

Oracle® Server CLI Tools and IPMItool 2.1 User's Guide



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Contents

Preface	5
Documentation and Feedback	5
About This Documentation (PDF and HTML)	5
Change History	6
Oracle Hardware CLI Tools Overview	7
Installing Components Using the Oracle Hardware Management Pack Installer	9
Getting Started	9
Prerequisites	9
Installation Issues	10
Getting the Software	11
Installing Hardware Management Pack Components Using Installer	11
CLI Tools Command Syntax and Conventions	39
CLI Tools Command Syntax	39
CLI Tools Device-Naming Convention	40
Using the biosconfig Tool	43
biosconfig Dependencies	44
biosconfig Terminology	44
Using biosconfig	45
biosconfig for Solaris OS	45
biosconfig for Windows	46
biosconfig Command Overview	54
What Changes the Boot List	56
Important Notes on Devices	56
Configuring the Device Boot Order	57
BIOS CMOS Configuration	63
Commands That Produce Unrelated, Innocuous, Extra Output	70
Using the fwupdate Tool	73
fwupdate Command-Line Interface	74

update Subcommand	76
list Subcommand	79
reset Subcommand	80
Device-Naming Convention	81
Execution Summary	81
Using the raidconfig Tool	83
raidconfig Overview	83
raidconfig Command Overview	84
list Subcommand	85
create raid Subcommand	89
delete raid Subcommand	90
add spare Subcommand	91
remove spare Subcommand and Options	92
modify Subcommand	93
export Subcommand	94
raidconfig export Options	94
import Subcommand	95
Using the ilomconfig Tool	97
ilomconfig Overview	97
ilomconfig Commands	99
Using ipmitool for Windows	109
ipmitool Overview	109
Sun IPMI System Management Driver 2.1	110
Using ipmitool for Configuration Tasks	110
CLI Tools Error Codes	113
Common Error Codes	113
biosconfig Error Codes	114
raidconfig Error Codes	115
ilomconfig Error Codes	116
fwupdate Error Codes	117
Index	119

Preface

The Oracle Hardware Management Pack documentation provides detailed information about how to install and use Hardware Management Pack and its components.

This preface describes related documentation, submitting feedback to Oracle, and a document change history.

- [“Documentation and Feedback”](#) on page 5
- [“About This Documentation \(PDF and HTML\)”](#) on page 5
- [“Change History”](#) on page 6

Documentation and Feedback

Documentation	Link
All Oracle products	http://www.oracle.com/documentation
Oracle Hardware Management Pack	http://download.oracle.com/docs/cd/E19960-01/index.html
Oracle ILOM 3.0	http://www.oracle.com/technetwork/documentation/sys-mgmt-networking-190072.html#ilom

Provide feedback on this documentation at:

<http://www.oracle-surveys.com/se.ashx?s=25113745587BE578>.

About This Documentation (PDF and HTML)

This documentation set is available in both PDF and HTML. The information is presented in topic-based format (similar to online help) and therefore does not include chapters, appendices or section numbering.

Change History

The following changes have been made to the documentation set.

- September 2010, initial publication
- January 2011, Installation Guide and Management Agent User's Guide updated
- July 2011, updated document URLs

Oracle Hardware CLI Tools Overview

Oracle Hardware CLI Tools is part of the Hardware Management Pack. Hardware Management Pack is a delivery mechanism for the operating system (OS) native tools and agents required for configuring and managing server hardware.

For more information on other Hardware Management Pack features, see [Oracle Hardware Management Pack 2.1 Installation Guide](#) and the [Oracle Server Management Agents 2.1 User's Guide](#).

The downloaded package includes the Oracle Hardware Management Pack Installer, which is a cross platform installer that can be used to manage the hardware components.

Oracle Hardware CLI Tools consists of the following installable components:

- `biosconfig` is a cross operating system CLI tool that enables the user to configure their server's BIOS CMOS settings and host boot order. See [“Using the biosconfig Tool” on page 43](#).
- `fwupdate` is a cross OS tool that enables you to upgrade firmware of any server component, and supports only the firmware update of SAS storage components. For more information, see [“Using the fwupdate Tool” on page 73](#).
- `raidconfig` is a cross OS and cross-vendor CLI tool that enables you to configure RAID volumes. For more information, see [“Using the raidconfig Tool” on page 83](#).
- `ilomconfig` is a cross OS tool that enables the user to manipulate ILOM configurations by way of XML input. For more information, see [“Using the ilomconfig Tool” on page 97](#).

For late-breaking issues and information about the CLI Tools, refer to the Release Notes document included with the software download.

See also:

- [“CLI Tools Command Syntax and Conventions” on page 39](#)

Installing Components Using the Oracle Hardware Management Pack Installer

This section describes how to install and uninstall Hardware Management Pack components on an Oracle server using the supplied Oracle Hardware Management Pack Installer. This section contains the following:

- “Getting Started” on page 9
- “Prerequisites” on page 9
- “Getting the Software” on page 11
- “Installing Hardware Management Pack Components Using Installer” on page 11

Getting Started

The following methods are available for installing the Hardware Management Pack components:

- GUI mode
- Console mode
- Silent mode

Regardless of the installation method you choose, you must carry out the installation as a user with administrative privileges, such as root on Linux or Solaris and Administrator on Windows.

Prerequisites

If you have previous versions of Hardware Management Pack or Component Manager installed, you will need to remove these before installing the Oracle Hardware Management Pack 2.1 components. For more information, refer to Sun Server Hardware Management Pack 2.1 documentation at

<http://download.oracle.com/docs/cd/E19960-01/index.html>

Different components are supported by different servers and operating systems, so ensure that your target platform is supported by all of the components you intend to install. Before proceeding make sure that you have consulted the support matrix for the version that you plan to install. The support matrix is available from the HMP tab at:

<http://www.oracle.com/goto/system-management>

Depending on the target server's operating system, you should note the following:

- Oracle Solaris operating system - For the Oracle Hardware SNMP Plugins to function correctly, you must have System Management Agent (SMA). SMA is installed by default on Solaris. For more information about SMA, see `snmpd(1M)`. When installing Hardware Management Pack components, you must be in the global zone. The device `/dev/bmc` must be present on your system for the Hardware Management Agent to function correctly.
- Linux operating system - For the Oracle Hardware SNMP Plugins to function correctly, you must have Net-SNMP installed. For more information about Net-SNMP, see the `snmpd` documentation. You must also make sure that the KCS IPMI interface between the Oracle server service processor and host operating system is enabled. When using the Hardware Management Agent, you must ensure the root user has read/write access to the IPMI device in order for the Hardware Management Agent to function correctly.
- Windows operating system - For the Oracle Hardware SNMP Plugins to function correctly, you must have an IPMI device installed and the SNMP service enabled. For more information about the IPMI devices available for your version of Windows, see your Windows product documentation.

Installation Issues

Review the following notes before performing the Hardware Management Pack installation.

Note – There might be additional installation issues in the Oracle Hardware Management Pack 2.1 Release Notes. Please review the Release Notes, along with the following issues, before installing Hardware Management Pack.

Unix Installer Issue (CR 6977584)

The installer aborts when the `DISPLAY` variable is set for a Solaris or Linux operating system. To avoid this issue, unset the `DISPLAY` variable before installing Hardware Management Pack.

Error Reported When Launching Installer on a Solaris System (CR 6982393)

When launching the Oracle Hardware Management Pack Installer on a Solaris system, the following error might appear: `./install.bin: !: not found` You can ignore this error. The Installer should launch normally.

Running Installer on Solaris With SUNWCreq Cluster Fails (CR 6982718)

Before installing Oracle Hardware Management Pack on a Solaris host installed with the `SUNWCreq` (Core System Support) metacluster, you must install `SUNWxcu4` (contains `POSIX df` command) or set the following environment variable: `IATEMPDIR=$HOME`.

Sun Fire X4170 M2 Requires Tools and Driver Installation for Correct ICH10 Slot Information (CR 6992155)

For a Sun Fire X4170 M2 system running Windows 2008 R2, you need to install the drivers from the X4170 M2 Tools and Drivers CD before using the RAIDconfig tool. Failure to install the drivers could result in the slot information for the HDDs attached to the internal ICH10 controller to be reported incorrectly.

You can also use the Oracle Hardware Installation Assistant to install Windows 2008 R2 to avoid this problem.

Getting the Software

Before you start, make sure that you have downloaded the latest Hardware Management Pack compatible with the operating system on your target server. Instructions for downloading Hardware Management Pack are available the Downloads tab at:

<http://www.oracle.com/goto/system-management>

This file contains the files necessary to install Hardware Management Pack components.

