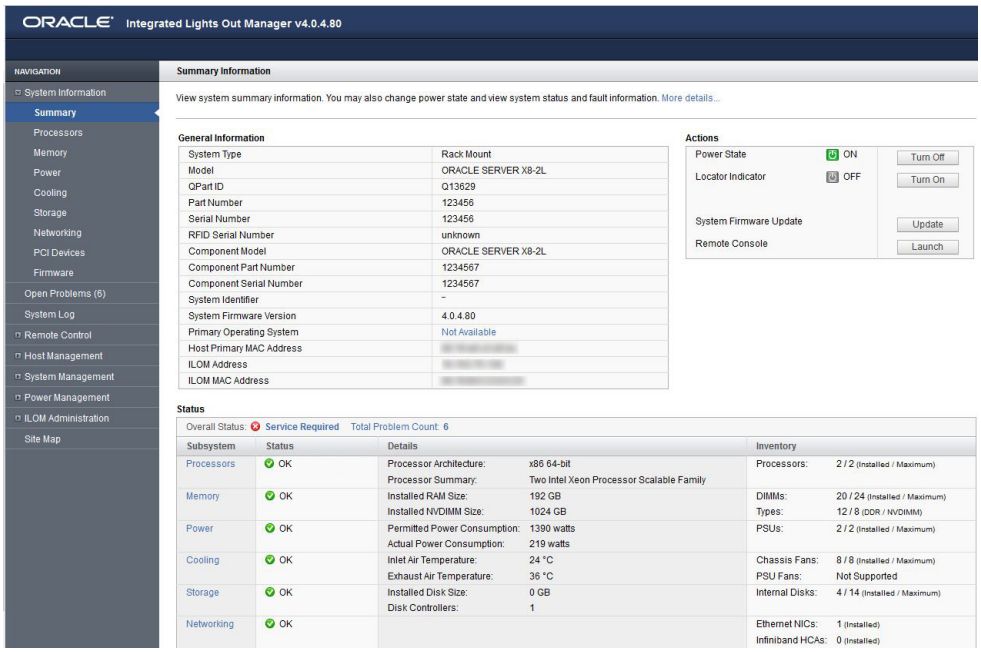
   b. **Ensure that the web browser is supported by Oracle ILOM. For more information, refer to the *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x* at `https://www.oracle.com/goto/x86admindiag/docs`.**

   c. **Type the IP address or host name of the server in the browser address bar, for example 192.0.2.23.**

   d. **In the Oracle ILOM Login dialog box, type your user name and password, and 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.

c. **At the Oracle ILOM password prompt, type your password, and press Enter.**

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

Establishing User Accounts and Roles

The Oracle ILOM software that is preinstalled on the SP is preconfigured with two user accounts:

- `root` – Create additional user accounts, as needed.
- `default` – Limited to password recovery of the `root` account and requires proof of physical presence at the server.

Use the following guidelines to establish additional user accounts and roles in Oracle ILOM. Assign user privileges to a user account from the web interface or CLI. For details, refer to *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at `https://www.oracle.com/goto/ilom/docs`

- Configure a maximum of 10 local user accounts or a centralized authentication service to allow additional remote user accounts. See “Adding Oracle ILOM User Accounts” on page 26.
- Use the Administrator or Operator profile to assign a set of predefined user roles to a single user account or configure the Advanced Roles profile to assign any of the six predefined user roles to a single account.
- Each user account is assigned specific roles that allow a user to execute certain Oracle ILOM commands and perform certain actions on a specific set of components. By specifying roles for each user account, you can control which operations each user is allowed to perform. For a complete description of the available roles and how to configure roles, refer to the Oracle ILOM documentation.

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.

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 27
- “Add an Oracle ILOM User Account (Oracle Hardware Management Pack)” on page 28

▼ Add an Oracle ILOM User Account (Oracle ILOM)

1. **Ensure that you have User Management (u) role privileges in Oracle ILOM.**
2. **To create an Oracle ILOM user account using the Oracle ILOM web interface:**
   a. **Log in to the Oracle ILOM web interface.**
   b. **In the navigation pane, click ILOM Administration → User Management, and click the User Accounts tab.**
   c. **In the Users table, click Add.**
   d. **In the User Account dialog box, specify a User Name, Password, and User Role.**
   e. **Click Save.**
3. **To create an Oracle ILOM user account using the Oracle ILOM command-line interface (CLI):**
   a. **Log in to the Oracle ILOM CLI.**
   b. **Type the `create` command:**

      `create /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 `https://www.oracle.com/goto/ilom/docs`
- Add New Users to Oracle ILOM, *Oracle ILOM Quick Start Guide, Firmware Release 4.0.x* at `https://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. See "Accessing the Host Console" on page 33 or "Using Oracle Hardware Management Pack" on page 35.**

2. **Type 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 `https://www.oracle.com/goto/ohmp/docs`

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:

Remote KVMS Direction Session	Description
Serial remote console redirection	■ View a text-based version of the host console. ■ Interrupt the boot process and configure server settings in the BIOS Setup Utility. ■ Navigate the operating system file system. ■ Enter commands from the operating system command-line application.
Graphical remote console redirection	■ View a graphical-based version of the host console using the Oracle ILOM Remote System Console Plus application. ■ Interrupt the boot process and configure server settings in the BIOS Setup Utility. ■ View the operating system desktop. ■ 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. ■ Is useful when installing an operating system.

▼ Start a Serial Console Redirection Session

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.

1. **Ensure that you have Console (c) role privileges in Oracle ILOM.**
2. **Log in to the Oracle ILOM command-line interface.**
3. **Type `start /HOST/console`.**
4. **At the confirmation prompt, type `y` to confirm that you want to access the host console.**
5. **At the host console, 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.

6. **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 **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* at `https://www.oracle.com/goto/ilom/docs`

▼ Start 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.

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.**

2. **On the Oracle ILOM Summary Information page, 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 Adminstrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at https://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.

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.**

   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.**

b. **To set the location of the image file, type `set /SP/services/kvms/host_storage_device/remote/server_URI=`*NFS_or_Samba_URI_file_location* `[username=`*username*`] [password=`*password*`].**

c. **To enable storage redirection, type `set /SP/services/kvms/host_storage_device/ mode=remote`.**

d. **To view the status of redirection, type `show /SP/services/kvms/host_storage_device/ status`.**

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

---

e. **When you are done, to disable redirection type `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 https://www.oracle.com/goto/ilom/docs

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 https://www.oracle.com/goto/ilom/docs.

1. **Connect a terminal or a terminal emulator to the serial management (SER MGT) port.**
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.**
4. **At the Oracle ILOM Login prompt, type your Oracle ILOM user name and password.**

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

5. **At the Oracle ILOM CLI prompt (->), connect to the host console, and 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 **Esc** key and type uppercase **B**.

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

Related Information

- Oracle Integrated Lights Out Manager (ILOM) 4.0 Documentation Library at https://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.

