Oracle® X6 Series Servers Administration Guide

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Using This Documentation

- **Overview** – Provides descriptions of and describes how to use the single-server management tools for Oracle X6 series servers.
- **Audience** – This document is written for technicians, system administrators, and authorized service providers.
- **Required knowledge** – Users should have experience configuring and administering servers.

Product Documentation Library

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

- *Oracle Server X6-2*: `http://www.oracle.com/goto/x6-2/docs`
- *Oracle Server X6-2L*: `http://www.oracle.com/goto/x6-2l/docs`

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

Overview of System Administration Tools

This section describes the tools used to manage Oracle servers.

Task	Link
Review brief descriptions of the tools available to manage a single server.	“Single-System Management Tools” on page 13
Review brief descriptions of the tools available to manage multiple servers.	“Multiple-System Management Tools” on page 15
Read about the tasks you can perform with each tool and where you can find documentation.	“Oracle Integrated Lights Out Manager (ILOM)” on page 16 “Oracle Hardware Management Pack” on page 18 “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	Link
Oracle Integrated Lights Out Manager (ILOM)	Embedded service processor (SP) utility with a command-line interface and web browser interface. No installation required. Configure and manage server components locally or remotely by connecting to a dedicated network port, a local serial port, or a sideband port.	“Oracle Integrated Lights Out Manager (ILOM)” on page 16

Tool	Description	Link
Oracle Hardware Management Pack	Add-on software package available from My Oracle Support. Must be installed once an operating system has been installed. Monitor hardware through the host operating system either remotely using SNMP, or locally using command-line interface tools.	"Oracle Hardware Management Pack" on page 18
BIOS Configuration Utility	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.	"BIOS Setup Utility" on page 19

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	Documentation
Power the server on and off remotely.	✓		"Controlling the Server Power State" on page 41
Configure the service processor.	✓	✓	"Configure the Service Processor" on page 65
Configure RAID.		✓	Refer to the hardware installation guide for your server.
Download software and firmware.	✓	✓	"Downloading and Updating System Firmware and Software" on page 119
See how much power the server is consuming at any given time.	✓		"Monitor Server Power Consumption and Component Temperatures" on page 93
Monitor hardware components.	✓	✓	"Monitoring Server Inventory and Health" on page 83
Update BIOS or Oracle ILOM firmware.	✓	✓	"Downloading and Updating System Firmware and Software" on page 119
Update HBA and expander firmware.		✓	"Downloading and Updating System

Task	Oracle ILOM	Oracle Hardware Management Pack	Documentation
			Firmware and Software" on page 119
Reset the server BIOS or Oracle ILOM to default values.	✓	✓	"Resetting the Firmware to Default Settings" on page 114

Related Information

- "Accessing and Using System Administration Tools" on page 23

Multiple-System Management Tools

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

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

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

Related Information

- "Single-System Management Tools" on page 13

Oracle Integrated Lights Out Manager (ILOM)

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

Oracle ILOM provides local or remote access through a serial management port and a network management port. By default, these ports offer a dedicated connection to Oracle ILOM. Any time power is applied to the server, you can log in to Oracle ILOM from a local terminal device or from a web browser or secure shell (SSH) session on a remote system. To access Oracle ILOM, see “Accessing Oracle ILOM” on page 23.

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

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

- “Oracle ILOM Tasks” on page 16
- “Oracle ILOM Documentation” on page 17

Oracle ILOM Tasks

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

Web Navigation	CLI Hierarchy	Description
System Information	`/System`	Review information about the server, including the serial number and BIOS version. View the overall health of the server and see a total problem count, or view subcomponent health and inventory details.
Remote Control	`/HOST/console`	Configure and launch a remote console session. Redirect storage devices.

Host Management	`/HOST/diag`
	
	`/HOST boot_device`
	
	`/System action`
		Run diagnostics on the server.
		
		Set the next boot device or control the server power state.

System Management	`/System/BIOS`	View BIOS settings. Backup or restore a BIOS configuration.

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

Oracle ILOM Documentation

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

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

Oracle ILOM features are also described in the Oracle ILOM 3.2 Documentation Library at http://www.oracle.com/goto/ilom/docs.

Oracle Hardware Management Pack

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

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

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

Once you have installed Oracle Hardware Management Pack, you can enter Oracle Hardware Management Pack commands from the operating system command-line application. This guide details some of the tasks you can perform using the Oracle Server CLI Tools included in Oracle Hardware Management Pack. For information about other components mentioned in this section, refer to the Oracle Hardware Management Pack Documentation Library at `http://www.oracle.com/goto/ohmp/docs`. To download and install Oracle Hardware Management Pack, see "Accessing Oracle Hardware Management Pack" on page 33.

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

- "Oracle Hardware Management Pack Utilities" on page 18
- "Oracle Hardware Management Pack Documentation" on page 19

Oracle Hardware Management Pack Utilities

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

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

CLI Tool	Description
`ubiosconfig`	Preserve BIOS settings and some service processor settings.
`fwupdate`	Update Oracle ILOM and BIOS; or query, update, and validate firmware versions on supported SAS storage devices, embedded SAS storage controllers, SAS storage expanders, storage drives, InfiniBand controllers, and Fibre Channel controllers.
`raidconfig`	View or create RAID volumes on storage drives that are attached to RAID controllers.
`ilomconfig`	Restore, set, and view Oracle ILOM settings, such as network management, clock configuration, and user management settings.
`hwtmgmtcli`	Monitor system health.
`ipmitool`	After loading the requisite driver, use Oracle Hardware Management Pack to read sensor data repository (SDR) data and display other information about the server. You can also get and set LAN configuration parameters and perform chassis power control operations.
`snmpwalk`	Read information about the server indicator and sensor readings from the system event log; or set the location indicator.
`itpconfig`	Configure Oracle ILOM to forward SNMP traps to the host.

Oracle Hardware Management Pack Documentation

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

BIOS Setup Utility

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

You can launch the utility locally or remotely by interrupting the server boot process. To access the BIOS Setup Utility, see “Accessing the BIOS Setup Utility” on page 36.

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

- “BIOS Setup Utility Tasks” on page 20
- “BIOS Setup Utility Documentation” on page 20

BIOS Setup Utility Tasks

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

Menu	Description
Main	View general information about the server, including the system date and time, total memory, USB device inventory, baseboard management controller status and firmware revision, system serial number, and CPU and DIMM information.
	Define an Administrator password for entering the BIOS Setup Utility.
Advanced	View and configure processor, memory, and USB settings; enable or disable Trusted Computing and PXE boot.
	Change baseboard management controller network settings.
	If the server is equipped with a RAID Internal HBA and it is booted in UEFI Boot Mode, the Advanced menu also provides access to a RAID configuration utility.
IO	Enable and disable Option ROMs.
	Configure PCIe subsystem and I/O virtualization settings.
Boot	Set the boot mode to UEFI Boot Mode or Legacy BIOS Boot Mode.
	Enable or disable Persistant Boot Support.
	Configure the Boot Option Priority list.
Exit	Exit the BIOS Setup Utility after optionally saving your changes; or restore the BIOS Setup Utility optimized default settings.

BIOS Setup Utility Documentation

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

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

Accessing and Using System Administration Tools

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

Task	Link
Set up a management connection to the server, and then launch and log in to Oracle ILOM.	“Accessing Oracle ILOM” on page 23
Download, install, and access Oracle Hardware Management Pack.	“Accessing Oracle Hardware Management Pack” on page 33
Access the BIOS Setup Utility and review BIOS key mappings for serial terminals.	“Accessing the BIOS Setup Utility” on page 36

Accessing Oracle ILOM

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

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

- “Oracle ILOM Management Connection Options” on page 24
- “Cable the Server for a Management Connection to Oracle ILOM” on page 25
- “Launch and Log In to Oracle ILOM Through a Remote Ethernet Connection” on page 26
- “Launching Remote KVMS Redirection Sessions” on page 29

Oracle ILOM Management Connection Options

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

Management Connection	Management Port	Description
Dedicated Remote 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.
Dedicated Local Serial Management Connection	SER MGT	The SER MGT port on the chassis provides a secure local connection to the Oracle ILOM command-line interface using a serial terminal or terminal emulator. This connection is particularly useful when a local console is the only way to access and diagnose system failures, or when you need to modify the preconfigured Oracle ILOM network properties prior to establishing a LAN connection.
Shared Sideband Network Management Connection	NET0–NET3 **Note -** Ethernet ports NET2 and NET3 are non-functional in single-processor systems.	You can optionally connect to Oracle ILOM and manage the server remotely through one of the 10GbE 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 could: (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, `NET0`, `NET1`, `NET2`, or `NET3`.
Host-to-ILOM Interconnect	None	A communication channel known as the Host-to-ILOM Interconnect enables you to communicate locally with Oracle ILOM from the host operating system (OS) without the use of a network management connection (NET MGT) to the server. 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 future server monitoring and fault detection operations that you typically perform from the host operating system through the use of Oracle enabled software tools and agents installed on the server.

▼ Cable the Server for a Management Connection to Oracle ILOM

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

   For information about management connections to Oracle ILOM, see "Oracle ILOM Management Connection Options" on page 24.

2. **To establish a dedicated remote network management connection to Oracle ILOM, perform the following steps:**

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

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

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

      To determine the dynamic IP address in Oracle ILOM, establish a serial connection to Oracle ILOM, and then view the properties under the `/network` and `/network/ipv6` hierarchies.

      Once you have cabled the server for a remote Ethernet connection to the SP, you can log in to Oracle ILOM from a remote system on the network. For further instructions, see "Launch and Log In to Oracle ILOM Through a Remote Ethernet Connection" on page 26.

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

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

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

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

      The Oracle ILOM login prompt appears. For further instructions, see "Log In to Oracle ILOM Through a Local Serial Connection" on page 28.

4. **To establish a remote sideband management connection to Oracle ILOM, refer to Sideband Network Management Connection in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x*.**

5. **To enable the Host-to-ILOM interconnect refer to one of the following:**

   - Dedicated Interconnect SP Management Connection in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x*.
   - Enabling the Host-to-ILOM Interconnect, *Oracle Hardware Management Pack Installation Guide*.

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

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Note - To enable first-time login and access to Oracle ILOM, a default Administrator account and its password are provided with the system. To build a secure environment and enforce user authentication and authorization in Oracle ILOM, you must change the default password (`changeme`) for the default Administrator account (`root`) after your initial login to Oracle ILOM. If this default Administrator account has since been changed, contact your system administrator for an Oracle ILOM user account with Administrator privileges.

Note - To prevent unauthorized access to Oracle ILOM, create user accounts for each user. For details, see "Adding Oracle ILOM User Accounts" on page 73.

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1. **Ensure that a physical management connection to Oracle ILOM has been established.**
   For instructions for establishing a physical management connection to Oracle ILOM see "Cable the Server for a Management Connection to Oracle ILOM" on page 25.

2. **To launch and log in to the Oracle ILOM web interface, perform the following steps:**

   a. **Open a web browser window.**
      Ensure that the web browser is supported by Oracle ILOM. For more information, refer to the *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 3.2.x*.

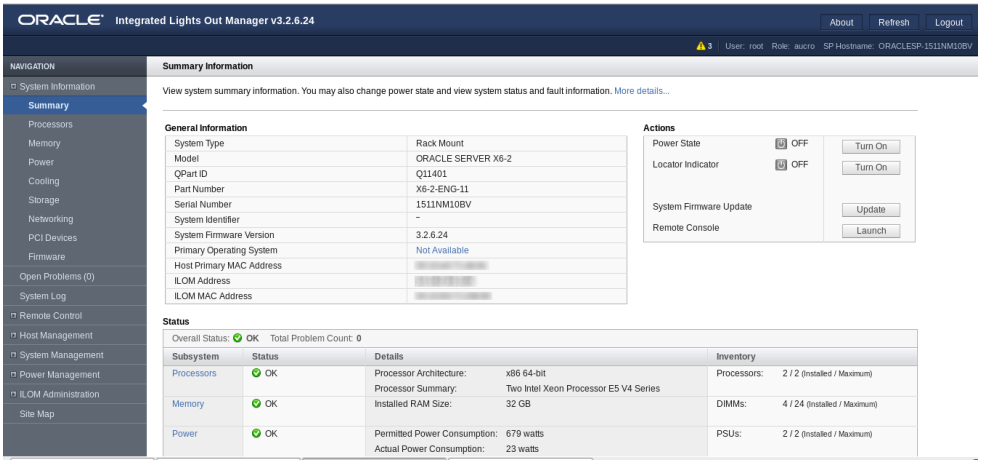
   b. **Type the IP address or host name of the server in the browser address bar, for example http://192.0.2.213.**

The Oracle ILOM log in page appears.