The Hardware Management Pack download file name for the operating systems supported by Hardware Management Pack is as follows:

`oracle-hmp-version-OSVersionNumber`

where *version* is the version of the Hardware Management Pack, and *OSVersionNumber* is the operating system that this Hardware Management Pack is designed for.

Once you download the Hardware Management Pack, you need to uncompress it to a local directory on the server that you want to manage.

Note – On the Solaris operating system, due to the restrictions of pkgadd(1M), the path that you uncompress the Hardware Management Pack to must not contain any spaces for the installation process to proceed.

Installing Hardware Management Pack Components Using Installer

This section covers the following topics:

- “Using GUI Mode to Install and Uninstall Components” on page 12
- “Using Console Mode to Install or Uninstall Components” on page 29

- [“Using Silent Mode to Install and Uninstall Components”](#) on page 35

Using GUI Mode to Install and Uninstall Components

This section covers the following procedures:

- [“How to Install Hardware Management Components Using GUI Mode”](#) on page 12
- [“How to Uninstall Hardware Management Components Using GUI Mode”](#) on page 22

▼ How to Install Hardware Management Components Using GUI Mode

Before You Begin

- To install Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.
- Download and extract the Hardware Management Pack Software. See [“Getting the Software”](#) on page 11.
The directory that you extract the files is referred to as *extract-directory* in this procedure.
- For Windows SP2 or earlier, you must first install the Sun IPMI System Management Driver. See [“Installing the Sun IPMI System Management Driver 2.1”](#) in *Oracle Hardware Management Pack 2.1 Installation Guide*. This driver is included with other operating systems.

1 To start the installer, issue one of the following commands:

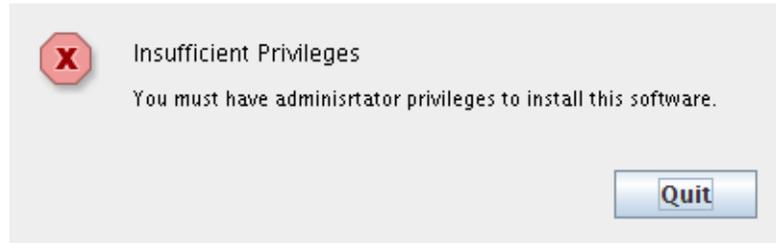
- **For Solaris or Linux systems:** `/extract-directory/oracle-hmp-2.1/SOFTWARE/install.bin`
- **For Windows systems:** `/extract-directory/oracle-hmp-2.1/SOFTWARE/install.exe`

The following splash screen appears.

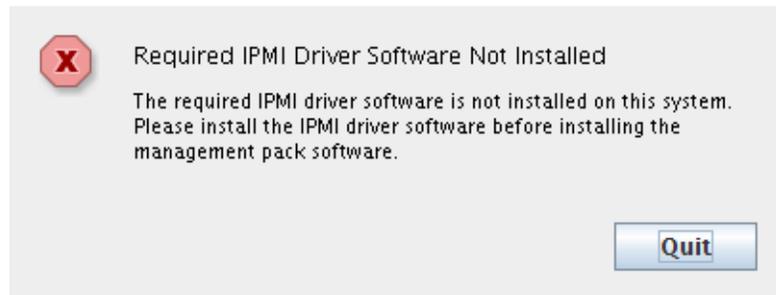


2 If any of the following dialogs display, perform the appropriate action.

- If the following dialog displays, click **Quit** and log into the system with Administrator privileges.



- If the following dialog appears, click the **Quit** button and install the IPMI driver software. See [“Installing the Sun IPMI System Management Driver 2.1”](#) in *Oracle Hardware Management Pack 2.1 Installation Guide*.



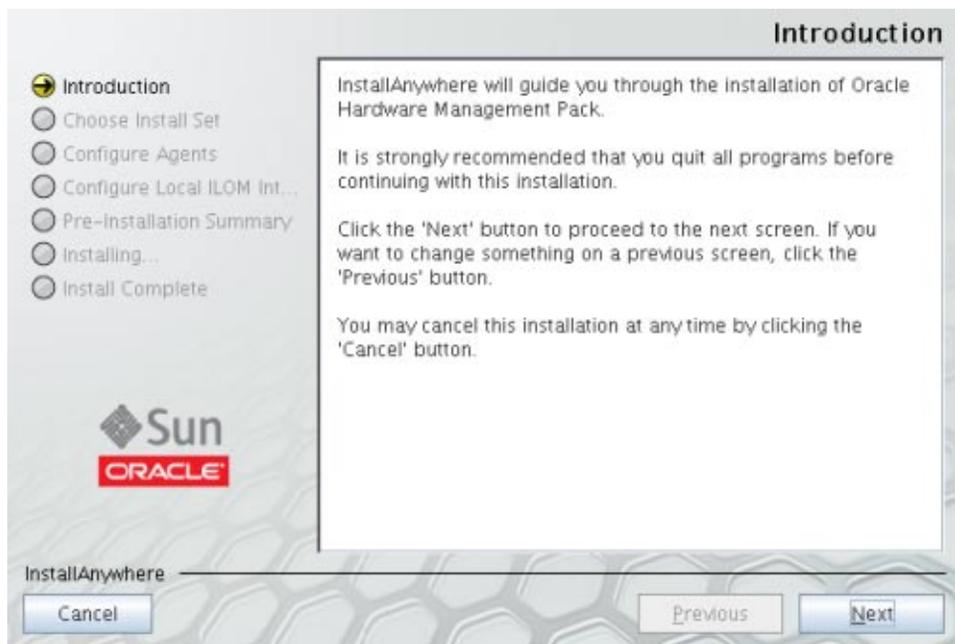
- If the following dialog displays, click **Quit** and remove the previously installed version of the software.



- If the following dialog displays, click quick and then ?



If the installation is ready to proceed, the Introduction screen appears.



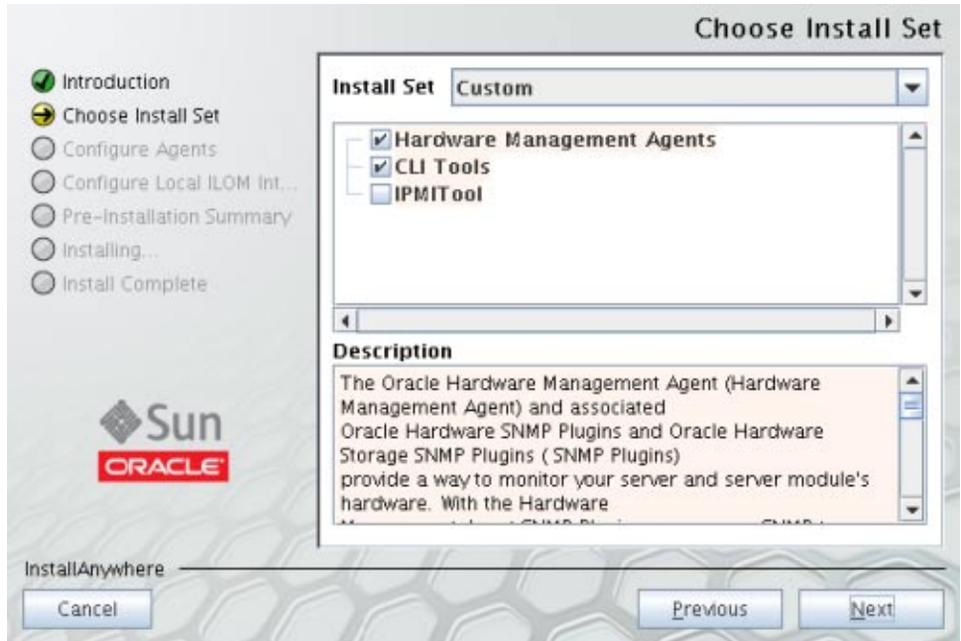
3 Click Next.

The Choose Install Set screen appears.

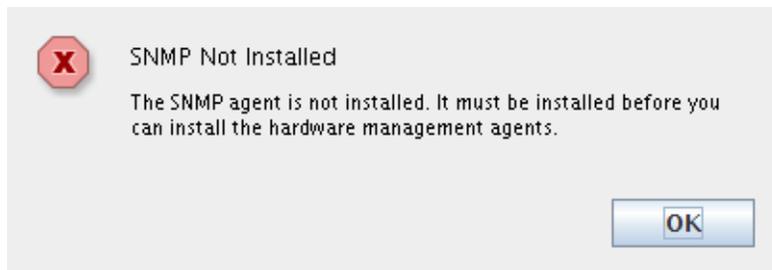
**4 Select either Typical or Custom and click Next.**

- If you select Standard, The Hardware Management Agents and CLI Tools options will automatically be selected.