1. **Verify that you have network access to Oracle ILOM, and know the server SP IP address or hostname.**
2. **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 press Enter.**
   b. **At the Oracle ILOM Login prompt, type your Oracle ILOM user name and password.**

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

   c. **On the Oracle ILOM Summary Information page, in the Actions panel, click the Remote Console Launch button.**

      The Oracle ILOM Remote System Console Plus screen appears.

      For more details, see "Start a Graphical Remote Console Redirection Session" on page 30.

3. **To use an SSH client connection:**

   a. **From a serial console, to establish an SSH connection to the server SP, type `ssh root@`*hostname*.**

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

   b. **At the Oracle ILOM Login prompt, type your Oracle ILOM user name and password.**

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

   c. **At the Oracle ILOM CLI prompt (->), 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 https://www.oracle.com/goto/ilom/docs

Using 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 36
- *Oracle Hardware Management Pack Installation Guide* at https://www.oracle.com/goto/ohmp/docs

To get started, see the following procedures:

- “Use Oracle Hardware Management Pack Commands ” on page 37
- “Oracle Hardware Management Pack Management Agents” on page 37

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 36
- "Install Oracle Hardware Management Pack" on page 36

▼ 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. Refer to `https://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 115.

▼ Install Oracle Hardware Management Pack

1. **Remove any previous versions of Oracle Hardware Management Pack installed on the server, as described in the *Oracle Hardware Management Pack Installation Guide* at `https://www.oracle.com/goto/ohmp/docs`.**
2. **Ensure that you have access to the Oracle Hardware Management Pack installation files.**
3. **Follow the instructions in the *Oracle Hardware Management Pack Installation Guide* to complete the installation.**

▼ Use Oracle Hardware Management Pack Commands

1. **Verify that Oracle Hardware Management Pack is installed on the server, as described in "Installing Oracle Hardware Management Pack" on page 36.**
2. **Ensure that the operating system is installed and booted.**
3. **Access the host console or a command line with root privileges.**

   For details, see "Accessing the Host Console" on page 33.
4. **Enter Oracle Hardware Management Pack commands from the operating system command-line interface.**

Related Information

- "Oracle Hardware Management Pack" on page 17

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.

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 ILOM SP to the network.

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

Using UEFI and the BIOS Setup Utility

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:

- "UEFI and BIOS Setup Utility" on page 38
- "Access the BIOS Setup Utility" on page 38
- "Exit the BIOS Setup Utility" on page 40
- "BIOS Setup Utility Key Mappings" on page 41
- "Common BIOS Setup Utility Tasks" on page 41

UEFI and 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.

▼ 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.**

   b. **In the navigation pane, click Host Management → Host Console.**

   c. **In the Next Boot Device drop-down list, select BIOS.**

      When you select BIOS from the list, the 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 28.
   - Establish a dedicated local (serial) management connection to Oracle ILOM.

     For details, see "Log In to Oracle ILOM Using a Local Serial Connection" on page 23.
   - From a command line or console on another server, to establish an SSH connection to the server SP, type `ssh root@`*hostname*.

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

3. **At the Oracle ILOM Login prompt, type your Oracle ILOM user name and password.**

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

4. **At the Oracle ILOM CLI prompt (->), type `start /HOST/console`.**

   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.**

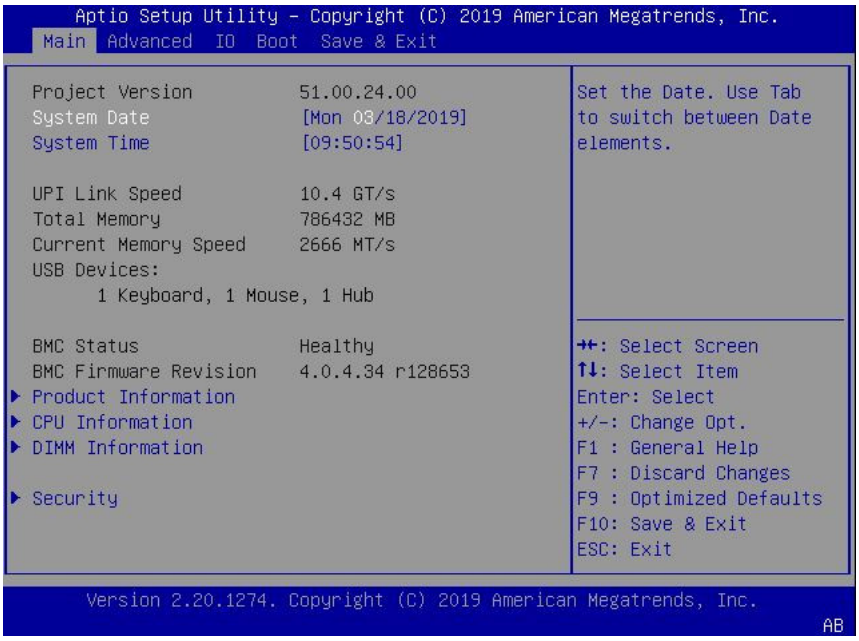
   For instructions, see "Controlling Server Power" on page 43.

   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.



▼ Exit the BIOS Setup Utility

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

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

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

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 65
- Reset the BIOS Firmware to Defaults: “Reset BIOS to Default Values (BIOS)” on page 94
- Configure TPM Support: “Configure BIOS Support for TPM (BIOS)” on page 100
- Exit BIOS Setup Utility: “Exit the BIOS Setup Utility” on page 40

Controlling Server Power

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).

- "Server Power States" on page 43
- "Power Control Options" on page 44
- "Powering the Server On and Off" on page 44
- "Setting Host Power at Boot" on page 46
- "Resetting the Server" on page 47

Server Power States

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 "Updating System Firmware Using Oracle ILOM" on page 117.

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 On and Off

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 the Server On or Off (On/Standby Button)" on page 45

- “Power the Server On or Off (Oracle ILOM)” on page 45

Power the Server On or Off (On/Standby Button)

For server-specific information, refer to the server Service Manual.

1. **To power the server on, use the On/Standby button on the front panel of the server.**
2. **To power off the server, use the On/Standby button on the front panel of the server.**

Power the Server On or Off (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, 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.

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **To change the server power state in the Oracle ILOM web interface:**
   a. **Log in to the Oracle ILOM web interface.**
   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 44.
3. **To change the server power state in the Oracle ILOM command-line interface (CLI):**

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

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`.**

4. **If you are prompted to confirm your choice, type `y`, and press Enter.**

Related Information

- Controlling Host Power, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at `https://www.oracle.com/goto/ilom/docs`

Setting Host Power at Boot

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 Host Power at Boot (Oracle ILOM)

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **To set a power-on policy in the Oracle ILOM web interface:**

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

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, you can enable only one policy 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.**

3. **To set a power-on policy in the Oracle ILOM command-line interface (CLI):**

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

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, you can enable only one policy 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* at `https://www.oracle.com/goto/ilom/docs`

Resetting the Server

During the reset process:

- It is unnecessary to power the server off and on to reset the server because a reset maintains host power but causes the processors to reinitialize.
- The server retains some register information. In case of a system host panic, error information might be available upon system recovery.