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

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

The Oracle ILOM Summary Information page appears.



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

a. Open a terminal window.

b. Specify 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@198.51.100.26`**

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

The Oracle ILOM password prompt appears.

c. **Type the password associated with your user name, and then press Enter.**

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

▼ Log In to Oracle ILOM Through a Local Serial Connection

Note - To enable first-time login and access to Oracle ILOM, a default Administrator account and its password are provided with the system. To build a secure environment and enforce user authentication and authorization in Oracle ILOM, you must change the default password (`changeme`) for the default Administrator account (`root`) after your initial login to Oracle ILOM. If this default Administrator account has since been changed, contact your system administrator for an Oracle ILOM user account with Administrator privileges.

Note - To prevent unauthorized access to Oracle ILOM, create user accounts for each user. For details, see "Adding Oracle ILOM User Accounts" on page 73.

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

   For instructions for establishing a physical management connection to Oracle ILOM see "Cable the Server for a Management Connection to Oracle ILOM" on page 25.

2. **At the login prompt, type your user name, and then press Enter.**

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

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

Launching Remote KVMS Redirection Sessions

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

- **Serial remote console redirection**: View a text-based version of the host console. You can use the serial remote console to interrupt the boot process and configure server settings in the BIOS Setup Utility, navigate the operating system file system, or enter commands from the operating system command-line application.
- **Graphical remote console redirection**: View a graphical version of the host console using the Oracle ILOM Remote System Console Plus application. You can use the graphical remote console to interrupt the boot process and configure server settings in the BIOS Setup Utility, view the operating system desktop, or enter commands from the operating system command-line application.
- **Host storage device redirection**: Mount an image file on the server service processor (SP) and redirect that image to the host. Host storage device redirection is useful when installing an operating system.

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

- "Launch a Serial Console Redirection Session" on page 29
- "Launch a Graphical Remote Console Redirection Session" on page 30
- "Configure a Host Storage Device Redirection Session" on page 31

▼ Launch a Serial Console Redirection Session

Use the Oracle ILOM command-line interface (CLI) to start or stop a serial console redirection session. You can launch multiple redirection sessions to the host from the Oracle ILOM command-line interface. However, only the first of all current serial console redirection sessions is granted read and write privileges. All other logged-in sessions are read-only. Read and write privileges are reassigned when a user with read and write privileges closes his or her session, and a new serial session is opened.

Before you start a serial console redirection session, ensure that you have Console (c) role privileges in Oracle ILOM.

1. **Log in to the Oracle ILOM command-line interface.**
   For instructions, see "Accessing Oracle ILOM" on page 23.

2. **Type `start /HOST/console`.**

A confirmation prompt appears.

3. **Type `y` to confirm that you want to start a serial console redirection.**

   You are now viewing the host console.

4. **If you are prompted for user credentials, enter the requested information to access the host server operating system.**

   You are now logged in to the host server operating system through the serial console.

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

5. **To terminate the serial console redirection session, perform the following steps:**

   a. **Log out of the host server operating system.**

   b. **Press `Escape` + `(`.**

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

Related Information

- Start Serial Host Console, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x*

▼ Launch a Graphical Remote Console Redirection Session

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

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

Before you launch a remote console redirection session, ensure that the following prerequisites are met:

- Java Runtime Environment (JRE) 1.6 or later is installed on the remote system from which you will launch the redirection.
- You set the KVMS State property to Enabled in the Oracle ILOM Remote Control > KVMS page.

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

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

   For instructions, see "Launch and Log In to Oracle ILOM Through a Remote Ethernet Connection" on page 26.

   The Oracle ILOM Summary Information page appears.

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

   The Oracle ILOM Remote System Console Plus window appears.

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

Related Information

- Oracle ILOM Remote System Console Plus, *Oracle ILOM Adminstrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x*

▼ Configure a Host Storage Device Redirection Session

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

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

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

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

Before you initiate a host storage device redirection, 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, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   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://198.51.100.2:/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://198.51.100.2/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), perform the following steps:**

   a. **Log in to the Oracle ILOM CLI.**
   For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **Set the location of the image file by typing:**
   `set /SP/services/kvms/host_storage_device/remote/ server_URI=`*`NFS_or_Samba_URI_file_location`* `[username=`*`username`*`] [password=`*`password`*`]`

   c. **Enable storage redirection by typing:**
   `set /SP/services/kvms/host_storage_device/ mode=remote`

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

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

   e. **When you are done, disable redirection by typing:**
   `set /SP/services/kvms/host_storage_device/ mode=disabled`

Related Information

- Redirecting a Remote Image File, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x*

Accessing Oracle Hardware Management Pack

Before using Oracle Hardware Management Pack, you must install it, 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 34
- *Oracle Hardware Management Pack Installation Guide*

To get started, see the following procedures:

- “Use Oracle Hardware Management Pack Commands (Oracle HMP)” on page 35
- “Use the Oracle Hardware Management Pack Management Agents (Oracle HMP)” on page 36

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.

Review the support matrix to ensure that the Oracle Hardware Management Pack tools you intend to install are supported on your server: `http://www.oracle.com/technetwork/server-storage/servermgmt/tech/hardware-management-pack/support-matrix-423358.html`.

Note - Beginning with Oracle Solaris 11.2, Oracle Hardware Management Pack (HMP) has become an integrated component of the Oracle Solaris operating system and is called Oracle HMP for Oracle Solaris. Do not download and use other versions of Oracle Hardware Management Pack that are not specifically qualified for the Oracle Solaris 11.2 (and later) operating system. If you have Oracle Solaris 11.1 or earlier or other operating systems, continue to use Oracle Hardware Management Pack, available as a separate download from the Oracle support web site.

See the following sections:

- “Download Oracle Hardware Management Pack Installation Files From My Oracle Support” on page 34
- “Install Oracle Hardware Management Pack” on page 35

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

- **To install a newer version of Oracle Hardware Management Pack, download it from the My Oracle Support web site. For instructions, see “Download Firmware and Software From My Oracle Support” on page 121.**

▼ Install Oracle Hardware Management Pack

Before you begin, remove any previous versions of Oracle Hardware Management Pack installed on the server as described in the *Oracle Hardware Management Pack Installation Guide* at `http://www.oracle.com/goto/ohmp/docs`.

1. **Ensure that you have access to the Oracle Hardware Management Pack installation files.**

2. **Follow the instructions in the *Oracle Hardware Management Pack Installation Guide* to complete the installation.**

▼ Use Oracle Hardware Management Pack Commands (Oracle HMP)

Before you begin, ensure that Oracle Hardware Management Pack is installed on the server as described in "Installing Oracle Hardware Management Pack" on page 34.

1. **Access the host console locally or remotely:**

   - **To establish a local connection to the host console, perform the following steps:**

     a. **Connect a VGA monitor to the VGA port on the server.**

     b. **Connect a USB keyboard and mouse to the USB connectors on the server.**

   - **To establish a remote connection to the host console, launch an Oracle ILOM Remote System Console Plus session.**

     For instructions, see "Launching Remote KVMS Redirection Sessions" on page 29.

2. **Ensure that the server is powered on and booted.**

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

   You enter Oracle Hardware Management Pack commands from the operating system command-line interface.

Related Information

- “Oracle Hardware Management Pack” on page 18

Use the Oracle Hardware Management Pack Management Agents (Oracle HMP)

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 and server module hardware from the operating system (OS).

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

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

Accessing the BIOS Setup Utility

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

Note - Your system can be configured to boot in Legacy BIOS Boot Mode or UEFI Boot Mode. See “Legacy BIOS Boot Mode and UEFI Boot Mode” on page 47 for details.

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

- “Access the BIOS Setup Utility” on page 37
- “BIOS Setup Utility Key Mappings” on page 38
- “Exit the BIOS Setup Utility” on page 39
- “Common BIOS Setup Utility Tasks” on page 39

▼ Access the BIOS Setup Utility

1. **Access the host console locally or remotely:**

   - **To establish a local connection to the host console, perform the following steps:**

     a. **Connect a VGA monitor to the VGA port on the server.**

     b. **Connect a USB keyboard and mouse to the USB connectors on the server.**

   - **To establish a remote connection to the host console, launch an Oracle ILOM Remote System Console Plus session.**

     For instructions, see "Launching Remote KVMS Redirection Sessions" on page 29.

2. **(Optional) Use Oracle ILOM web interface to select BIOS as the next boot device.**

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

   For instructions, see "Accessing Oracle ILOM" on page 23.

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

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

   d. **Click Save.**

   If you select BIOS from the list, next time you boot you do not have to press F2 to access the BIOS Setup Utility (Step 4 below).

3. **Reset the server.**

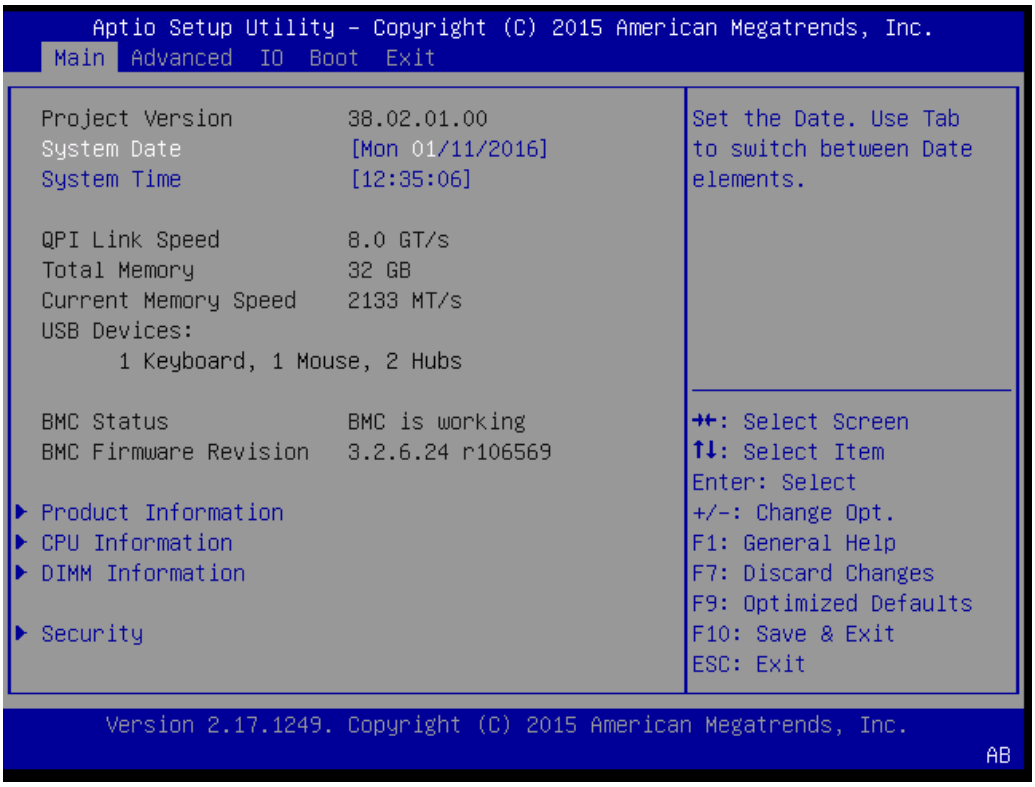
   For instructions, see "Controlling the Server Power State" on page 41.

   Boot messages appear on the screen.

4. **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 2 above).

The BIOS Setup Utility Main menu appears.