- If you select Custom, the Choose Install Set screen appears.



- 5 Select the features that you want to install and click Next.
- 6 Take action, as needed, if one of the following dialogs appear:
 - If the following dialog appears, click OK and de-select the Hardware Management Agent feature from the Choose Install Set screen.

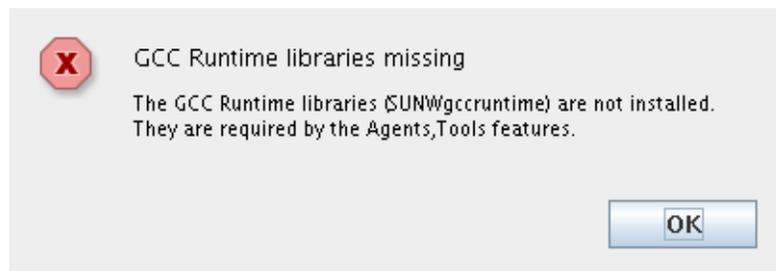


- If the following dialog appears, click OK and de-select the IPMITool feature from the Choose Install Set screen.

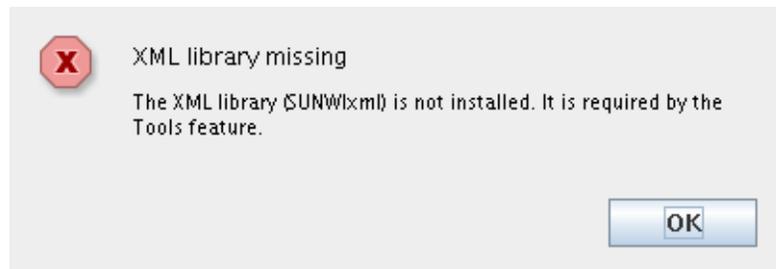


Alternatively, you can cancel the wizard and install SNMP software or remove IMPITool software, then restart the installation.

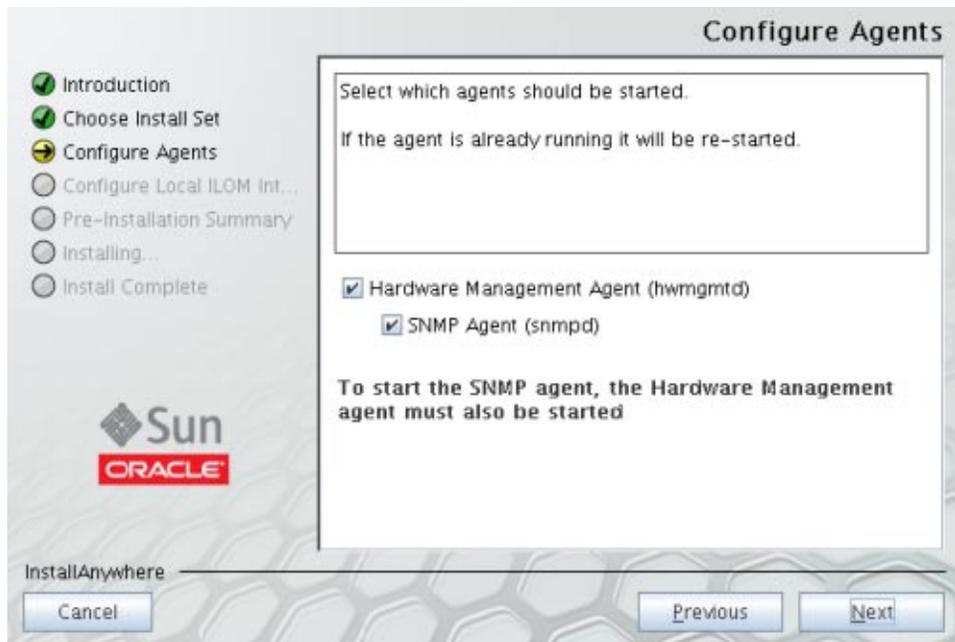
- If the following dialog appears click Quit and install the Solaris GCC runtime libraries.



- If the following dialog appears, click Quit and install the Solaris XML libraries.



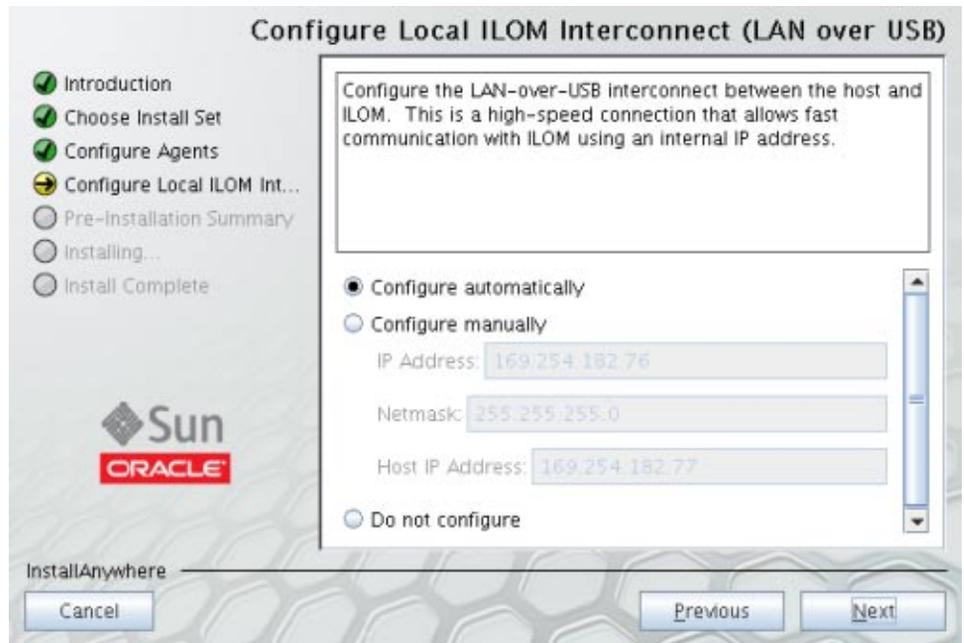
The Configure Agents screen appears.



- 7 Select Start for the Hardware Management Agent and SNMP Agent and click Next.

Note – If you select SNMP Agent, you must also select Hardware Management Agent.

The Local ILOM Interconnect (LAN Over USB) screen appears.

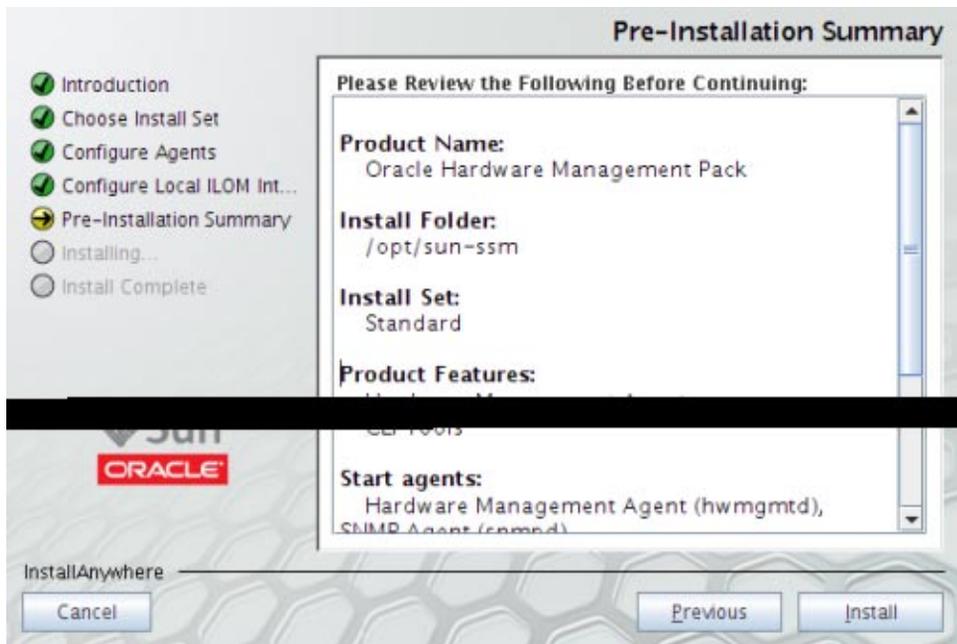


8 Select one of the options for configuring the Local ILOM Interconnect.

If you select the Configure manually option, you need to enter the ILOM IP Address, Netmask, and Host IP Address information.

