Oracle® X5 Series Servers Administration Guide

Part No: E52424-09
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Contents

Using This Documentation

- **Overview** – Provides descriptions of and describes how to use the single-server management tools for Oracle X5 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 X5-2*: http://www.oracle.com/goto/x5-2/docs
- *Oracle Server X5-2L*: http://www.oracle.com/goto/x5-2l/docs
- *Oracle Server X5-4*: http://www.oracle.com/goto/x5-4/docs-videos
- *Oracle Server X5-8*: http://www.oracle.com/goto/x5-8/docs-videos

Feedback

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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 15
Read about the tasks you can perform with each tool and where you can find documentation.	“Oracle System Assistant” on page 17 “Oracle Integrated Lights Out Manager (ILOM)” on page 19 “Oracle Hardware Management Pack” on page 20 “BIOS Setup Utility” on page 22
Review brief descriptions of the tools available to manage multiple servers.	“Multiple-System Management Tools” on page 24

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 24.

Tool	Description	Link
Oracle System Assistant	Graphical setup tool embedded on an optional USB drive in the internal USB slot and accessed by booting the system to the tool. No installation required. Locally or remotely configure and update server hardware, and install supported operating systems.	“Oracle System Assistant” on page 17

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 19
Oracle Hardware Management Pack	Add-on software package available with Oracle System Assistant or 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 20
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 22

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 System Assistant	Oracle ILOM	Oracle Hardware Management Pack	Documentation
Power the server on and off remotely.		✓		“Controlling the Server Power State” on page 61
Configure the service processor.	✓	✓	✓	“Configure the Service Processor” on page 95
Configure host network interface.	✓			“Configure Network Interface Settings (Oracle System Assistant)” on page 181
Configure RAID.	✓		✓	“Configuring RAID on the Server” on page 77
Install a supported Linux, Windows, Oracle Solaris, or Oracle VM operating system.	✓			“Installing an Operating System” on page 113
Download software and firmware.	✓	✓	✓	“Downloading and Updating System

Task	Oracle System Assistant	Oracle ILOM	Oracle Hardware Management Pack	Documentation
				Firmware and Software" on page 179
See how much power the server is consuming at any given time.		✓		"Monitor Server Power Consumption and Component Temperatures" on page 129
Monitor hardware components.	✓	✓	✓	"Monitoring Server Inventory and Health" on page 119
Update BIOS or Oracle ILOM firmware.	✓	✓	✓	"Downloading and Updating System Firmware and Software" on page 179
Update HBA and expander firmware.	✓		✓	"Downloading and Updating System Firmware and Software" on page 179
Reset the server BIOS or Oracle ILOM to default values.	✓	✓	✓	"Resetting the Firmware to Default Settings" on page 163

Related Information

- "Accessing and Using System Administration Tools" on page 25

Oracle System Assistant

Oracle System Assistant is a startup and maintenance tool for Oracle servers. It is embedded on an optional USB drive in a dedicated internal USB port and does not need to be installed. The components of Oracle System Assistant include:

- A bootable, graphical utility used to perform configuration, upgrade, and installation tasks
- Oracle Hardware Management Pack
- Oracle Linux command-line environment
- Operating system drivers and tools
- Server-specific firmware

You can launch Oracle System Assistant locally or remotely by interrupting the server boot process. For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

For more information about the utility, see “Oracle System Assistant Tasks” on page 18.

Note - Oracle continually strives to improve its products. To send comments about Oracle System Assistant, contact **server-sysmgmt-feedback_ww_grp@oracle.com**.

Oracle System Assistant Tasks

The following table lists the tasks you can perform using the Oracle System Assistant utility.

Navigation Pane Option	Description
System Information	Review general information about the server, including the serial number and BIOS version, or view an inventory of server components.
Configure Network	Configure network settings for Ethernet controllers on the server.
Get Updates	Update your version of Oracle System Assistant, which consists of firmware, drivers, and server management tools.
Update Firmware	Update firmware for server components, such as host bus adapters, the service processor, or the server BIOS.
Configure Hardware	Create a RAID array, configure service processor settings, or restore the server BIOS to default settings.
Install OS	Install a supported operating system from local or remote installation media. Some operating systems supported by the server cannot be installed using the Oracle System Assistant Utility. For details, see “Installing an Operating System” on page 113.
Preferences	Disable Oracle System Assistant, or set a keyboard language for Oracle System Assistant. Once you disable the utility, it can only be enabled from the BIOS Setup Utility.
Advanced Tasks	Access an Oracle Linux command-line environment. Check the integrity of the Oracle System Assistant media. Export a RAID, service processor, or BIOS configuration. Import a RAID, service processor, or BIOS configuration. Export Oracle System Assistant usage logs and system logs.

Oracle System Assistant Documentation

The Oracle System Assistant utility features an embedded help system that you can access by clicking the Help button on any screen. Also, clicking the Platform Documentation button opens a link to the online documentation library if you are connected to the external network.

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 41.

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

- “Oracle ILOM Tasks” on page 19
- “Oracle ILOM Documentation” on page 20

Oracle ILOM Tasks

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

Web Navigation	CLI Hierarchy	Description
System Information	`/System`	Review general information about the server, including the serial number and BIOS version. View the overall health of the system and 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`
	
	`/System/BIOS/Config`
	
	`/SP/policy`
		View BIOS settings.
		
		Backup or restore a BIOS configuration.
		
		Configure system policies such as the Enhanced PCIe Cooling Mode policy.

Power Management	`/SP/powermgmt`	View actual system power consumption.

Web Navigation	CLI Hierarchy	Description
		View system power requirements for capacity planning. View historical power usage data.

ILOM Administration	`/SP system_identifier`
	
	`/SP/logs`
	
	`/SP/clients`
	
	`/SP/users`
	
	`/SP/network`
	
	`/SP/network/ipv6`
	
	`/SP/config`
	
	`/SP/alertmgmt`
	
	`/SP/clock`
	
	`/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. Although Oracle Hardware Management Pack is included on the Oracle System Assistant USB drive and with each server software release, it is not automatically installed on the server. 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 21.
- **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 51.

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

- "Oracle Hardware Management Pack Utilities" on page 21
- "Oracle Hardware Management Pack Documentation" on page 22

Oracle Hardware Management Pack Utilities

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

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

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

CLI Tool	Description
`fwupdate`	Update Oracle ILOM and BIOS; or query, update, and validate firmware versions on supported SAS storage devices, embedded SAS storage controllers, SAS storage expanders, storage drives, InfiniBand controllers, and Fibre Channel controllers.
`raidconfig`	View or create RAID volumes on storage drives that are attached to RAID controllers.
`ilomconfig`	Restore, set, and view Oracle ILOM settings, such as network management, clock configuration, and user management settings.
`hwtmgmtcli`	Monitor system health.
`ipmitool`	After loading the requisite driver, use Oracle Hardware Management Pack to read sensor data repository (SDR) data and display other information about the server. You can also get and set LAN configuration parameters and perform chassis power control operations.
`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 56.

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

- “BIOS Setup Utility Tasks” on page 23
- “BIOS Setup Utility Documentation” on page 23

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.
	Enable or disable Oracle System Assistant.
	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.

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 15

Accessing and Using System Administration Tools

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

Task	Link
Launch, enable, or disable Oracle System Assistant; or access files on the Oracle System Assistant flash drive.	“Accessing and Using Oracle System Assistant” on page 25
Set up a management connection to the server, and then launch and log in to Oracle ILOM.	“Accessing Oracle ILOM” on page 41
Download, install, and access Oracle Hardware Management Pack.	“Accessing Oracle Hardware Management Pack” on page 51
Access the BIOS Setup Utility and review BIOS key mappings for serial terminals.	“Accessing the BIOS Setup Utility” on page 56

Accessing and Using Oracle System Assistant

Use Oracle System Assistant to prepare a new system for operation and to perform maintenance tasks such as upgrading software and firmware. The utility is embedded on an optional USB drive in a dedicated internal USB port and does not need to be installed.

You can launch Oracle System Assistant locally or remotely. To get started, see the following procedures:

- “Launch Oracle System Assistant Remotely (Oracle ILOM)” on page 26
- “Launch Oracle System Assistant Locally” on page 28
- “Exit Oracle System Assistant” on page 30
- “Enabling and Disabling Oracle System Assistant” on page 31
- “Setting the Oracle System Assistant Keyboard Language” on page 39

Note - Oracle System Assistant is enabled by default but can be disabled. For details, see "Enable or Disable Oracle System Assistant (BIOS)" on page 33.

Note - For information about potential problems and workarounds for Oracle System Assistant, see "Oracle System Assistant Known Issues" on page 169.

▼ Launch Oracle System Assistant Remotely (Oracle ILOM)

Use this procedure to launch Oracle System Assistant from the Oracle ILOM web interface or command-line interface (CLI). Launching Oracle System Assistant using this method initiates an Oracle ILOM remote console session to the server.

Before you begin, ensure the following:

- You have Admin (a) and Console (c) role privileges in Oracle ILOM.
- You have met the requirements for launching and using the Oracle ILOM Remote System Console Plus as described in "Launch a Graphical Remote Console Redirection Session" on page 48.

1. **To launch Oracle System Assistant 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 41.

      The Summary Information page appears.

   b. **Ensure that the server is powered off.**

      The server power state appears in the Actions panel.

      For instructions to power off the server, see "Powering the Server Off and On" on page 62.

   c. **In the Actions panel, click the Oracle System Assistant Launch button.**

      The Oracle ILOM Remote System Console Plus window appears, and the server is powered on. Boot messages appear on the screen. After a few moments, the Oracle System Assistant System Overview screen appears.

If the Software License Agreement (SLA) dialog box appears instead of the Oracle System Assistant window, click Accept in the SLA dialog box to continue launching Oracle System Assistant.

2. **To launch Oracle System Assistant 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 41.

   b. **Ensure that the server is powered off:**

      i. **Type `show /System power_state` command.**

      ii. **If the `power_state` is `On`, type `stop /System`.**

      For information about the server power states, see "Controlling the Server Power State" on page 61.

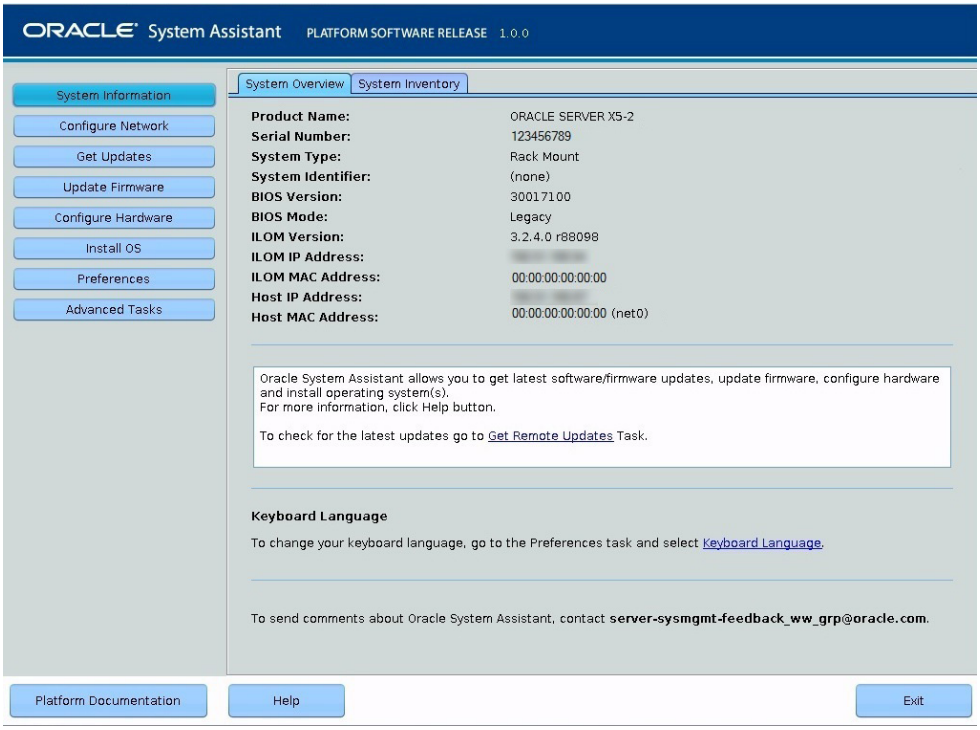
   c. **Type `start /HOST/provisioning/system-assistant`.**

      A confirmation prompt appears.

   d. **Type `y` to confirm that you want to launch Oracle System Assistant.**

      The Oracle ILOM Remote System Console Plus window appears, and the server is powered on. Boot messages appear on the screen. After a few moments, the Oracle System Assistant System Overview screen appears.

If the Software License Agreement (SLA) dialog box appears instead of the Oracle System Assistant window, click Accept in the SLA dialog box to continue launching Oracle System Assistant.



Related Information

- “Powering the Server Off and On” on page 62
- “Launch a Graphical Remote Console Redirection Session” on page 48

▼ Launch Oracle System Assistant Locally

Use the following procedure to launch Oracle System Assistant while you are physically present at the server.

1. **Ensure that you have established a direct connection to the host console:**

a. **A VGA monitor is connected to the VGA port on the server.**

b. **A USB keyboard and mouse are connected to the USB connectors on the server.**

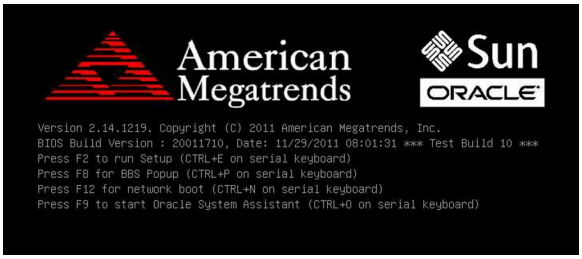
2. **Ensure that the server is powered off.**

   For instructions, see "Controlling the Server Power State" on page 61.

3. **Power on the server.**

   For instructions, see "Controlling the Server Power State" on page 61.

   Boot messages appear on the monitor.

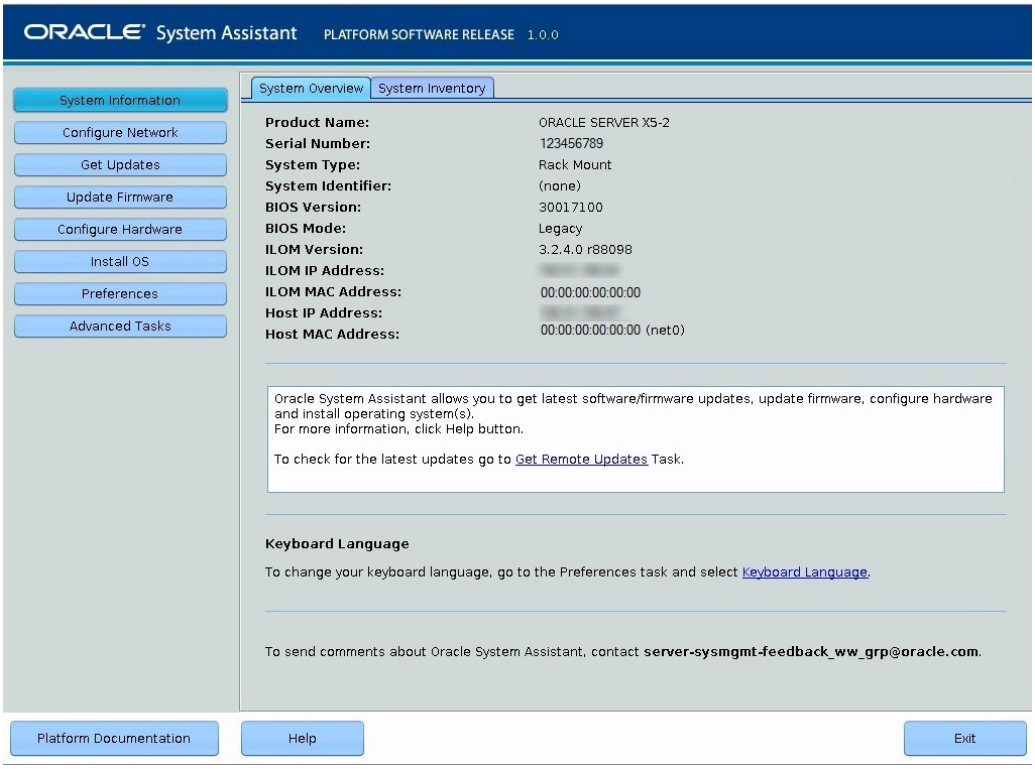


4. **When prompted, press the F9 function key (or CTRL + O on a serial keyboard) to launch Oracle System Assistant.**

   Checkpoint messages appear, including the text `[Oracle System Assistant Selected]`.

   If the Software License Agreement (SLA) dialog box appears, click Accept in the SLA dialog box to continue.

The `Launching Oracle System Assistant` screen appears, followed by the System Overview screen.



Related Information

- “BIOS Setup Utility Key Mappings” on page 58
- “Troubleshooting Oracle System Assistant” on page 169
- “Powering the Server Off and On” on page 62

▼ Exit Oracle System Assistant

1. **In the Oracle System Assistant application, click the Exit button at the bottom of the screen.**

2. **Select whether you want to reboot or power off the server.**

   Oracle System Assistant is closed. The server is rebooted or powered off.

Enabling and Disabling Oracle System Assistant

Oracle System Assistant is enabled by default but it can be disabled. If you disable the utility, you must access the BIOS Setup Utility to enable it again. See the following procedures to enable or disable Oracle System Assistant:

- "Disable Oracle System Assistant (Oracle System Assistant)" on page 31
- "Enable or Disable Oracle System Assistant (BIOS)" on page 33

▼ Disable Oracle System Assistant (Oracle System Assistant)

Use this procedure to disable Oracle System Assistant. When Oracle System Assistant is disabled, it is not bootable and the host operating system cannot access files on the Oracle System Assistant USB drive. Disabling the utility might be desirable for security reasons.

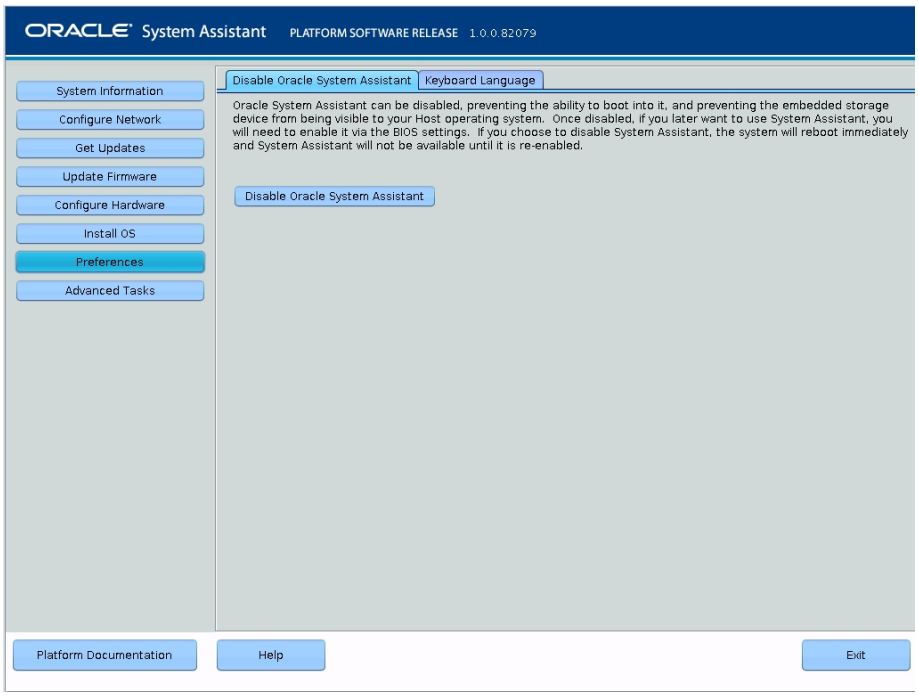
To re-enable Oracle System Assistant, see "Enable or Disable Oracle System Assistant (BIOS)" on page 33.

1. **Launch Oracle System Assistant.**

   For instructions, see "Launch Oracle System Assistant Locally" on page 28 or "Launch Oracle System Assistant Remotely (Oracle ILOM)" on page 26.

2. **In the navigation pane, click Preferences, and then click the Disable Oracle System Assistant tab.**

The Disable Oracle System Assistant screen appears.