Caution - Possible Data Loss. Resetting the server causes any unsaved data on the server to be lost.

Reset the Server (Oracle ILOM)

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **To reset the server in the Oracle ILOM web interface:**
   a. **Log in to the Oracle ILOM web interface using an account with Admin (a) role privileges.**
   b. **In the left pane, click Host Management → Power Control, and in the Select Action list box, select Reset.**
   c. **Click Save and click OK to reset the server.**
3. **To reset the server in the Oracle ILOM command-line interface:**
   a. **Log in to the Oracle ILOM command-line interface.**
   b. **Type `-> reset /System`.**
   c. **When prompted, type y to confirm:**

```
Are you sure you want to reset /System (y/n)? y

Performing hard reset on /System
```

Configuring SP and Host Network Addresses

This section provides instructions for configuring the service processor (SP) and host network settings.

- "Modifying SP Network Settings" on page 49
- "Configuring SP Sideband Management" on page 52
- "Configuring DNS Server Settings" on page 54

Modifying SP Network Settings

The server has two connections to the network:

- **Host connection** – Accesses the Internet from the server operating system.
- **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:

- "Disable or Enable Network Access to the SP (Oracle ILOM)" on page 49
- "Modify SP Network Settings (Oracle ILOM)" on page 50
- "Modify SP Network Settings (Oracle Hardware Management Pack)" on page 52

▼ Disable or Enable Network Access to the SP (Oracle ILOM)

By default, network access to the SP is enabled and DHCP is used to obtain an IP address for the SP. You can disable or enable network access using the Oracle ILOM web interface or command-line interface.

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **To disable or enable network access to the SP in the Oracle ILOM web interface:**
   a. **Log in to the Oracle ILOM web interface using an account with Admin (a) role privileges.**
   b. **Click ILOM Administration → Connectivity → Network → Network Settings.**
   c. **For the network State property, select Enable or Disable.**
   d. **To save the network property changes, click Save.**
3. **To reset the server in the Oracle ILOM command-line interface (CLI):**
   a. **Log in to the Oracle ILOM CLI.**
   b. **At the Oracle ILOM CLI prompt, type `set /SP/network state=`*value*.**
      The *value* can be:

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

▼ 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. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **To modify the SP network settings in the Oracle ILOM web interface:**
   a. **Log in to the Oracle ILOM web interface.**
   b. **Click ILOM Administration → Connectivity → Network.**
   c. **Modify the settings on the Network Settings page as required.**

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

e. To save your network property changes, click Save.

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.

---

3. To modify the SP network settings in the Oracle ILOM command-line interface (CLI):

a. Log in to the Oracle ILOM CLI.

b. To view the assigned IPv4 or IPv6 network settings on the SP:

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

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

c. To view the descriptions for each IPv4 and IPv6 network property:

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

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

d. To modify the IPv4 and IPv6 network properties on the SP, type 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.

---

e. 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.**
2. **To modify IPv4 network settings, type 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, type 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 `https://www.oracle.com/goto/ohmp/docs`

Configuring SP Sideband Management

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

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

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

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

▼ Configure SP Sideband Access (Oracle ILOM)

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

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

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

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

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

3. **To view the current network settings, type:**

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

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

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

4. **To set the SP management port to a sideband port, type:**

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

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

5. **To verify the change, type:**

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

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

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

Configuring DNS Server Settings

Auto DNS through 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 Settings on the SP (Oracle ILOM)" on page 54
- "Configure DNS Server Settings on the SP (Oracle Hardware Management Pack)" on page 55

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

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **To configure DNS server information from the Oracle ILOM web interface:**
   a. **Log in to the Oracle ILOM web interface.**
   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.**

3. **To configure DNS server information from the Oracle ILOM command-line interface (CLI):**

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

   b. **To enable Oracle ILOM to automatically retrieve DNS information from a DHCP server on the network, type 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 `https://www.oracle.com/goto/ilom/docs`

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

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

2. **To enable Oracle ILOM to automatically retrieve DNS information from a DHCP server on the network, type 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`, type 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 `https://www.oracle.com/goto/ohmp/docs`

Monitoring Server Information

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

- "Assigning System Identification Information" on page 57
- "Viewing System Information and Inventory" on page 59
- "Locating a Server" on page 61
- "Setting the SP Clock" on page 61

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 log in 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 57
- "Assign System Identification Information (Oracle Hardware Management Pack)" on page 58

▼ Assign System Identification Information (Oracle ILOM)

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**

2. **To assign system identification information from the Oracle ILOM web interface:**

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

   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.**

3. **To assign system identification information from the Oracle ILOM command-line interface (CLI):**

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

   b. **Type 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 https://www.oracle.com/goto/ilom/docs

▼ Assign System Identification Information (Oracle Hardware Management Pack)

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

2. **To set one or more identifiers, type the `ilomconfig modify` command:**

   `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 `https://www.oracle.com/goto/ohmp/docs`

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 59
- "View System Information and Inventory (Oracle Hardware Management Pack)" on page 60

▼ 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.**

   b. **On 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. **To view information about a subsystem, in the navigation pane, click on the name of 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.**

b. **To view general information about the server, type `show/ System`.**

   Oracle ILOM displays details such as the system type and host primary MAC address.

c. **To view information about a particular subsystem, type `show/ System/`*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 `https://www.oracle.com/goto/ilom/docs`
- "View and Resolve Faults (Oracle ILOM)" on page 78

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 `https://www.oracle.com/goto/ohmp/docs`.

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

2. **Type 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 `https://www.oracle.com/goto/ohmp/docs`

Locating a Server

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

▼ Turn the Locator Indicator On and Off (Oracle ILOM)

When a server must be serviced, lighting the system Locator indicator assists in easily identifying the correct server. You do not need administrator permissions to use the `set /System locator_indicator` commands. After service of a server is completed, you can turn off the Locator indicator.

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

1. **To turn the Locator indicator on or off from the Oracle ILOM web interface):**
   a. **Log in to the Oracle ILOM web interface.**
   b. **On the Oracle ILOM Summary Information page, in the Actions section, for Locator Indicator, click Turn On or Turn Off.**
2. **To turn the Locator indicator on or off from the Oracle ILOM command-line interface (CLI):**
   a. **Log in to the Oracle ILOM CLI.**
   b. **To illuminate the Locate indicator, type `set /System locator_indicator=on`.**
   c. **To turn off the Locate indicator, type `set /System locator_indicator=off`.**

Setting the SP 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 62
- "Set the SP Clock (Oracle Hardware Management Pack)" on page 63

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)

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **To set the service processor clock from the Oracle ILOM web interface:**
   a. **Log in to the Oracle ILOM web interface.**
   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.**

3. **To set the service processor clock from the Oracle ILOM command-line interface (CLI):**

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

   b. **Configure the service processor clock manually, or enable the clock to synchronize with an NTP server:**

   - **To set the service processor clock manually, type the `set` command:**

     -> **`set /SP/clock datetime=`** *MMDDhhmmYYYY* **`timezone=`***3_to_4_characters*

   - **To synchronize the service processor clock with an NTP server, type the `set` command:**

     -> **`set /SP/clock usentpserver=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 `https://www.oracle.com/goto/ilom/docs`

▼ Set the SP Clock (Oracle Hardware Management Pack)

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

2. **Type 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 --usentp=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 `https://www.oracle.com/goto/ohmp/docs`

Modifying Boot Properties

This section provides instructions on modifying how the server boots.