Note – For more information on Local ILOM Interconnect, see [“Enabling the Local Interconnect Interface”](#) in *Oracle Hardware Management Pack 2.1 Installation Guide*.

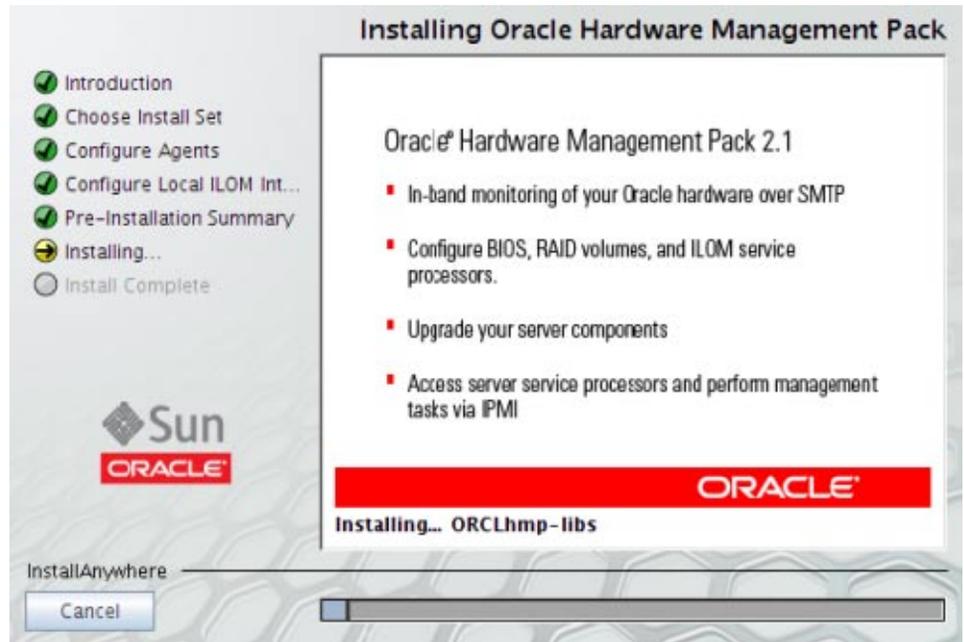
A Pre-Installation Summary screen appears with information similar to the following screen.



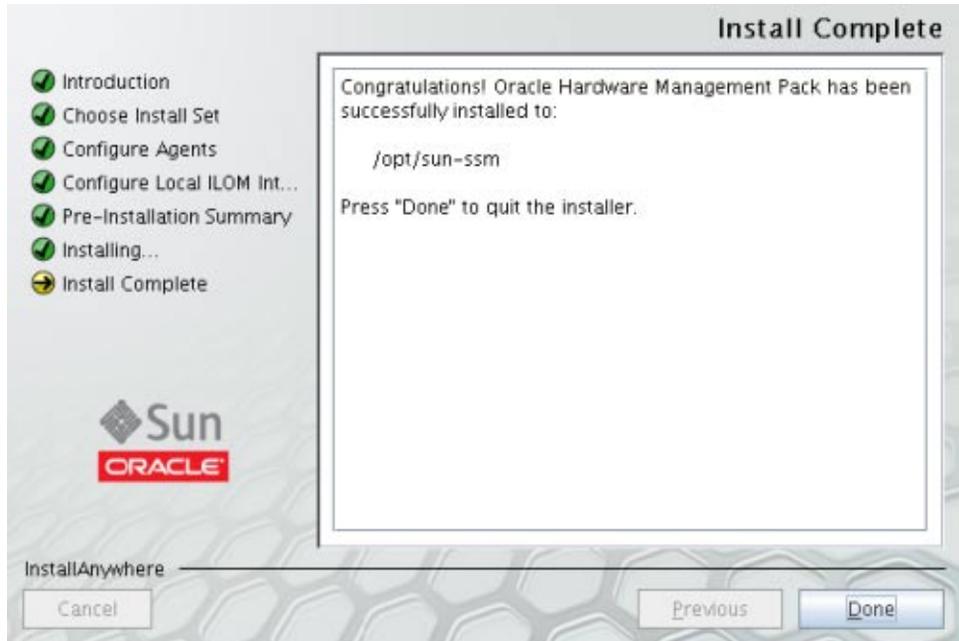
- 9 Make sure that the information in the Pre-Installation Summary is correct.
 - If you want to change any of the installation items, click the Previous button until you get back to the screen where you want to make the changes.

- If the information is correct, click Install.

The Installing Oracle Hardware Management screen appears.



The Install Complete screen appears when the installation has completed.



- 10 Click Done to complete the installation.

- See Also**
- “How to Uninstall Hardware Management Components Using GUI Mode” on page 22
 - “Using Console Mode to Install or Uninstall Components” on page 29
 - “Using Silent Mode to Install and Uninstall Components” on page 35

▼ How to Uninstall Hardware Management Components Using GUI Mode

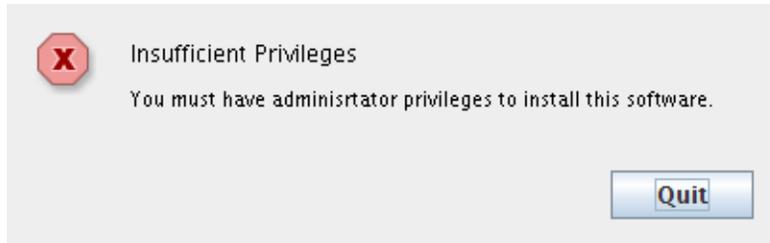
- Before You Begin**
- To uninstall Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.

- 1 To start the uninstaller, issue one of the following commands:
 - For Solaris or Linux systems: `/opt/sun-ssm/setup/uninstall`
 - For Windows systems: `C:\Program Files\Oracle\Oracle Hardware Management Pack\setup\uninstall`

The following splash screen appears.



- 2 If the following dialog displays, click Quit and log into the system with Administrator privileges.



The Uninstall Oracle Management Pack screen appears.



3 Click Next.

The Uninstall Options screen appears.

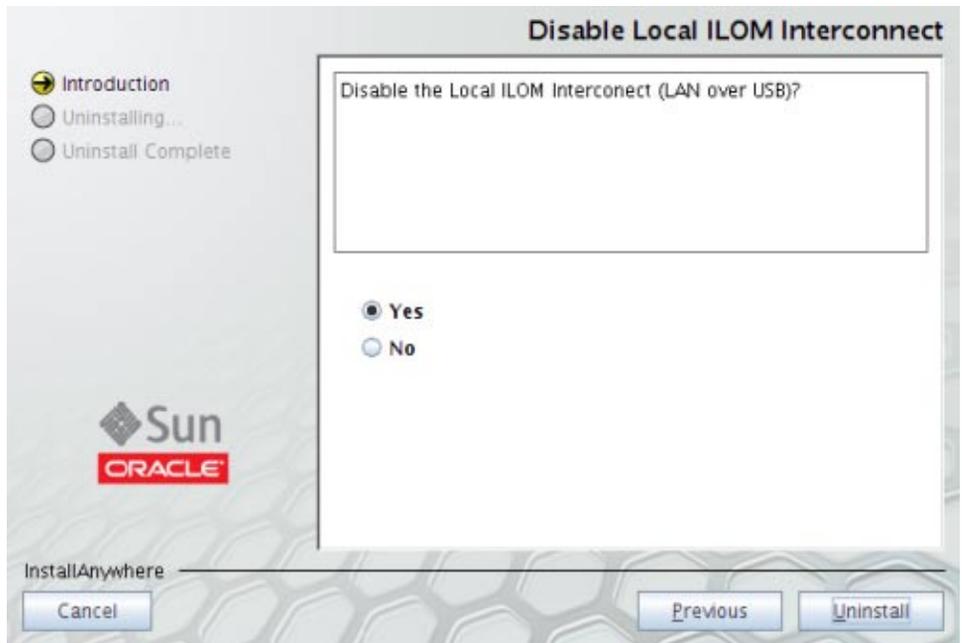


4 Select Complete Uninstall or Uninstall Specific Features and click Next.

If you selected Uninstall Specific Features, the Choose Product Features screen appears.