BIOS Setup Utility Key Mappings

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

Function Key	Control Key Sequence	BIOS POST Function	BIOS Setup Function
F1	Ctrl+Q	Not applicable.	Activate the BIOS Setup Utility Help menu.
F2	Ctrl+E	Enter the BIOS Setup Utility while the system is performing the power-on self-test (POST).	Not applicable.
F7	Ctrl+D	Not applicable.	Discard changes. Not applicable to the LSI 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 LSI 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 Legacy BIOS or UEFI Boot Mode: “Select UEFI Boot Mode or Legacy BIOS Boot Mode (BIOS)” on page 49
- Select the Boot Device: “Modifying the Boot Order” on page 51
- Configure TPM Support: “Configuring BIOS Support for TPM” on page 54
- Configure SP Network Settings: “Modify Service Processor Network Settings (BIOS)” on page 70
- Configure Option ROM Settings and I/O Space Allocation: “Configure Option ROM and I/O Space Allocation” on page 100
- Reset the BIOS Firmware to Defaults: “Reset the BIOS Firmware to Default Settings (BIOS)” on page 114
- Exit BIOS Setup Utility: “Exit the BIOS Setup Utility” on page 39

▼ Exit the BIOS Setup Utility

1. **In the BIOS Setup Utility, use the arrow keys to navigate to the Exit menu.**

2. **In the Exit menu, select one of the following options:**

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

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

Controlling the Server Power State

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

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

Server Power State Overview

The server has the following possible 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 on. The green OK status indicator on the front panel blinks.
Full power	When you power on the host, the server enters Full power mode. In Full power mode, the green OK status indicator is steady on. You can power the host off gracefully, or immediately. When you power off the server gracefully, Advanced Configuration and Power Interface (ACPI)-enabled operating systems prepare the operating system before shutting it down. When you power the server off immediately, no such attempt occurs.

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

Note - If you updated the system firmware and selected the Delay BIOS Upgrade option, when you reset or power cycle your server, Oracle ILOM installs the BIOS firmware upgrade. This causes a reset to take longer than normal and causes the server to power cycle during the reset. This is normal, expected behavior during a delayed BIOS upgrade. For more details, see "Update the BIOS and Service Processor Firmware (Oracle ILOM)" on page 122.

Power Control Options

The server supports the following power control actions.

Power Control Action	Description
Graceful shutdown	Graceful shutdown allows ACPI-enabled operating systems to perform an orderly shutdown. Servers *not* running ACPI-enabled operating systems might ignore this event and fail to shut down. Once the shutdown is completed, the green OK status indicator on the front panel blinks to indicate that the server is in Standby power mode.
Immediate power off	Immediate shutdown abruptly closes all applications and files without saving changes. Once the shutdown is completed, the green OK status indicator on the front panel blinks to indicate that the server is in Standby power mode.
Reset	Reset causes the server to reboot, while power remains applied to system components (such as disk drives).
Power cycle	Power cycle removes power from all system components, and then reverts the server to Full power mode.
Power on	Power on causes the server to enter Full power mode.

Powering the Server Off and On

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

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

- "Power Off the Server Using the Power Button" on page 43
- "Power On the Server Using the Power Button" on page 43
- "Power the Server Off or On (Oracle ILOM)" on page 44

Power Off the Server Using the Power Button

1. **Locate the Power button on the server front panel.**

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

   Note - The Power button is recessed on most systems.

2. **Use a stylus or other pointed, non-conducting object to press the Power button.**

   - **To perform a graceful shutdown, press and quickly release the power button.**
   - **To perform an immediate shutdown, press and hold the Power button for at least 5 seconds.**

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

The server enters Standby power mode.

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

Power On the Server Using the Power Button

1. **Ensure that the power supplies are connected to a power source.**
2. **Verify that the server is in Standby power mode.**

   See "Server Power State Overview" on page 41.

3. **Locate the Power button on the front panel of the server.**

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

Note - The Power button is recessed on most systems.

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

Power the Server Off or On (Oracle ILOM)

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

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

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

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

1. **To change the server power state in the Oracle ILOM web interface, perform the following steps:**

   a. **Log in to the Oracle ILOM web interface.**
   For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **In the navigation pane, click Host Management > Power Control.**

   c. **In the Select Action drop-down menu, select a power control option.**
   For descriptions of the power control options, see "Power Control Options" on page 42.

2. **To change the server power state in the Oracle ILOM command-line interface (CLI), perform the following steps:**

   a. **Log in to the Oracle ILOM CLI.**
   For instructions, see "Accessing Oracle ILOM" on page 23.

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

- **To reset the server, type `reset /System`.**
- **To gracefully shut down the server, type `stop /System`.**
- **To immediately shut down the server, type `stop -f /System`.**
- **To power on the server, type `start /System`.**

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

Related Information

- Controlling Host Power, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x*

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

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

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

▼ Set SP Host Power Policy at Boot

1. **To set a power-on policy in the Oracle ILOM web interface, perform the following steps:**

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

   For instructions, see "Accessing Oracle ILOM" on page 23.

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

c. **In the Service Processor Policies table, select one of the following policies:**

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

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

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

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

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

For instructions, see "Accessing Oracle ILOM" on page 23.

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

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

The power-on policies are mutually exclusive, that is, only one can be enabled at a time. For more information about each policy, see the Related Information section following this procedure.

Related Information

- Power-On and Cooling-Down Policies Configurable from the Server SP, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x*

Viewing and Modifying Boot Properties

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

Task	Link
Read about the supported boot modes.	“Legacy BIOS Boot Mode and UEFI Boot Mode” on page 47
View or change the current boot mode.	“Viewing or Modifying the Current Boot Mode” on page 48
Make persistent or temporary changes to the boot order list.	“Modifying the Boot Order” on page 51
Enable the Persistent Boot Support feature.	“Enabling Persistent Boot Support” on page 54
Enable Trusted Platform Module features.	“Configuring BIOS Support for TPM” on page 54

Legacy BIOS Boot Mode and UEFI Boot Mode

The server is equipped with a Unified Extensible Firmware Interface (UEFI), which can be configured to support either UEFI or Legacy BIOS Boot Mode. Legacy BIOS is the default boot mode, and should be used with software and adapters that do not have UEFI drivers.

When you change the server boot mode, the change takes effect at the next server reset. If you intend to switch boot modes, you should back up the current UEFI configuration. For instructions on backing up current firmware configurations, see “Backing Up Current Firmware and Hardware Configurations” on page 105.

Typically, you set the boot mode only once, before you install an operating system (OS) on the server. If you change the boot mode after you have installed an OS, the OS will not boot. Review the OS installation guide to determine whether the OS you intend to install supports UEFI Boot Mode.

The advantages of UEFI Boot Mode include:

- Faster boot time.
- No legacy option ROM address constraints.
- Support for operating system boot partitions greater than 2 terabytes (2 TB). For more information about limitations for supported operating systems, refer to your server product notes.
- PCIe device configuration utilities are integrated with the BIOS Setup Utility.
- Bootable operating system images are displayed in the boot list as labeled entities. For example, it displays Windows boot manager labels instead of raw device labels.
- Efficient power and system management.
- Robust reliability and fault management.
- UEFI drivers.

However, you should choose Legacy BIOS Boot Mode in the following situations:

- The operating system you intend to install does not support booting in UEFI Boot Mode.
- The boot devices on the server contain legacy option ROMs that must be loaded.

To view or modify the boot mode, see "Viewing or Modifying the Current Boot Mode" on page 48.

Viewing or Modifying the Current Boot Mode

You can view the current boot mode in the BIOS Setup Utility or in Oracle ILOM. However, you can only modify the boot mode from the BIOS Setup Utility.

To view or modify the boot mode, see the following procedures:

- "View the Current Boot Mode (Oracle ILOM)" on page 48
- "Select UEFI Boot Mode or Legacy BIOS Boot Mode (BIOS)" on page 49

▼ View the Current Boot Mode (Oracle ILOM)

1. **To view the current boot mode in the Oracle ILOM web interface, perform the following steps:**

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

   For instructions, see "Accessing Oracle ILOM" on page 23.

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

   The BIOS Configuration screen appears.

c. **Review the Boot Mode property.**

2. **To view the current boot mode in the Oracle ILOM command-line interface (CLI), perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **Type `show /System/BIOS boot_mode`.**

▼ Select UEFI Boot Mode or Legacy BIOS Boot Mode (BIOS)

Caution - If you change the boot mode after you have installed an operating system (OS), the OS will not boot.

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

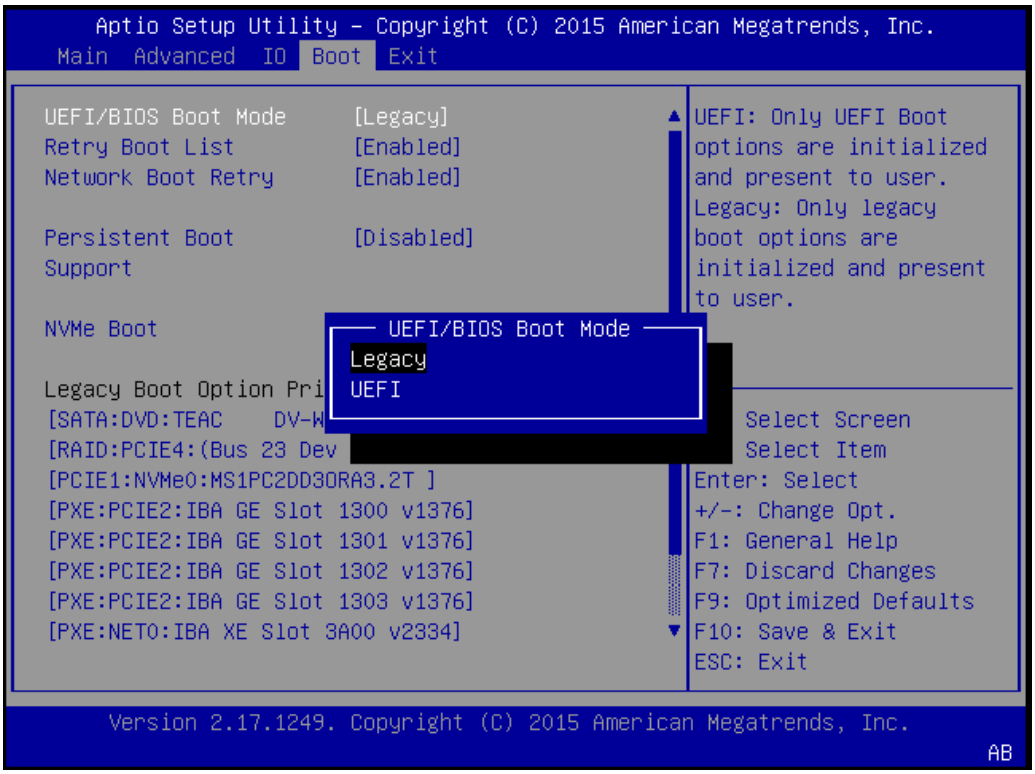
   For instructions, see "Accessing the BIOS Setup Utility" on page 36.

2. **Navigate to the Boot menu.**

   The UEFI/BIOS Boot Mode property displays the current boot mode.

3. **In the Boot menu, select UEFI/BIOS Boot Mode.**

The UEFI/BIOS Boot Mode dialog box appears.



4. **Select Legacy or UEFI.**

Note - Before you can configure the boot order list, you must reset the server and reenter the BIOS Setup Utility. After you reset the server, the boot order list is populated with the devices that support the chosen boot mode.

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

Modifying the Boot Order

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

By default, the boot order list is populated only with devices detected on the server that support the current boot mode. However, if you enable the Persistent Boot Support feature, every physical slot, network port, and disk drive bay in the server is shown in the boot order list. For more information about Persistent Boot Support, see "Enabling Persistent Boot Support" on page 54.

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

- "Modify the Boot Order (BIOS)" on page 51
- "Set Temporary Next Boot Device (Oracle ILOM)" on page 53

▼ Modify the Boot Order (BIOS)

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

   For instructions, see "Accessing the BIOS Setup Utility" on page 36.