Modifying the Boot Order

The boot order list determines which device the server boots from. To change the order of devices in the boot order list, see the following procedures:

- “Modify the Boot Order (BIOS)” on page 65
- “Set Temporary Next Boot Device (Oracle ILOM)” on page 66

▼ Modify the Boot Order (BIOS)

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

   For instructions, see “Using UEFI and the BIOS Setup Utility” on page 37.

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.

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

▼ 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.

1. **Ensure that you have Reset and Host Control (r) role privileges in Oracle ILOM.**

2. **To set a once-only boot device for the next power reset in the Oracle ILOM web interface:**

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

   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 65.

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.

---

3. **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.**

   b. **Type 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* at https://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.

- "Monitoring Server Power Consumption" on page 69
- "Monitoring Server Inlet and Exhaust Temperature" on page 72

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 70
- "View Power Allocated to Server Components (Oracle ILOM)" on page 70
- "View Historical Power Consumption Data (Oracle ILOM)" on page 71

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.**
   b. **In the navigation pane, click Power Management → Consumption.**
   c. **On the Power Consumption page, review the Actual Power property.**
2. **To view current server power consumption in the Oracle ILOM command-line interface (CLI):**
   a. **Log in to the Oracle ILOM CLI.**
   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 https://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.**
   b. **In the navigation pane, click Power Management → Allocation.**
   c. **On the Power Allocation page, review the Per Component Power Map.**

2. **To view the power allocated to server components in the Oracle ILOM command-line interface (CLI):**

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

   b. **Type the following command:**

      -> **`show /SP/powermgmt/powerconf/`***component*

      Where component is one of the following: `Fans`, `PSUs`, `CPUs`, `memory`, `IO`, or `MB`.

   c. **Review the `allocated_power` property.**

Related Information

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

▼ View Historical Power Consumption Data (Oracle ILOM)

In the Oracle ILOM web interface, you can view the average power consumption for each minute of the last hour or for each hour of the last 14 days. Historical power consumption data is not viewable from the Oracle ILOM command-line interface.

1. **Log in to the Oracle ILOM web interface.**
2. **In the navigation pane, click Power Management → History.**
3. **Review the Power History table.**

Related Information

- Analyzing Power Usage Statistics, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at `https://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 Server Inlet and Exhaust Temperature (Oracle ILOM)" on page 72
- "Set Enhanced PCIe Cooling Policy (Oracle ILOM)" on page 72

View 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.**
   b. **In the navigation pane, click System Information → Cooling.**
   c. **On the Cooling page, 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.**
   b. **Type: `show /System/Cooling`.**
   c. **Review the `inlet_temp` and `outlet_temp` properties.**

Set Enhanced PCIe Cooling Policy (Oracle ILOM)

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **To set the Enhanced PCIe Cooling Policy in the Oracle ILOM web interface:**

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

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

c. **On the Policy Configuration page, 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.

3. **To set the Enhanced PCIe Cooling Policy in the Oracle ILOM command-line interface:**

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

   b. **Type 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 https://www.oracle.com/goto/ilom/docs

Diagnosing and Resolving Faults

This section includes an overview of hardware fault management and diagnostics on the server.

- “Fault Detection and Diagnostics Tools” on page 75
- “Monitoring and Resolving Faults” on page 77
- “Using the Oracle ILOM Diag Shell” on page 80
- “Using UEFI Diagnostics” on page 82
- “Sending Auto Service Requests” on page 82

Fault Detection and Diagnostics Tools

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	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. The Oracle ILOM Fault Manager is part of the Oracle ILOM firmware embedded on the server service processor (SP).	Refer to Protecting Against Hardware Faults: Oracle ILOM Fault Manager, *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x* at: `https://www.oracle.com/goto/ilom/docs`
Oracle Linux Fault Management Architecture (FMA)	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. Oracle Linux FMA software can be optionally installed on the server through Oracle Hardware Management Pack.	Refer to the *Oracle Hardware Management Pack Linux Fault Management Architecture User's Guide* at: `https://www.oracle.com/goto/ohmp/docs`

Tool	Description	Documentation
Oracle Solaris Fault Management Architecture (FMA)	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. Oracle Solaris FMA is included with the Oracle Solaris operating system (OS).	Refer to *Oracle Solaris Administration: Common Tasks* at: `https://docs.oracle.com/cd/E23824_01/index.html`
Auto Service Request (ASR)	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.	Go to: `https://www.oracle.com/support/premier/auto-service-request.html`
Oracle ILOM Diag Shell	The Oracle ILOM Diag Shell allows you to run HWdiag commands to check the status of a system and its components. You run Diag shell from the Oracle ILOM command-line interface (CLI).	See "Check System Components With HWdiag Commands (Oracle ILOM)" on page 81.
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 Preliminary Troubleshooting Procedures section in the *Oracle x86 Servers Diagnostics Guide for Oracle ILOM 4.0.x* at: `https://www.oracle.com/goto/x86admindiag/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 *Oracle x86 Servers Diagnostics Guide for Oracle ILOM 4.0.x* at: `https://www.oracle.com/goto/x86admindiag/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 ILOM web interface or command-line interface (CLI).
		Refer to one of the following resources:
		
		■ The UEFI Diagnostics section in the *Oracle x86 Servers Diagnostics Guide for Oracle 4.0* at:
		`https://www.oracle.com/goto/x86admindiag/docs`
		■ The x86 diagnostics section in the *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x* at:
		`https://www.oracle.com/goto/ilom/docs`

Monitoring and Resolving Faults

The Oracle server management tools allow you to proactively monitor the health of your system and configure 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 the Event Log (Oracle ILOM)" on page 77
- "View and Resolve Faults (Oracle ILOM)" on page 78
- "View and Resolve Faults (Oracle Hardware Management Pack)" on page 79
- "Clear Faults Manually (Oracle ILOM)" on page 80

▼ 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.**

   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.**

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

▼ View and Resolve Faults (Oracle ILOM)

1. **To view faults on the server from the Oracle ILOM web interface:**

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

   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 faults on the server from the Oracle ILOM command-line interface (CLI):**

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

   b. **Type `show /System/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.

```
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
```

Related Information

- Administering Open Problems, *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 4.0.x* at https://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 https://www.oracle.com/goto/ilom/docs

▼ View and Resolve Faults (Oracle Hardware Management Pack)

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

2. **Type `hwmgmtcli list 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.

```
=== 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)
```

▼ Clear Faults Manually (Oracle ILOM)

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.