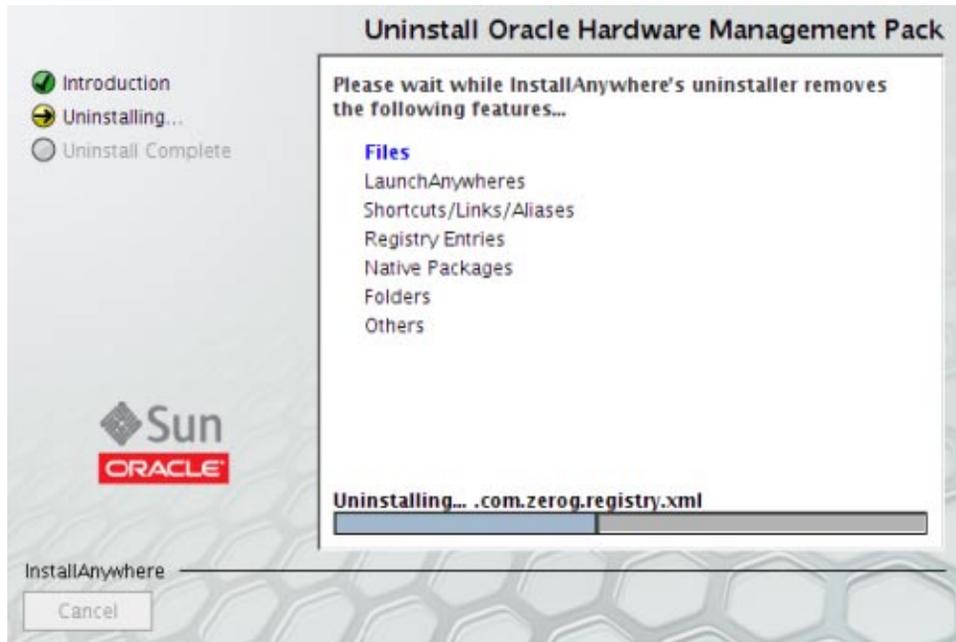
If the Local ILOM Interconnect as enabled during installation, the following screen appears.



- 5 Select Yes or No and click Uninstall.

6 Select any features that you want to uninstall and click Uninstall.

The Uninstall Oracle Hardware Management Pack screen appears.



When the components have been uninstalled, the Uninstall Complete screen appears.



7 Click Done.

- See Also**
- [“How to Install Hardware Management Components Using GUI Mode”](#) on page 12
 - [“Using Console Mode to Install or Uninstall Components”](#) on page 29
 - [“Using Silent Mode to Install and Uninstall Components”](#) on page 35

Using Console Mode to Install or Uninstall Components

This section covers the following procedures:

- [“How to Install Hardware Management Components Using Console Mode”](#) on page 29
- [“How to Uninstall Hardware Management Pack Components Using Console Mode”](#) on page 34

▼ How to Install Hardware Management Components Using Console Mode

- Before You Begin**
- To install Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.

- Download and extract the Hardware Management Pack Software. See [“Getting the Software” on page 11](#).

The directory that you extract the files is referred to as *extract-directory* in this procedure.

- For Windows SP2 or earlier, you must first install the Sun IPMI System Management Driver. See [“Installing the Sun IPMI System Management Driver 2.1” in *Oracle Hardware Management Pack 2.1 Installation Guide*](#).

1 Set up a console session with the server.

See product documentation for instructions on doing this.

2 To start the installer, issue one of the following commands:

- **For Solaris or Linux systems:** `/extract-directory/oracle-hmp-2.1/SOFTWARE/install.bin -i console`
- **For Windows systems:** `\extract-directory\oracle-hmp-2.1\SOFTWARE\install.exe -i console`

You will see output similar to the following:

```
Preparing to install...
Extracting the installation resources from the installer archive...
Configuring the installer for this system's environment...

Launching installer...

Preparing CONSOLE Mode Installation...
```

```
=====
Oracle Hardware Management Pack                (created with InstallAnywhere)
-----
```

```
=====
Introduction
-----
```

InstallAnywhere will guide you through the installation of Oracle Hardware Management Pack.

It is strongly recommended that you quit all programs before continuing with this installation.

Respond to each prompt to proceed to the next step in the installation. If you want to change something on a previous step, type 'back'.

You may cancel this installation at any time by typing 'quit'.

PRESS <ENTER> TO CONTINUE:

3 Press Enter to Continue.

The following screen appears:

```
Choose Install Set
-----
```

Please choose the Install Set to be installed by this installer.

```
->1- Standard
    2- Customize...
```

ENTER THE NUMBER FOR THE INSTALL SET, OR PRESS <ENTER> TO ACCEPT THE DEFAULT:

4 Type the number for your choice or press Enter to select Standard.

- If you selected Standard installation, go to Step 6.

- If you selected Custom installation, the following screen appears.

ENTER A COMMA SEPARATED LIST OF NUMBERS REPRESENTING THE FEATURES YOU WOULD LIKE TO SELECT, OR DESELECT. TO VIEW A FEATURE'S DESCRIPTION, ENTER '?<NUMBER>'. PRESS <RETURN> IF YOU ARE DONE:

```
1- [X] Hardware Management Agents
2- [X] CLI Tools
3- [ ] IPMITool
```

Please choose the Features to be installed by this installer.:

Options 1 and 2 are pre-selected. When you enter a number, it will select an item that is not selected and deselect an item that is already selected.

For example, if you type 1, 3 Hardware Management Agents is deselected and IPMITool is selected.

5 Type one or more numbers separated by a comma.

If you chose to install Agents, the following screen appears. If you did not choose to install agents, go to Step 8.

```
Configure Hardware Management Agent
-----
```

Start the Hardware Management Agent? This agent's short name is hwmgmt.

```
->1- Yes
    2- No
```

ENTER THE NUMBER FOR YOUR CHOICE, OR PRESS TO ACCEPT THE DEFAULT::

6 Type the number for your choice or press Enter to select Yes.

The following screen appears:

```
Configure SNMP Agent
-----
```

Start the SNMP agent? This agent's short name is snmpd on Unix and SNMP on Windows.

- >1- Yes
- 2- No

ENTER THE NUMBER FOR YOUR CHOICE, OR PRESS `<ENTER>` TO ACCEPT THE DEFAULT::

7 Type the number for your choice or press Enter to select Yes..

The following screen appears, if you selected CLI Tools in Step 5. If you did not select CLI Tools, go to Step 10:

Configure LAN Over USB

Configure the LAN-over-USB interconnect between the host and ILOM.
This is a high-speed connection that allows fast communication with ILOM using an internal IP address. This enables IPMI and SSH clients as well as a web browser running on the host operating system to connect directly to ILOM.

- >1- Configure automatically
- 2- Configure manually
- 3- Do not configure

ENTER THE NUMBER FOR YOUR CHOICE, OR PRESS `<ENTER>` TO ACCEPT THE DEFAULT:

8 Type the number for your choice or Enter to select Configure automatically.

If you choose 1 or 3, go to Step 11. If you choose 2—Configure manually, the following screen appears.

Configure LAN Over USB Manually

Specify the following parameters.

IP Address: (DEFAULT: 192.168.1.1):

Netmask: (DEFAULT: 255.255.255.0):

Host IP Address: (DEFAULT: 192.168.1.2):

9 Enter the appropriate values for the IP Address, Netmask, and Host IP Address and press Enter.

A screen similar to the following appears, to confirm your installation choices.

Pre-Installation Summary

Please Review the Following Before Continuing:

Product Name:
Oracle Hardware Management Pack

Install Folder:
/opt/sun-ssm

Install Set:
Custom

```

Product Features:
  Hardware Management Agents,
  CLI Tools

Start Agents:
  Hardware Management Agent (hwmgmt), SNMP Agent (snmpd/SNMP)

LAN Over USB:
  Configure manually

Disk Space Information (for Installation Target):
  Required: 930,151 bytes
  Available: 11,144,399,872 bytes

```

PRESS <ENTER> TO CONTINUE

10 Make sure that the information displayed is correct.

- If the information is not correct, type Back until you get back to the screen where you want to change the information.
- If the information shown in the screen is correct, press Enter to continue.

The following screen appears:

```

Ready To Install
-----

```

```

InstallAnywhere is now ready to install Oracle Hardware Management Pack onto
your system at the following location:

```

```

/opt/sun-ssm

```

PRESS <ENTER> TO INSTALL:

11 Press Enter to begin the installation.

The installation should take about 2 minutes. A progress bar is displayed as the installation proceeds.