3. **Click the Disable Oracle System Assistant button.**

   A confirmation dialog box appears.

4. **Click Yes to confirm.**

   The system reboots.

Related Information

- “Accessing and Using Oracle System Assistant” on page 25
- “Select UEFI Boot Mode or Legacy BIOS Boot Mode (BIOS)” on page 69
- “Enable or Disable Oracle System Assistant (BIOS)” on page 33

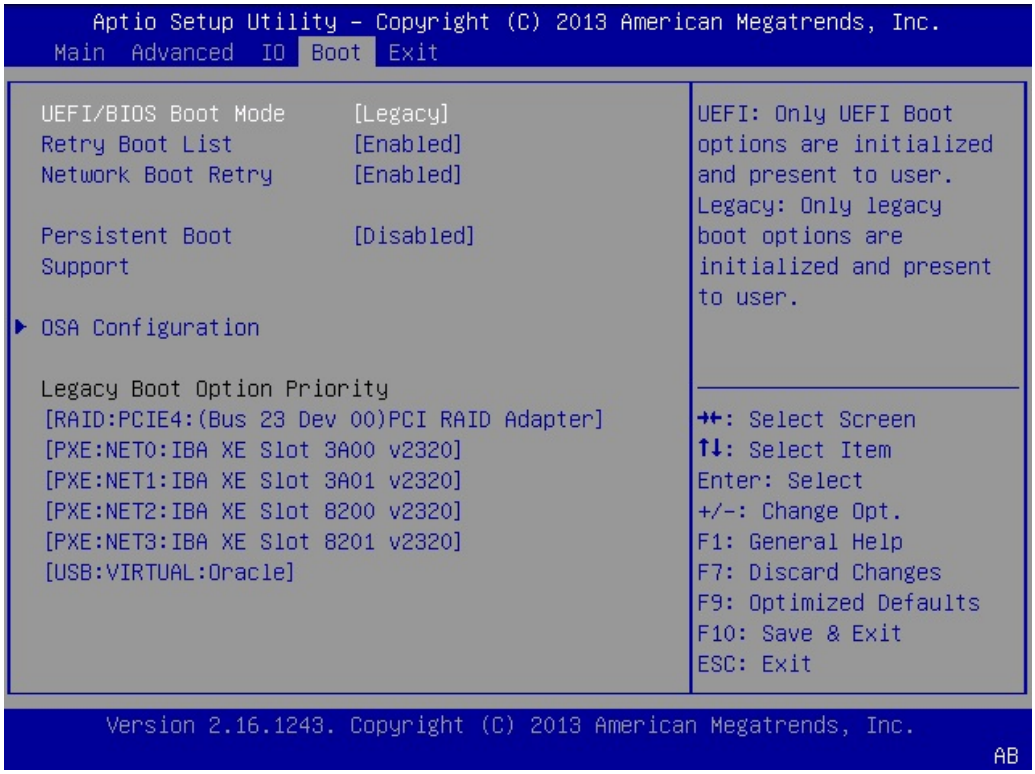
▼ Enable or Disable Oracle System Assistant (BIOS)

Use the Oracle System Assistant Configuration setting in the BIOS Setup Utility Boot menu to disable or enable Oracle System Assistant. When Oracle System Assistant is disabled, it is not bootable and the host operating system cannot access files on the Oracle System Assistant USB drive. Disabling the utility might be desirable for security reasons.

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

   See "Accessing the BIOS Setup Utility" on page 56.

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



3. **In the Boot menu, select OSA Configuration.**

4. **Select the OSA Internal Support property, and then select Enabled or Disabled.**

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

   The server reboots.

Accessing Oracle System Assistant Flash Drive Files

The Oracle System Assistant USB drive contains installation packages. You can access the files on the USB drive using the Oracle System Assistant command-line shell or the host operating system. It might be necessary to mount the USB flash drive on the host before you can access the files. For instructions, see the following procedures:

- "Access Oracle System Assistant Flash Drive Files From an Operating System" on page 34
- "Mount Oracle System Assistant Flash Drive on Oracle Solaris Host" on page 35
- "Mount Oracle System Assistant Flash Drive on Oracle VM Host" on page 36
- "Mount Oracle System Assistant Flash Drive on Linux Host" on page 38

▼ Access Oracle System Assistant Flash Drive Files From an Operating System

You can access the flash drive files from the operating system using a command line or a file browser.

1. **Access the host operating system (OS).**

2. **Using the operating system command-line application or a file browser, navigate to the Oracle System Assistant flash drive.**

   The USB drive is labeled on the OS as follows:

   - *Oracle Solaris, Linux, and Windows:* `ORACLE_SSM`
   - *Oracle VM:* `ORACLE SSM`

3. **If you cannot see the flash drive, ensure that Oracle System Assistant is enabled.**

   For details, see "Enable or Disable Oracle System Assistant (BIOS)" on page 33.

4. **If you can see the flash drive but cannot not access it, perform one of the following procedures to mount the flash drive:**

- *Oracle Solaris:* “Mount Oracle System Assistant Flash Drive on Oracle Solaris Host” on page 35
- *Oracle VM:* “Mount Oracle System Assistant Flash Drive on Oracle VM Host” on page 36
- *Linux:* “Mount Oracle System Assistant Flash Drive on Linux Host” on page 38
- *Windows:* It is not necessary to mount the Oracle System Assistant flash drive on a Windows host.

▼ Mount Oracle System Assistant Flash Drive on Oracle Solaris Host

If the server is running the Oracle Solaris operating system, you must mount the Oracle System Assistant USB flash drive before you use the file system to display or access its contents.

1. **In the Oracle Solaris command line, use the following command to turn off the volfs service:**

```
# svcadm disable volfs
```

2. **To identify the USB flash drive, use the following command:**

```
# rmformat -l
```

The system displays a list of devices:

```
Looking for devices...
1. Logical Node: /dev/rdsk/c1t0d0p0
Physical Node:
/pci@0,0/pci108e,484e@1a/hub@1/storage@2/disk@0,0
Connected Device: ORACLE    SSM    PMAP
Device Type: Removable
#
```

3. **To manually mount the USB flash drive in read-only mode, use the following command:**

```
# mount -F pcfs -o ro /dev/dsk/c1t0d0p1 /mnt
```

4. **To retrieve the Oracle Solaris content, use the following commands:**

```
# cd /mnt/Solaris
# ls
```

The system displays:

```
10U10 11
```

```
#
```

5. **To unmount the Oracle System Assistant device, use the following commands:**

```
# cd /
# umount /mnt
```

6. **To restart the volfs service, use the following command:**

```
# svcadm enable volfs
```

The Oracle System Assistant USB flash drive is now mounted.

View Help and the ReadMe File

Use this procedure to view the Oracle System Assistant help and the ReadMe file (Release Notes) for the installed platform software release.

The ReadMe file contains Release Notes, which provide information about Oracle System Assistant including information specific to your software release.

1. **Access Oracle System Assistant.**

   For details, see "Launch Oracle System Assistant Locally" on page 28 or "Launch Oracle System Assistant Remotely (Oracle ILOM)" on page 26.

   The System Overview task screen appears.

2. **At the bottom of the System Overview task screen, click the Help button.**

   The ReadMe file appears.

   Note - You can also access the ReadMe file on My Oracle Support, and by browsing to the top level of the flash drive . For details, see "Accessing Oracle System Assistant Flash Drive Files" on page 34.

3. **Click other buttons to display help as required.**

Mount Oracle System Assistant Flash Drive on Oracle VM Host

If the server is running the Oracle VM, you must mount the Oracle System Assistant USB flash drive before you use the file system to display or access its contents.

1. **Connect to your Oracle VM server as the root user.**

2. **In the Oracle VM command line, use the `lsscsi` command to determine the device mapping of the Oracle System Assistant USB flash drive:**

   An example of how this command displays the storage devices on the server is shown below.

```
# lsscsi
[0:0:0:0]  disk    SEAGATE ST360057SSUN600G 0805 /dev/sda
[0:0:1:0]  disk    SEAGATE ST32000SSSUN2.0T 0313 /dev/sdb
[0:0:2:0]  disk    SEAGATE ST32000SSSUN2.0T 0313 /dev/sdc
[0:0:3:0]  disk    ATA INTEL SSDSA2BZ30     0362 /dev/sdd
[0:0:4:0]  enclosu ORACLE BLADE14           0903 -
[7:0:0:0]  disk    SUN StorEdge 3511        421F /dev/sde
[7:0:0:1]  disk    SUN StorEdge 3511        421F /dev/sdf
[7:0:0:2]  disk    SUN StorEdge 3511        421F /dev/sdg
[7:0:0:3]  disk    SUN StorEdge 3511        421F /dev/sdh
[9:0:0:0]  disk    SUN CSM200_R             0660 /dev/sdi
[9:0:0:1]  disk    SUN CSM200_R             0660 /dev/sdj
[9:0:0:2]  disk    SUN CSM200_R             0660 /dev/sdk
[9:0:0:3]  disk    SUN CSM200_R             0660 /dev/sdl
[9:0:0:4]  disk    SUN CSM200_R             0660 /dev/sdm
[9:0:0:5]  disk    SUN CSM200_R             0660 /dev/sdn
[11:0:0:0] disk     ORACLE SSM              PMAP /dev/sdo
```

   The Oracle System Assistant USB flash drive is the disk labeled `ORACLE SSM` and in this example is mapped to `/dev/sdo`.

3. **To determine the name of the partition on the Oracle System Assistant USB device, use the `fdisk -l /dev/sdo` command.**

   The next example shows the output produced by this command.

```
# fdisk -l /dev/sdo
Disk /dev/sdo: 3880 MB, 3880452096 bytes
4 heads, 32 sectors/track, 59211 cylinders
Units = cylinders of 128 * 512 = 65536 bytes

Device Boot Start End   Blocks  Id System
/dev/sdo1 * 17    57344 3668992 ef EFI (FAT-12/16/32)
```

4. **(Optional) Create a mount point to use when mounting the Oracle System Assistant USB flash drive.**

   For example:

```
# mkdir /mnt/OSA
```

5. **To mount the Oracle System Assistant USB device, use the partition name determined in Step 3 and an existing mount point or the mount point that you created in Step 4.**

   Here is an example of a mount command:

```
# mount -t vfat -o codepage=850 /dev/sdo1 /mnt/OSA
# ls /mnt/OSA
boot          Firmware    LiveOS       OracleVM    syslinux.cfg
Documentation ldlinux.sys manifest.xml readme.html Versions.txt
EFI           Linux       Oracle       Solaris     Windows
#
```

   The Oracle System Assistant USB flash drive is now mounted at the `mount` location specified.

▼ Mount Oracle System Assistant Flash Drive on Linux Host

If the server is running a Linux operating system, you might have to mount the Oracle System Assistant USB flash drive before you use the file system to display or access its contents.

- **To mount the Oracle System Assistant USB flash drive, use the following commands in the Linux command line:**

```
#>mkdir /mnt/OSA
#>mount LABEL=ORACLE_SSM /mnt/OSA
#>cd /mnt/OSA
#>ls -l
total 916
drwxr-xr-x 2  root root 4096   Nov 21 07:42 boot
drwxr-xr-x 3  root root 4096   Nov 21 07:42 Documentation
drwxr-xr-x 3  root root 4096   Oct 26 21:05 EFI
drwxr-xr-x 16 root root 4096   Nov 21 07:42 Firmware
-r-xr-xr-x 1  root root 15218  Oct 26 19:10 ldlinux.sys
drwxr-xr-x 5  root root 4096   Nov 21 07:41 Linux
drwxr-xr-x 2  root root 4096   Oct 26 21:05 LiveOS
-rwxr-xr-x 1  root root 787672 Nov 21 08:17 manifest.xml
drwxr-xr-x 2  root root 4096   Nov 21 08:00 Oracle
-rwxr-xr-x 1  root root 78879  Nov 21 07:42 readme.html
drwxr-xr-x 4  root root 4096   Nov 21 07:41 Solaris
-rwxr-xr-x 1  root root 263    Oct 26 21:05 syslinux.cfg
-rwxr-xr-x 1  root root 3755   Nov 21 07:42 Versions.txt
drwxr-xr-x 3  root root 4096   Nov 21 07:42 VMware
drwxr-xr-x 4  root root 4096   Nov 21 07:42 Windows
#>
```

  The Oracle System Assistant USB flash drive is now mounted at the location specified.

Setting the Oracle System Assistant Keyboard Language

By default, the Oracle System Assistant keyboard language is set to English (U.S.). However, you can set the keyboard language to the following locales:

- English (U.S.)
- French
- German
- Italian
- Spanish
- Swedish

Note - The Keyboard Language task setting only applies to Oracle System Assistant. This setting does not apply to other system interfaces.

For instructions on changing the Oracle System Assistant keyboard language, see the following procedure:

- “Set Oracle System Assistant Keyboard Language” on page 39

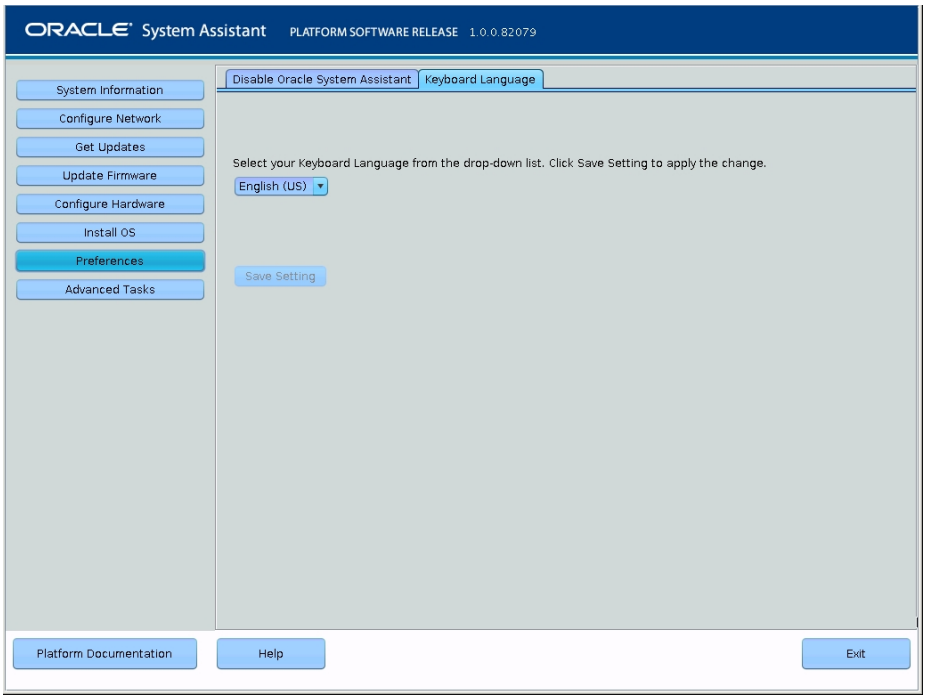
▼ Set Oracle System Assistant Keyboard Language

1. **Launch Oracle System Assistant.**

   For instructions, see “Launch Oracle System Assistant Locally” on page 28 or “Launch Oracle System Assistant Remotely (Oracle ILOM)” on page 26.

2. **In the navigation pane, click Preferences, and then click the Keyboard Language tab.**

The Keyboard Language screen appears.



3. **From the drop-down list, select a keyboard language.**

   Oracle System Assistant supports the following keyboard languages: English (U.S.), French, German, Italian, Spanish, and Swedish

4. **Click the Save Setting button.**

Related Information

- “Accessing and Using Oracle System Assistant” on page 25

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 41
- "Cable the Server for a Management Connection to Oracle ILOM" on page 42
- "Launch and Log In to Oracle ILOM Through a Remote Ethernet Connection" on page 44
- "Launching Remote KVMS Redirection Sessions" on page 46

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	NET0–NET3 **Note -** Ethernet ports NET2 and	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

Management Connection	Management Port	Description
Management Connection	NET3 are non-functional in single-processor systems.	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 41.

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 44.

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 46.

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

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 104.

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 42.

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*.

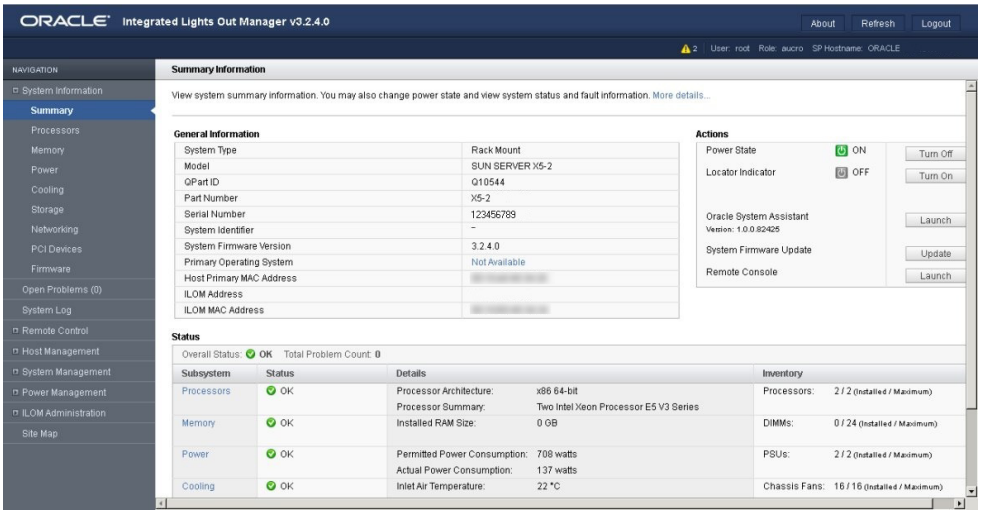
   b. **Type the IP address or host name of the server in the browser address bar, for example http://192.0.2.213.**

      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 104.

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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 42.

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 issue 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 or Oracle System Assistant, 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 47
- "Launch a Graphical Remote Console Redirection Session" on page 48
- "Configure a Host Storage Device Redirection Session" on page 49

▼ 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 41.

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 44.

   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 41.

   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 41.

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 if the status is 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 or from the Oracle System Assistant command-line shell, and you can configure and use the management agents.

For installation instructions, see:

- "Installing Oracle Hardware Management Pack" on page 52
- *Oracle Hardware Management Pack Installation Guide*

To get started, see the following procedures:

- "Use Oracle Hardware Management Pack Commands (Oracle HMP)" on page 54
- "Use Oracle Hardware Management Pack Commands (Oracle System Assistant)" on page 55
- "Use the Oracle Hardware Management Pack Management Agents (Oracle HMP)" on page 56

Installing Oracle Hardware Management Pack

To install Oracle Hardware Management Pack, you must access the installation files on the Oracle System Assistant USB drive or download them 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 - When you use Oracle System Assistant to install a new operating system, Oracle System Assistant installs the latest downloaded version of Oracle Hardware Management Pack automatically.

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:

- "Access Oracle Hardware Management Pack Installation Files on the Oracle System Assistant USB Drive" on page 53
- "Download Oracle Hardware Management Pack Installation Files (Oracle System Assistant)" on page 53
- "Download Oracle Hardware Management Pack Installation Files From My Oracle Support" on page 54
- "Install Oracle Hardware Management Pack" on page 54

▼ Access Oracle Hardware Management Pack Installation Files on the Oracle System Assistant USB Drive

1. **Access the host operating system.**
2. **Using the operating system command-line application or a file browser, navigate to the Oracle System Assistant flash drive.**

   For instructions, see "Access Oracle System Assistant Flash Drive Files From an Operating System" on page 34.
3. **Navigate first to the applicable OS directory in the file system, and then to the subdirectory for drivers and tools.**
4. **Locate the Oracle Hardware Management Pack installation files.**

   For example, the installation file might be labeled `install.x86.bin`.
5. **Copy the files from the USB drive to a location of your choice.**

▼ Download Oracle Hardware Management Pack Installation Files (Oracle System Assistant)

Oracle Hardware Management Pack is automatically included on the Oracle System Assistant USB drive. Use this procedure *only* if you do not have access to the USB drive or if you want to install a newer version of Oracle System Assistant. Alternatively, see "Access Oracle Hardware Management Pack Installation Files on the Oracle System Assistant USB Drive" on page 53.