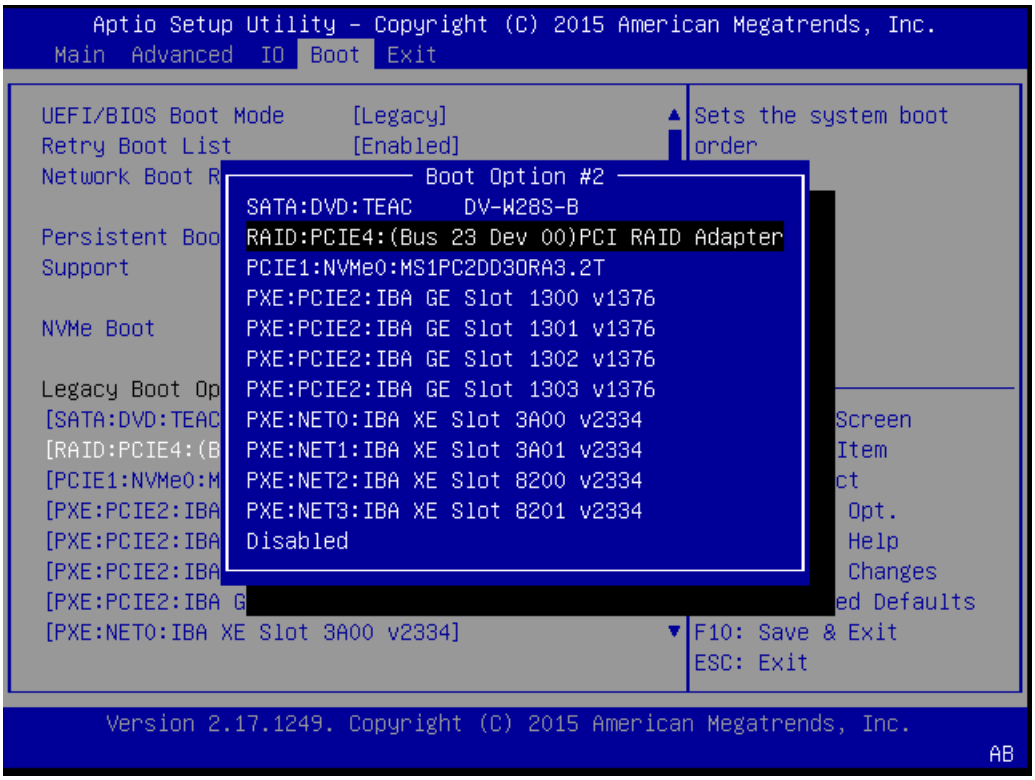
2. **Navigate to the Boot menu.**

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

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

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

The Boot Option dialog box appears.



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

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

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

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

▼ Set Temporary Next Boot Device (Oracle ILOM)

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

Before you begin, ensure that you have Reset and Host Control (`r`) role privileges in Oracle ILOM.

1. **To set a boot device for the next power reset in the Oracle ILOM web interface, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

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

   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 51.

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

2. **To set a boot device for the next power reset in the Oracle ILOM command-line interface (CLI), perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

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

      `set /HOST boot_device=`*bootDevice*

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

Related Information

- Setting Next Boot Device on x86 Host Server, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x*

Enabling Persistent Boot Support

By default, when a boot device is removed and then replaced, that boot device moves to the last position in the boot order list. The Persistent Boot Support feature enables you to fix the position of every physical slot, network port, and disk drive bay in the boot order list, regardless of the presence of a bootable device at each location.

Persistent Boot Support is disabled by default. To enable the Persistent Boot Support feature, see the following procedure:

- "Enable Persistent Boot Support (BIOS)" on page 54

▼ Enable Persistent Boot Support (BIOS)

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

   For instructions, see "Accessing the BIOS Setup Utility" on page 36.

2. **Navigate to the Boot menu.**

3. **In the Boot menu, select Persistent Boot Support, and then select Enabled.**

   The boot order list is populated with every physical slot, network port, and disk drive bay in the server.

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

Configuring BIOS Support for TPM

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

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

To enable BIOS support for TPM, see the following procedure:

- “Configure BIOS Support for TPM (BIOS)” on page 55

▼ Configure BIOS Support for TPM (BIOS)

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

   For instructions, see “Accessing the BIOS Setup Utility” on page 36.

2. **Navigate to the Advanced > Trusted Computing screen.**

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

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

Configuring Storage Resources

This section describes how to configure RAID and iSCSI virtual drives.

- RAID arrays can improve performance and increase tolerance for disk failures.
- If you prefer to run a supported operating system that resides on an external server, you must configure iSCSI virtual drive parameters in the BIOS Setup Utility.

See the following sections:

Task	Link
Configure RAID on the server.	"Configuring RAID on the Server" on page 57
Configure iSCSI virtual drive parameters.	"Modifying iSCSI Virtual Drive Properties" on page 59

Configuring RAID on the Server

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

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

- **Before you install the operating system**, you can use the BIOS utilities to configure RAID. This is a necessary step that must be completed before installing the operating system. For details, refer to your hardware installation guide.

Caution - These procedures erase all data on the disk, including the operating system.

- **After the operating system is installed**, you can use the following tools to configure and modify RAID configurations. However this 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.

Tool	Description	Supported RAID Levels	Documentation
Oracle Hardware Management Pack	See "Oracle Hardware Management Pack" on page 18. Command-line server management tool that can be used to configure drives (except boot drives) after the operating system has been installed.	Review the output of the `raidconfig list controller` subcommand.	"Configure RAID (Oracle Hardware Management Pack)" on page 58
MegaRAID Command Tools	Command-line RAID configuration application that must be installed on the server after the operating system has been installed.	■ RAID 0 ■ RAID 1 ■ RAID 5 ■ RAID 6 ■ RAID 00 ■ RAID 10 ■ RAID 50	*MegaRAID SAS Software User Guide* at: `https://www.broadcom.com/support/oem/oracle/`

▼ Configure RAID (Oracle Hardware Management Pack)

Before you begin, ensure the following:

- The disk drives have been properly installed on the server.

  For more information, review the server service manual.
- The host bus adapter (HBA) installed on the server is supported.

  A list of supported HBAs is provided in the server product notes.
- If the server is running a UNIX-based platform, you have `root` permission.
- If the server is running Windows, you have `administrator` privileges.
- 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.**

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

2. **Use the `raidconfig create raid` command:**

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

Related Information

- Configuring RAID (`raidconfig`), *Oracle Server CLI Tools User's Guide*

Modifying iSCSI Virtual Drive Properties

In UEFI Boot Mode, you can use iSCSI virtual drives to run supported operating systems that reside on an external server. This section describes how to configure iSCSI virtual drives using the BIOS Setup Utility.

Note - iSCSI is not available in Legacy BIOS Boot Mode.

- "Modify iSCSI Virtual Drive Properties in UEFI Boot Mode (BIOS)" on page 60

Required Information for iSCSI Configuration

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

Parameter	Example
Target name	iqn.1988-12.com.oracle:*platform*-target
iSCSI initiator name	iqn.1988-12.com.oracle:0010E02E458F

Parameter	Example
Note - iSCSI requires iSCSI Qualified Names (iqn) formats for its initiator and target names.	
Logical Unit Number	LUN 0
IP address of iSCSI server	192.167.1.24 (IPv4)
Port number	3260

▼ Modify iSCSI Virtual Drive Properties in UEFI Boot Mode (BIOS)

Use this procedure to configure iSCSI virtual drives using the iSCSI BIOS Setup Utility screens on systems configured to use UEFI Boot Mode.

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

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

Before you begin, ensure that the following prerequisites are met:

- You are familiar with iSCSI theory of operation and with iSCSI server setup procedures.
- You have verified that iSCSI targets can be mounted on a client. Review the operating system documentation for more information.
- You have access to an external iSCSI server running on a supported operating system.
- The server is in UEFI Boot Mode, not Legacy BIOS Boot Mode. See “Select UEFI Boot Mode or Legacy BIOS Boot Mode (BIOS)” on page 49.

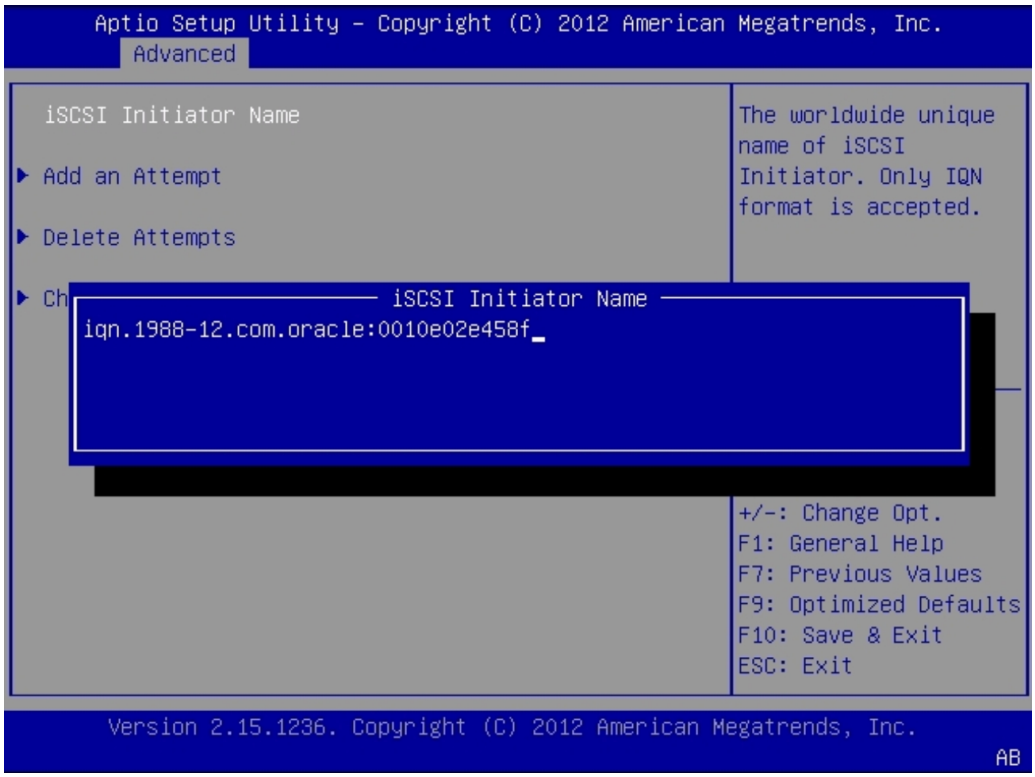
1. **Access the BIOS Setup Utility.**

   For instructions, see “Accessing the BIOS Setup Utility” on page 36.

2. **Navigate to the Advanced menu.**

3. **Select iSCSI Configuration.**

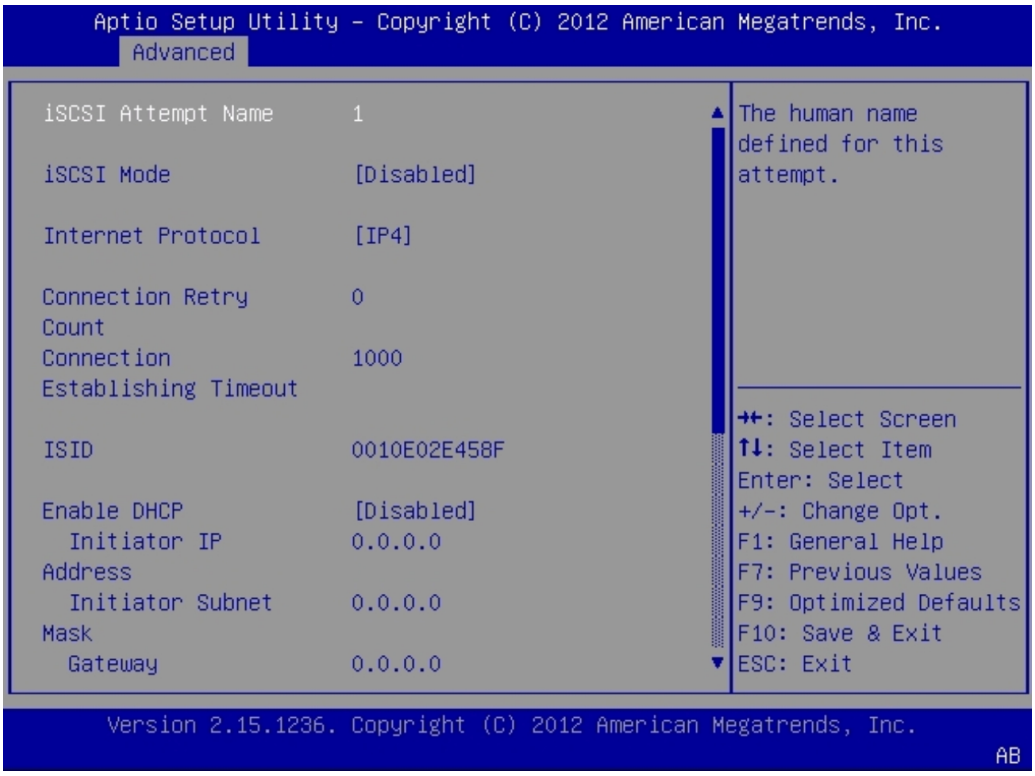
4. **Select iSCSI Initiator Name, and then specify the iSCSI initiator name in iSCSI Qualified Name (iqn) format, for example `iqn.1988-12.com.oracle:0010e02e458f`.**



5. **Select Add an Attempt.**

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

The Port Configuration screen appears.