When the installation is complete, the following screen appears:

```

Installation Complete
-----

```

```

Congratulations. Oracle Hardware Management Pack has been successfully
installed to:

```

```

/opt/sun-ssm

```

PRESS <ENTER> TO EXIT THE INSTALLER:

- See Also** ▪ [“How to Uninstall Hardware Management Pack Components Using Console Mode” on page 34](#)

- [“Using GUI Mode to Install and Uninstall Components” on page 12](#)
- [“Using Silent Mode to Install and Uninstall Components” on page 35](#)

▼ **How to Uninstall Hardware Management Pack Components Using Console Mode**

Before You Begin ▪ To uninstall Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.

1 To start the unininstallation, issue one of the following command:

- **For Solaris or Linux systems:** `/opt/sun-ssm/setup/uninstall -i console`
- **For Windows systems:** `C:\Program Files\Oracle\Oracle Hardware Management Pack\setup\uninstall -i console`

The following screen appears:

```
Uninstall Oracle Hardware Management Pack
-----
```

```
About to uninstall...
```

```
Oracle Hardware Management Pack
```

```
This will remove features installed by InstallAnywhere. It will not remove
files and folders created after the installation.
```

```
PRESS <ENTER> TO CONTINUE:
```

2 Press Enter.

The following screen appears.

```
Uninstall Options
-----
```

```
ENTER THE NUMBER FOR YOUR CHOICE, OR PRESS <ENTER> to select the default.
```

```
->1- Completely remove all features and components.
```

```
    2- Choose specific features that were installed by InstallAnywhere.
```

```
Please choose one of the following options:
```

3 Enter the number that represents your choice or press Enter to completely remove all features and components.

The uninstall begins. When the uninstall is complete, the following screen appears.

```
Uninstall Complete
-----
```

```
All items were successfully uninstalled.
```

4 Press Enter to exit the installer.

- See Also**
- “How to Install Hardware Management Components Using Console Mode” on page 29
 - “Using GUI Mode to Install and Uninstall Components” on page 12
 - “Using Silent Mode to Install and Uninstall Components” on page 35

Using Silent Mode to Install and Uninstall Components

The following topics are included in this section:

- “Silent Mode Installation Options” on page 35
- “How to Install Hardware Management Pack Component Using Silent Mode” on page 35
- “How to Uninstall Hardware Management Pack Component Using Silent Mode” on page 37

Silent Mode Installation Options

Silent mode is a non-interactive installation method. Silent mode can be executed in one of two ways:

- A silent installation can be directed by supplying a response file. The response file contains parameters and properties that define the installation choices for the Installer.

A response file can first be created by running a GUI or console mode installation using the `-r` option as shown in the following example:

```
# ./install.bin -i GUI -r /path_to_file/response.txt
```

Once the response file is created, you can use the file to do an identical silent installation, using the following command:

```
# ./install.bin -i silent -f /path_to_file/response.txt
```

- If no response is supplied, a typical installation is performed with no post-installation configuration steps.

▼ How to Install Hardware Management Pack Component Using Silent Mode

- Before You Begin**
- To install Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.
 - Download and extract the Hardware Management Pack Software. See “Getting the Software” on page 11.
The directory that you extract the files is referred to as *extract-directory* in this procedure.
 - For Windows SP2 or earlier, you must first install the Sun IPMI System Management Driver. See “Installing the Sun IPMI System Management Driver 2.1” in *Oracle Hardware Management Pack 2.1 Installation Guide*.
 - Refer to “Silent Mode Installation Options” on page 35 before performing the installation.

- **To start the silent mode installation process, use one of the following commands:**

For Solaris or Linux systems:

- **For Solaris or Linux systems:**

- **To perform a typical silent installation:**

```
/extract-directory/oracle-hmp-2.1/SOFTWARE/install.bin -i silent
```

- **To perform an installation directed by a response file:**

```
/extract-directory/oracle-hmp-2.1/SOFTWARE//install.bin -i silent  
-f/path_to_file/response.txt
```

- **For Window systems:**

- **To perform a typical silent installation:**

```
\extract-directory\oracle-hmp-2.1\SOFTWARE\install.bin -i silent
```

- **To perform an installation directed by a response file:**

```
\extract-directory\oracle-hmp-2.1\SOFTWARE\install.bin -i silent  
-f\path_to_file\response.txt
```

The following output appears:

```
Preparing to install...  
Extracting the installation resources from the installer archive...  
Configuring the installer for this system's environment...  
  
Launching installer...  
  
Preparing SILENT Mode Installation...
```

```
=====
Oracle Hardware Management Pack                (created with InstallAnywhere)
-----
```

The installation should take about two minutes. A progress bar is displayed as the installation proceeds.

When the installation is complete, the following output displays:

```
Installation Complete.  
$
```

- See Also**
- [“How to Uninstall Hardware Management Pack Component Using Silent Mode”](#) on page 37
 - [“Using GUI Mode to Install and Uninstall Components”](#) on page 12
 - [“Using Console Mode to Install or Uninstall Components”](#) on page 29

▼ How to Uninstall Hardware Management Pack Component Using Silent Mode

Before You Begin ■ To uninstall Management Pack components with Oracle Hardware Management Pack Installer, you must be logged into your system with Administrator privileges.

● To start the silent mode installation process, use one of the following commands:

- For Solaris or Linux systems: `/opt/sun-ssm/setup/uninstall -i silent`
- For Windows systems: `C:\Program Files\Oracle\Oracle Hardware Management Pack\setup\uninstall -i silent`

The following output appears:

```
Preparing SILENT Mode Uninstallation...
```

```
=====
Oracle Hardware Management Pack                (created with InstallAnywhere)
-----
```

```
=====
Uninstalling...
9-----
```

The installation should take about 2 minutes. A progress bar is displayed as the installation proceeds.

When the installation is complete, the following output displays:

```
Uninstallation Complete.
$
```

- See Also**
- [“How to Install Hardware Management Pack Component Using Silent Mode”](#) on page 35
 - [“Using GUI Mode to Install and Uninstall Components”](#) on page 12
 - [“Using Console Mode to Install or Uninstall Components”](#) on page 29

CLI Tools Command Syntax and Conventions

This section describes the common meta syntax to be used by all storage management Command-Line Interface (CLI) tools.

- [“CLI Tools Command Syntax” on page 39](#)
- [“CLI Tools Device-Naming Convention” on page 40](#)

CLI Tools Command Syntax

The CLI tools must conform to one of the following two command syntax formats:

- *command* [*option*]
- *command subcommand target* [*option*]

Note – The `biosconfig` tool does not conform to the above syntax. See [“Using the biosconfig Tool” on page 43](#) for more information.

The following table describes the command fields:

Command Field	Description	Examples
<i>command</i>	The action that you want to perform. Consists of lower-case letters only.	<code>biosconfig</code> , <code>fwupdate</code> , <code>raidconfig</code> , <code>ilomconfig</code>
<i>subcommand</i>	Further defines the task to be performed by the <i>command</i> . Generally used as verbs. Consists of lower-case letters, hyphens, or the underscore character. The subcommand is not required when the <code>--version</code> or <code>--help</code> options is used immediately following the command.	<code>list</code> , <code>update</code> , <code>reset</code> , <code>expander-boot-record</code> , <code>sas_bridgefirmware</code>
<i>target</i>	Describes the object or target that is being acted upon by the subcommand. Application specific.	<code>all</code> , <code>disk</code> , <code>expander</code> , <code>bridge</code> , <code>controller</code> , <code>user</code> , <code>snmp-community</code>

Command Field	Description	Examples
<i>option</i>	<p>Modifies the command or subcommand and can be optional or mandatory depending on the command or subcommand.</p> <p>There are long and short options that have identical functionality and are provided for ease of use:</p> <p>Short-option is a hyphen followed by a single letter.</p> <p>Long-option is two hyphens followed by a string.</p>	<p>-n or <i>--device_name</i></p> <p>-f or <i>--filename</i></p> <p>-r or <i>--reset</i></p>

The following options apply to all CLI tools commands:

Short Option	Long Option	Description
-?	--help	Help—Displays help information.
-V	--version	Version—Displays the tool version.
-q	--quiet	Quiet—Suppresses informational message output and returns only error codes.
-y	--yes	Yes—Confirms operation. Does not prompt user for confirmation on the operation when running.