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.
2. **In the navigation pane, click Get Updates.**
3. **Click the Check for Updates button.**
4. **Download the software update as described in "Update Oracle System Assistant and the Firmware Files on the Oracle System Assistant USB Drive (Oracle System Assistant)" on page 190.**

   The software update should include the latest version of Oracle Hardware Management Pack.

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

- **Oracle Hardware Management Pack is automatically included on the Oracle System Assistant USB drive. However, if you do not have access to the USB drive or if you want to install a newer version of Oracle Hardware Management Pack, you can download Oracle Hardware Management Pack from My Oracle Support. For instructions, see "Download Firmware and Software From My Oracle Support" on page 186.**

  Alternatively, see "Accessing Oracle System Assistant Flash Drive Files" on page 34.

▼ 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 the *Oracle Hardware Management Pack Installation Guide* at `http://www.oracle.com/goto/ohmp/docs`.

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 46.

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 20

▼ Use Oracle Hardware Management Pack Commands (Oracle System Assistant)

Before you begin, ensure that Oracle Hardware Management Pack is installed on the server as described in the "Installing Oracle Hardware Management Pack" on page 52.

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

2. **In the navigation pane, click Advanced Tasks, and then click the Shell tab.**

3. **Click the Start Shell button.**

   You can enter Oracle Hardware Management Pack commands from the Oracle System Assistant command-line shell.

Related Information

- "Oracle Hardware Management Pack" on page 20

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 67 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

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 46.

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 41.

   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.**

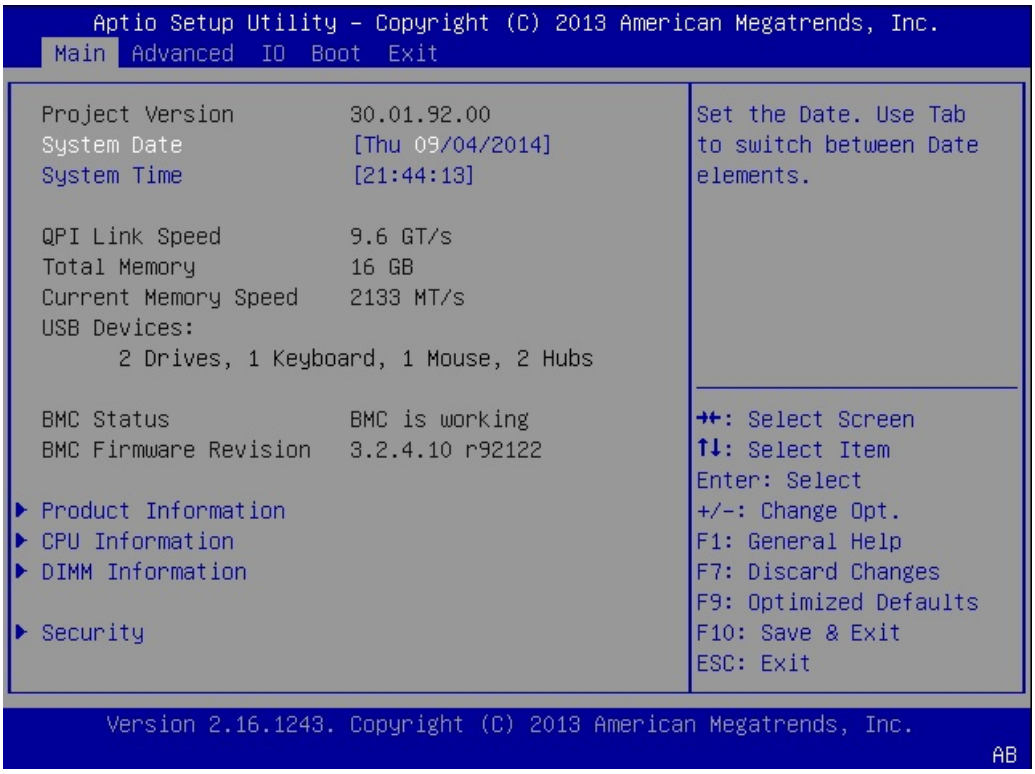
   For instructions, see "Controlling the Server Power State" on page 61.

   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.
F9	Ctrl+O	Launch Oracle System Assistant. BIOS boots to Oracle System Assistant, bypassing the current Boot Option Priority list for this one-time boot method.	Activate Load Optimal Values dialog box menu. Not applicable to the LSI MegaRAID Configuration Utility.
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 Boot Mode or UEFI Boot Mode: “Select UEFI Boot Mode or Legacy BIOS Boot Mode (BIOS)” on page 69
- Select the Boot Device: “Modifying the Boot Order” on page 71
- Enable or Disable Oracle System Assistant: “Enable or Disable Oracle System Assistant (BIOS)” on page 33
- Configure TPM Support: “Configuring BIOS Support for TPM” on page 74
- Configure SP Network Settings: “Modify Service Processor Network Settings (BIOS)” on page 101
- Configure Option ROM Settings and I/O Space Allocation: “Configure Option ROM and I/O Space Allocation” on page 136
- Reset the BIOS Firmware to Defaults: “Reset the BIOS Firmware to Default Settings (BIOS)” on page 164

- Exit BIOS Setup Utility: “Exit the BIOS Setup Utility” on page 60

▼ 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 61
Review power control options.	“Power Control Options” on page 62
Power the server off or on.	“Powering the Server Off and On” on page 62
Set a power-on policy.	“Setting SP Policy for Host Power at Boot (Oracle ILOM)” on page 65

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, Oracle ILOM installs the BIOS firmware upgrade when you reset or power cycle your server. 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 195.

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

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 61.

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 41.

   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 62.

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 41.

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 41.

   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 41.

   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 67
View or change the current boot mode.	“Viewing or Modifying the Current Boot Mode” on page 68
Make persistent or temporary changes to the boot order list.	“Modifying the Boot Order” on page 71
Enable the Persistent Boot Support feature.	“Enabling Persistent Boot Support” on page 74
Enable Trusted Platform Module features.	“Configuring BIOS Support for TPM” on page 74

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 Boot Mode or Legacy BIOS Boot Mode. Legacy BIOS Boot Mode 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 153.

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 68.

Viewing or Modifying the Current Boot Mode

You can view the current boot mode in the BIOS Setup Utility, Oracle System Assistant, and 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 System Assistant)" on page 68
- "View the Current Boot Mode (Oracle ILOM)" on page 69
- "Select UEFI Boot Mode or Legacy BIOS Boot Mode (BIOS)" on page 69

▼ View the Current Boot Mode (Oracle System Assistant)

1. **Launch Oracle System Assistant.**

For instructions, see “Accessing and Using Oracle System Assistant” on page 25.

The System Overview screen appears.

2. **In the System Overview screen, review the BIOS Mode property.**

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 41.

   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 41.

   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 does not boot.

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

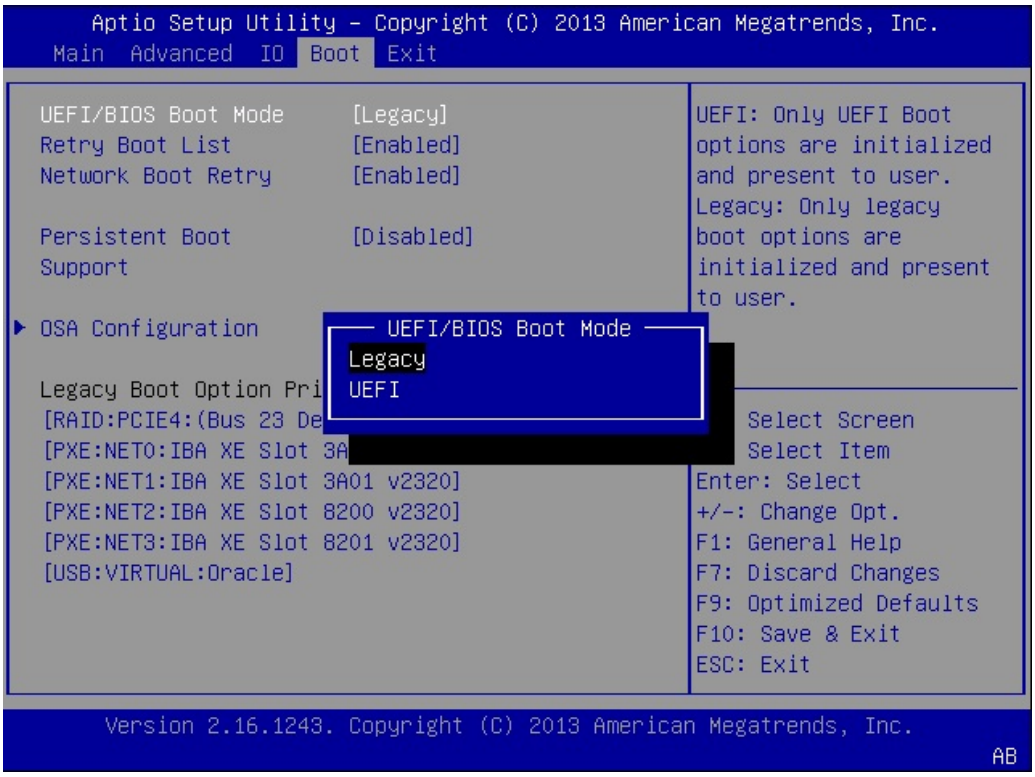
   For instructions, see “Accessing the BIOS Setup Utility” on page 56.

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 74.

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

- "Modify the Boot Order (BIOS)" on page 71
- "Set Temporary Next Boot Device (Oracle ILOM)" on page 73

▼ Modify the Boot Order (BIOS)

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

   For instructions, see "Accessing the BIOS Setup Utility" on page 56.

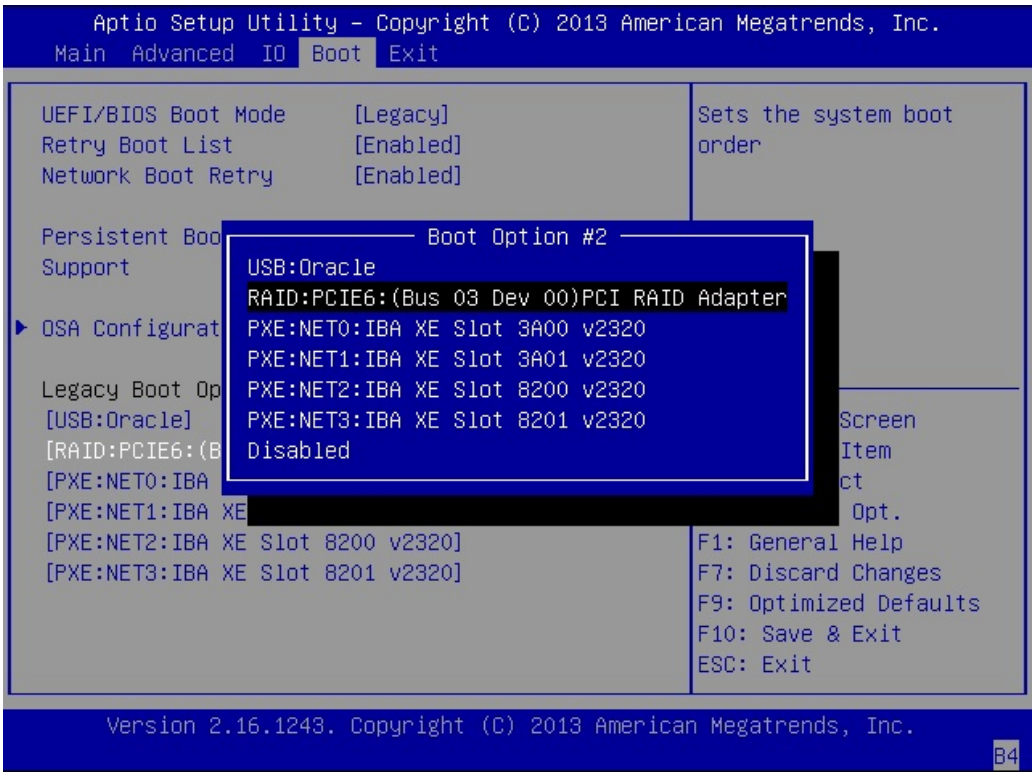
2. **Navigate to the Boot menu.**

   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 41.

   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 71.

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.

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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 41.

   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 74

▼ Enable Persistent Boot Support (BIOS)

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

   For instructions, see "Accessing the BIOS Setup Utility" on page 56.

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 75

▼ Configure BIOS Support for TPM (BIOS)

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

   For instructions, see “Accessing the BIOS Setup Utility” on page 56.

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 provides instructions for configuring RAID and iSCSI virtual drives.

In order to boot and install an OS, the drive(s) must be configured for RAID and made bootable. If you want to boot from a drive that is not part of a RAID array, you must configure it as a RAID 0 volume.

Note - Some drives are shipped preconfigured with a RAID 0 volume.

In any case, you should finish configuring RAID before installing an operating system..

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.

Task	Link
Configure RAID on the server.	“Configuring RAID on the Server” on page 77
Configure iSCSI virtual drive parameters.	“Modifying iSCSI Virtual Drive Properties” on page 83

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, some 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.

Before you create RAID volumes on the server, decide what RAID level is appropriate for your environment. To review the RAID levels supported by the Oracle Storage 12 Gb/s SAS PCIe RAID Host Bus Adapter (HBA), refer to one of the following resources:

- *LSI MegaRAID SAS Software User Guide* at https://www.broadcom.com/support/oem/oracle/
- *Oracle Storage 12 Gb/s SAS PCIe RAID HBA, Internal Installation Guide* at http://www.oracle.com/technetwork/documentation/oracle-storage-networking-190061.html

Once you have decided on a RAID level, review the RAID configuration requirements in your server installation guide, and the following sections:

- "RAID Configuration Tools" on page 78
- "Configure RAID on Storage Drives Using a RAID Internal HBA (Oracle System Assistant)" on page 79
- "Configure RAID (Oracle Hardware Management Pack)" on page 82

RAID Configuration Tools

This section describes some of the tools used to configure RAID.

If you are preparing disk drives to install an operating system, use Oracle System Assistant or the BIOS RAID configuration utilities.

Caution - These procedures erase all data on the configured disks, including the operating system if one is present.

Tool	Description	Supported RAID Levels	Documentation
Oracle System Assistant	See "Oracle System Assistant" on page 17. Graphical server management tool that can be used to configure drives before the operating system is installed.	■ RAID 0 ■ RAID 1 ■ RAID 5 ■ RAID 10	"Configure RAID on Storage Drives Using a RAID Internal HBA (Oracle System Assistant)" on page 79
BIOS RAID Configuration Utilities	■ *LSI MegaRAID BIOS Configuration Utility*: Simple, graphical RAID configuration utility that resides on the HBA. Accessible during the server boot process if server is booted in **Legacy BIOS** Boot Mode. ■ *Human Interface Infrastructure (HII) Configuration Utility*: Simple, graphical RAID configuration utility that resides on the HBA. Accessible from the Advanced menu in the BIOS Setup Utility. Available when the server is booted in **UEFI** Boot Mode.	■ RAID 0 ■ RAID 1 ■ RAID 5 ■ RAID 6 ■ RAID 00 ■ RAID 10 ■ RAID 50	Server hardware installation guide

Tool	Description	Supported RAID Levels	Documentation
Oracle Hardware Management Pack	See "Oracle Hardware Management Pack" on page 20. 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 82
MegaRAID Storage Manager	Graphical RAID configuration wizard 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/`
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/`

Related Information

- Oracle Storage Networking host bus adapter and converged network adapter documentation at:

  `http://www.oracle.com/technetwork/documentation/oracle-storage-networking-190061.html`

▼ Configure RAID on Storage Drives Using a RAID Internal HBA (Oracle System Assistant)

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.

Caution - This procedure erases all data on the configured disks, including the operating system if one is present.

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

2. **In the System Overview screen, verify that the BIOS Mode is set to the boot mode (UEFI or Legacy BIOS) that you plan to use when you install the operating system.**

   For instructions for switching the BIOS mode from UEFI to Legacy BIOS, or vice versa, see "Legacy BIOS Boot Mode and UEFI Boot Mode" on page 67.

3. **In the navigation pane, click Configure Hardware.**

   The RAID Configuration screen appears.

4. **In the HBA drop-down list, select the RAID, Internal HBA.**

   Note - After you select an HBA, you can click the HBA Info button to see details about the controller.

5. **In the Select RAID Level drop-down list, select a RAID level.**

   Oracle System Assistant supports the following RAID levels: RAID 0, RAID 1, RAID 5, and RAID 10. To configure the disks using a different RAID level, use the BIOS RAID Configuration Utilities. For more information about the BIOS RAID Configuration Utilities, refer to the server installation guide.

6. **In the Available Disks table, select the disk drives that you want to add to the RAID volume.**

   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.

   If a disk is already included in a RAID volume, it does not appear in the Available Disks table. If necessary, you can highlight and delete an existing volume in the Created Volumes table.

   Note - Disks in a RAID volume must be of the same size and type.

7. **Click the Create Volume button.**

The Creating RAID Volume message appears.

8. **In the Create Volume dialog box, do the following:**

   a. **(Optional) In the Volume Name field, enter the volume name.**

      Entering a volume name is optional. If you do not name the volume, Oracle System Assistant creates a volume without a name.

   b. **Select the volume Stripe Size.**

   c. **Click Create.**

      The Creating RAID Volume information box appears.

      After the volume is created, it is displayed in the Created Volumes table.

9. **To set a volume as bootable, perform the following steps:**

   In Legacy BIOS Boot Mode, you must make a volume bootable if you plan to install an OS on it.

   a. **In the Details/Actions column of the Created Volumes table, click the Details button for the volume you want to set as bootable.**

      The Volume Details dialog box appears.

   b. **(Optional) In the Volume Name field, enter a volume name or modify it.**

      If you did not enter a volume name earlier, you may do so in the Volume Details dialog box. If you entered a volume name earlier, you can modify it here; however, you cannot delete the name entirely.

Note - You can change a volume name at any time by clicking on the Details button for the volume in the Created Volumes table; however, once a volume name is assigned, you cannot delete it.

---

   c. **Select the Set As Boot Target check box.**

   d. **Click Save & Close.**

      The Set Volume For Boot confirmation dialog appears.

   e. **Click OK.**

      The volume is listed as the current boot target above the Created Volumes table.

10. **To designate a disk as a global hot spare, perform the following steps:**

    a. **In the Details/Actions column of the Available Disks table, click the Details button for the disk you want to set as a global hot spare.**

    The Disk Details dialog box appears.

    b. **Select the Set as Hot Spare check box.**

    Note - You can create a maximum of 256 hot spares.

    c. **Click Save.**

    The Disk Details dialog box closes.

11. **To delete a volume, perform the following steps:**

    a. **Select the volume you want to delete in the Created Volumes table.**

    b. **Click the Delete Volume button.**

▼ 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 - This procedure erases all data on the configured disks, including the operating system if one is present.

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

   For more information, see "Accessing Oracle Hardware Management Pack" on page 51.

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

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. It includes separate instructions for systems configured to boot in legacy BIOS or UEFI Boot Mode:

- "Modify iSCSI Virtual Drive Properties in Legacy BIOS Boot Mode (BIOS)" on page 84
- "Modify iSCSI Virtual Drive Properties in UEFI Boot Mode (BIOS)" on page 90

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 Legacy BIOS Boot Mode (BIOS)

Use this procedure to configure iSCSI virtual drives using the iSCSI BIOS Setup Utility screens on systems configured to use Legacy BIOS 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 iSCSI option ROM.

Before you begin, ensure that the following requirements 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 Legacy BIOS Boot Mode, not UEFI Boot Mode. For servers in UEFI Boot Mode, see "Modify iSCSI Virtual Drive Properties in UEFI Boot Mode (BIOS)" on page 90.