7. **In the Port Configuration screen, perform the following steps:**

   a. **Set the iSCSI Mode property to Enabled.**

   b. **Set the Internet Protocol property to IPv4.**

   c. **Set the Connection Retry Count property to 1.**

   d. **Set the Enable DHCP property to Enabled or Disabled to specify an addressing method for the iSCSI initiator.**

   e. **If you set the Enable DHCP property to Disabled, specify the Initiator IP Address, Initiator Subnet Mask, and Gateway.**

Note - Use the same subnet.

f. **Set the Get Target Info Via DHCP property to Enabled or Disabled to specify an addressing method for the iSCSI target.**

g. **If you set the Get Target Info Via DHCP property to Disabled, specify the Target IP Address, Target Port, and Boot LUN.**

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

h. **Specify the Target Name in iSCSI Qualified Name (iqn) format, for example** `iqn.1988-12.com.oracle:X6-2-target.`

i. **Set the Authentication Type property to CHAP or None.**

CHAP refers to Challenge-Handshake Authentication Protocol.

j. **Select Save Changes.**

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

The server reboots.

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

Related Information

- "Select UEFI Boot Mode or Legacy BIOS Boot Mode (BIOS)" on page 49

Configure the Service Processor

Before you perform administrative tasks on the server, configure the service processor. This section provides instructions for configuring server-specific information on the service processor.

Task	Link
Assign identification information to the server.	“Assigning System Identification Information” on page 65
Configure the service processor network connections.	“Modifying Service Processor Network Settings” on page 67
Add Oracle ILOM user accounts.	“Adding Oracle ILOM User Accounts” on page 73
Configure the service processor clock.	“Setting the Service Processor Clock” on page 74
Identify DNS servers in your network.	“Configuring DNS Server Information on the Service Processor” on page 77

Assigning System Identification Information

System identification information is stored in Oracle ILOM, and is used to identify aspects of the server. You can assign four identifiers to the server:

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

The following procedures describe how to assign system identification information:

- “Assign System Identification Information (Oracle ILOM)” on page 66
- “Assign System Identification Information (Oracle Hardware Management Pack)” on page 67

Assign System Identification Information (Oracle ILOM)

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

1. **To assign system identification information from the Oracle ILOM web interface, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **In the navigation pane, click ILOM Administration > Identification.**

   c. **Specify one or more of the following system identifiers:**

      - SP Hostname
      - SP System Identifier
      - SP System Contact
      - SP System Location

   d. **Click Save.**

2. **To assign system identification information from the Oracle ILOM command-line interface (CLI), perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

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

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

      You have the option of setting one or more identifiers.

Related Information

- Setting Identification Labels for a Managed Device, *Oracle ILOM Getting Started Guide, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

▼ Assign System Identification Information (Oracle Hardware Management Pack)

1. **Access the operating system command-line interface.**
   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

2. **Use the `ilomconfig modify` command:**
   `ilomconfig modify identification [--hostname=`*hostname***`] [--system-contact=`***system_contact***`] [--system-location=`***system_location***`] [--system-identifier=`***system_identifier***`]**
   You have the option of setting one or more identifiers.

Related Information

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

Modifying Service Processor Network Settings

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

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

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

- "Modify Oracle ILOM SP Network Settings (Oracle ILOM)" on page 67
- "Modify Service Processor Network Settings (Oracle Hardware Management Pack)" on page 69
- "Modify Service Processor Network Settings (BIOS)" on page 70

▼ Modify Oracle ILOM SP Network Settings (Oracle ILOM)

When you use Oracle ILOM to deploy or manage the server, you can optionally modify the default network settings provided for the service processor (SP).

This procedure provides web and command-line interface (CLI) instructions for viewing and modifying the network settings that are assinged to the SP. For further details about this task, see the instructions below.

Note - Earlier releases of Oracle ILOM support the ability to configure an IPv4 network connection or a dual-stack (IPv4 and IPv6) network connection. Newer enhanced releases of Oracle ILOM support the ability to configure a static IPv6 gateway address and any of the following: IPv4 network connection only, IPv6 network connection only, or a dual-stack network connection (where IPv4 and IPv6 are both enabled). Refer to your product notes to determine which Oracle ILOM release supports these enhancements.

---

1. **Log in to Oracle ILOM as an Administrator.**

   For instructions on how launch Oracle ILOM from the CLI or web interface, see: "Accessing Oracle ILOM" on page 23

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

   - **From the web interface, perform these steps:**

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

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

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

     c. **Click Save to save your network property changes in Oracle ILOM.**

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

   - **From the CLI interface, perform these steps:**

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

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

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

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

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

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

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

IPv4 Example:

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

IPv6 Example:

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

---

Note - For servers that include the enhanced version of Oracle ILOM, the `/SP/network/state=enabled` command does not enable IPv6. Instead, use the command `/SP/network/ipv6 state=enabled`.

---

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

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

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

▼ Modify Service Processor Network Settings (Oracle Hardware Management Pack)

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

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

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

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

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

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

Related Information

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

▼ Modify Service Processor Network Settings (BIOS)

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

- For IPv4 network environments, the IP Discovery Mode property is set to DHCP by default.
- For IPv6 network environments, the Autoconfig property is set to Stateless by default.

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

   For instructions, see "Accessing the BIOS Setup Utility" on page 36.

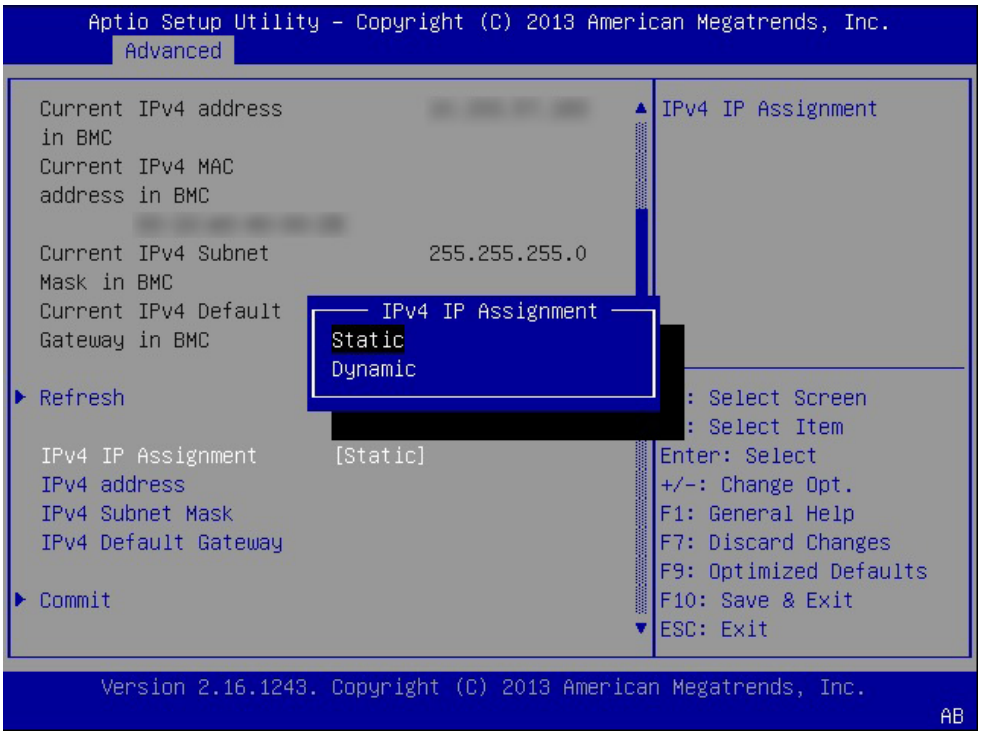
2. **Navigate to the Advanced menu.**

3. **Select BMC Network Configuration.**

   The BMC Network Configuration screen appears.

4. **To configure an IPv4 environment, perform the following steps in the IPv4 portion of the screen:**

a. **In the IPv4 IP Assignment field, select Dynamic or Static IP addressing.**



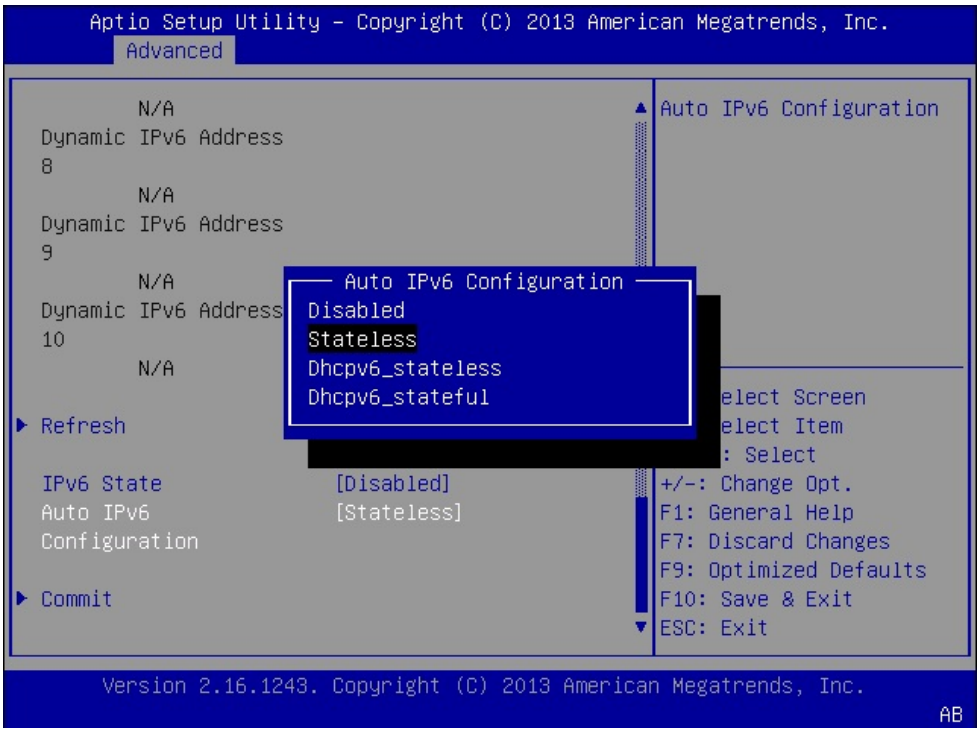
b. **If you selected Static IP addressing, specify an IPv4 Address, IPv4 Subnet Mask, and IPv4 Default Gateway.**

c. **Select Commit.**

5. **To configure an IPv6 environment, perform the following steps in the IPv6 portion of the screen:**

a. **In the IPv6 State field, select Enabled.**

b. In the Auto IPv6 Configuration, select an auto-configuration option.



c. If you selected Disabled in the Auto IPv6 Configuration field, specify a Static IPv6 Address.

d. Select Commit.

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

Adding Oracle ILOM User Accounts

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

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

- “Add an Oracle ILOM User Account (Oracle ILOM)” on page 73
- “Add an Oracle ILOM User Account (Oracle Hardware Management Pack)” on page 74

▼ Add an Oracle ILOM User Account (Oracle ILOM)

Before you begin, ensure that you have User Management (u) role privileges in Oracle ILOM.

1. **To create an Oracle ILOM user account using the Oracle ILOM web interface, perform the following steps:**

   a. **Log in to the Oracle ILOM web interface.**
   For instructions, see “Accessing Oracle ILOM” on page 23.

   b. **In the navigation pane, click ILOM Administration > User Management, and then click the User Accounts tab.**

   c. **In the Users table, click Add.**
   The User Account dialog box appears.

   d. **Specify a User Name, Password, and User Role.**

   e. **Click Save.**

2. **To create an Oracle ILOM user account using the Oracle ILOM command-line interface (CLI), perform the following steps:**

   a. **Log in to the Oracle ILOM CLI.**
   For instructions, see “Accessing Oracle ILOM” on page 23.