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **Log in to the Oracle ILOM command-line interface.**
3. **To launch the Oracle ILOM Fault Management shell, type `start /SP/faultmgmt/shell`.**
4. **To confirm that you want to start the Oracle ILOM Fault Management shell, at the confirmation prompt, type `y`.**
5. **At the `faultmgmtsp>` prompt, use the `fmadm` utility to indicate that a component must 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: https://www.oracle.com/goto/ilom/docs.

Using the Oracle ILOM Diag Shell

The Oracle ILOM Diag shell allows you to run HWdiag commands to check the status of a system and its components, and access HWdiag and uefidiag logs.

▼ Access the Oracle ILOM Diag Shell

Use the Oracle ILOM command-line interface (CLI) to access 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.**
2. **At the Oracle ILOM prompt, access the Diag Shell.**

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

The `diag>` prompt appears.

Check System Components With HWdiag Commands (Oracle ILOM)

You can run HWdiag commands in the Oracle ILOM Diag shell to check the status of system components.

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.**
2. **At the Oracle ILOM prompt, access the Diag Shell.**

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

3. **At the `diag>` prompt, type the following command:**

`diag>` **`hwdiag`** *parameters*

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* at `https://www.oracle.com/goto/x86admindiag/docs`.

4. **Choose any of the following ways to display help for hwdiag options and commands:**

- To display an overview of HWdiag options and main commands, type **`help hwdiag`**.
- To display all HWdiag main commands and their subcommands, type **`help hwdiag -h`**.
- To display the command structure with all options available by command, type **`help hwdiag -h -v`**.

- To display help specific to a main command, type **`help hwdiag -h`** *main command*.

5. **In the Diag shell, type any of the following commands:**

   - To display the external commands available in the Diag shell, type **`help`**.
   - To display information, type **`echo`**. For example, type **`echo $?`**.
   - To exit the Diag shell, type **`exit`**.
   - To run hardware diagnostics, type **`hwdiag`**.
   - To list the diagnostics log directories and files, type **`ls`**.
   - To print the content of the diagnostics log files, type **`cat`**.

Using UEFI Diagnostics

The Unified Extensible Firmware Interface (UEFI) diagnostic tests in Oracle Integrated Lights Out Manager (ILOM) allow you to test and detect problems on motherboard components, drives, ports, and slots. You can use either the Oracle ILOM web interface or the command-line interface (CLI) to run UEFI diagnostics. From Oracle ILOM, you select the level of test that you want to perform. For details on how to run UEFI diagnostics, refer to *Oracle x86 Servers Diagnostics and Troubleshooting Guide for Servers With Oracle ILOM 4.0.x* at `https://www.oracle.com/goto/x86admindiag/docs`

Sending Auto Service Requests

Oracle Auto Service Requests (ASR) is a feature available to customers having Oracle Premier Support and is provided to those customers at no additional cost. Oracle ASR is the fastest way to restore system availability if a hardware fault occurs. Oracle ASR software is secure and customer installable, with the software and documentation downloadable from My Oracle Support at `https://support.oracle.com`. When you log in to My Oracle Support, refer to the "Oracle Auto Service Request" knowledge article document (ID 1185493.1) for instructions on downloading the Oracle ASR software.

When a hardware fault is detected, Oracle ASR opens a service request with Oracle and transfers electronic fault telemetry data to help expedite the diagnostic process. Oracle diagnostic capabilities then analyze the telemetry data for known issues and delivers immediate corrective actions. For security, the electronic diagnostic data sent to Oracle includes only what is needed to solve the problem. The software does not use any incoming Internet connections and does not include any remote access mechanisms.

For more information about Oracle ASR, go to: https://www.oracle.com/support/premier/auto-service-request.html.

Backing Up, Restoring, and Resetting Firmware Default Values

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

- "Backing Up Current Firmware and Hardware Configurations" on page 85
- "Restoring Saved Firmware Configurations" on page 89
- "Resetting BIOS to Default Values" on page 94
- "Resetting Oracle ILOM SP to Default Values" on page 96

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 89.

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

- "Back Up Current BIOS Configuration (Oracle ILOM)" on page 86
- "Back Up Current Oracle ILOM Configuration (Oracle ILOM)" on page 87
- "Back Up Current BIOS Configuration (Oracle Hardware Management Pack)" on page 87
- "Back Up Current Oracle ILOM Configuration (Oracle Hardware Management Pack)" on page 89
- "Back Up RAID Controller Configuration (Oracle Hardware Management Pack)" on page 106

Back Up Current BIOS Configuration (Oracle ILOM)

1. **Ensure that you have Reset and Host Control (r) and Admin (a) role privileges in Oracle ILOM.**

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

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

   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.**

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

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

   b. **Type 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 https://www.oracle.com/goto/ilom/docs

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

1. **Access the operating system command line with root privileges.**
2. **Type 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 https://www.oracle.com/goto/ohmp/docs

▼ Back Up Current Oracle ILOM Configuration (Oracle ILOM)

1. **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).**
2. **To back up the current Oracle ILOM configuration in the Oracle ILOM web interface:**

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

   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 is not 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.

---

g. Click Run.

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

a. Log in to the Oracle ILOM CLI.

b. Type the `set` command:

-> **`set /SP/config passphrase=`***passphrase* **`include_faultdata=[`***true*|*false***`] dump_uri=`** *transfer_method://username:password@host/filepath*

Where:

- `passphrase` is a passphrase 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 is not included in the backup file.
- `include_faultdata=true` includes fault data in the backup. The default is `false`.

  Note - The fault data backup and restore is reserved for Oracle Service personnel when they replace the SP. It is available with Oracle ILOM 3.2.6 or newer.

- `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 Oracle ILOM Configuration File, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at https://www.oracle.com/goto/ilom/docs

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

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

2. **Type 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 https://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 85.

- "Restore a Saved BIOS Configuration (Oracle ILOM)" on page 90
- "Restore a Saved Oracle ILOM Configuration (Oracle ILOM)" on page 92
- "Restore a Saved BIOS Configuration (Oracle Hardware Management Pack)" on page 91
- "Restore a Saved Oracle ILOM Configuration (Oracle Hardware Management Pack)" on page 93
- "Restore RAID Controller Configuration (Oracle Hardware Management Pack)" on page 107

▼ Restore a Saved BIOS Configuration (Oracle ILOM)

1. **Ensure that you have Reset and Host Control (`r`) and Admin (`a`) role privileges in Oracle ILOM.**
2. **To restore a saved BIOS configuration in the Oracle ILOM web interface:**
   a. **Log in to the Oracle ILOM web interface.**
   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.**
3. **To restore a saved BIOS configuration in the Oracle ILOM command-line interface (CLI):**
   a. **Log in to the Oracle ILOM CLI.**
   b. **Type 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 `https://www.oracle.com/goto/ilom/docs`

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

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

2. **Type 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 `https://www.oracle.com/goto/ohmp/docs`

Restore a Saved Oracle ILOM Configuration (Oracle ILOM)

1. **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).**

2. **To restore a saved Oracle ILOM configuration from the Oracle ILOM web interface:**

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

   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.