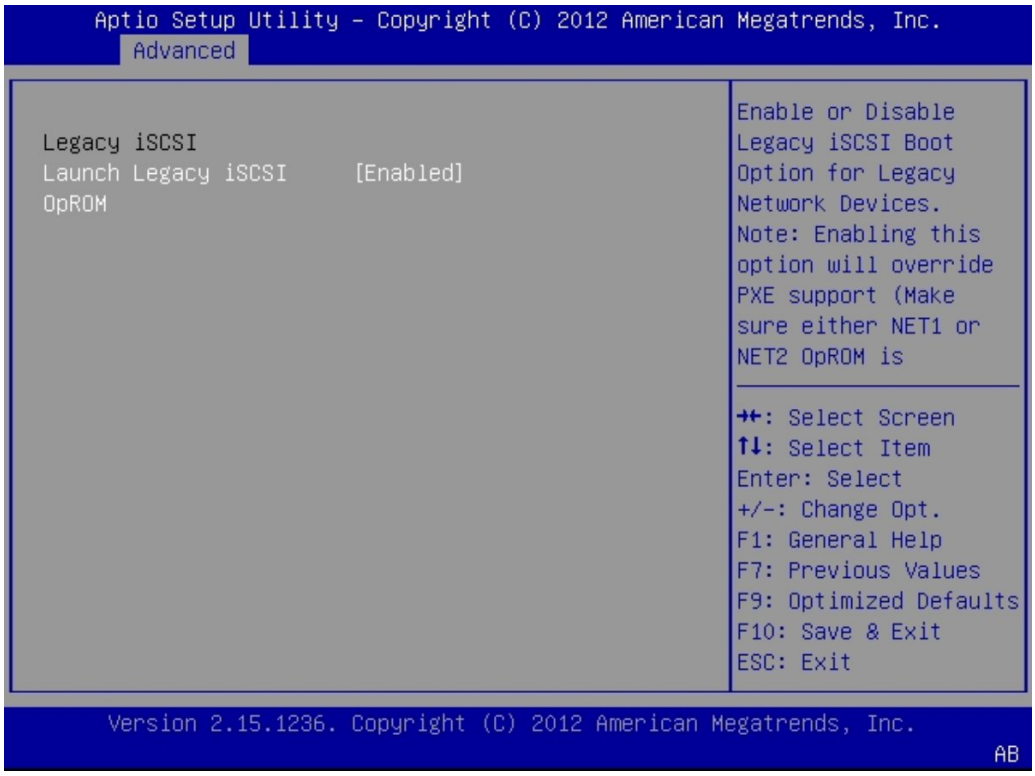
1. **Access the BIOS Setup Utility.**

   For instructions, see "Accessing the BIOS Setup Utility" on page 56.

2. **Navigate to the Advanced menu, and then select Legacy iSCSI.**

Note - If you do not see Legacy iSCSI on the Advanced menu, select the IO menu, and then select Legacy iSCSI.

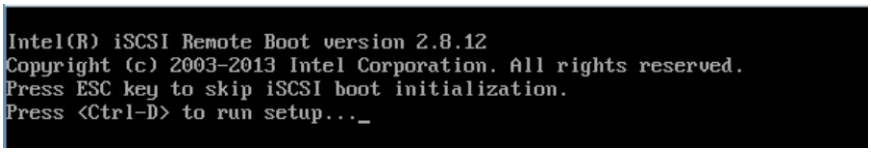
The Launch Legacy iSCSI OpROM screen appears.



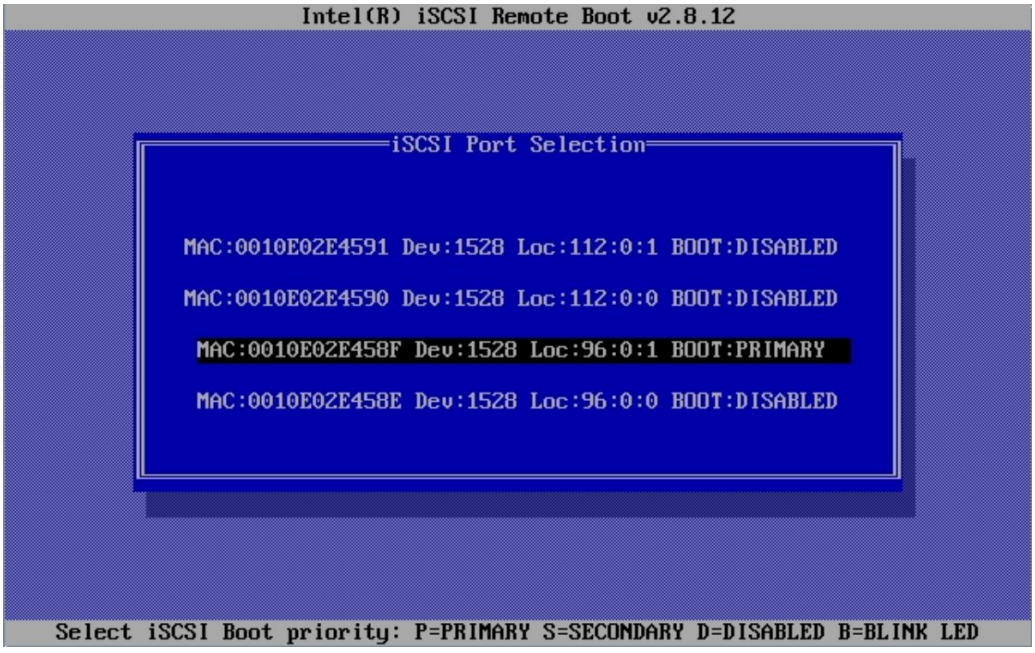
3. **Select Launch Legacy iSCSI OpROM, and then select Enable.**

4. **Press the F10 function key to save your changes and exit the BIOS Setup Utility.**
   The system reboots, and boot messages appear.

5. **When the following messages appear, press Ctrl+D several times to access the iSCSI option ROM.**



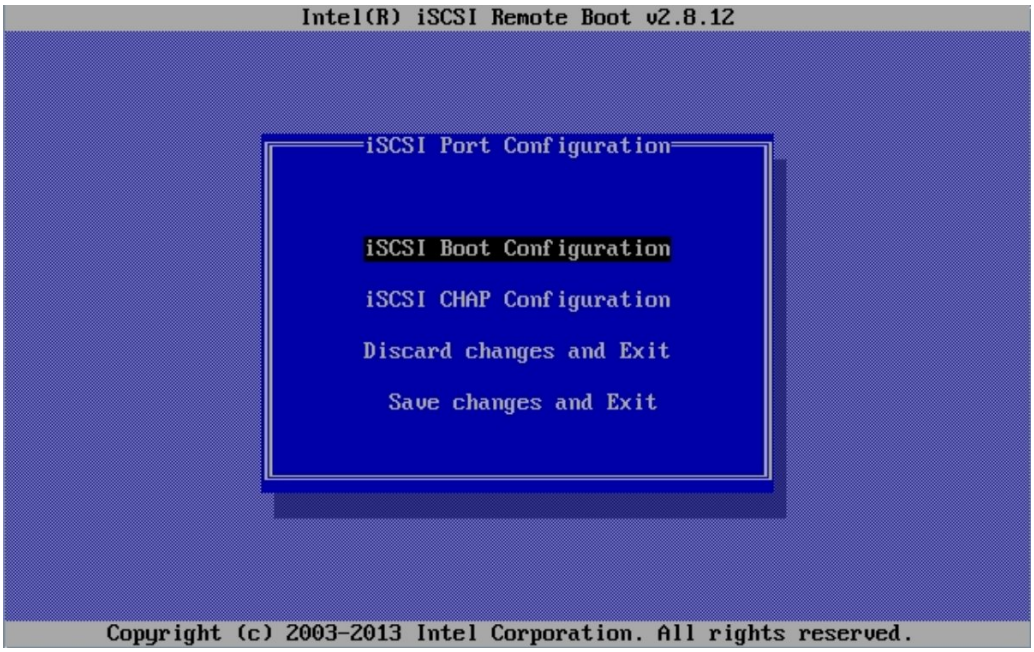
The iSCSI Port Selection screen appears.



6. **Highlight the network adapter MAC address configured in the iSCSI server and Type `P` to change its state to Boot:PRIMARY.**

7. **Select the network adapter MAC address.**

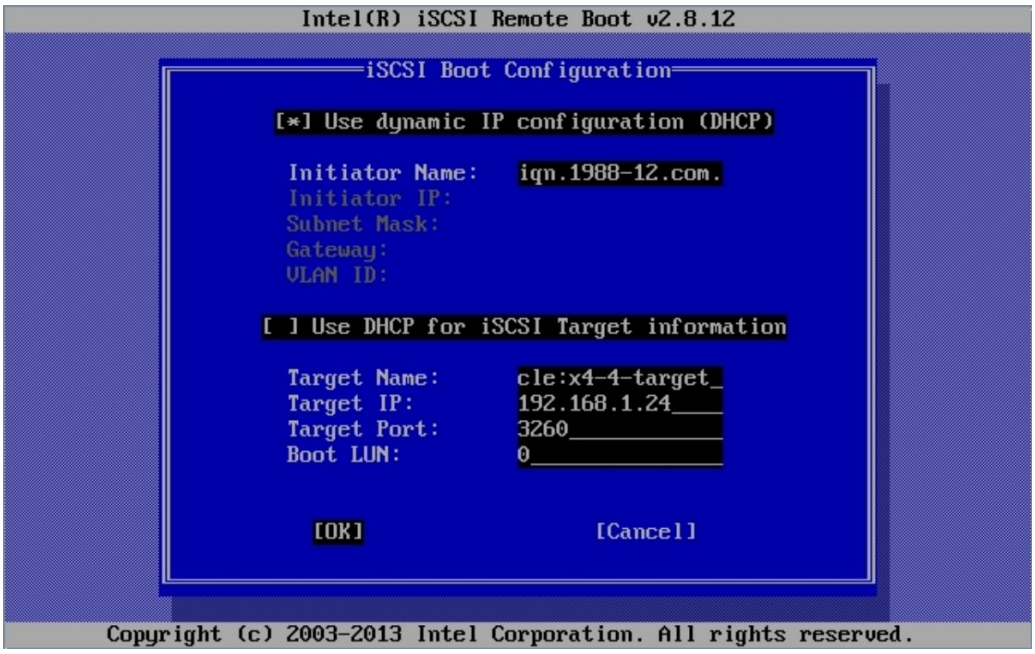
The iSCSI Port Configuration screen appears.



8. **Select iSCSI Boot Configuration.**

Note - If you do not see iSCSI boot configuration, select iSCSI Port Configuration instead.

The iSCSI Boot Configuration screen appears.



9. **In the iSCSI Boot Configuration screen, perform the following steps:**

   a. **Select or deselect the Use Dynamic IP Configuration property for the iSCSI initiator.**

   b. **Specify the initiator name in iSCSI Qualified Name (iqn) format, for example `iqn.1988-12.com.oracle:0010e02e458f`.**

   c. **If you deselected the Use Dynamic IP Configuration property, specify the iSCSI initiator IP address, Subnet Mask, Gateway, and VLAN ID.**

   d. **Select or deselect the Use DHCP for iSCSI Target Information property.**

   e. **Specify the target name iSCSI Qualified Name (iqn) format, for example `iqn.1988-12.com.oracle:X5-2-target`.**

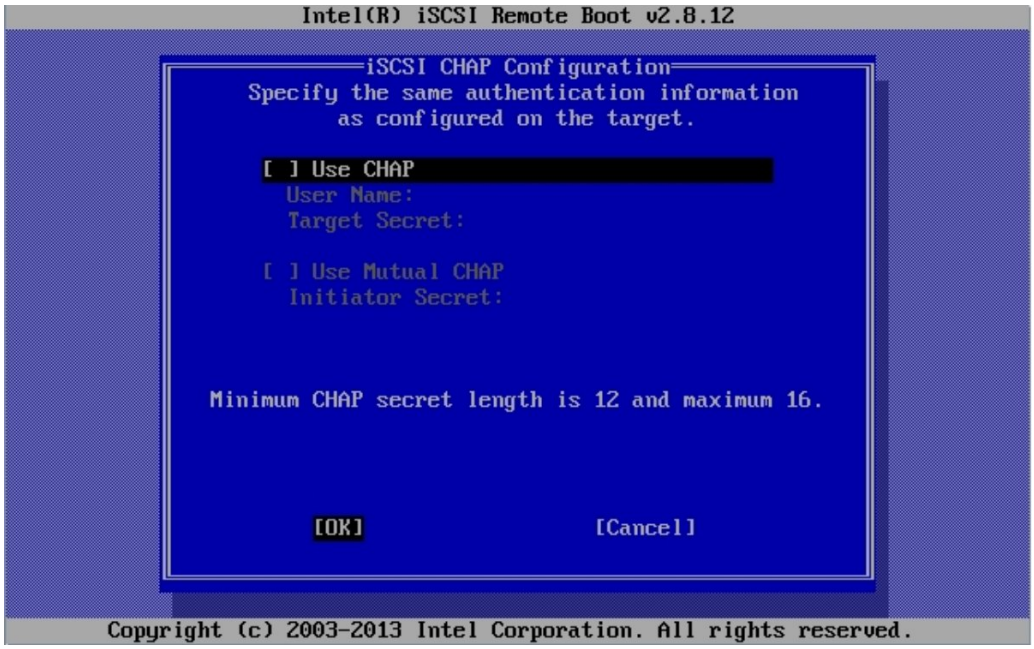
f. **If you deselected the Use DCHP for iSCSI Target Information property, specify the Target IP, Target Port, and Boot LUN.**

g. **Select OK.**

The iSCSI Port Configuration screen reappears.

10. **Select iSCSI CHAP Configuration.**

The iSCSI CHAP Configuration screen appears.



11. **To configure CHAP (Challenge-Handshake Authentication Protocol), perform the following steps in the iSCSI CHAP Configuration screen:**

a. **Select one of the CHAP options.**

b. **Specify the required information for the CHAP option you selected.**

c. **Select OK.**

The iSCSI Port Configuration screen reappears.

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

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 69

▼ 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 69.

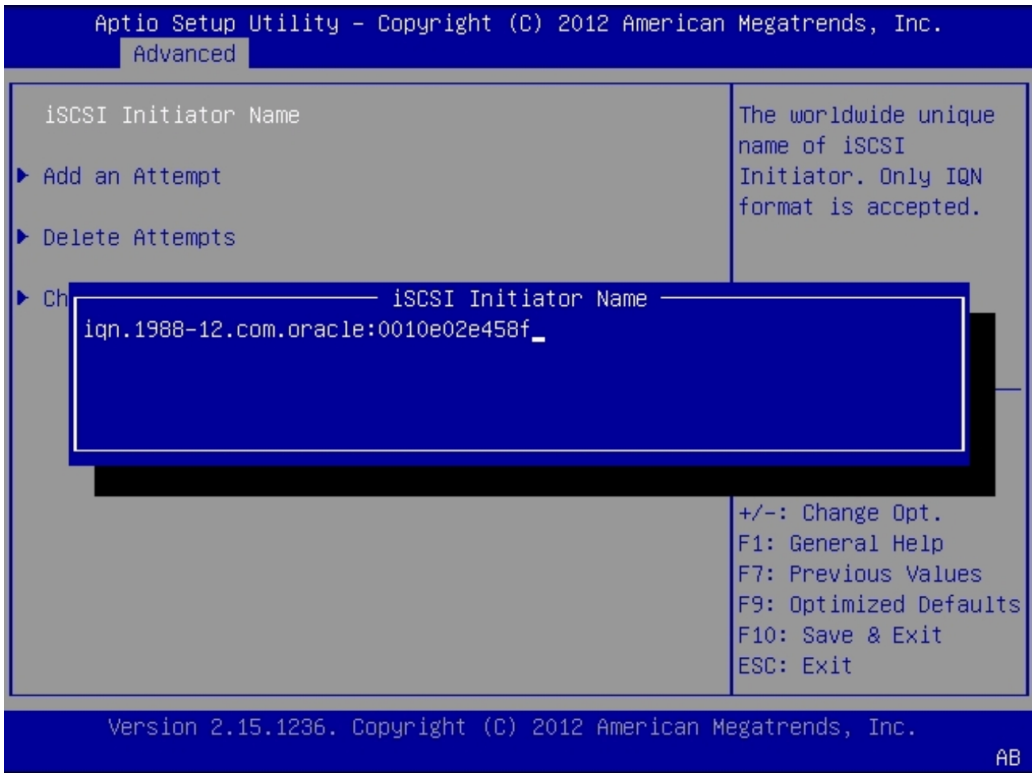
1. **Access the BIOS Setup Utility.**

   For instructions, see "Accessing the BIOS Setup Utility" on page 56.

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

3. **Select iSCSI Configuration.**

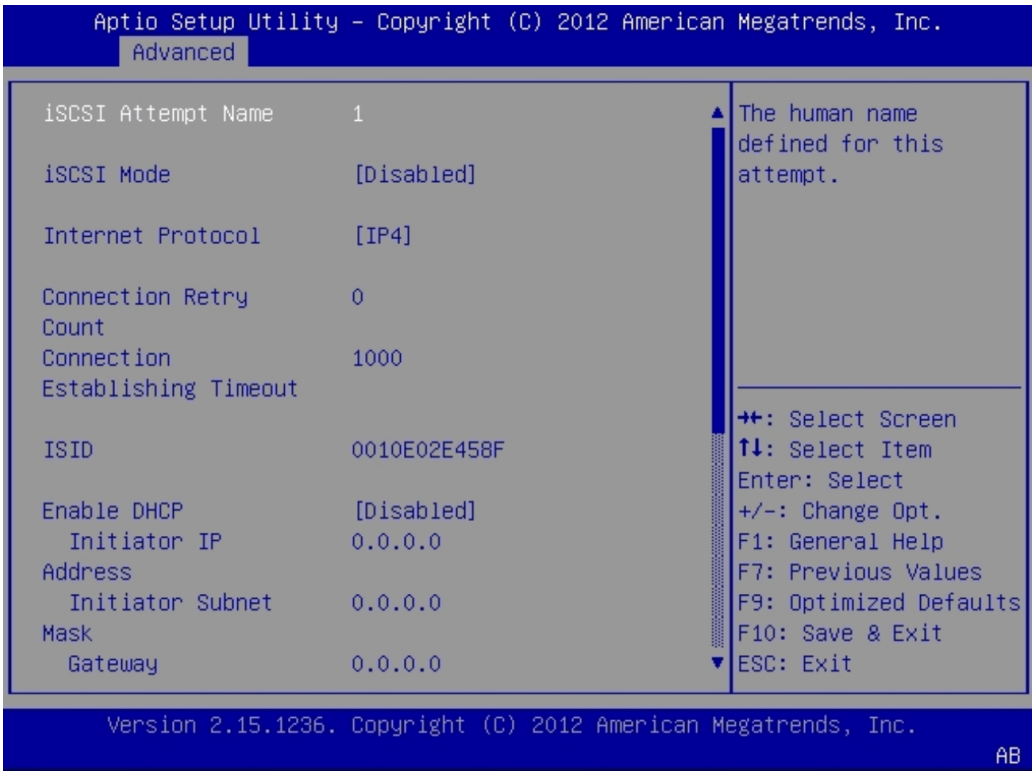
4. **Select iSCSI Initiator Name, and then specify the iSCSI initiator name in iSCSI Qualified Name (iqn) format, for example `iqn.1988-12.com.oracle:0010e02e458f`.**



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:X5-2-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 69

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 95
Configure the service processor network connections.	“Modifying Service Processor Network Settings” on page 98
Add Oracle ILOM user accounts.	“Adding Oracle ILOM User Accounts” on page 104
Configure the service processor clock.	“Setting the Service Processor Clock” on page 106
Identify DNS servers in your network.	“Configuring DNS Server Information on the Service Processor” on page 109

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 System Assistant)” on page 96
- “Assign System Identification Information (Oracle ILOM)” on page 96
- “Assign System Identification Information (Oracle Hardware Management Pack)” on page 97

Assign System Identification Information (Oracle System Assistant)

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

2. **In the navigation pane, click Configure Hardware, and then click the Service Processor Configuration tab.**

3. **Select Identification Information from the drop-down list.**

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

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

5. **Click Apply Settings.**

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 41.

   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 41.

   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 51.

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 Service Processor Network Settings (Oracle System Assistant)" on page 98
- "Modify Oracle ILOM SP Network Settings (Oracle ILOM)" on page 99
- "Modify Service Processor Network Settings (Oracle Hardware Management Pack)" on page 101
- "Modify Service Processor Network Settings (BIOS)" on page 101

▼ Modify Service Processor Network Settings (Oracle System Assistant)

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

1. **Launch Oracle System Assistant.**
   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.
2. **In the navigation pane, click configure Hardware, and then click the Service Processor Configuration tab.**
3. **Select Network Configuration in the drop-down list.**
4. **Specify the network settings:**
   - **For an IPv4 environment, do the following in the IPv4 panel:**
     a. **Select an IP Discovery Mode.**
     b. **If you selected Static, enter an IP Address, Netmask, and Gateway.**
   - **For an IPv6 environment, do the following in the IPv6 panel:**

a. **Select Enabled in the IPv6 portion of the screen.**

b. **Configure the remaining IPv6 properties as needed.**

For more information about the network properties, click the Help button.