When using command options and its corresponding value or device name, you can use an equal sign (=) or a space as shown in the following examples:

- Using a command with spaces:
raidconfig create raid -c c2 --raid-level 1 --number-disks 2
- Using a command with equal signs (=):
raidconfig create raid -c=c2 --raid-level=1 --number-disks=2

See also:

- [“CLI Tools Device-Naming Convention” on page 40](#)

CLI Tools Device-Naming Convention

User-friendly, fully qualified device names are used with the CLI commands. The single characters represent all of the nodes that make up the device as follows:

Character	Description
c	Controller — Using a unique logical ID.

Character	Description
r	RAID Volume (logical disk) — The logical ID name of the volume or disk.
d	Disk — The physical disk logical ID name.
x	Expander — The unique expander logical ID name.
j	Chassis — The unique chassis logical ID name.

All integers used to represent the device are 0 based. Disks are represented by a logical ID name, assigned by the tool at initialization. The disks are sorted by expander, and slot ID, to come up with a unique numerical identifier. The numbering is sequential.

Here are examples of device names:

- c1 — Controller 1
- c1d2 — Disk with a logical ID 2 on controller 1
- c2r1 — RAID 1 on controller 2

Multiple devices can be listed together in a comma-separated list, for example: dev1, dev2, dev3.

Here is an example from `RAIDconfig` when you create a RAID volume with three disks:

```
./raidconfig create --disks c1d2,c1d4,c1d5 --level 1
```

The following shows an implementation of the disk-naming scheme.

ID	Brand	Model	Chassis	Slot	Type	Media	Size (GB)	Firmware Revision
c1d0	SEAGATE	ST373455SSUN72G	0	0	sas	HDD	73	0791
c1d1	SEAGATE	ST35000N	0	1	sata	HDD	500	3AZQ
c1d2	SEAGATE	ST373455SSUN72G	0	2	sas	HDD	73	0B92
c1d3	SEAGATE	ST373455SSUN72G	0	3	sas	HDD	73	0B92
c1d4	SEAGATE	ST35000N	0	4	sata	HDD	500	3AZQ
c1d5	SEAGATE	ST35000N	0	5	sata	HDD	500	3AZQ
c1d6	SEAGATE	ST35000N	0	6	sata	HDD	500	3AZQ
c1d7	SEAGATE	ST373455SSUN72G	0	7	sas	HDD	73	0B92
c1d8	SEAGATE	ST373455SSUN72G	0	8	sas	HDD	73	0B92
c1d9	SEAGATE	ST373455SSUN72G	0	9	sas	HDD	73	0B92
c1d10	SEAGATE	ST35000N	0	10	sata	HDD	500	3AZQ
c1d11	SEAGATE	ST373455SSUN72G	0	11	sas	HDD	73	0B92
c1d12	SEAGATE	ST373455SSUN72G	0	12	sas	HDD	73	0B92
c1d13	SEAGATE	ST373455SSUN72G	0	13	sas	HDD	73	0B92
c1d14	SEAGATE	ST373455SSUN72G	0	14	sas	HDD	73	0B92
c1d15	SEAGATE	ST373455SSUN72G	0	15	sas	HDD	73	0B92
c1d16	SEAGATE	ST373455SSUN72G	0	16	sas	HDD	73	0B92
c1d17	SEAGATE	ST373455SSUN72G	0	17	sas	HDD	73	0B92
c1d18	SEAGATE	ST373455SSUN72G	0	18	sas	HDD	73	0B92
c1d19	SEAGATE	ST373455SSUN72G	0	19	sas	HDD	73	0B92
c1d20	SEAGATE	ST35000N	0	20	sata	HDD	500	3AZQ

c1d21	SEAGATE	ST35000N	0	21	sata	HDD	500	3AZQ
c1d22	SEAGATE	ST35000N	0	22	sata	HDD	500	3AZQ
c1d23	SEAGATE	ST35000N	0	23	sata	HDD	500	3AZQ
c1d24	SEAGATE	ST373455SSUN72G	1	0	sas	HDD	73	0791
c1d25	SEAGATE	ST35000N	1	1	sata	HDD	500	3AZQ
c1d26	SEAGATE	ST373455SSUN72G	1	3	sas	HDD	73	0791
c1d27	SEAGATE	ST35000N	1	4	sata	HDD	500	3AZQ
c1d28	SEAGATE	ST373455SSUN72G	1	5	sas	HDD	73	0791
c1d29	SEAGATE	ST35000N	1	6	sata	HDD	500	3AZQ
c1d30	SEAGATE	ST373455SSUN72G	1	7	sas	HDD	73	0791
c1d31	SEAGATE	ST373455SSUN72G	1	8	sas	HDD	73	0791
c1d32	SEAGATE	ST373455SSUN72G	1	9	sas	HDD	73	0791
c1d33	SEAGATE	ST373455SSUN72G	1	10	sas	HDD	73	0791
c1d34	SEAGATE	ST373455SSUN72G	1	11	sas	HDD	73	0791
c1d35	SEAGATE	ST35000N	1	12	sata	HDD	500	3AZQ
c1d36	SEAGATE	ST373455SSUN72G	1	13	sas	HDD	73	0791
c1d37	SEAGATE	ST373455SSUN72G	1	14	sas	HDD	73	0791
c1d38	SEAGATE	ST35000N	1	15	sata	HDD	500	3AZQ
c1d39	SEAGATE	ST373455SSUN72G	1	16	sas	HDD	73	0791
c1d40	SEAGATE	ST373455SSUN72G	1	17	sas	HDD	73	0791
c1d41	SEAGATE	ST35000N	1	18	sata	HDD	500	3AZQ
c1d42	SEAGATE	ST35000N	1	19	sata	HDD	500	3AZQ
c1d43	SEAGATE	ST35000N	1	20	sata	HDD	500	3AZQ
c1d44	SEAGATE	ST35000N	1	21	sata	HDD	500	3AZQ
c1d45	SEAGATE	ST35000N	1	22	sata	HDD	500	3AZQ
c1d46	SEAGATE	ST35000N	1	23	sata	HDD	500	3AZQ

See also:

- [“CLI Tools Command Syntax” on page 39](#)

Using the biosconfig Tool

`biosconfig` is an application that runs on the host's OS and configures that host's BIOS CMOS settings, host boot order, and some service processor settings.

`biosconfig` allows you to manipulate BIOS configurations from the OS command line. Due to the nature of this utility, it must be run with administrative access. You should also close all other applications and quiesce your system when running `biosconfig`. The configuration files and command-line interfaces are compatible with the Solaris, Windows, and Linux versions. Solaris `biosconfig` can be used to configure the BIOS settings.

`biosconfig` enables you to configure settings across multiple like systems where distributions of `biosconfig` spans multiple like systems. `biosconfig` enables you to configure BIOS CMOS settings on like machines using the same XML file. However, if the configuration that is being modified refers to a peripheral or component that is not on both systems, then you need to customize the XML file.

This section shows sample XML configurations and specific configurations needed to change BIOS or BIOS CMOS settings. These XML configurations can be used to make changes to your configuration using `biosconfig`. The XML files are edited by the editor of your choice, such as `vi`.

`biosconfig` is supported on several operating systems on various platforms with common functionality. For more information, see: [“Installing Components Using the Oracle Hardware Management Pack Installer”](#) on page 9.

This section covers the following topics:

- [“biosconfig Dependencies”](#) on page 44
- [“biosconfig Terminology”](#) on page 44
- [“Using biosconfig”](#) on page 45
- [“biosconfig for Solaris OS”](#) on page 45
- [“biosconfig for Windows”](#) on page 46
- [“biosconfig Command Overview”](#) on page 54
- [“What Changes the Boot List”](#) on page 56
- [“Important Notes on Devices”](#) on page 56
- [“Configuring the Device Boot Order”](#) on page 57
- [“BIOS CMOS Configuration”](#) on page 63
- [“Configuring Individual CMOS Settings”](#) on page 65

- “Commands That Produce Unrelated, Innocuous, Extra Output” on page 70

biosconfig Dependencies

You must run `biosconfig` as root (Linux, Solaris) or Administrator (Windows) because it needs to use drivers that are in read— and write-protected physical address space.

For more on `biosconfig` for Solaris, see: “[biosconfig for Solaris OS](#)” on page 45.

Linux versions of `biosconfig` also depend on access to `/dev/nvram` to guarantee serialized access to the CMOS. RHEL4 distributions do not seem to include this device by default, RHEL5 and SLES do. For you to use `/dev/nvram`, the driver needs to be compiled into the kernel (or loaded as a module), and `/dev/nvram` must exist (root can create it using `mknod /dev/nvram c 10 144`).

For information on `biosconfig` for Windows, see: “[biosconfig for Windows](#)” on page 46.