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

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

   b. **Type 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 `https://www.oracle.com/goto/ilom/docs`

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

1. **Access the operating system command line with root privileges.**
2. **Type the `ilomconfig import` command:**

   `ilomconfig import config --xmlfile=`*filename*`.xml`**
3. **To confirm that you want to proceed, at the confirmation prompt, type `y`.**

A second prompt appears asking whether you want to specify a passphrase. If you used a passphrase 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 `https://www.oracle.com/goto/ohmp/docs`

Resetting BIOS to Default Values

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

- "Reset BIOS to Default Values (BIOS)" on page 94
- "Reset BIOS to Default Values (Oracle ILOM)" on page 95
- "Reset BIOS to Default Values (Oracle Hardware Management Pack)" on page 96

▼ Reset BIOS to Default Values (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.

1. **Ensure that your server is equipped with a properly installed hard disk drive (HDD) or solid state drive (SSD). For instructions, refer to the server Service Manual.**

2. **Access the BIOS Setup Utility.**

For instructions, see "Using UEFI and the BIOS Setup Utility" on page 37.

3. **To automatically load the optimal default settings, press the F9 key.**

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

4. **In the message, highlight `OK`, and press Enter.**

5. **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 to Default Values (Oracle ILOM)

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**

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

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

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

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

   d. **Click Save.**

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

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

   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 `https://www.oracle.com/goto/ilom/docs`

▼ Reset BIOS to Default Values (Oracle Hardware Management Pack)

1. **Access the operating system command line with root privileges.**
2. **Type:** `ubiosconfig reset config.`

Related Information

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

Resetting Oracle ILOM SP to Default Values

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

- "Reset SP to Default Values (Oracle ILOM)" on page 96
- "Reset SP to Default Values (Oracle Hardware Management Pack)" on page 97

▼ Reset SP to Default Values (Oracle ILOM)

1. **Ensure that you have Admin (a) role privileges in Oracle ILOM.**
2. **To reset the Oracle ILOM firmware to default settings in the Oracle ILOM web interface:**
   a. **Log in to the Oracle ILOM web interface.**
   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.**
3. **To reset the SP to default settings in the Oracle ILOM command-line interface (CLI):**

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

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

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 https://www.oracle.com/goto/ilom/docs

Reset SP to Default Values (Oracle Hardware Management Pack)

1. **Access the operating system command line with root privileges.**
2. **Type:** `ilomconfig reset config`
3. **To confirm that you want to proceed, type** `y`.

Related Information

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

Configuring Security Features

This section provides instructions on configuring authentication and security for users, firmware, software, operating systems, and platform hardware.

- "User Authentication on the Oracle ILOM SP" on page 99
- "Trusted Execution Technology and UEFI Secure Boot" on page 100
- "Configuring Support for Trusted Platform Module" on page 100

User Authentication on the Oracle ILOM SP

- Users or management agents can access the Oracle ILOM SP and its components only through authorized user interfaces. Users and agents cannot access any of the underlying operating system interfaces, and users cannot install individual software components on the SP.
- Oracle ILOM can authenticate user accounts through local accounts that you configure, or against a remote user authentication database such as Active Directory or LDAP/SSL. With remote authentication, you can use a centralized user database rather than configuring local accounts on each Oracle ILOM instance.
- You also can remotely authenticate and authorize user access based on a user's membership in a host group. A user can belong to more than one host group, and on these servers, you can configure up to 10 host groups using the Oracle ILOM web interface, the CLI, or SNMP.
- You can use Active Directory or LDAP/SSL to configure host groups for remote user authentication.
- The tasks involved in configuring host groups include managing certificates (LDAP/SSL), administrator groups, operator groups, custom groups, and user domains.

For details, refer to *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 4.0.x* at `https://www.oracle.com/goto/ilom/docs`.

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 and local and remote management applications can 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 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.

Configuring Support for Trusted Platform Module

TPM enables you to administer the TPM security hardware in your server. The TMP feature set is enabled by default. If you want to disable it, or to enable it after it was disabled, perform the procedure in this section.

▼ Configure BIOS Support for TPM (BIOS)

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

For additional information about implementing TPM, refer to the Windows Trusted Platform Module Management documentation provided by your operating system or third-party software vendor.

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

   For instructions, see “Using UEFI and the BIOS Setup Utility” on page 37.

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

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

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

Configuring RAID and Storage Resources

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

- "Configuring RAID" on page 103
- "Configuring iSCSI Virtual Drive Properties" on page 109

Configuring RAID

The BIOS RAID configuration utilities support configuring RAID. You can configure RAID arrays using the BIOS RAID configuration Utilities or Rapid Storage Technology Enterprise (RSTe). For details on RSTe, see "Configuring RAID Using Rapid Storage Technology Enterprise (RSTe)" on page 107.

Before you can install an operating system on a storage device:

- The storage device must appear as a valid target to the OS installation program.
- If you want a RAID array, configure the RAID volume before installing the OS.

Caution - Configuring RAID removes the OS and all other data from the target drives.

There are two types of RAID:

- **Hardware RAID** – An internal Host Bus Adapter (HBA) card manages the array and presents the volumes to the OS as simple disks. Hardware RAID unburdens the OS and is more robust than software RAID.

  The Oracle Storage 12 Gb SAS PCIe RAID Host Bus Adapter supports hardware RAID.
- **Software RAID** – The OS manages the array, which normally must be created and configured using an OS. In a typical use case, you boot an OS on one device to create a software RAID volume on a different device.

Configure RAID (Oracle ILOM)

Perform this procedure to make a RAID volume (virtual drive) bootable if you created more than one RAID volume. You do *not* need to perform this procedure if you created only one virtual drive.

1. **Create at least one virtual drive, or RAID volume, using the BIOS Configuration Utility or RSTe (see "Configure RAID Using RSTe" on page 108.**
2. **Access the host console locally or through Oracle ILOM.**
3. **Reset or power on the server.**

   For example, to reset the server:

   - **From the local server,** press the On/Standby button on the front panel of the server for approximately 1 second to power off the server, and then press the On/Standby button again to power on the server.
   - **From the Oracle ILOM web interface,** select `Host Management → Power Control`, and then select `Reset` from the `Select Action` list box. Click `Save`, and then click `OK`.
   - **From the Oracle ILOM CLI,** type: `reset /System`

   The power-on self-test (POST) sequence begins.