5. **Click Apply Settings.**

Some changes are applied immediately. Others will be applied at the next boot.

▼ 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.

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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 41

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 51.

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 56.

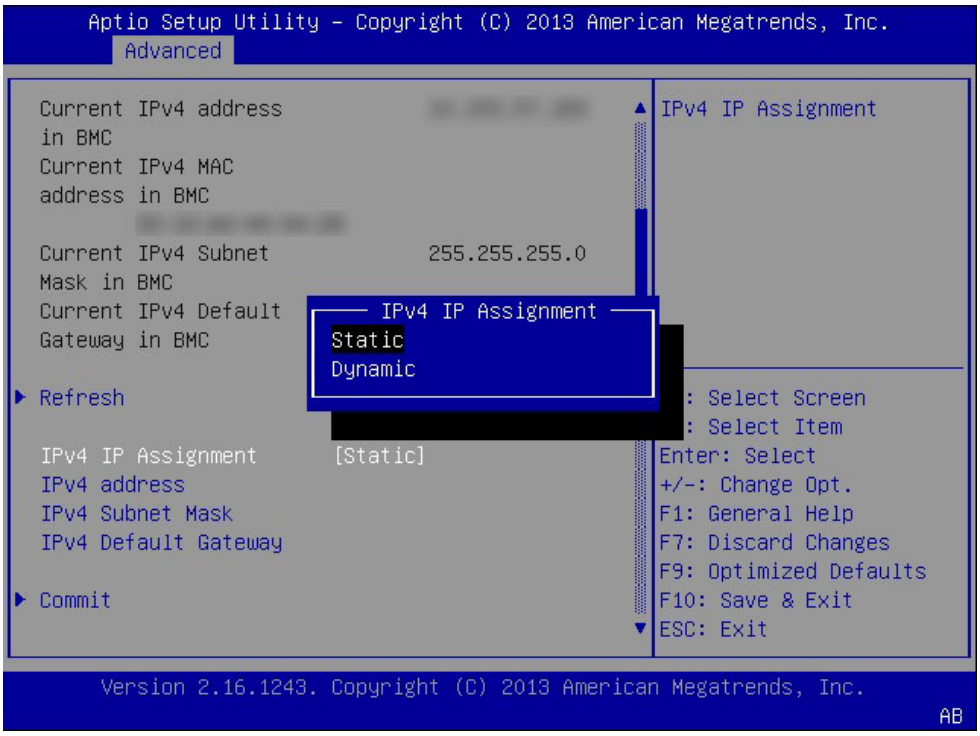
2. **Navigate to the Advanced menu.**

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.**



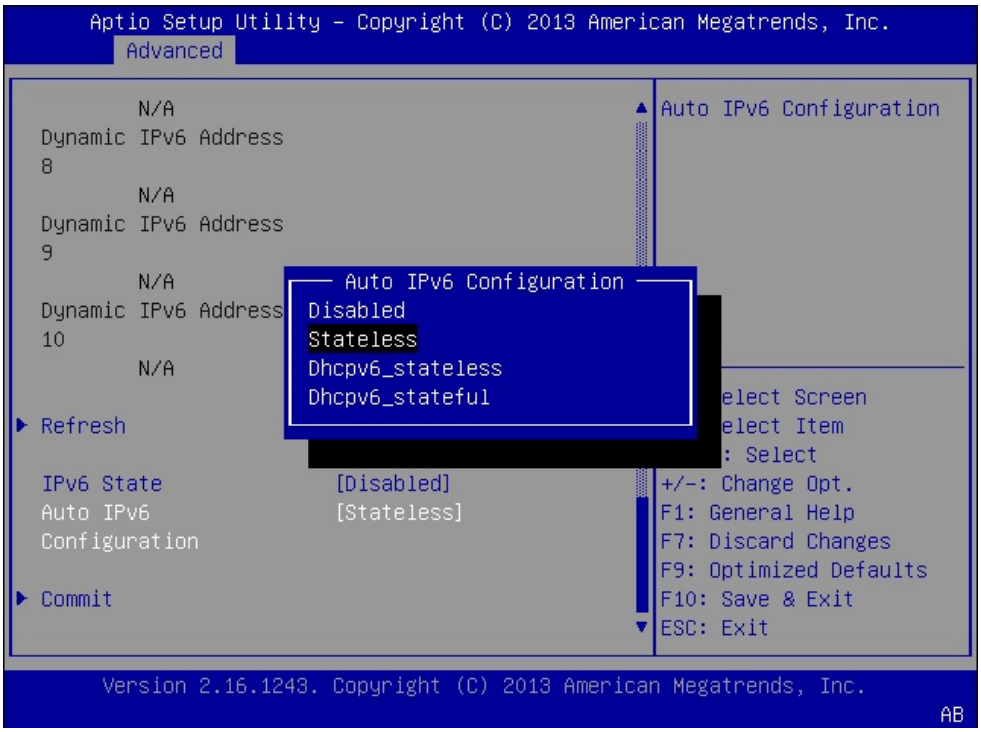
b. **If you selected Static IP addressing, specify an IPv4 Address, IPv4 Subnet Mask, and IPv4 Default Gateway.**

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 System Assistant)” on page 104
- “Add an Oracle ILOM User Account (Oracle ILOM)” on page 104
- “Add an Oracle ILOM User Account (Oracle Hardware Management Pack)” on page 105

▼ Add an Oracle ILOM User Account (Oracle System Assistant)

1. **Launch Oracle System Assistant.**
   For instructions, see “Accessing and Using Oracle System Assistant” on page 25.
2. **In the navigation pane, Click Configure Hardware, and then click the Service Processor Configuration tab.**
3. **Select User Accounts Settings from the drop-down list.**
   The User Management panel appears.
4. **Click Add User.**
   The Add User dialog box appears.
5. **Specify a User Name, Role Privileges, and Password for the user account, and then click Add User.**

Note - In Oracle System Assistant, you cannot create, modify, or delete an account with the user name "user." To manage a user account named "user," use Oracle ILOM.

▼ 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 41.

   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 41.

   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, *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 51.

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 System Assistant)" on page 106
- "Set the Service Processor Clock (Oracle ILOM)" on page 107
- "Set the Service Processor Clock (Oracle Hardware Management Pack)" on page 108

▼ Set the Service Processor Clock (Oracle System Assistant)

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

2. **In the navigation pane, click Configure Hardware, and then click the Service Processor Configuration tab.**

3. **Select Clock Settings from the drop-down list.**

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

   - *To set the service processor clock manually*, **specify a Date, Time, and Timezone.**

   - *To synchronize the service processor clock with an NTP server*, **select the Enabled check box in the Synchronize Time Using NTP field, and then enter the IP address of one or more NTP servers.**

5. **Click Apply Settings.**

▼ 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 41.

   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 41.

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 51.

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 System Assistant)" on page 109
- "Configure DNS Server Information on the Service Processor (Oracle ILOM)" on page 110
- "Configure DNS Server Information on the Service Processor (Oracle Hardware Management Pack)" on page 111

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

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

2. **In the navigation pane, click Configure Hardware, and then click the Service Processor Configuration tab.**

3. **Select DNS Configuration from the drop-down list.**

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

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

6. **Select a DNS Timeout from the drop-down list.**
7. **Select the number of DNS Retries from the drop-down list.**
8. **Click Apply Settings.**

▼ 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 41.
   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 41.
   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 51.

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`

Installing an Operating System

This section provides instructions for installing an operating system on the server using Oracle System Assistant.

Note - Oracle System Assistant facilitates installations for most of the operating systems supported by the server. However, some operating systems supported by the server cannot be installed using Oracle System Assistant.

To install an operating system using other methods, refer to the operating system installation guides for your server. Alternatively, see the following sections:

Task	Link
Prepare the server for operating system installation.	"Preparing to Install an Operating System" on page 113
Install an operating system on the server using Oracle System Assistant.	"Install an Operating System (Oracle System Assistant)" on page 114

Note - To install an operating system on multiple servers, see the Oracle Enterprise Manager Ops Center product information page at `http://www.oracle.com/technetwork/oem/ops-center/index.html`.

Preparing to Install an Operating System

Before you install an operating system, prepare the server by performing the actions listed in the following table. You can complete these actions using Oracle System Assistant (recommended) or an alternative method.

Step	Task	Link
1.	Access the installation guide for the operating system you plan to install.	Go to one of the following libraries:

Step	Task	Link
		■ Oracle Server X5-2 Documentation Library: `http://www.oracle.com/goto/x5-2/docs` ■ Oracle Server X5-2L Documentation Library: `http://www.oracle.com/goto/x5-2l/docs` ■ For Oracle Server X5-4, go to: `http://www.oracle.com/goto/x5-4/docs-videos` ■ For Oracle Server X5-8, go to: `http://www.oracle.com/goto/x5-8/docs-videos`
2.	Prepare Oracle System Assistant for updates.	■ "Configure Network Interface Settings (Oracle System Assistant)" on page 181 ■ "Configure MOS to Enable Oracle System Assistant Updates" on page 183
3.	Download and install updates of platform software, drivers, and firmware.	"Downloading and Updating System Firmware and Software" on page 179
4.	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 67
5.	Configure RAID on the server.	"Configuring Storage Resources" on page 77
6.	Prepare the installation target and installation media.	Refer to the operating system installation guide.

▼ Install an Operating System (Oracle System Assistant)

Oracle System Assistant is the preferred method for installing Oracle Solaris, Windows, or Linux operating systems, or for installing Oracle VM software. While VMware ESXi is supported on the server, it cannot be installed using Oracle System Assistant.

Caution - Before you install Oracle Solaris 11.3, you might have to update your firmware. See your platform product notes for details.

Note - Only the Full Installation options are supported for Windows. The Server Core Installation options are not supported.

In the Oracle System Assistant application, you can prepare the server, install the operating system, and update the operating system drivers.

Before you begin installing an operating system, review "Preparing to Install an Operating System" on page 113.

1. **Ensure that the server has local or remote access to the installation media.**

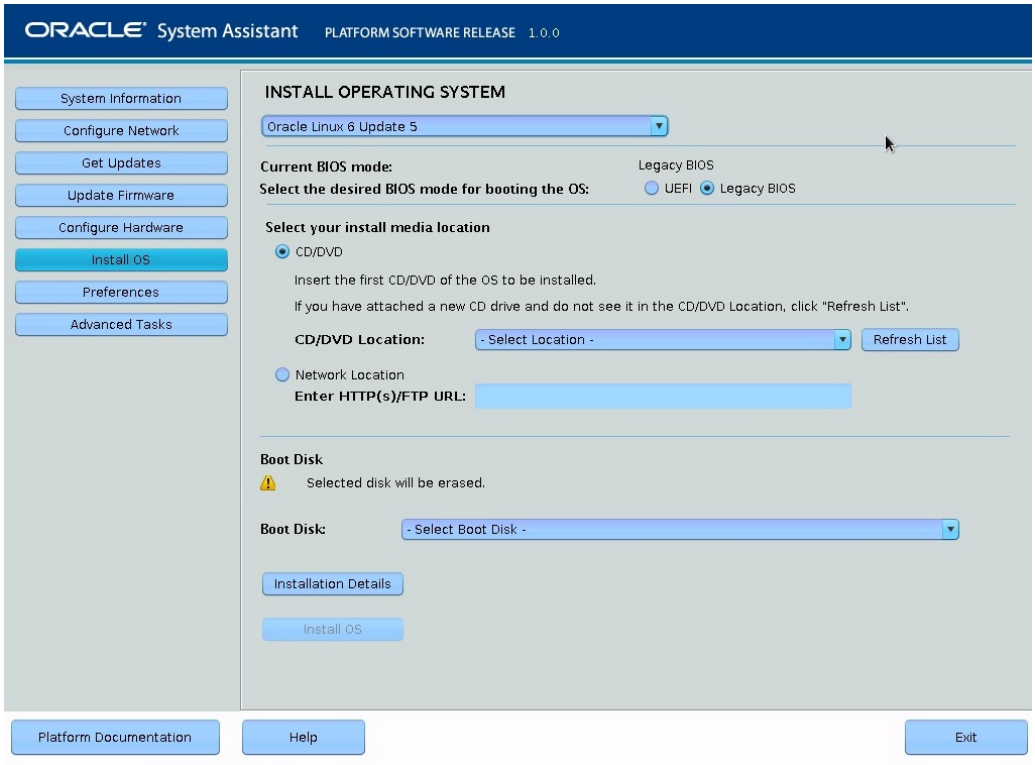
   For details about preparing the installation media, refer to the operating system installation guide.

2. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

3. **In the navigation pane, click the Install OS task button.**

   The Install Operating System screen appears.



4. **From the Supported OS drop-down list, select the operating system you want to install.**

Note - Oracle System Assistant facilitates installations for most of the operating systems supported by the server. However, some operating systems supported by the server cannot be installed using Oracle System Assistant.

5. **In the Select the Desired BIOS Mode for Booting the OS field, select UEFI or Legacy BIOS Boot Mode.**

   This field only appears if the target operating system supports booting in UEFI Boot Mode. For more information about the boot modes supported on the server, see "Legacy BIOS Boot Mode and UEFI Boot Mode" on page 67.

6. **In the Select Your Install Media Location panel, specify the local or network location of the operating system installation media.**

   If you launched Oracle System Assistant locally and you want to install an operating system from a network location, ensure that you have configured the network settings as described in "Configure Network Interface Settings (Oracle System Assistant)" on page 181.

   Note - If you select Network Location, use lowercase letters for the http or ftp portion of the URL. For more information see "Oracle System Assistant Known Issues" on page 169.

   If you launched Oracle System Assistant from Oracle ILOM and you want to install an operating system from a network location, place the installation media on a network shared location or mount the remote installation media on the service processor as described in "Configure a Host Storage Device Redirection Session" on page 49.

7. **In the Boot Disk portion of the screen, select the installation target from the drop-down list.**

   This field does not appear for Windows installations.

   Oracle System Assistant prepares the selected disk with the preinstallation environment and the components required to install the operating system.

Caution - Data loss The operating system installation erases the contents of the disk.

8. **Click Yes to confirm your boot device selection.**

9. **Click Installation Details.**

   The Operating System Installation Details dialog box appears.

10. **In the Operating System Installation Details dialog box, deselect any components that you do not want to install.**

Note - For most operating systems, all of the listed components are required.

11. **To exit the dialog box, click Close.**

12. **Click the Install OS button.**

13. **Respond to the installer prompts until the installation is complete.**
    After the installation is complete, the server reboots.

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 119
Learn about fault detection on the server.	“Fault Detection and Diagnostics Overview” on page 122
View a list of faulty components.	“Monitoring Hardware Faults” on page 123
Manually clear hardware faults.	“Manually Clearing Hardware Faults” on page 128

Viewing System Information and Inventory

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

- “View System Information and Inventory (Oracle System Assistant)” on page 119
- “View System Information and Inventory (Oracle ILOM)” on page 120
- “View System Information and Inventory (Oracle Hardware Management Pack)” on page 121

▼ View System Information and Inventory (Oracle System Assistant)

1. **Access Oracle System Assistant.**

For instructions, see “Accessing and Using Oracle System Assistant” on page 25.

2. **In the navigation pane, click System Information.**

   The System Overview screen provides general information about the system, such as the product name, BIOS version, and host IP address.

3. **Click the System Inventory tab.**

   The System Inventory screen appears.

4. **To view detailed information about a particular subsystem, click on the icon next to the subsystem name.**

5. **To expand or collapse information for all entries, click Expand All or Collapse All.**

▼ View System Information and Inventory (Oracle ILOM)

1. **To view information about server subsystems 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 41.

   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), perform the following steps:**

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

   For instructions, see "Accessing Oracle ILOM" on page 41.

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 124

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 51.

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
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	Refer to the Oracle VTS section in the *Oracle x86 Servers Diagnostics, Applications, and Utilities Guide for*

Tool	Description	Documentation
	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.	*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 124
- "View and Resolve Open Problems (Oracle Hardware Management Pack)" on page 125
- "View the Event Log (Oracle ILOM)" on page 126
- "Export System and Usage Logs (Oracle System Assistant)" on page 127

View and Resolve Open Problems (Oracle ILOM)

1. **To view open problems on the server 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 41.

   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), perform the following steps:**

   a. **Log in the the Oracle ILOM CLI.**
   For instructions, see "Accessing Oracle ILOM" on page 41.

   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 51.

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, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 41.

   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), perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 41.

   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

Export System and Usage Logs (Oracle System Assistant)

To assist you in troubleshooting the server, you can export system and Oracle System Assistant usage log files to a USB drive, FTP server, or network location. These files contain information about tasks performed on the server, including each task performed in Oracle System Assistant.

Caution - Information Security: The log files might contain secure information, and should be protected from unauthorized access.

1. **Launch Oracle System Assistant.**

   For instructions, see “Accessing and Using Oracle System Assistant” on page 25.

2. **In the navigation pane, click Advanced Tasks, and then click the Export Log tab.**

   The Export Usage Log page appears.

3. **Select one of the following export methods:**

   - Save to USB
   - Upload to FTP server
   - Secure file Copy

   Note - You cannot save the logs to the Oracle System Assistant USB drive.

4. **Fill in the required information for the transfer method you selected.**

5. **Click the Export Log button.**

   Oracle System Assistant exports the file to the location you specified.

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. That is, 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 the following procedure:

- "Manually Clear a Hardware Fault (Oracle ILOM)" on page 128

▼ Manually Clear a Hardware Fault (Oracle ILOM)

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

   For instructions, see "Accessing Oracle ILOM" on page 41.

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 129
View server inlet and exhaust temperatures, or enable the Enhanced PCIe Cooling Policy.	“Monitoring Server Inlet and Exhaust Temperature” on page 132

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 130
- “View Power Allocated to Server Components (Oracle ILOM)” on page 130
- “View Historical Power Consumption Data (Oracle ILOM)” on page 131

View Current Server Power Consumption (Oracle ILOM)

1. **To view current server power consumption 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 41.

   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), perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 41.

   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, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 41.

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), perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 41.

   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 41.

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 132
- "Set Enhanced PCIe Cooling Policy (Oracle ILOM)" on page 133

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

1. **To view the temperatures 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 41.

   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), perform the following steps:**

   a. **Log in to the Oracle ILOM CLI.**
   For instructions, see "Accessing Oracle ILOM" on page 41.

   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, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 41.

   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, perform the following steps:**

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

      For instructions, see "Accessing Oracle ILOM" on page 41.

   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

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 136

▼ 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 135.

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:

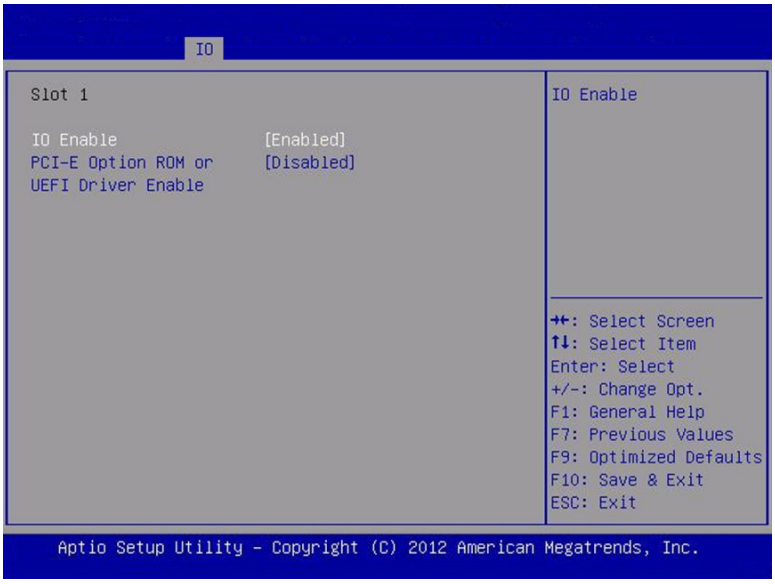
- For PCIe cards, select Select IO > Add In Cards.
- For Net 0, 1, 2, or 3, select IO > Internal Devices.

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.