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

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

Related Information

- Managing User Credentials and Managing Password Policy Restrictions for Local Users *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at http://www.oracle.com/goto/ilom/docs
- Add New Users to Oracle ILOM, *Oracle ILOM Quick Start Guide, Firmware Release 3.2.x* at http://www.oracle.com/goto/ilom/docs

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

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

2. **Use the `ilomconfig create user` command:**

   ilomconfig create user *username* **[--role=***role***]**

Related Information

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

Setting the Service Processor Clock

Choose to 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 Service Processor Clock (Oracle ILOM)" on page 74
- "Set the Service Processor Clock (Oracle Hardware Management Pack)" on page 76

▼ Set the Service Processor Clock (Oracle ILOM)

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

1. **To set the service processor clock from the Oracle ILOM web interface, perform the following steps:**

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

      For instructions, see “Accessing Oracle ILOM” on page 23.

   b. **In the navigation pane, click ILOM Administration > Date and Time.**

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

      - **To set the service processor clock manually, do the following:**

        i **Specify a Date and Time, and then click Save.**

        ii **Click the Timezone tab.**

        iii **Select a Timezone from the drop-down list.**

        iv **Click Save.**

      - **To synchronize the service processor clock with an NTP server, do the following:**

        i **Select the Enabled check box in the Synchronize Time Using NTP field.**

        ii **Enter the IP address or hostname of one or more NTP servers.**

        iii **Click Save.**

2. **To set the service processor clock from the Oracle ILOM command-line interface (CLI), perform the following steps:**

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

      For instructions, see “Accessing Oracle ILOM” on page 23.

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

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

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

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

  `set /SP/clock usentpserver=enabled`

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

Related Information

- Setting Properties for SP or CMM Clock, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

▼ Set the Service Processor Clock (Oracle Hardware Management Pack)

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

   For more information see "Accessing Oracle Hardware Management Pack" on page 33.

2. **Use the `ilomconfig modify clock` command:**

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

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

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

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

Related Information

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

Configuring DNS Server Information on the Service Processor

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

- "Configure DNS Server Information on the Service Processor (Oracle ILOM)" on page 77
- "Configure DNS Server Information on the Service Processor (Oracle Hardware Management Pack)" on page 78

▼ Configure DNS Server Information on the Service Processor (Oracle ILOM)

1. **To configure DNS server information from the Oracle ILOM web interface, perform the following steps:**

   a. **Log in to the Oracle ILOM web interface.**
   For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **In the navigation pane, click ILOM Administration > Connectivity, and then click the DNS tab.**

   c. **To enable Oracle ILOM to automatically retrieve DNS information from a DHCP server on the network, select the Enabled check box.**

   d. **If you did not enable Auto DNS via DHCP, enter one or more DNS server IP addresses and search paths.**

   e. **Enter the DNS Timeout as an integer between 1 and 10.**

   f. **Enter the DNS Retries as an integer between 0 and 4.**

   g. **Click Save.**

2. **To configure DNS server information from the Oracle ILOM command-line interface (CLI), perform the following steps:**

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

   For instructions, see "Accessing Oracle ILOM" on page 23.

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

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

c. **If `auto_dns` is disabled, set one more nameservers and searchpaths:**

   `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 searchpaths.

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 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

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

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

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

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

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

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

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

Related Information

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

Preparing to Install an Operating System

Before you install an operating system, prepare the server by performing the actions listed in the following table.

Task	Link
Access the installation guide for the operating system you plan to install.	Go to one of the following libraries: ■ Oracle Server X6-2 Documentation Library: `http://www.oracle.com/goto/x6-2/docs` ■ Oracle Server X6-2L Documentation Library: `http://www.oracle.com/goto/x6-2l/docs`
Download and install updates of platform software, drivers, and firmware.	"Downloading and Updating System Firmware and Software" on page 119
Set the server boot mode. **Note -** You must run the operating system (OS) in the boot mode in which it was installed. If you switch boot modes after you install the OS, the OS will not boot.	"Legacy BIOS Boot Mode and UEFI Boot Mode" on page 47
Configure RAID on the server.	Refer to the hardware installation guide for your server. For an overview of RAID, see "Configuring Storage Resources" on page 57.
Prepare the installation target and installation media.	Refer to the operating system installation guide.

Monitoring Server Inventory and Health

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

Task	Link
View general information about the server, including a component inventory.	"Viewing System Information and Inventory" on page 83
Learn about fault detection on the server.	"Fault Detection and Diagnostics Overview" on page 85
View a list of faulty components.	"Monitoring Hardware Faults" on page 87
Manually clear hardware faults.	"Manually Clearing Hardware Faults" on page 90

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 83
- "View System Information and Inventory (Oracle Hardware Management Pack)" on page 84

▼ View System Information and Inventory (Oracle ILOM)

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

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

For instructions, see “Accessing Oracle ILOM” on page 23.

b. **In the Summary Information page, review the General Information and Status panels.**
The General Information panel provides details such as the system type and host primary MAC address. The Status panel provides details about server subsystems and a high-level component inventory.

c. **In the navigation pane, click on the name of a subsystem to view information about that subsystem.**
Subsystem options include Processors, Memory, Power, Cooling, Storage, Networking, PCI Devices, and Firmware.

2. **To view information about server subsystems from the Oracle ILOM command-line interface (CLI):**

a. **Log in to the Oracle ILOM CLI.**
For instructions, see “Accessing Oracle ILOM” on page 23.

b. **Type `show/System` to view general information about the server.**
Oracle ILOM displays details such as the system type and host primary MAC address.

c. **Type `show/System/`*subsystem* to view information about a particular subsystem:**
`show /System/[Processors|Memory|Power|Cooling|Storage|PCI_Devices|Firmware]`

Related Information

- Collecting System Information, *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`
- “View and Resolve Open Problems (Oracle ILOM)” on page 87

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

This procedure describes how to view basic information about the server using the Oracle Hardware Management Pack command-line tools. If you prefer to use the SNMP agents included with Oracle Hardware Management Pack to monitor the server, refer to the *Oracle Server Management Agents User's Guide* at `http://www.oracle.com/goto/ohmp/docs`.

1. **Access the operating system command-line.**
   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

2. **Use the `hwmgmtcli list` command:**
   `hwmgmtcli list` *subsystem*
   Where *subsystem* is one of the following: *all*, *server*, *cooling*, *processor*, *memory*, *power*, *storage*, *network*, *firmware*, *device*, *bios*, or *iomodule*

Related Information

- Displaying Hardware Information (`hwmgmtcli`), *Oracle Server CLI Tools User's Guide* at `http://www.oracle.com/goto/ohmp/docs`

Fault Detection and Diagnostics Overview

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

Tool	Description	Documentation
Oracle ILOM Fault Manager	The Oracle ILOM Fault Manager is part of the Oracle ILOM firmware embedded on the server service processor (SP). 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.	Refer to Protecting Against Hardware Faults: Oracle ILOM Fault Manager, *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 3.2.x* at: `http://www.oracle.com/goto/ilom/docs`
Oracle Linux Fault Management Architecture (FMA)	Oracle Linux FMA software can be optionally installed on the server through Oracle Hardware Management Pack. 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.	Refer to the *Oracle Linux Fault Management Architecture User's Guide* at: `http://docs.oracle.com/cd/E52095_01`
Oracle Solaris Fault Management Architecture (FMA)	Oracle Solaris FMA is included with the Oracle Solaris operating system (OS). 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.	Refer to *Oracle Solaris Administration: Common Tasks* at: `http://docs.oracle.com/cd/E23824_01/index.html`

Tool	Description	Documentation
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: `http://www.oracle.com/us/support/auto-service-request/index.html`
BIOS POST	At system startup, the system BIOS performs a power-on self-test (POST) that checks the hardware on your server to ensure that all components are present and functioning properly. It displays the results of this test on the system console. To launch the power-on self-test and view the test output, reset the power on the server.	Refer to the BIOS POST section in the *Oracle x86 Servers Diagnostics, Applications, and Utilities Guide for Servers with Oracle ILOM 3.1 and Oracle ILOM 3.2.x* at: `http://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, Applications, and Utilities Guide for Servers with Oracle ILOM 3.1 and Oracle ILOM 3.2.x* at: `http://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 Integrated Lights Out Manager (ILOM) web interface or command-line interface (CLI):
	
	Web:
	
	1. Navigate to the Host Management > Diagnostics page.
	2. In the Mode drop-down list, select the level of diagnostics you want to run (Enabled, Disabled, Extended, or Manual).
	3. Click Start Diagnostics.
	
	CLI:
	
	■ Use the following command to specify the diagnostics mode:
	
	`set /HOST/diag mode=[`*enabled*|*disabled*|*extended*|*manual***`]`**
	
	■ Use the following command to start the diagnostics:
	
	`start /HOST/diag`
		Refer to one of the following resources:
		
		■ The UEFI Diagnostics section in the *Oracle x86 Servers Diagnostics, Applications, and Utilities Guide for Servers with Oracle ILOM 3.1 and Oracle ILOM 3.2.x* at:
		
		`http://www.oracle.com/goto/x86admindiag/docs`
		
		■ The x86 diagnostics section in the *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 3.2.x* at:
		
		`http://www.oracle.com/goto/ilom/docs`

Monitoring Hardware Faults

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

- "View and Resolve Open Problems (Oracle ILOM)" on page 87
- "View and Resolve Open Problems (Oracle Hardware Management Pack)" on page 88
- "View the Event Log (Oracle ILOM)" on page 89

▼ View and Resolve Open Problems (Oracle ILOM)

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

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **In the navigation pane, click Open Problems.**

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

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

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

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

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

```
Open Problems (7)
Date/Time                Subsystems          Component
-----------------------  ------------------  ------------
Wed Apr  2 20:03:19 2014  System             MB (Motherboard)
        fault.io.pciex.bus-linkbw-down (Probability:50,
        UUID:d8b3b979-1e73-c846-a071-f47c09213ae7, Part Number:7066886, Serial
        Number:489089M+13494B004E, Reference
        Document:http://support.oracle.com/msg/PCIEX-8000-V2)
```

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

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

Related Information

- Administering Open Problems, *Oracle ILOM User's Guide for System Monitoring and Diagnostics, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`
- Set up Alert Notifications, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

View and Resolve Open Problems (Oracle Hardware Management Pack)

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

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

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

```
=== open_problems report ===
Open Problem 1
Problem time        : Thu Feb 14 22:38:19 2013
Problem subsystem   : System
Problem location    : /SYS (Host System)
Problem description : The top cover of server was opened while AC
```

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

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

▼ View the Event Log (Oracle ILOM)

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

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

   a. **Log in to the Oracle ILOM web interface.**
   For instructions, see “Accessing Oracle ILOM” on page 23.

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

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

   a. **Log in to the Oracle ILOM CLI.**
   For instructions, see “Accessing Oracle ILOM” on page 23.

   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 2014  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 2014  IPMI      Log       minor
       ID =   d9 : 04/04/2014 : 13:49:14 : System Firmware Progress : BIOS :
       System boot initiated : Asserted
935    Fri Apr  4 13:49:03 2014  IPMI      Log       minor
       ID =   d8 : 04/04/2014 : 13:49:03 : System Firmware Progress : BIOS :
       Option ROM initialization : Asserted
934    Fri Apr  4 13:49:00 2014  IPMI      Log       minor
       ID =   d7 : 04/04/2014 : 13:49:00 : System Firmware Progress : BIOS :
       Option ROM initialization : Asserted
933    Fri Apr  4 13:48:58 2014  IPMI      Log       minor
       ID =   d6 : 04/04/2014 : 13:48:58 : System Firmware Progress : BIOS :
       Option ROM initialization : Asserted
932    Fri Apr  4 13:48:55 2014  IPMI      Log       minor
       ID =   d5 : 04/04/2014 : 13:48:55 : System Firmware Progress : BIOS :
       Option ROM initialization : Asserted
931    Fri Apr  4 13:48:55 2014  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 3.2.x* at `http://www.oracle.com/goto/ilom/docs`
- Configuring Alert Notifications, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

Manually Clearing Hardware Faults

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

For instructions on manually clearing a fault, see: "Manually Clear a Hardware Fault (Oracle ILOM)" on page 90

▼ Manually Clear a Hardware Fault (Oracle ILOM)

Caution - The Oracle ILOM Fault Management restricted shell is intended to help Oracle Services personnel diagnose and resolve system problems. Do not run commands in the shell unless requested to do so by Oracle Services.