4. **Create a virtual drive.**

   a. **On the BIOS Setup Utility screen, select the Advanced tab, select `Avago MegaRAID Configuration Utility`, and press Enter.**

   b. **On the ACTIONS Menu, select `Configure`.**

   c. **Select `Create Virtual Drive` and press Enter.**

   d. **On the Create Virtual Drive – menu, select `RAID Level` and press Enter to set the RAID level.**

   e. **Navigate to `Select Drives` and press Enter.**

   f. **Select the drives you want to configure.**

   g. **To enable drives, press Enter and select `Enabled`. Press ESC to close the pop up.**

h. **Select `Apply Changes`, and press Enter.**

   For more information on performing this procedure, refer to the *12GB/s MegaRAID SAS Software User's Guide* at `https://docs.broadcom.com/docs/pub-005110`.

i. **To return to the Create Virtual Drive Advanced Menu, press ESC.**

5. **Select `Save Configuration`.**

6. **Select `Confirm`, select `Enabled`, and press Enter.**

7. **To save your new boot configuration, select `Yes`.**

8. **To exit the Avago MegaRAID Utility, press the ESC key.**

▼ Configure RAID (Oracle Hardware Management Pack)

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.**

2. **Type 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 `https://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.**

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 `https://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 106.

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.**

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 `https://www.oracle.com/goto/ohmp/docs`

Configuring RAID Using Rapid Storage Technology Enterprise (RSTe)

You can create and manage RAID arrays on the Oracle Servers X8 SATA M.2 (SSDs) using Intel Rapid Storage Technology Enterprise (RSTe), which provide the following benefits:

- Additional protection from data loss.
- Data is protected against a drive failure when you configure your system for RAID level 1 (mirror).
- Additional advantage of allowing an operating system to install directly to the RAID volume.
- BIOS exports the volumes as a target device to the operating system installer, streamlining the OS installation.

- The OS uses the system CPUs to manage and configure the RAID volumes.

You can configure the volumes from the BIOS level or from Windows or Linux operating systems.

Note - Oracle Solaris does not support RSTe. You can mirror Oracle Solaris M.2 root volumes with Oracle ZFS File System.

Configure RAID Using RSTe

This procedure configures a RAID volume so that you can install an operating system.

Note - This procedure applies only to servers with SATA M.2 SSDs.

1. **Access the host console locally or through Oracle ILOM.**

2. **Reset or power on the server.**

   For example, to reset the server:

   - **From the local server,** press the On/Standby button on the front panel of the server for approximately 1 second to power off the server, and then press the On/Standby button again to power on the server.
   - **From the Oracle ILOM web interface,** select `Host Management → Power Control`, and then select `Reset` from the `Select Action` list box. Click `Save`, and then click `OK`.
   - **From the Oracle ILOM CLI,** type: `reset /System`

   The power-on self-test (POST) sequence begins.

3. **When prompted on the BIOS screen, press `F2` (Ctrl+E from a serial connection) to launch the BIOS Setup Utility.**

   Note - The steps and screens in this procedure are examples. What you actually see might differ depending on your system equipment and configuration.

4. **Configure SATA.**

   a. **On the BIOS Setup Utility screen, select the Advanced tab, select `PCH SATA Configuration`, and press Enter.**

b. **On the PCH SATA Configuration screen, select `Configure SATA as`.**

c. **In the Configure SATA as pop up, select `RAID` and press Enter.**

d. **On the Save and Exit screen, select `Save Changes and Exit` and press Enter.**

5. **To return to the main BIOS Setup Utility menu, press F2.**

6. **To select the Intel RSTe SATA controller option, select the Advanced tab and press Enter.**

7. **Create and configure a RAID volume.**

   a. **Select `Create RAID Volume` and press Enter.**

   b. **On the Create RAID Volume Screen, select `Name`, and press Enter.**

   c. **You can assign a name to the RAID volume.**

   d. **To set the RAID level, select `RAID Level`, and press Enter.**

   e. **Select the disk you are configuring for RAID.**

   f. **Scroll to the bottom of the Create RAID Volume screen and select `Create Volume`. Press Enter.**

   g. **Verify that the new volume appears beneath RAID volumes, and to return to the Main BIOS Setup Utility menu, press ESC.**

8. **On the Save and Exit screen, select `Save Changes and Exit` and press Enter.**
   This completes the RAID configuration. You can now install an operating system on the volume that you created.

Configuring 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.

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

▼ Configure 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.

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 “Using UEFI and the BIOS Setup Utility” on page 37.

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 (ISID), for example `0010e02e458f`.**

7. **On the iSCSI 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:`*XN-N*`-target`.**

   i. **Set the `Authentication Type` property to `CHAP` (Challenge-Handshake Authentication Protocol) or `None`.**

   j. **Select `Save Changes`.**

8. **Press the F10 function key to save your changes, exit the BIOS Setup Utility, and reboot the server.**

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

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 113
- "Firmware and Software Update Options" on page 114
- "Software Releases" on page 114
- "Getting Updates From My Oracle Support" on page 115
- "Download Firmware and Software Updates From My Oracle Support" on page 115
- "Updating System Firmware Using Oracle ILOM" on page 117
- "Installing System Firmware Using Other Methods" on page 119
- "Downloading an OS or Software Applications" on page 119
- "Oracle Support" on page 120

Firmware and Software Updates

Firmware and software for your server are updated periodically. These updates are made available as software releases. The software releases are a set of downloadable files (patches) that include all available firmware, software, hardware drivers, tools, and utilities for the server. All of these files have been 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 your server has the latest firmware and software. These updates will increase your system performance, security, and stability.

To determine which firmware version is installed on your server, you can use either the Oracle ILOM web interface or the command-line interface (CLI).

- From the web interface, click System Information → Summary, then view the property value for System Firmware Version in the General Information table.
- From the CLI, at the command prompt, type: `show /System/Firmware`

The server Product Notes list the current server software release and firmware version that are available.

Firmware and Software Update Options

Use one of the following options to update your server to the latest firmware and software:

- **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 from the My Oracle Support web site, see "Software Releases" on page 114.
- **Other Methods** – You can use Oracle Enterprise Manager Ops Center, Oracle Hardware Management Pack, or Oracle ILOM to update your server software and firmware.

  For information, see "Installing System Firmware Using Other Methods" on page 119.

Software Releases

Software releases on My Oracle Support are grouped by product family (such as Oracle Server), then the product (the specific server), and finally the 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 within a zip file that contains set of firmware and software subdirectories and files, along with a ReadMe file. The ReadMe file provides information about the patch, such as what has changed since the prior software release and the bugs that have been fixed in the current release.

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.

Parameter	Example	When to Download This Package
SW *release* – Firmware Pack	Contains all system firmware, including Oracle ILOM, BIOS, and option card firmware.	You need the latest firmware.
SW *release* – OS Pack	Includes a package of all tools, drivers, and utilities for a specific OS. An OS Pack is available for each supported operating system version. Software includes Oracle Hardware Management Pack, Avago MegaRAID software, and any other optional software that Oracle recommends. For the Windows OS, the OS Pack also includes Intel Network Teaming and Install Pack.	You need to update OS-specific tools, drivers, or utilities.
SW *release* – All Packs	Includes the Firmware Pack and all OS Packs. This pack does not include the Oracle VTS image.	You need to update a combination of system firmware and OS-specific software.
SW *release* – Diagnostics	Includes Oracle VTS diagnostics image.	You need the Oracle VTS diagnostics image.

Getting Updates From My Oracle Support

You can obtain updated firmware and software from the My Oracle Support web site at `https://support.oracle.com`. For instructions, see "Download Firmware and Software Updates From My Oracle Support" on page 115.