   - **PCI-E Option ROM or UEFI Driver 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.

Configure Elastic Computing

The elastic computing feature allows you to maximize the performance of your server for your specific workload at runtime. Oracle servers with the elastic computing capability use an Intel Xeon® E7-8895v3 processor that combines the capabilities of multiple other Intel processors into one. This allows you to adjust the core counts and processor speeds dynamically at runtime, as often as you need.

Note - Elastic computing is supported on Oracle Server X5-4 and Oracle Server X5-8. For best performance, use the latest Oracle Solaris operating system or the latest version of Oracle Linux with UEK kernel.

During some periods, your enterprise applications or databases might benefit from having as many cores as possible, while at other times having fewer but faster cores results in greater overall performance. Rather than requiring you to pre-select a processor that is optimized for only one fixed workload, Oracle servers with the Intel Xeon E7-8895 v3 processor allow you to dynamically adjust to your enterprise or database workload at runtime to enable maximum performance at all times.

Oracle firmware and operating systems have been extended to allow you to take advantage of the elastic capabilities of the Intel Xeon E7-8895v3 processor by efficiently handling the processor state changes required to vary the core count and maximum frequency of the processor at runtime.

The elastic computing capability is simple to configure. As you deactivate cores, the remaining cores are able to achieve higher maximum frequencies. You can adjust the number of active cores at any time and as often as desired.

Understanding Elastic Computing

Elastic computing refers to the ability to maximize performance by selectively activating and deactivating processor cores, which causes a subsequent decrease or increase in maximum frequency of the remaining active cores. This allows you to set the optimal balance between core count and maximum frequency for a given workload.

Each core supports one or two virtual processors, depending on whether hyperthreading is enabled or not. Virtual processors support *threads*; increasing the number of active cores increases the number of virtual processors, which allows the application to support more threads.

Deactivating *all of the virtual processors* associated with a core deactivates the core.

Note - For Linux operating systems, *virtual processors* are called *logical processors*.

Some workloads are not able to take advantage of having many threads, but instead benefit from having fewer threads running at higher frequencies.

Before elastic computing, you had to order your server with a processor designed to have the optimal core count and frequency for your specific workload. Elastic computing gives you the ability to configure a single server dynamically to meet the needs of many types of workloads.

You can activate or deactivate cores using the Solaris or Oracle Linux OS, or the BIOS Setup Utility.

- Using the OS commands, you can activate and deactivate virtual processors while the application is running, causing the desired change in the number of cores available to optimize application performance. . This is the preferred method; however it requires that you have the Oracle Linux or Oracle Solaris operating systems. *Using this method you can adjust performance dynamically, as often as necessary.*
- If you have any other supported operating system, you can activate or deactivate cores using the BIOS Setup Utility. While you can change the settings whenever you wish, this method requires rebooting the server.

Note - If hyperthreading is enabled, to deactivate a core, you must deactivate both virtual processors associated with that core.

Cores and Maximum Frequency

The following table shows the relationship between active cores (on a given socket) and maximum frequency.

Note - The Intel Xeon E7-8895v3 processor has a core frequency of 2.6 GHz, but has a maximum frequency of 3.0 to 3.5 GHz. Changing the number of active cores changes the maximum frequency, not the core frequency.

Number of Active Cores	Maximum Frequency (GHz)
1 to 6	3.5
7 to 8	3.4
9 to 12	3.3
13 to 14	3.2
15 to 18	3.0

▼ Calculate Socket and Core Numbers

To activate or deactivate a core using operating system commands, you must know the number or numbers of the virtual or logical processors associated with that core. This task provides instructions for calculating those numbers.

- Your server has two, four, or eight sockets numbered 0 through 1, 3, or 7.
- Each socket has 18 cores numbered 0 through 17.
- Each core has one or two virtual processors associated with it, depending on whether hyperthreading is enabled or not. To deactivate a core, you must deactivate both virtual processors associated with that core.

You can also use operating system commands to display virtual processor numbers. See:

- “Configure Elastic Computing (Oracle Solaris Operating System)” on page 143
- “Configure Elastic Computing (Oracle Linux Operating System)” on page 145

1. **Calculate the number of the first virtual processor.**

   a. **Multiply the socket number by 18.**

   b. **Add the core number to the socket number.**

   For example, to calculate the number of the first virtual processor for core 2 on socket 2:

   2 x 18 +2 = 38

Note - If hyperthreading is disabled, this is the only number you need to activate or deactivate the core.

2. **If hyperthreading is enabled, calculate the number of the second virtual processor.**

   a. **Calculate the number of the first virtual processor by using the number or the calculation from Step 1.**

      For example: 2 x 18 +2 = 38

   b. **To calculate the total number of first virtual processors in the system, multiply the number of sockets by 18.**

      For example, in a 4 socket system: 4 x 18 = 72

   c. **Add the number of the first virtual processor to the total number of first virtual processors in the system.**

      For example: 72 + 38 = 110

3. **To obtain the core number, divide the first virtual processor number by 18.**

   - The quotient is the socket number.
   - The remainder is the core number.

   For example 38 / 18 = 2 with a remainder of 2. Virtual processor 38 runs on socket 2, core 2.

Note - To calculate the remainder using a calculator:

1. Divide the core number by the number of processors per core. This produces a whole number and a decimal. For example:

   38 / 18 = 2.111111111111111
2. The whole number is the socket. Subtract it from the total. For example:

   2.111111111111111 - 2 = .111111111111111
3. Multiply the decimal by 18 to find the remainder, which is the core number on this socket. For example:

   .111111111111111 x 18 = 2.

Core 38 is processor 2, core 2.

Configure Elastic Computing (Oracle Solaris Operating System)

Use this procedure to activate or deactivate cores using the Oracle Solaris operating system (OS). You can do this as often as you need, while the application is running.

Note - If a core is deactivated in BIOS, it cannot be activated in the OS.

Before You Begin This task requires root privileges.

Elastic computing requires Intel Speed Step, which can be enabled or disabled in the Advanced - CPU Power Management Configuration screen in the BIOS Setup Utility. This setting is enabled by default.

1. **If you do not know the number of the virtual processors associated with the core you wish to deactivate, use the `psrinfo -vp` command.**
   The following sample shows the output on a four-socket server:

```
# psrinfo -vp

The physical processor has 18 cores and 36 virtual processors (0-18 72-89)
continue conversion here...
  The core has 2 virtual processors (0 90)     Socket 0, core 0, VPs (0, 72)
  The core has 2 virtual processors (1 91)
  The core has 2 virtual processors (2 92)
  The core has 2 virtual processors (3 93)
  The core has 2 virtual processors (4 94)
  The core has 2 virtual processors (5 95)
  The core has 2 virtual processors (6 96)
  The core has 2 virtual processors (7 97)
  The core has 2 virtual processors (8 98)
  The core has 2 virtual processors (9 99)
  The core has 2 virtual processors (10 100)
  The core has 2 virtual processors (11 101)
  The core has 2 virtual processors (12 102)
  The core has 2 virtual processors (13 103)
  The core has 2 virtual processors (14 104)
  The core has 2 virtual processors (15 105)
  The core has 2 virtual processors (16 106)
  The core has 2 virtual processors (17 107)
    Socket 0, core 14, VPs (14, 74)
    x86 (GenuineIntel 306E7 family 6 model 62 step 7 clock 2793 MHz)
      Intel(r) Xeon(r) CPU E7-8895 v3 @ 2.60GHz
    ... To conserve space, physical processors 1 and 2 are not shown here
```

```
The physical processor has 18 cores and 36 virtual processors (72-89 105-119)
  The core has 2 virtual processors (72 144)     Socket 3, core 0, VPs (72, 144)
  The core has 2 virtual processors (73 145)
  The core has 2 virtual processors (74 146)
  The core has 2 virtual processors (75 147)
  The core has 2 virtual processors (76 148)
  The core has 2 virtual processors (77 149)
  The core has 2 virtual processors (78 150)
  The core has 2 virtual processors (79 151)
  The core has 2 virtual processors (80 152)
  The core has 2 virtual processors (81 153)
  The core has 2 virtual processors (82 154)
  The core has 2 virtual processors (83 155)
  The core has 2 virtual processors (84 156)
  The core has 2 virtual processors (85 157)
  The core has 2 virtual processors (86 158)
  The core has 2 virtual processors (87 159)
  The core has 2 virtual processors (88 160)
  The core has 2 virtual processors (89 161)     Socket 3, core 15 VPs (89, 161)
    x86 (GenuineIntel 306E7 family 6 model 62 step 7 clock 2793 MHz)
      Intel(r) Xeon(r) CPU E7-8895 v3 @ 2.60GHz
```

To obtain the core number, divide the first virtual processor number by 18.

- The quotient is the socket number.
- The remainder is the core number.

Note - You can also find the virtual processor and core numbers using the instructions in "Calculate Socket and Core Numbers" on page 141.

---

2. To activate or deactivate cores, use the `psradm` command to activate or deactivate the corresponding virtual processors.

- To deactivate cores, use `psradm -f` to deactivate individual virtual processors.

  To deactivate a core when hyperthreading is enabled, you must deactivate both virtual processors associated with the target core.

  For example:

  `psradm -f 71 143` deactivates virtual processors 71 and 143, thereby deactivating core 71.
- To activate cores and virtual processors, use the `psradm -n` command.

  Activating either virtual processor associated with a core activates the core.

  `psradm -n 71 143` activates both virtual processors associated with core 71.

See Also "Understanding Elastic Computing" on page 140

Configure Elastic Computing (Oracle Linux Operating System)

Use this procedure to activate or deactivate cores using the Oracle Linux operating system. You can do this as often as you need, while the application is running.

Note - If a core is deactivated in BIOS, it cannot be activated in the OS.

Before You Begin

This task is supported on Oracle Linux Unbreakable Enterprise Kernel.

This task requires root privileges.

Elastic computing requires Intel Speed Step, which can be enabled or disabled in the Advanced - CPU Power Management Configuration screen in the BIOS Setup Utility. This setting is enabled by default.

Note - For Linux operating systems virtual processors are called logical processors.

In the Linux command line, logical processors are referred to as `cpu`*NN*, where *NN* is the logical processor number. For example, logical processor 18 appears as `cpu18`.

1. **To find out how many logical processors your server has, use the command:**

```
ls /sys/devices/system/cpu/cpu*/online | wc -l
```

   - If hyperthreading is enabled, this returns the number of sockets x 36.
   - If hyperthreading is disabled, this returns the number of sockets x 18.

2. **To find the logical processor mapping, use the command:**

```
grep . /sys/devices/system/node*/cpulist
```

Note - You can also find the logical processor and core numbers using the instructions in "Calculate Socket and Core Numbers" on page 141.

This returns a list of sockets and logical processors.

- If hyperthreading is enabled, this returns two ranges of 18 logical processors per socket.
- If hyperthreading is disabled, this returns one range of 18 logical processors per socket.

The following example shows a four-socket server with hyperthreading enabled:

```
# grep . /sys/devices/system/node*/cpulist
socket 0:    0-17, 72-89
```

```
socket 1:   18-35, 90-107
socket 2:   36-53, 108-125
socket 3:   54-71, 126-143
```

3. **Use the `echo 0` command to deactivate logical processors.**

   For example, to deactivate the last core on the first socket on a four-socket server:

   - `echo 0 > /sys/devices/system/cpu/cpu17/online` deactivates logical processor 17.
   - `echo 0 > /sys/devices/system/cpu/cpu89/online` deactivates logical processor 89.

     Disabling logical processor 89 on a four-socket server is only necessary if hyperthreading is enabled.

4. **Use the `echo 1` command to enable logical processors.**

   For example, to activate the last core on the first socket on a four-socket server:

   - `echo 1 > /sys/devices/system/cpu/cpu17/online` to enable logical processor 17.

     Enabling either logical processor activates the core.
   - `echo 1 > /sys/devices/system/cpu/cpu89/online` to enable logical processor 89.

     Logical processor 89 only exists on a four-socket server if hyperthreading is enabled.

   The following sample shows the commands to deactivate the last core on every socket of a four-socket server with hyperthreading enabled:

```
# echo 0 > /sys/devices/system/cpu/cpu17/online
# echo 0 > /sys/devices/system/cpu/cpu89/online
# echo 0 > /sys/devices/system/cpu/cpu35/online
# echo 0 > /sys/devices/system/cpu/cpu107/online
# echo 0 > /sys/devices/system/cpu/cpu53/online
# echo 0 > /sys/devices/system/cpu/cpu125/online
# echo 0 > /sys/devices/system/cpu/cpu71/online
# echo 0 > /sys/devices/system/cpu/cpu143/online
```

   The following sample shows how to reverse this action and reactivate all the logical processors and cores that were deactivated in the previous example:

```
# echo 1 > /sys/devices/system/cpu/cpu17/online
# echo 1 > /sys/devices/system/cpu/cpu89/online
# echo 1 > /sys/devices/system/cpu/cpu35/online
# echo 1 > /sys/devices/system/cpu/cpu107/online
# echo 1 > /sys/devices/system/cpu/cpu53/online
# echo 1 > /sys/devices/system/cpu/cpu125/online
# echo 1 > /sys/devices/system/cpu/cpu71/online
# echo 1 > /sys/devices/system/cpu/cpu143/online
```

See Also “Understanding Elastic Computing” on page 140

Configure Elastic Computing (BIOS Setup Utility)

Use this task to activate or deactivate cores using the BIOS Setup Utility.

- If a core is deactivated in BIOS, it cannot be activated in the OS.
- When you activate or deactivate cores in BIOS, it applies the change to all sockets in the server equally.
- The BIOS Setup Utility provides the ability to select how many cores are active (1 through 18). It does not allow you to select individual cores or ranges of cores.

Before You Begin Elastic computing requires Intel Speed Step, which can be enabled or disabled in the Advanced - CPU Power Management Configuration screen. This setting is enabled by default.

1. **Start the BIOS Setup Utility.**
2. **Select Advanced > Processor Configuration.**
3. **Use the Active Processor Cores pull-down menu to select the number of cores you want to be active.**
   a. **Highlight the desired number of active cores in the list.**
   b. **Press the Enter key.**

      The Active Processor Cores dialog exits and the selected number of cores appears on the Advanced -> Processor Configuration screen.
4. **Check Advanced > CPU Power Management Configuration and verify that Intel Speed Step is enabled.**
5. **After you are finished, select F10 to save your work and exit the BIOS Setup Utility.**

See Also
- “Understanding Elastic Computing” on page 140

Ultra Performance Computing

This section describes Ultra Performance Computing, which is supported on Oracle Server X5-4 and Oracle Server X5-8 with Oracle Solaris or Oracle Linux operating systems.

This section includes:

Understanding Ultra Performance Computing

Ultra Performance Computing allows you to select one of several pre-configured settings that turn off numbers of cores, causing corresponding increases in the clock speed. This feature also configures the system so that the clock always runs at the indicated speed, removing jitter, or changes in clock speed due to conditions such as temperature or CPU load.

To change the Ultra Performance Computing settings, you must use the BIOS Setup Utility and reset the system. See "Configure Ultra Performance Computing (BIOS)" on page 150.

Note - You can also change the number of cores dynamically using Elastic Computing. For details, see "Configure Elastic Computing" on page 139.

The following table lists the available choices, including the number of active cores, and the corresponding clock speed:

Note - The Intel Xeon E7-8895v3 processor has a core frequency of 2.6 GHz, but when Ultra Performance Computing is enabled, it has a maximum frequency of 3.3 to 3.5 GHz. Changing the number of active cores changes the maximum frequency, not the core frequency.

Number of Active Cores	Maximum Frequency
4	3.5 GHz
8	3.4 GHz

Number of Active Cores	Maximum Frequency
12	3.3 GHz
18 - Feature is disabled	2.6 Ghz

Enabling Ultra Performance Computing causes three changes to the system:

- Turns off the corresponding number of cores
- Increases the maximum frequency and locks the clock speed at the indicated value.

  Ultra Performance Computing is designed so that the CPU always runs at the indicated speed. This removes the possibility of "jitter" or changes in the system's clock speed.
- Overrides all power management settings and disables those selections in the BIOS Setup Utility.

▼ Configure Ultra Performance Computing (BIOS)

Before You Begin To use this feature you must have an Oracle Server X5-4 or Oracle Server X5-8 with the Oracle Linux or Oracle Solaris operating system installed.

Before enabling Ultra Performance Computing:

- Enable any cores that are disabled by the operating system.
  - For Oracle Solaris see “Configure Elastic Computing (Oracle Solaris Operating System)” on page 143
  - For Oracle Linux see “Configure Elastic Computing (Oracle Linux Operating System)” on page 145
- For Oracle Linux operating systems, disable Intel native drivers.
  1. Add **`intel_pstate=disable intel_idle.max_cstate=0`** to the `grub.cfg` or `grub.conf` kernel line.
  2. Reboot your system.

1. **Start the BIOS Setup Utility.**

   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.

2. **Select Advanced > CPU Power Management Configuration.**

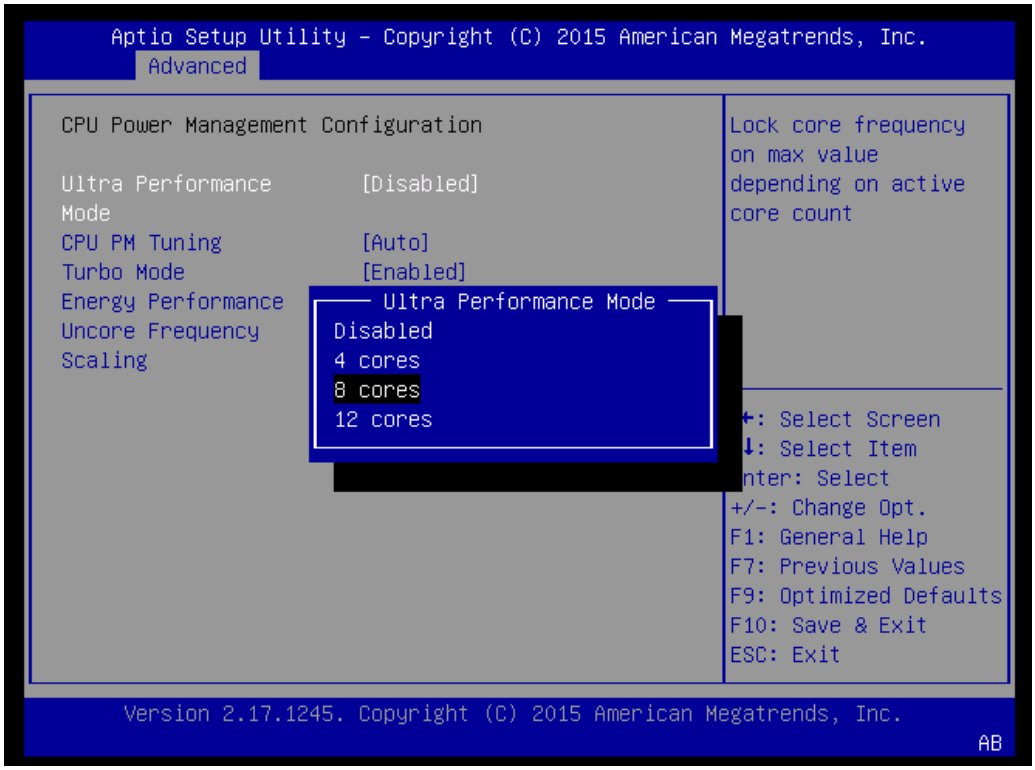
3. **Use the Ultra Performance Mode pull-down menu to select the number of cores you want to be active.**

   a. **Highlight the desired number of active cores in the list.**

   b. **Press the Enter key.**

   The Ultra Performance Mode pull-down menu exits and the your selection appears on the Advanced > CPU Power Management Configuration page.

   If you selected 4, 8, or 12 cores, all other selections on the Advanced > CPU Power Management Configuration page are disabled.