1. **Log in to the Oracle ILOM command-line interface.**

   For instructions, see "Accessing Oracle ILOM" on page 23.

2. **Type `start /SP/faultmgmt/shell` to launch the Oracle ILOM Fault Management shell.**

   A confirmation prompt appears.

3. **Type `y` to confirm that you want to start the Oracle ILOM Fault Management shell.**

   The `faultmgmtsp>` prompt appears.

4. **Use the `fmadm` utility to indicate that a component should not be considered faulted.**

   For more information, refer to Using the Oracle ILOM Fault Management Shell, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at: `http://www.oracle.com/goto/ilom/docs`.

Monitor Server Power Consumption and Component Temperatures

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

Task	Link
View current server power consumption and historical power consumption data.	“Monitoring Server Power Consumption” on page 93
View server inlet and exhaust temperatures, or enable the Enhanced PCIe Cooling Policy.	“Monitoring Server Inlet and Exhaust Temperature” on page 96

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 94
- “View Power Allocated to Server Components (Oracle ILOM)” on page 94
- “View Historical Power Consumption Data (Oracle ILOM)” on page 95

View Current Server Power Consumption (Oracle ILOM)

1. **To view current server power consumption in the Oracle ILOM web interface:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **In the navigation pane, click Power Management > Consumption.**

      The Power Consumption page appears.

   c. **Review the Actual Power property in the Power Consumption page.**

2. **To view current server power consumption in the Oracle ILOM command-line interface (CLI):**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   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 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

View Power Allocated to Server Components (Oracle ILOM)

1. **To view the power allocated to server components in the Oracle ILOM web interface:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

b. **In the navigation pane, click Power Management > Allocation.**

   The Power Allocation page appears.

c. **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.**

      For instructions, see "Accessing Oracle ILOM" on page 23.

   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 3.2.x* at `http://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.**

   For instructions, see "Accessing Oracle ILOM" on page 23.

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 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

Monitoring Server Inlet and Exhaust Temperature

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

- "View the Server Inlet and Exhaust Temperature (Oracle ILOM)" on page 96
- "Set Enhanced PCIe Cooling Policy (Oracle ILOM)" on page 97

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

1. **To view the temperatures in the Oracle ILOM web interface:**

   a. **Log in to the Oracle ILOM web interface.**
   For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **In the navigation pane, click System Information > Cooling.**
   The Cooling page appears.

   c. **Review the Inlet Temperature and Exhaust Temperature fields.**

2. **To view the temperatures in the Oracle ILOM command-line interface (CLI):**

   a. **Log in to the Oracle ILOM CLI.**
   For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **Type `show /System/Cooling`.**

   c. **Review the `inlet_temp` and `outlet_temp` properties.**

▼ Set Enhanced PCIe Cooling Policy (Oracle ILOM)

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

1. **To set the Enhanced PCIe Cooling Policy in the Oracle ILOM web interface:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

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

      The Policy Configuration page appears.

   c. **In the Service Processor Policies table, select Set Enhanced PCIe Cooling Mode Policy.**

   d. **Select Enable or Disable in the Actions drop-down list.**

      The policy takes effect at the next server reset.

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

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **Use the `set /SP/policy ENHANCED_PCIE_COOLING_MODE=`*enabled*|*disabled* command.**

      The policy takes effect at the next server reset.

Related Information

- Power On and Cooling Down Policies Configurable from SP, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at: `http://www.oracle.com/goto/ilom/docs`

Option ROM and I/O Space Allocation

Bootable devices such as onboard I/O or PCIe express modules require option ROM and I/O space to boot. However the total option ROM and I/O space for the system is limited by the PC architecture and is allocated automatically when the system is booted. If your system includes many potentially bootable devices, you must decide which ones you wish to boot from, and configure the BIOS to allocate these resources to them.

Option ROM is also required to run some configuration utilities, such as RAID configuration utilities.

Note - These limitations apply to systems configured to use Legacy BIOS Boot Mode. Systems configured to use UEFI Boot Mode do not normally encounter option ROM or I/O space limitations.

This section includes:

- "Determine Whether You Need to Allocate Option ROM and I/O Space" on page 99
- "Configure Option ROM and I/O Space Allocation" on page 100

▼ Determine Whether You Need to Allocate Option ROM and I/O Space

If you add a PCIe express module to your server, when the server boots, the BIOS might not be able to allocate option ROM or I/O space to all the devices that require it.

If this happens, when you boot, POST generates error messages. These identify any devices that have not had option ROM or I/O space allocated.

1. **Power on the system to start the BIOS.**
2. **During POST, look for one or more messages, such as these.**
   - For option ROM, the messages look like this:

```
Warning: Out of option ROM space for <device path | address>
```

- For I/O space, the messages look like this:

```
Warning: Not enough IO address space allocated for device path | address
Warning: Not enough IO address space allocated for device device path | address
Warning: Not enough IO address space allocated for device device path | address
Warning: Not enough IO address space allocated for device device path | address
Warning: Not enough IO address space allocated for device device path | address
Warning: Not enough IO address space allocated for device device path | address
```

Each slot can generate several messages. This is normal.

It is possible that the device you added has been assigned option ROM and/or I/O space at the expense of some other device. If this is the case, the device you added does not appear in the list, but the original device does. This depends on the position of each device in the probe order.

3. **Decide whether you need to configure option ROM or I/O space allocation for one of the following reasons.**

- Error messages inform you that a device that you wish boot from has not been allocated option ROM and/or I/O space.
- You wish to be able to run a utility such as a RAID configuration utility on a device that has not been allocated option ROM.
- (Optional) You wish to make the error messages go away.

Note - There is no need to configure option ROM or I/O space allocation simply because of these messages, unless you require the functionality provided by the option ROM and the I/O space.

See Also "Configure Option ROM and I/O Space Allocation" on page 100

▼ Configure Option ROM and I/O Space Allocation

Before You Begin Identify the devices on which you need to configure option ROM and/or I/O space allocation. See "Determine Whether You Need to Allocate Option ROM and I/O Space" on page 99.

1. **Start the BIOS.**

   a. **Power on the system.**

b. To enter the BIOS setup menu, when the POST appears, press:

- F2 if you are connected through a Java console.
- Control-E if you are connected through a serial console.

The BIOS setup menu appears.

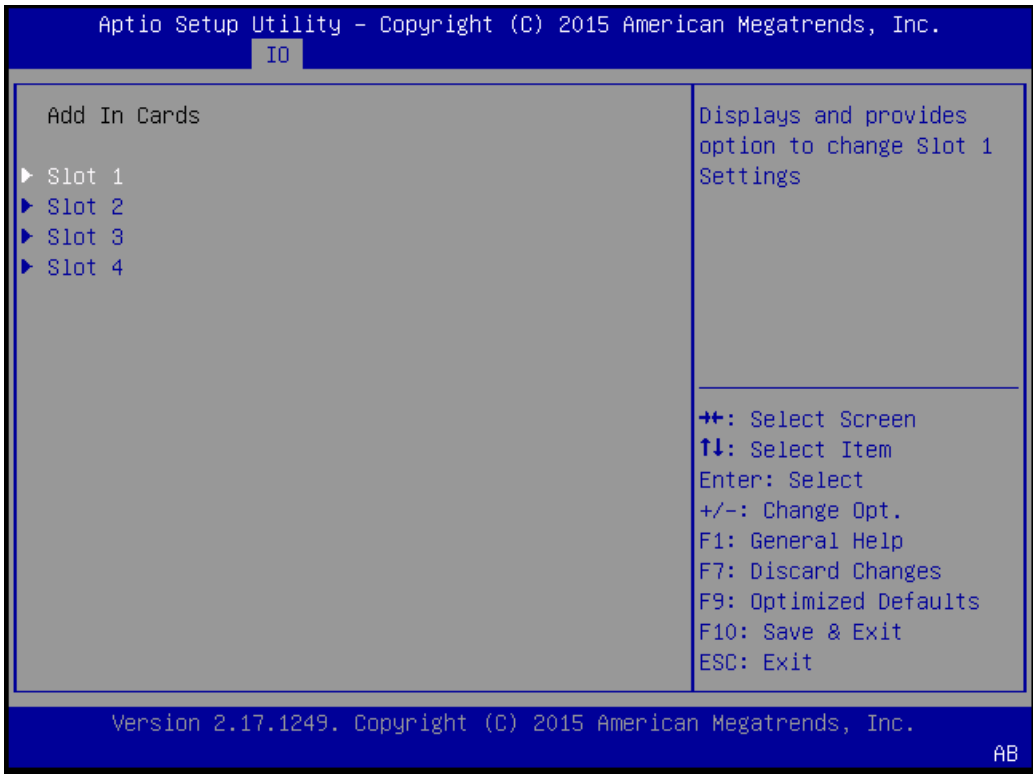
- Use the arrow and tab keys to navigate through the BIOS Setup Utility.
- Use the Enter key to make selections.
- When you are done, press F10, or navigate to the Exit menu screen to exit and save your changes.

2. Select one of the following:

- For PCIe cards, select Select IO > Add In Cards.
- For Net 0, 1, 2, or 3, select IO > Internal Devices.

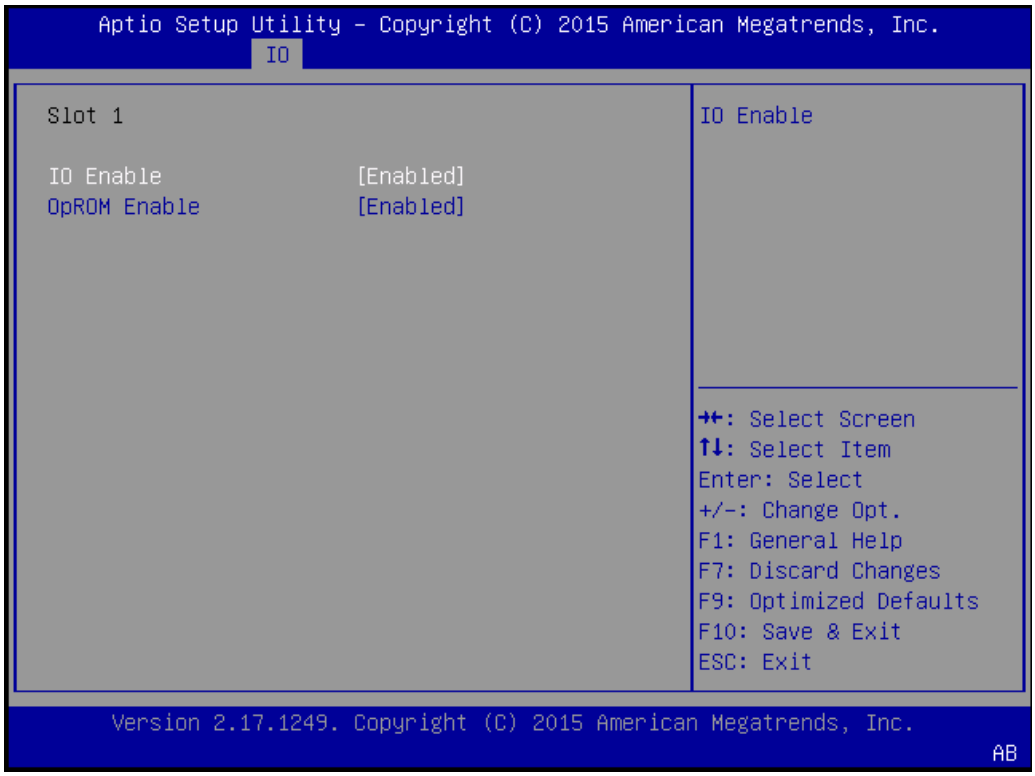
The corresponding IO screen appears.

The following figures shows the IO Add In Cards screen.



3. **Select a network port or a slot number from the drop-down list.**

A screen displays options for the selected slot.



4. **Select one of the following:**

   - **IO Enable to enable or disable I/O to and from the device in the selected PCIe slot.**

     This selection is not available for network ports.