▼ Download Firmware and Software Updates From My Oracle Support

1. **Go to the My Oracle Support web site: `https://support.oracle.com`.**
2. **Sign in to My Oracle Support.**
3. **At the top of the page, click the Patches & Updates tab.**

4. **On the right side of the screen, in the Patch Search pane, click Product or Family (Advanced) in the Search tab area.**

5. **In the Product field, select the product from the drop-down list, or type a full or partial product name (for example, Server X8-2) until a match appears.**

6. **In the Release field, select a software release from the drop-down list.**

7. **Click Search to see a list the paths for the software releases. For a description of the available software releases, see "Software Releases" on page 114.**

8. **On the Patch Advanced Search Results screen, click the patch number next to the software release version.**

   Note - To select more than one patch, use the **Shift** key.

9. **In the pop-up action panel, perform any of the following actions.**

   - **To review the ReadMe file for this patch, click ReadMe.**
   - **To download the patch for the software release, click Download. In the File Download dialog box, click the patch zip file name. The patch for the software release downloads. The download is an archive zip file, which you must extract to find the directory containing the image `.pkg` file.**
   - **For information about the Add to Plan option, click the Add to Plan button and select "Why use a plan?".**

Updating System Firmware Using Oracle ILOM

You can update Oracle ILOM system firmware while the host is powered on. The Oracle ILOM firmware image includes firmware for the service processor (SP, Oracle ILOM) and the server's host components (FPGAs). The Oracle ILOM firmware update goes into effect immediately. However, the update of host components is deferred until the affected host is power cycled. Because Oracle ILOM can be updated while the host is powered on, this feature reduces the total system downtime.

Updating System Firmware Using Oracle ILOM

This procedure uses the Oracle ILOM command-line interface to update the system firmware. You can also update system firmware using the Oracle ILOM web interface. For web interface instructions, refer to the Oracle ILOM documentation at https://www.oracle.com/goto/ilom/docs.

1. **Determine the Oracle ILOM firmware version currently installed on the system. At the Oracle ILOM prompt, type: `show /System/Firmware`**
2. **Download the Firmware Pack (Patch) update from My Oracle Support.**
3. **Notify Oracle ILOM SP users of the scheduled firmware update and ask them to close all client sessions until after the firmware update is complete. Do not perform any other Oracle ILOM tasks during the firmware update.**
4. **Navigate to the directory where you saved the FIRMWARE PACK (Patch) archive zip file.**
5. **Extract the FIRMWARE PACK files from the archive zip file.**

   When you extract the files, the <*image.pkg*> file is in the `Firmware/service-processor` directory.

   For example:

   ```
   % unzip p26981570_102_Generic.zip
   Archive: 26981570_102_Generic.zip
   creating Oracle_Server_X7-2-1.0.2.87665-FIRMWARE_PACK/Firmware/service-processor/
   inflating: Oracle_Server_X7-2-1.0.2.87665-FIRMWARE_PACK/Firmware/service-processor/
   ILOM-4_0_0_28_r121827-ORACLE_SERVER_X7-2-rom.pkg
   ```

6. **Review the README file that accompanies the firmware image to be aware of any special release notes or instructions.**
7. **Update the firmware using the Oracle ILOM command-line interface:**

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

   b. **Load the firmware image from the stored location using the `load -source` command followed by the directory path to the firmware image you want to install. Type:**

      -> **`load -source`** *protocol://server_IPaddress/<path_to_image>/<image.pkg>*

      Where *protocol* can be: `http, https, ftp, tftp, sftp, scp`

For example, if you are accessing the server through a tftp server with an IP address of 198.51.100.123 in a directory called `ilom/jdoe` and with the <*image.pkg*> named `firmware.pkg`, enter the following command:

```
-> load -source tftp://198.51.100.123/tftpboot/ilom/jdoe/firmware.pkg
```

The following information is displayed:

```
An upgrade takes several minutes to complete. Oracle ILOM will enter a
special mode to load new firmware. No other tasks can be performed in
Oracle ILOM until the firmware upgrade is complete and Oracle ILOM is
reset.

You can choose to postpone the server BIOS upgrade until the next server
power off. If you do not do that, you should perform a clean shutdown of
the server before continuing.
```

c. Answer the following prompts:

```
Are you sure you want to load the specified file? y

Preserve existing SP configuration (y/n)? y
```

This prompt preserves your existing Oracle ILOM settings after the firmware update is complete.

```
Preserve existing BIOS configuration (y/n)? y
```

This prompt preserves your existing BIOS configuration settings after the firmware upgrade is complete.

```
Delay BIOS upgrade until the next poweroff or reset (y/n)? y
```

Answer "Y" (yes) to the Delay BIOS Upgrade question and, if the host is ON and there are host components to be updated, the host remains powered on and the host component updates are deferred until the next time the host powers off and powers on (next reset/reboot).

Answer "N" (no) to the Delay BIOS Upgrade question and, if the host is ON and there are host components to be updated, the host is forced OFF so that host component updates can be applied immediately. After Oracle ILOM reboots, the host is powered on automatically if it was forced off.

Note - If the server has a pending BIOS upgrade, the power reset could take longer to complete. This is expected behavior, as it is necessary to power cycle the server to upgrade the BIOS firmware. If the upgrade includes an FPGA update, the process can take as long as 26 minutes to complete.

---

d. **Wait for the Oracle ILOM status message to confirm that the process is complete.**

8. **To verify that the updated firmware is installed, at the Oracle ILOM prompt, type `show /System/Firmware`.**

Installing System Firmware Using Other Methods

In addition to using Oracle ILOM, you can install firmware and software updates using one of the following methods:

- **Oracle Enterprise Manager Ops Center** – You can use Ops Center Enterprise Controller to automatically download the latest firmware from Oracle, or firmware can be loaded manually into the Enterprise Controller. In either case, Ops Center can install the firmware onto one or more servers.

  For information, go to:

  http://www.oracle.com/technetwork/oem/ops-center/index.html

- **Oracle Hardware Management Pack** – You can use the `fwupdate` CLI Tool within the Oracle Hardware Management Pack software to update firmware within the system.

  For information, refer to the Oracle Hardware Management Pack Documentation Library at:

  `https://www.oracle.com/goto/ohmp/docs`

Downloading an OS or Software Applications

You can download an operating system (OS) or software applications for all licensed Oracle products from Oracle Software Delivery Cloud (formerly called Oracle eDelivery). Software is available in zip and ISO formats, which you can unzip or burn to DVDs, respectively. All of the download links on the Oracle Technology Network (OTN) point to the Software Delivery Cloud, making this site the authoritative source for all Oracle OS and application downloads. To access Oracle Software Delivery Cloud, go to `https://edelivery.oracle.com/`.

Oracle Support

If you need help getting firmware or software updates, or downloading a complete software application, you can call Oracle Support. Use the appropriate number from the Oracle Global Customer Support Contacts Directory at:

https://www.oracle.com/support/contact.html

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