4. **After you are finished, select F10 to save your work and exit the BIOS Setup Utility.**

See Also

- "Understanding Ultra Performance Computing" on page 149

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 153
Restore a saved BIOS, Oracle ILOM, or RAID configuration.	“Restoring Saved Firmware Configurations” on page 158
Reset the BIOS firmware to factory defaults.	“Resetting the Firmware to Default Settings” on page 163

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 Firmware and Hardware Configurations (Oracle System Assistant)” on page 154
- “Back Up the Current BIOS Firmware Configuration (Oracle ILOM)” on page 154
- “Back Up the Current Oracle ILOM Firmware Configuration (Oracle ILOM)” on page 155
- “Back Up the Current BIOS Firmware Configuration (Oracle Hardware Management Pack)” on page 157
- “Back Up the Current Oracle ILOM Firmware Configuration (Oracle Hardware Management Pack)” on page 158

Back Up the Current Firmware and Hardware Configurations (Oracle System Assistant)

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

2. **In the navigation pane, click Advanced Tasks, and then click the Export Hardware Configuration tab.**

3. **Select the configurations you want to export.**

4. **If you selected Service Processor Configuration, enter and confirm a Passphrase for the XML file.**

5. **In the Transfer Method drop-down list, select a Transfer Method.**

6. **Specify the destination of the exported configurations.**

7. **Click Export.**

   The system exports the current configurations as XML files, zips the files, and then writes the resulting zip file to the specified destination.

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 41.

   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 41.

   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 41.

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 41.

   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 51.

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 51.

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 Saved Firmware and Hardware Configurations (Oracle System Assistant)" on page 159
- "Restore a Saved BIOS Firmware Configuration (Oracle ILOM)" on page 159
- "Restore a Saved Oracle ILOM Firmware Configuration (Oracle ILOM)" on page 161
- "Restore a Saved BIOS Firmware Configuration (Oracle Hardware Management Pack)" on page 162
- "Restore a Saved Oracle ILOM Firmware Configuration (Oracle Hardware Management Pack)" on page 163

Restore Saved Firmware and Hardware Configurations (Oracle System Assistant)

Caution - Loss of service If the information in the imported XML files is not configured correctly, or if the files were exported from a mismatched system, this procedure could disable your server.

Before you begin, ensure that you have one XML file for each configuration that you want to import, and that these files are included in a single zip file.

The content of the XML files must be accurate and complete. The system used to export the file must have the same model number, firmware versions, disk drive configuration, and option cards as the system being updated.

1. **In the navigation pane, click Advanced Tasks, and then click the Import Hardware Configuration tab.**
2. **Select a Transfer Method from the drop-down list.**
3. **Specify the location of the XML file.**
4. **Click Get File.**

   The system imports the configuration information from the zipped XML files you specified. If the files are not configured correctly, Oracle System Assistant displays a warning message and prompts you to confirm or exit.

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 41.

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 41.

   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 41.

   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 41.

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 51.

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 51.

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)

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

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 persist 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 56.
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 System Assistant)

Before you begin, consider backing up the current BIOS configuration. For instructions, see "Backing Up Current Firmware and Hardware Configurations" on page 153.

1. **Launch Oracle System Assistant.**
   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.
2. **In the navigation pane, click Configure Hardware, and then click the Restore BIOS Defaults tab.**
3. **Select the Restore Defaults at Next Boot check box.**
4. **Click Apply Settings.**

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 41.
   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 41.
   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 51.

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 System Assistant)

Before you begin, consider backing up the current Oracle ILOM configuration. For instructions, see "Backing Up Current Firmware and Hardware Configurations" on page 153.

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

2. **In the navigation pane, click Configure Hardware, and then click the Service Processor Configuration tab.**

3. **Select Configuration Management from the drop-down list.**

4. **Select one of the following options in the Restore Defaults field:**

   - **All**: Removes all service processor configuration data, but preserves log files.
   - **Factory**: Removes all service processor configuration data and log files.

5. **Click Apply Settings.**

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 41.

   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 41.

   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 51.

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`

Troubleshooting Oracle System Assistant

If you are unable to launch Oracle System Assistant, see the following sections to troubleshoot the utility.

Task	Link
Provides a list of known issues for Oracle System Assistant.	“Oracle System Assistant Known Issues” on page 169
Perform basic troubleshooting steps to determine a cause if Oracle System Assistant is not functioning properly.	“Troubleshoot and Verify Oracle System Assistant” on page 170
Ensure that the Oracle System Assistant media files have not been damaged.	“Check Oracle System Assistant Media Integrity” on page 173
Restore the Oracle System Assistant image to the Oracle System Assistant USB drive if it has been corrupted.	“Restore Oracle System Assistant Software” on page 174

Oracle System Assistant Known Issues

This section describes known issues with Oracle System Assistant.

Oracle System Assistant Does Not Provide Complete Support for Oracle VM 3.3.1 Installation (19870207, 19870253)

If you use Oracle System Assistant to install Oracle VM 3.3.1, the network and boot loader configuration screens do not appear during the installation process. The boot loader default values are applied to the installation.

Workaround

Do one of the following:

- If you want to configure the network and boot loader during installation, use a different method to install Oracle VM 3.3.1.
- If you wish to accept default boot loader values, install Oracle VM 3.3.1 using Oracle System Assistant with one of the following methods:
  - Use the network-based installation method, which will allow you to set the network configuration during the installation process.
  - Use the CD, DVD, or virtual ISO method and complete the network configuration after Oracle VM is installed.

Use Lowercase Letters for Oracle System Assistant Network OS Installation Location (19872922)

Oracle System Assistant does not recognize upper case "HTTP" or "FTP" as part of a URL in OS Install screen.

Workaround

When doing network-based OS installation using Oracle System Assistant, use lowercase letters for the http or ftp portion of the URL.

▼ Troubleshoot and Verify Oracle System Assistant

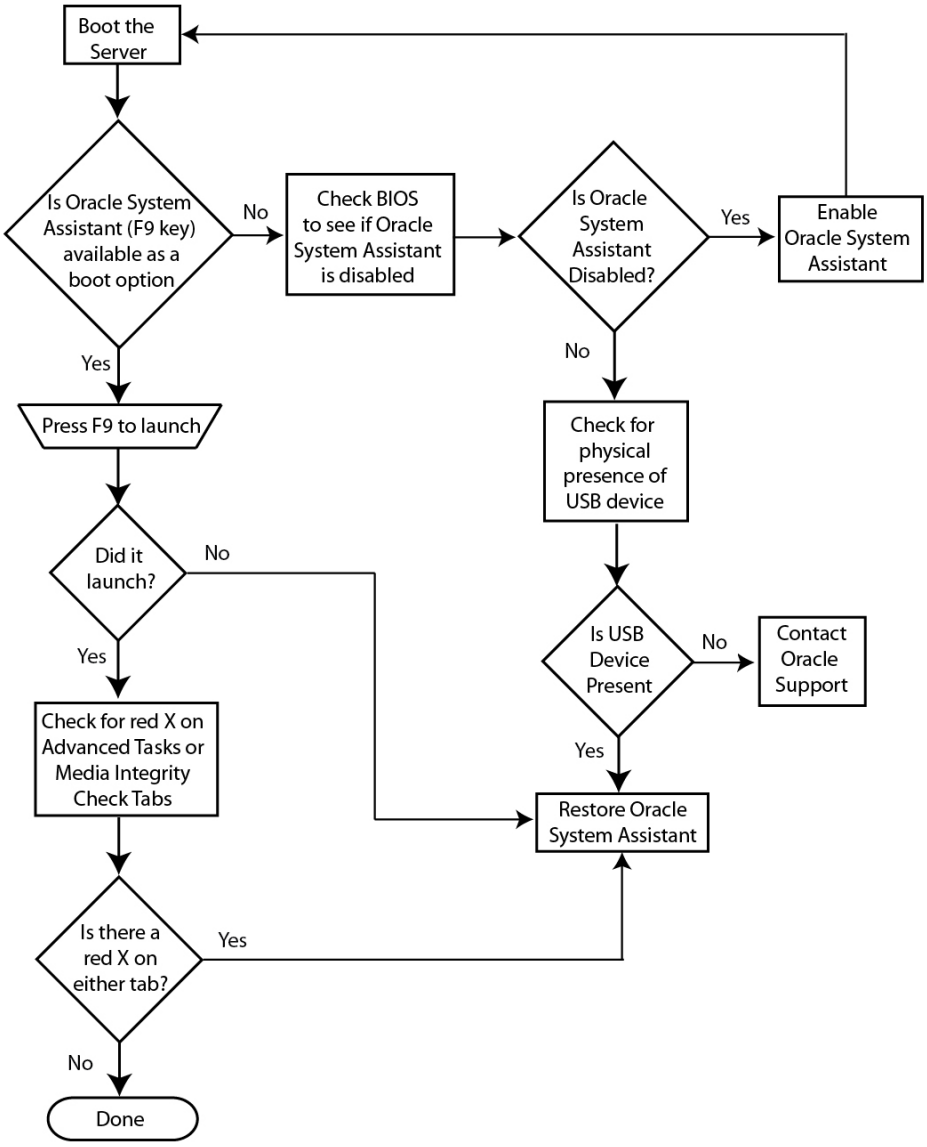
Your server supports Oracle System Assistant, and, unless you have opted out, it is preinstalled in the server. If Oracle System Assistant is not visible from the file system, or if you are unable to launch it, it could be offline, corrupted, or not installed.

Use this procedure to verify the functionality of Oracle System Assistant and fix it if necessary.

1. **Use the following flowchart or the following steps to troubleshoot Oracle System Assistant.**

   Launch Oracle System Assistant locally.

For instructions, see “Launch Oracle System Assistant Locally” on page 28.



2. **Boot the server.**

3. **To determine whether Oracle System Assistant is in the boot list, perform one of the following actions:**

   - See if F9 appears in BIOS POST, or
   - Select F2 to access the BIOS Setup Utility, then select the Boot menu.

     Oracle System Assistant should appear in the list of boot options.

4. **If Oracle System Assistant appears in the boot list, try to launch it. See "Launch Oracle System Assistant Locally" on page 28.**

   - If it launches, proceed to Step 7.
   - If it does not launch, restore it.

     See "Restore Oracle System Assistant Software" on page 174.

5. **If Oracle System Assistant does not appear in BIOS POST or as a boot option, access the BIOS Setup Utility and check if Oracle System Assistant is disabled.**

   - If Oracle System Assistant is disabled, enable it in the BIOS Setup Utility.

     See "Enable or Disable Oracle System Assistant (BIOS)" on page 33.
   - If Oracle System Assistant is NOT disabled, check to see if it is physically present in the server. Check your hardware documentation for details and contact Oracle Support.

6. **Perform one of the following actions:**

   - If Oracle System Assistant is enabled in BIOS and physically present but you still cannot launch it, restore Oracle System Assistant.

     See "Restore Oracle System Assistant Software" on page 174.
   - If Oracle System Assistant is not physically present, contact Oracle Support.

7. **If you can launch Oracle System Assistant successfully, look at the Advanced Tasks and Media Integrity tabs.**

   - If you see a red "X" in either tab, restore Oracle System Assistant.

     See "Restore Oracle System Assistant Software" on page 174.
   - If you do not see a red "X" in either tab, Oracle System Assistant is working correctly.

Related Information

- "Accessing and Using Oracle System Assistant" on page 25

Check Oracle System Assistant Media Integrity

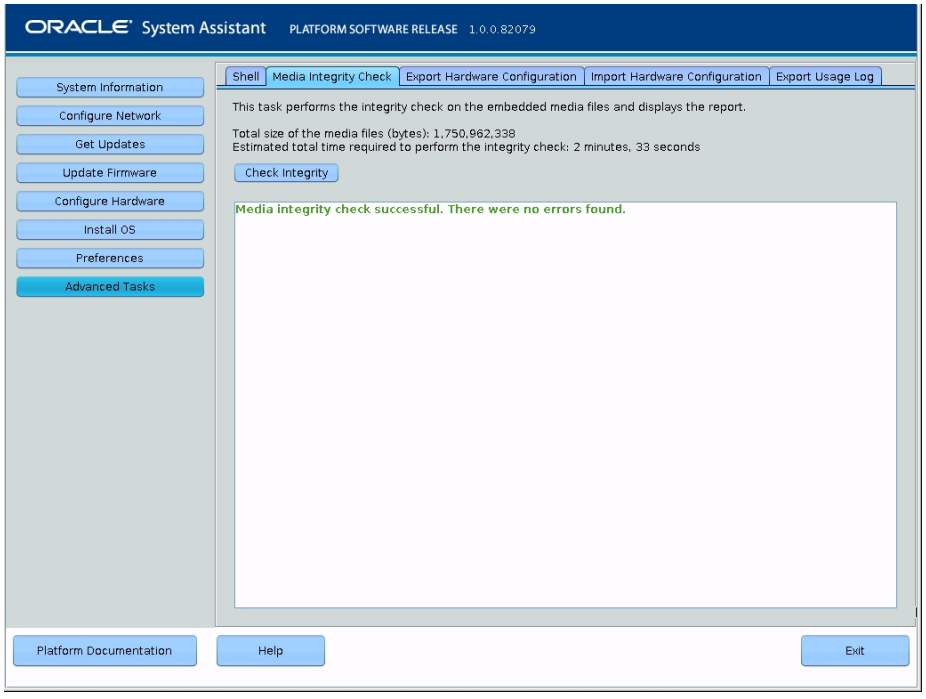
The Media Integrity Check task verifies the integrity of the Oracle System Assistant media files and displays a report. You should perform this task when the USB device produces errors or when requested by Oracle Service personnel.

If your version of Oracle System Assistant is damaged, download the Oracle System Assistant updater image file for your server from My Oracle Support. For more information, see "Restore Oracle System Assistant Software" on page 174.

Use this procedure to verify the integrity of the Oracle System Assistant USB media files.

1. **Launch Oracle System Assistant.**
   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

2. **In the navigation pane, click Advanced Tasks, and then click the Media Integrity Check tab.**
   The Media Integrity Check screen appears.



3. **Click the Check Integrity button.**

   The system tests the Oracle System Assistant USB device and generates a report. The test provides an estimated run time. You can cancel the test at any time.

Related Information

- "Restore Oracle System Assistant Software" on page 174

▼ Restore Oracle System Assistant Software

If the Oracle System Assistant software has been overwritten, erased, or corrupted, you can download the image file that is available from the My Oracle Support web site to restore Oracle System Assistant to the USB device.

Use this procedure to restore the Oracle System Assistant software.

1. **Download the Oracle System Assistant image file from the My Oracle Support web site.**

   Download the image that is specific to your server. The package name for the update image for the server is: *system_name and SW version* `-- Oracle System Assistant`

   For information about accessing My Oracle Support and downloading this image, see "Download Firmware and Software From My Oracle Support" on page 186.

2. **To make the update image available to the server, do one of the following:**

   - **Use the image file to burn a physical DVD image.**

     Install the DVD in a DVD drive attached to the server.

   - **Make the update image file available to the server as an ISO image using the Oracle ILOM Remote System Console Plus application.**

3. **Access the BIOS Setup Utility.**

   For instructions, see "Accessing the BIOS Setup Utility" on page 56.

4. **Navigate to the Boot menu.**

5. **In the Boot menu, specify the Oracle System Assistant installation media as the boot device:**

- **If you chose to burn a recovery DVD and have placed the DVD into an attached DVD drive, select `SATA:HDD:P4:TSSTcorp CDDVDW TS-T633C` as shown in the Please Select Boot Device menu, and then press `Enter`.**

- **If you chose to use the Oracle ILOM Remote System Console Plus application to make the recovery image available to the server as a redirected DVD or as an ISO image, select `USB:VIRTUAL:AMI Virtual CDROM 1.00` as shown in the Please Select Boot Device menu, and then press `Enter`.**

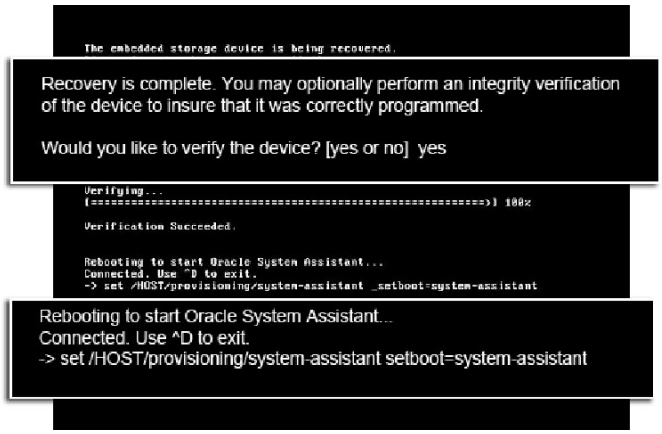
Note - The items listed in the Please Select Boot Device menu might differ, depending on whether the system was booted in Legacy BIOS Boot Mode or UEFI Boot Mode.

A message appears, and a prompt asks whether you want to continue the recovery process.

6. **Type `yes` to confirm that you want to proceed, and then press Enter.**

The following message appears, indicating the progress of the recovery process. Do *not* interrupt the recovery process.

When the recovery process is finished, you have the option to verify the integrity of the files on the USB drive.



7. **At the verification prompt, do one of the following:**

   - **To skip verification of the USB drive, type `no`, and then press Enter.**

     The server boots to Oracle System Assistant.

   - **To verify the USB drive, type `yes`, and then press Enter.**

The verification process starts. When the process is finished, the server boots to Oracle System Assistant.

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, or from Oracle System Assistant.

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 179
If you intend to install updates across the network using Oracle System Assistant, prepare Oracle System Assistant for updates.	“Preparing Oracle System Assistant for Updates” on page 181
If you do not intend to install updates using Oracle System Assistant, obtain updates from My Oracle Support.	“Obtaining Software and Firmware Updates” on page 186
Install updates using Oracle System Assistant, Oracle ILOM, or Oracle Hardware Management Pack.	“Install Software and Firmware Updates” on page 188

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, and what bugs are fixed in 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.

- Oracle System Assistant allows you to select specific updates to apply. It also allows you to apply updates from an older software release.
- 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
ORACLE SYSTEM ASSISTANT UPDATER	Boot ISO file	Bootable file that replaces older versions of Oracle System Assistant and provides updated versions of firmware, server-specific drivers for supported operating systems, server management tools. This patch updates the firmware, drivers, and server management tools on the USB drive, but does not install them.
LOCAL UPDATE CONTENT	Oracle System Assistant	Updates the existing version of Oracle System Assistant, and provides updated versions of firmware, server-specific drivers for supported operating systems, server management tools. This patch updates the firmware, drivers, and server management tools on the USB drive, but does not install them.
FIRMWARE PACK	Oracle System Assistant 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.

Patch Name	Tools	Description
		An OS Pack is available for each supported operating system version.
ALL PACKS	Oracle System Assistant Oracle ILOM Oracle Hardware Management Pack Operating system command-line application	All available updates, except updates to Oracle VTS or Oracle System Assistant. This patch includes the Firmware Pack, all OS Packs, and server-related documentation.

Preparing Oracle System Assistant for Updates

Before you can use Oracle System Assistant to check for updates from My Oracle Support, you must prepare Oracle System Assistant to access My Oracle Support. To prepare Oracle System Assistant, see the following procedures:

- “Configure Network Interface Settings (Oracle System Assistant)” on page 181
- “Configure MOS to Enable Oracle System Assistant Updates” on page 183.

▼ Configure Network Interface Settings (Oracle System Assistant)

Use this procedure to configure network settings for network devices, such as Ethernet controllers, detected on the server.

Before you can download software and firmware updates using the Get Updates task in Oracle System Assistant, you must configure one of the Ethernet ports on the server for Internet access.

When you launch Oracle System Assistant, the application automatically requests an IP address for NET0 from a DHCP server on the network. If NET0 is not connected to a network that is DHCP enabled, you must manually configure network settings for the port.