   - **OpROM Enable to enable or disable option ROM for the device in the selected slot.**

     - Option ROM only applies to servers configured to use Legacy BIOS Boot Mode.
     - UEFI Driver Enable only applies to servers configured to use UEFI Boot Mode.

5. **Use the enter key to toggle the Enabled/Disabled function.**

6. **When you have made all of your selections, select F10 to save your changes and exit.**

   The BIOS enables or disables option ROM, and reallocates I/O space based on your selections the next time the server boots.

Backing Up and Restoring Hardware and Firmware Configurations

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

Task	Link
Back up the current BIOS, Oracle ILOM, or RAID configuration.	“Backing Up Current Firmware and Hardware Configurations” on page 105
Restore a saved BIOS, Oracle ILOM, or RAID configuration.	“Restoring Saved Firmware Configurations” on page 110
Reset the BIOS firmware to factory defaults.	“Resetting the Firmware to Default Settings” on page 114

Backing Up Current Firmware and Hardware Configurations

To prevent the loss of functioning firmware settings, back up the current BIOS, Oracle ILOM, or RAID configurations. Backed up configurations can be restored on the server or on another server in your data center. The following procedures describe how to back up firmware configurations to an XML file using the system administration tools:

- “Back Up the Current BIOS Firmware Configuration (Oracle ILOM)” on page 106
- “Back Up the Current Oracle ILOM Firmware Configuration (Oracle ILOM)” on page 107
- “Back Up the Current BIOS Firmware Configuration (Oracle Hardware Management Pack)” on page 109
- “Back Up the Current Oracle ILOM Firmware Configuration (Oracle Hardware Management Pack)” on page 109

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

Before you begin, ensure that you have Reset and Host Control (`r`) and Admin (`a`) role privileges in Oracle ILOM.

1. **To back up the current BIOS configuration in the Oracle ILOM web interface, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

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

   c. **In the Backup section of the page, select a Transfer Method from the drop-down list.**

   d. **Specify the destination of the exported configuration.**

   e. **Click Start Backup.**

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

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **Use the following command:**

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

      Where:

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

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

Related Information

- Back Up the BIOS Configuration, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

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

1. **To back up the current Oracle ILOM configuration in the Oracle ILOM web interface, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **In the navigation pane, click ILOM Administration > Configuration Management.**

   c. **Select Backup in the Operation drop-down list.**

   d. **In the Transfer Method drop-down list, select a transfer method.**

   e. **Specify the destination of the exported configuration.**

   f. **If you want to include sensitive information in the backup file, specify and confirm a Passphrase to encrypt the sensitive data.**

      If you specify a Passphrase, the Passphrase is required to restore the backed up configuration.

      If you do not specify a Passphrase, sensitive data will not be included in the backup file.

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

   g. **Click Run.**

2. **To back up the current Oracle ILOM configuration in the Oracle ILOM command-line interface (CLI), perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   b. **Use 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 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

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

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

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

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

Related Information

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

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

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

2. **Use the `ilomconfig export` command:**

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

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

3. **If you choose to encrypt sensitive data in the file, type `y`, and then specify a passphrase.**

4. **If you choose not to include sensitive data in the backup file, type `n`.**

Related Information

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

Restoring Saved Firmware Configurations

To recover from unwanted configuration changes, you can revert the server BIOS, Oracle ILOM firmware, or RAID settings to a saved configuration. To load a configuration from a previously exported XML file, see the following procedures.

- “Restore a Saved BIOS Firmware Configuration (Oracle ILOM)” on page 110
- “Restore a Saved Oracle ILOM Firmware Configuration (Oracle ILOM)” on page 111
- “Restore a Saved BIOS Firmware Configuration (Oracle Hardware Management Pack)” on page 113
- “Restore a Saved Oracle ILOM Firmware Configuration (Oracle Hardware Management Pack)” on page 113

▼ Restore a Saved BIOS Firmware Configuration (Oracle ILOM)

Before you begin, ensure that you have Reset and Host Control (`r`) and Admin (`a`) role privileges in Oracle ILOM.

1. **To restore a saved BIOS configuration in the Oracle ILOM web interface, perform the following steps:**

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

      For instructions, see “Accessing Oracle ILOM” on page 23.

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

   c. **In the Restore section of the page, select a restore option from the Restore Options drop-down list.**

   d. **In the Transfer Method drop down list, select a transfer method.**

   e. **Specify the location of the XML file.**

   f. **Click Start Restore.**

2. **To restore a saved BIOS configuration in the Oracle ILOM command-line interface (CLI), perform the following steps:**

a. Log in to the Oracle ILOM CLI.
For instruction, see "Accessing Oracle ILOM" on page 23.

b. Use the `set` command:
`set System/BIOS/Config restore_options=[all|config_only|bootlist_only] load_uri=`*transfer_method://username:password@host/filepath*
Where:

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

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

Related Information

- Restore BIOS Configuration, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

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

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

1. To restore a saved Oracle ILOM configuration from the Oracle ILOM web interface, perform the following steps:

a. Log in to the Oracle ILOM web interface.
For instructions, see "Accessing Oracle ILOM" on page 23.

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.**

Note - With Oracle ILOM 3.2.6 or newer, if you included fault data in the backup, you can select Include Fault Data to restore it. This selection is reserved for Oracle service personnel when they replace the SP. It requires a passphrase.

---

g. **Click Run.**

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

---

2. **To restore a saved Oracle ILOM configuration in the Oracle ILOM command-line interface (CLI), perform the following steps:**

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

For instructions, see "Accessing Oracle ILOM" on page 23.

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

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

Where:

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

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

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

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

Related Information

- Restore the Oracle ILOM Backup XML File, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

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

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

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

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

Related Information

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

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

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

For more information, see “Accessing Oracle Hardware Management Pack” on page 33.

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

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

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

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

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

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

Related Information

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

Resetting the Firmware to Default Settings

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

- “Reset the BIOS Firmware to Default Settings (BIOS)” on page 114
- “Reset the BIOS Firmware to Default Settings (Oracle ILOM)” on page 115
- “Reset the BIOS Firmware to Default Settings (Oracle Hardware Management Pack)” on page 116
- “Reset the Oracle ILOM Firmware to Default Settings (Oracle ILOM)” on page 116
- “Reset the Oracle ILOM Firmware to Default Settings (Oracle Hardware Management Pack)” on page 117

▼ Reset the BIOS Firmware to Default Settings (BIOS)

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

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

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

Before You Begin

Ensure that your server meets the following requirements:

- The server is equipped with a hard disk drive (HDD) or solid state drive (SSD).
- The HDD or SSD is properly installed in the server. For instructions, refer to your service manual.

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

   For instructions, see "Accessing the BIOS Setup Utility" on page 36.

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

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

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

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

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

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

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

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

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

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

   d. **Click Save.**

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

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

   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 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

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

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

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

Related Information

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

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

1. **To reset the Oracle ILOM firmware to default settings in the Oracle ILOM web interface, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

b. **In the navigation pane, click ILOM Administration > Configuration Management, and then click the Reset Defaults tab.**

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

d. **Click Reset Defaults.**

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

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

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

Related Information

- Reset the Oracle ILOM Configuration to Factory Defaults, *Oracle ILOM Administrator's Guide for Configuration and Maintenance, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

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

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 33.

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

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

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

Related Information

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

Downloading and Updating System Firmware and Software

Firmware and software for the server are updated periodically. The updates are made available as a software release. You can obtain the latest software release from My Oracle Support.

This section describes the components of software releases and provides instructions for downloading and installing them.

Task	Link
Review the components of a software release and the tools that can be used to install them.	"Software Release Overview" on page 119
Obtain updates from My Oracle Support.	"Obtaining Software and Firmware Updates" on page 120
Install updates using Oracle ILOM, or Oracle Hardware Management Pack.	"Install Software and Firmware Updates" on page 122

Software Release Overview

A software release is a server-specific set of downloadable files (patches) containing the 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 should 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 it has the latest firmware and software.

The ReadMe document that is included with each patch in a software release contains information about the patch, such as what has changed or not changed from the prior software release, as well as bugs that are fixed with the current release.

The server product notes identify the software releases supported on your server.

Software Release Components

Each software release includes one or more downloadable files (patches). The following table describes the patches and identifies the tools that can be used to install each.

- For more information about the operating system command-line application, see your operating system documentation.
- Some patches might have files that can't be updated using the tools indicated in this table. Review the ReadMe file included with the patch before attempting to install an update.

Patch Name	Tools	Description
FIRMWARE PACK	Oracle ILOM Oracle Hardware Management Pack	Updates for system firmware,including Oracle ILOM, BIOS, and hardware device firmware.
DIAGNOSTICS	Operating system command-line application	Updates for diagnostic tools, including Oracle VTS. For more information, refer to http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0.
OS PACK	Operating system command-line application	Updates for tools, drivers, and utilities for a specific operating system. For example, the Windows OS Pack might include an update to Oracle Hardware Management Pack and an LSI MegaRAID driver for Windows Server 2012. An OS Pack is available for each supported operating system version.
ALL PACKS	Oracle ILOM Oracle Hardware Management Pack Operating system command-line application	All available updates, except updates to Oracle VTS. This patch includes the Firmware Pack, all OS Packs, and server-related documentation.

Obtaining Software and Firmware Updates

Before you can install software and firmware updates, you must obtain them.

You can download updates directly from My Oracle Support. Then, you can use Oracle Hardware Management Pack, or the operating system command-line to install them. Each tool

is capable of installing a subset of the updates available for the server. To decide which tool is best suited to update the server, see “Software Release Overview” on page 119.

To obtain updates from My Oracle Support, see :“Download Firmware and Software From My Oracle Support” on page 121

▼ Download Firmware and Software From My Oracle Support

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

   The Patch Search pane appears at the right of the screen.
4. **Within the Search tab area, click Product or Family (Advanced).**

   The Search tab area appears with search fields.
5. **In the Product field, select the product from the drop-down list.**

   Alternatively, type a full or partial product name (for example, Oracle Server X6-2) until a match appears.
6. **In the Release field, select a software release from the drop-down list.**

   Expand the list to see all available software releases.
7. **Click Search.**

   The Patch Advanced Search Results screen appears, listing the patches for the software release.

   See your server product notes for a description of the available software releases.
8. **To select a patch for a software release, right-click the patch number next to the software release version.**

   Alternatively, you can click the patch number to go to the patch download page.

   To select more than one patch, hold the Ctrl key while you right-click each patch number.

   A context menu appears. The context menu enables you to view the ReadMe file, Download the patch, and add the patch to your patch plan. For information about adding the patch to your plan, click the Add to Plan button and select “Why use a plan?”.

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

10. **To download the patch for the software release, click Download.**

    The File Download dialog box appears.

11. **In the File Download dialog box, click the patch zip file name, and then specify where you want to save the file.**

    The patch for the software release downloads to the location you specified.

Install Software and Firmware Updates

Once you have access to software and firmware updates, see the following procedures to install them:

- "Update the BIOS and Service Processor Firmware (Oracle ILOM)" on page 122
- "Update the Hardware Device Firmware (Oracle Hardware Management Pack)" on page 125

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

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

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

---

1. **Obtain the FIRMWARE PACK patch using one of the methods described in "Obtaining Software and Firmware Updates" on page 120.**

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

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

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

      For instructions, see "Accessing Oracle ILOM" on page 23.

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

c. Click the Enter Upgrade Mode button.

The Firmware Update page appears.

d. Select the following options:

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

e. Follow the prompts until the upgrade is complete.

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

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

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

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

---

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

a. Log in to the Oracle ILOM CLI.

For instructions, see “Accessing Oracle ILOM” on page 23.

b. Type the `load source` command:

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

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

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

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

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

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

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

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

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

Related Information

- Update the Server SP or CMM Firmware Image, *Oracle ILOM Administrator's Guide for Configuration and Maintenance Guide, Firmware Release 3.2.x* at `http://www.oracle.com/goto/ilom/docs`

Update the Hardware Device Firmware (Oracle Hardware Management Pack)

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

1. **Obtain the FIRMWARE PACK patch using one of the methods described in "Obtaining Software and Firmware Updates" on page 120.**
2. **Ensure that the update files are accessible from the server operating system.**
3. **Access the operating system command-line.**

   For details, see "Accessing Oracle Hardware Management Pack" on page 33.
4. **Type the `fwupdate` command.**

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

Related Information

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

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