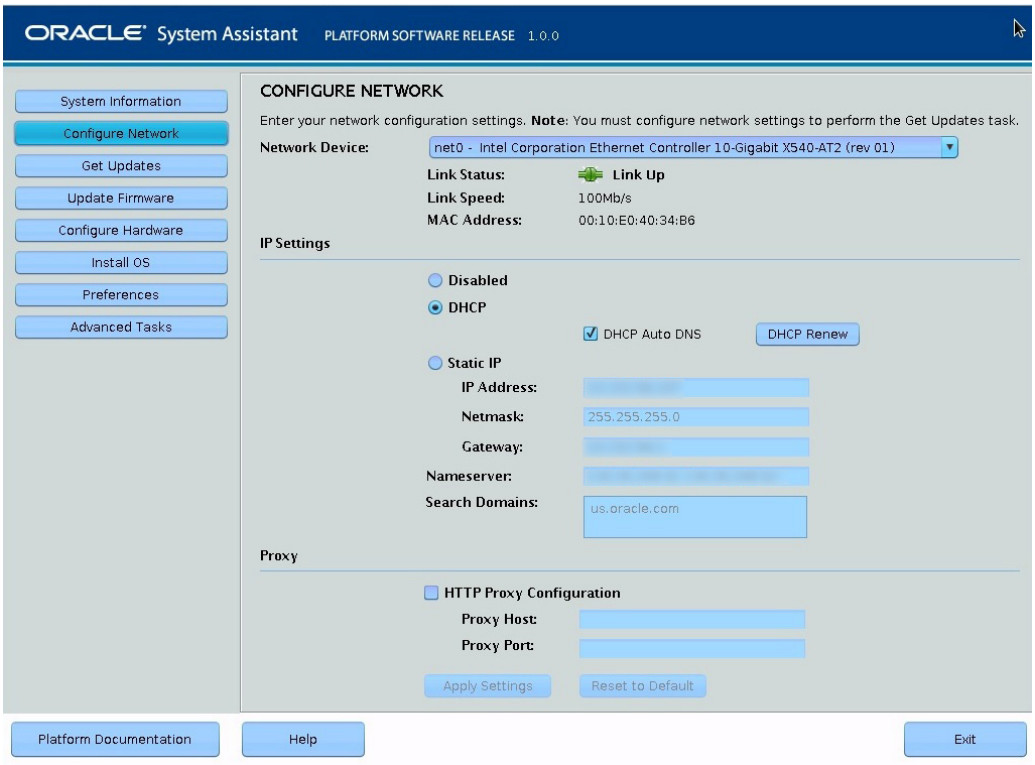
1. **Launch Oracle System Assistant.**

   For instructions, see “Accessing and Using Oracle System Assistant” on page 25.

2. **In the navigation pane, click Configure Network.**

If the server is connected to the network through a proxy that requires authentication, enter credentials for the authentication server.

The Configure Network screen appears.



3. **Select a device from the Network Device drop-down list.**

4. **In the IP Settings panel, select DHCP or Static IP to indicate how the network device should obtain an IP address:**

   - **DHCP**: An IP address is automatically assigned to the device using the Dynamic Host Configuration Protocol (DHCP). The DHCP setting allows Auto DNS through DHCP. If you select the DHCP Auto DNS check box, a domain name server IP address and search domain are automatically configured through DHCP. Otherwise, you must specify the IP address of the domain name server.

Note - Clicking the DHCP Renew button causes Oracle System Assistant to request an IP address for the device from the DHCP server.

- **Static**: Network settings are not automatically assigned. You must specify an IP address, Netmask, and Gateway for the device.

5. **In the Proxy panel, optionally configure an HTTP proxy:**

   a. **Select the HTTP Proxy check box.**

   b. **Specify a Proxy Port and Proxy Host.**

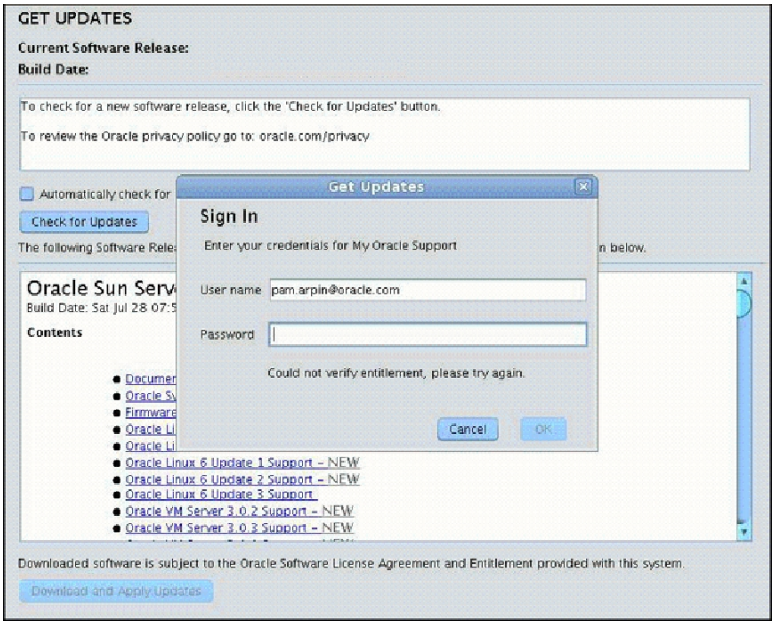
6. **Click Apply Settings.**

   A confirmation prompt appears.

7. **Click Yes to confirm your changes.**

▼ Configure MOS to Enable Oracle System Assistant Updates

Before downloading a platform software release update, Oracle System Assistant verifies that the server is entitled to obtain downloads from My Oracle Support (MOS). Before updated files can be downloaded, the server serial number must be associated with a valid MOS Customer Support Identifier (CSI). If this association has not been made, then the update process halts at the Get Updates Sign-in screen.



Use this procedure to associate the server with a CSI on MOS.

Note - This is a one-time setup procedure. Once the association is made, the configuration persists.

Before you begin, ensure that you have the following information available:

- Customer Support Identifier (CSI), which is printed on the Oracle Premier Support for Systems purchase confirmation letter or available in the server warranty contract documents
- Server serial number, which is available on the Oracle System Assistant System Overview tab
- Organization name

1. **In a web browser, go to My Oracle Support at `https://support.oracle.com`.**
2. **Log in to My Oracle Support.**
3. **Select the Settings tab from the More drop-down list.**
4. **In the navigation pane, click Accounts/Privileges.**

5. **Click the Request Access button in the Support Identifiers window.**

   The Request Access to a Support Identifier window appears.

6. **Do one of the following:**

   - **If you have the CSI, enter it in the Support Identifier field of the Request Access tab and click Request Access.**

   Approval *might* be required, but once access is granted, the Oracle System Assistant Get Updates capability is enabled for all servers associated with the CSI.

Note - If you cannot obtain the CSI or are unable to download updates for the server using Oracle System Assistant, contact Oracle Support.

   - **If you have the server serial number but do not have the CSI, perform the following steps:**

     a. **Click the Find a Support Identifier tab.**

b. **Type the server serial number in the System Serial Number field.**

c. **Type the organization name in the Organization field.**

d. **Click Search.**

e. **Highlight the CSI in the search results table and click Request Access.**
Approval *might* be required, but, once access is granted, the Oracle System Assistant Get Updates capability is enabled for all servers associated with the CSI.

Note - If you cannot obtain the CSI or are unable to download updates for the server using Oracle System Assistant, contact Oracle Support.

Obtaining Software and Firmware Updates

Before you can install software and firmware updates, you must obtain them. Use one of the following options:

- **Oracle System Assistant**: Using Oracle System Assistant you can download updates from My Oracle Support.

  To use Oracle System Assistant to obtain and install updates, see "Install Software and Firmware Updates" on page 188.
- **My Oracle Support**: You can download updates directly from My Oracle Support. Then, you can use Oracle System Assistant, Oracle ILOM, 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 179.

To obtain updates from My Oracle Support see: "Download Firmware and Software From My Oracle Support" on page 186

▼ 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 X5-2) 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.

    To update Oracle System Assistant, select either:

    - Oracle Server X*N*-*N* SW *X.Y.Z* LOCAL UPDATE CONTENT to apply updates to your existing version of Oracle System Assistant.
    - Oracle Server X*N*-*N* SW *X.Y.Z* - ORACLE SYSTEM ASSISTANT UPDATER to replace Oracle System Assistant with an entirely new version.

Install Software and Firmware Updates

Once you have access to software and firmware updates, see the following procedures to install them:

- “Updating Oracle System Assistant and the Firmware Files on the Oracle System Assistant USB Drive” on page 188
- “Update the BIOS, Service Processor, and Hardware Device Firmware (Oracle System Assistant)” on page 193
- “Update the BIOS and Service Processor Firmware (Oracle ILOM)” on page 195
- “Update the Hardware Device Firmware (Oracle Hardware Management Pack)” on page 198

Updating Oracle System Assistant and the Firmware Files on the Oracle System Assistant USB Drive

Before you can update your server using Oracle System Assistant, you must update Oracle System Assistant so that it has the files to install on your server.

When you update Oracle System Assistant it does two things:

- Applies updates to the Oracle System Assistant application *immediately*.
- Updates copies of software, firmware, and drivers on the Oracle Systems Assistant USB drive to the latest versions. *These can be installed on the server later.*

The following table lists and describes the different methods of updating Oracle System Assistant:

Action and Link	Description
“Replace Oracle System Assistant and Update the Firmware Files on the Oracle System Assistant USB Drive (BIOS)” on page 189	Boot from the ISO file included in the patch ORACLE SYSTEM ASSISTANT UPDATER. This installs a completely new version of Oracle System Assistant and updates all firmware and drivers so that they are available to be installed on your server.
“Update Oracle System Assistant and the Firmware Files on the Oracle System Assistant USB Drive (Oracle System Assistant)” on page 190	Start Oracle System Assistant and select Get Updates. This causes Oracle System Assistant to apply selected updates to the existing version of Oracle System Assistant. This method includes two options, remote and local:

Action and Link	Description
	■ **Get Remote Updates**: Use the Get Remote Updates tab to check for updates from My Oracle Support over the network, and then download and install selected updates. ■ **Get Local Updates**: Use the Get Local Updates tab to install updates from the ISO file included in the patch LOCAL UPDATE CONTENT.

To use either of the downloadable files to update Oracle System Assistant on a server that is not connected to the net, download the ISO file to a server that is connected to the net, make the ISO file available to the non-connected server using a CD/DVD drive, network location, or USB drive, and perform the corresponding replacement procedure.

▼ Replace Oracle System Assistant and Update the Firmware Files on the Oracle System Assistant USB Drive (BIOS)

This procedure replaces the Oracle System Assistant application, and places the latest versions of the firmware and drivers on the USB drive so that they are available to be installed. It does *not* install the updated firmware and drivers.

To install the updated firmware and drivers, see "Update the BIOS, Service Processor, and Hardware Device Firmware (Oracle System Assistant)" on page 193.

You can use this procedure to replace Oracle System Assistant on a server that is not connected to the network.

1. **Obtain a copy of the ORACLE SYSTEM ASSISTANT UPDATER patch. For details, see "Obtaining Software and Firmware Updates" on page 186.**
   If the server you are updating is not connected to the network, after you get the bootable updater ISO file, make it available to the server using a CD/DVD drive, network location, or USB drive.
2. **Configure BIOS to boot from the updater ISO file.**
   For details, see "Access the BIOS Setup Utility" on page 56.
3. **Boot from the updater ISO file.**
   The server boots from the updater ISO file.
4. **Follow the prompts to complete the installation.**
   This installs a new version of Oracle System Assistant on your server and updates the firmware, software, and driver files on the Oracle System Assistant USB drive.
   To install the firmware, software, and drivers, see "Install Software and Firmware Updates" on page 188.

▼ Update Oracle System Assistant and the Firmware Files on the Oracle System Assistant USB Drive (Oracle System Assistant)

This procedure updates the Oracle System Assistant application, and places the latest versions of the firmware and drivers on the USB drive so that they are available to be installed. It does *not* install the updated firmware and drivers.

To install the updated firmware and drivers, see "Update the BIOS, Service Processor, and Hardware Device Firmware (Oracle System Assistant)" on page 193.

Before You Begin If you are going to use the local updates option obtain a copy of the non-bootable ISO file. For details, see "Obtaining Software and Firmware Updates" on page 186.

To update a server that is not connected to the web, download the non-bootable updater file (LOCAL UPDATE CONTENT) to a connected server and then make the corresponding ISO file available to the unconnected server using a CD/DVD drive, network location, or USB drive.

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

2. **In the navigation pane, click Get Updates, and then click one of the following tabs:**

   - **Get Remote Updates**
   - **Get Local Updates**

3. **If you selected the Get Remote Updates tab, perform the following steps:**

   a. **Ensure that you have performed the procedures in "Preparing Oracle System Assistant for Updates" on page 181.**

   b. **Click the Check for Updates button.**

      If updates are available, they appear in the Available Updates drop-down list.

   c. **Select an update from the Available Updates drop-down list.**

   d. **Click the Download and Apply Updates button.**

      The Get Updates Sign-In screen appears.

e. **Provide your My Oracle Support (MOS) credentials.**

Enter your MOS user name and password.

Note - If the sign-in process stops, it might be because your user name and password do not match, or because My Oracle Support is not configured to enable your server to get updates. To configure My Oracle Support to enable your server to get updates, see "Configure MOS to Enable Oracle System Assistant Updates" on page 183.

The server downloads the updates and then displays a message asking to reboot the server.

f. **Select OK.**

The server reboots and restarts Oracle System Assistant.

4. **If you selected the Get Local Updates tab, perform the following steps:**

Note - To update Oracle System Assistant on a server that is not connected to the network, use this method.

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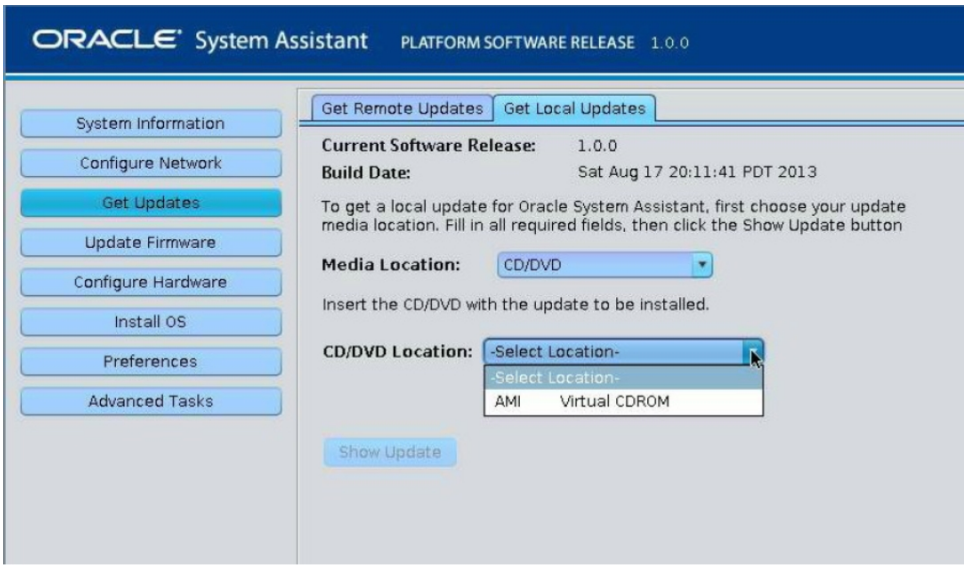
a. Use the drop-down lists on the Get Local Updates screen to navigate to the updater ISO file.



b. Click the Show Update button.

A browser appears.

c. In the browser, select the update you want to install, and then click Get Updates.

For best results, keep your version of Oracle System Assistant synchronized with the latest version available from My Oracle Support.

The server reboots and restarts Oracle System Assistant.

This updates Oracle System Assistant and updates the firmware, software, and driver files on the Oracle System Assistant USB drive.

To install the firmware, software, and drivers, see "Install Software and Firmware Updates" on page 188.

▼ Update the BIOS, Service Processor, and Hardware Device Firmware (Oracle System Assistant)

Oracle System Assistant enables you to update the system firmware to the latest versions. You can preview the changes, compare version numbers, manually select the components to update, or choose to update all firmware components.

For best results, update all firmware components to the latest versions.

Note - Some firmware components require a server reboot immediately after a firmware update. If required, the server might automatically reboot one or more times during the update process.

The time required to perform an update on the service processor firmware depends on whether the Host-to-ILOM Interconnect is enabled. If the interconnect is enabled, the update is completed more quickly. For more information about the Host-to-ILOM Interconnect, see "Oracle ILOM Management Connection Options" on page 41.

Before you begin, perform the procedures in "Preparing Oracle System Assistant for Updates" on page 181.

Note - To ensure that you have the latest firmware versions, complete the procedure in "Update Oracle System Assistant and the Firmware Files on the Oracle System Assistant USB Drive (Oracle System Assistant)" on page 190.

---

1. **Launch Oracle System Assistant.**

   For instructions, see "Accessing and Using Oracle System Assistant" on page 25.

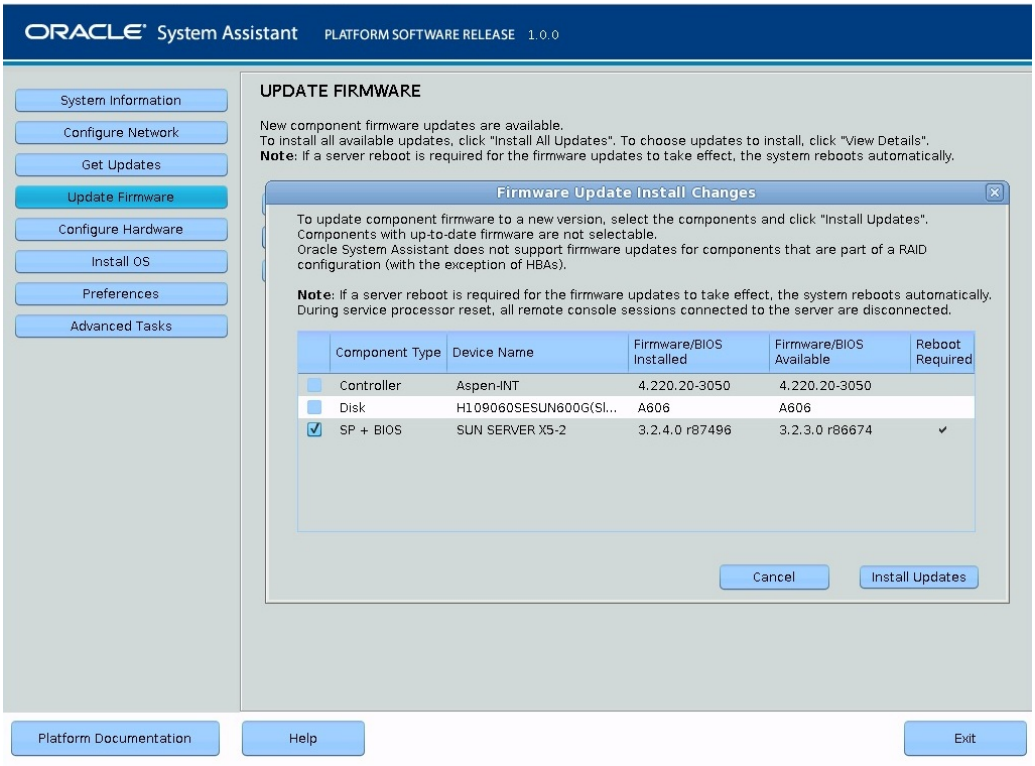
2. **In the navigation pane, click Update Firmware.**

3. **Click the Check for Firmware Updates button.**

   The Firmware Update Check progress bar appears. Once Oracle System Assistant has finished checking for updates, the Install All Updates and View Details buttons appear.

4. **Click the View Details button.**

The Firmware Update Install Changes dialog box appears.



5. **Select the firmware components you want to update.**

6. **Click the Install Updates button.**

   During the update process, the server might reboot several times. After each reboot, the server will automatically launch Oracle System Assistant and continue the update process.

   If the firmware update includes updates to Oracle ILOM, remote console sessions will be disconnected during the update process.

   Oracle System Assistant displays a completion message when the updates are all installed.

Caution - Data corruption and loss of functionality: Do not interrupt the firmware update process.

▼ 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 186.**

   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 41.

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

   c. **Click the Enter Update Mode button.**

      The Firmware Update page appears.

   d. **To select a firmware image, either:**

      - Click Browse to browse to the firmware image, and then click Upload.
      - Input the path to the firmware image, and then click Upload.

      Oracle ILOM validates the firmware image and then displays options in the Firmware Verification page.

   e. **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.

f. Click Start to start the update process, then follow the prompts until the Update Status page appears.

What happens next depends on whether you selected Delay BIOS Upgrade:

- 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 and boots 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 (in some cases as much as 26 minutes). This is normal behavior when a delayed BIOS upgrade is applied during a reset.

Caution - Service interruption. Do not interrupt the update process while the server is upgrading the BIOS firmware. This can result in corrupted firmware and server down time.

---

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 41.

b. Use 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:

- 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 186.**
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 51.
4. **Use 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`

Index

E

F

H

I

K

L

P

R

S

T

U

V

W