See also:

- “[biosconfig Terminology](#)” on page 44
- “[Using biosconfig](#)” on page 45
- “[biosconfig Command Overview](#)” on page 54

biosconfig Terminology

- BIOS is the software that initializes the computer hardware and then boots the operating system.
- CMOS in this context means the 128 or 256 bytes of battery-backed-up RAM that holds the state that was configured through the BIOS setup menus (or `biosconfig`).
- IPMI is a standard interface used to manage servers. For more information, go to: <http://www.intel.com/design/servers/ipmi>
- `ipmitool` is an open-source tool used to manage a system. `ipmitool` is distributed on the Tools and Drivers CD for each Oracle platform. You can find documentation (for example, on the `ipmitool chassis bootdev` command) at: <http://ipmitool.sourceforge.net/manpage.html>.
- NVRAM in this context means the portion of the BIOS ROM that holds the BIOS’s boot information.

See also:

- “[biosconfig Terminology](#)” on page 44
- “[biosconfig Dependencies](#)” on page 44
- “[biosconfig Command Overview](#)” on page 54

Using biosconfig



Caution – Do not use `biosconfig` to change BIOS settings that are not visible in the normal BIOS setup menu.

To use `biosconfig`, you must have a working knowledge of editing XML files. The process of editing the BIOS includes using `biosconfig` to do the following tasks:

1. Run `BIOSconfig` to create an XML file.
2. Review the XML file and modify it, if necessary, to configure the system to your specific needs.
3. Write the XML file back to the system (or another system) using `BIOSconfig`.

The following sections describe how to execute a detailed configuration.

Note – In the output examples in this section, all white space outside the XML elements, such as indentation, is optional. For example, see output in [“How to Make a Persistent Change to Boot Order”](#) on page 58.

For installation instructions on Component Manager, see: [“Getting Started”](#) on page 9.

See also:

- [“biosconfig Dependencies”](#) on page 44
- [“biosconfig Command Overview”](#) on page 54
- [“biosconfig Error Codes”](#) on page 114

biosconfig for Solaris OS

The BIOS configuration tool for Solaris (`biosconfig`) is a utility that runs on the OS of the host system and configures the host’s BIOS CMOS settings, host boot order, and some service processor settings.

Solaris `biosconfig` consists of a Solaris `biosdrv` driver and the `BIOSconfig` application.

This section covers the following:

- [“How to Obtain the BMC Driver” on page 46](#)

▼ How to Obtain the BMC Driver

Baseboard management controller firmware enables communication over the Intelligent Platform Management Interface (IPMI) controller on the alarm card.

Note – Legal considerations prevent the unrestricted redistribution of the Baseboard Management Controller (BMC) driver on the OpenSolaris OS.

1 Access the SUNWckr package from your Solaris builds:

2 Copy the following files:

```
/kernel/drv/amd64/bmc f none 0755 root sys 35984 42138 1225816778 SUNWckr
```

```
/kernel/drv/bmc f none 0755 root sys 23684 5173 1225816787 SUNWckr
```

```
/kernel/drv/bmc.conf f none 0644 root sys 177 14089 1225787326 SUNWckr
```

3 Use the network interface.

Instead of using `ipmitool -I bmc fru list`, use `ipmitool -I lan -H SP's_IP_address -U root`.

See Also ▪ [“Using the biosconfig Tool” on page 43](#)

biosconfig for Windows

`biosconfig` for Windows is a BIOS configuration tool that runs on the host's OS and configures that host's BIOS CMOS settings and host boot order. This tool is supported on several operating systems on various platforms.

With `biosconfig` version 2.2.1 for Windows, `biosconfig.exe` is run only in its installation directory so it can access its low-level management driver.

The Oracle System Management driver is required in order to run `biosconfig` on Windows Server 2008 SP2 64-bit or Windows Server 2008 R2 systems. This driver is not required for Windows 2008 32-bit.

Note – On some systems, when using the Oracle System Management Driver, biosconfig might take several minutes to complete some operations.

The Oracle System Management driver is not needed for other applications. The driver should be uninstalled to free system resources if biosconfig is not going to be used, but deinstallation is not mandatory. When biosconfig is uninstalled, the driver must be uninstalled manually.

This section covers the following procedures:

- [“How to Install the biosconfig Oracle System Management Driver on Windows 2008 R2 and Windows 2008 64-bit” on page 48](#)
- [“How to Uninstall the biosconfig Oracle System Management Driver on Windows 2008 R2 and Windows 2008 64-bit” on page 52](#)

▼ How to Install the biosconfig Oracle System Management Driver on Windows 2008 R2 and Windows 2008 64-bit

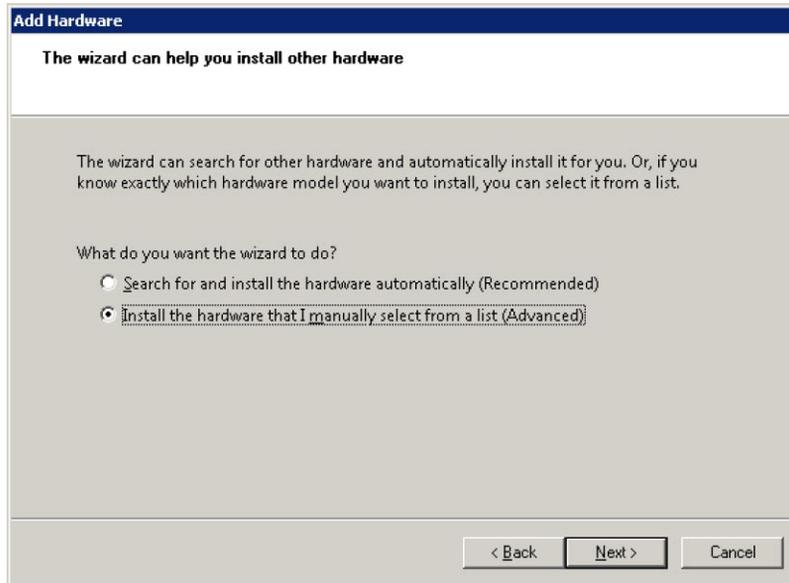
- 1 In an Administrator terminal window (cmd.exe), run the Hardware Wizard executable file, `hdwiz.exe`.



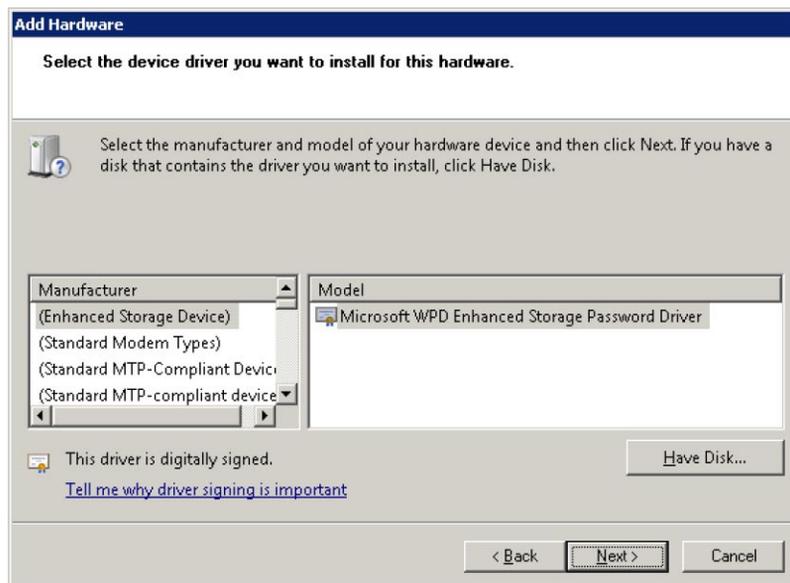
- 2 Read the Welcome screen and click Next.



- 3 To install the hardware device manually, select **Install the hardware that I manually select from a list**.

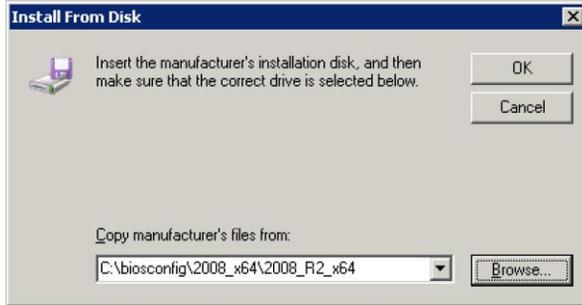


- 4 Click **Have Disk**.

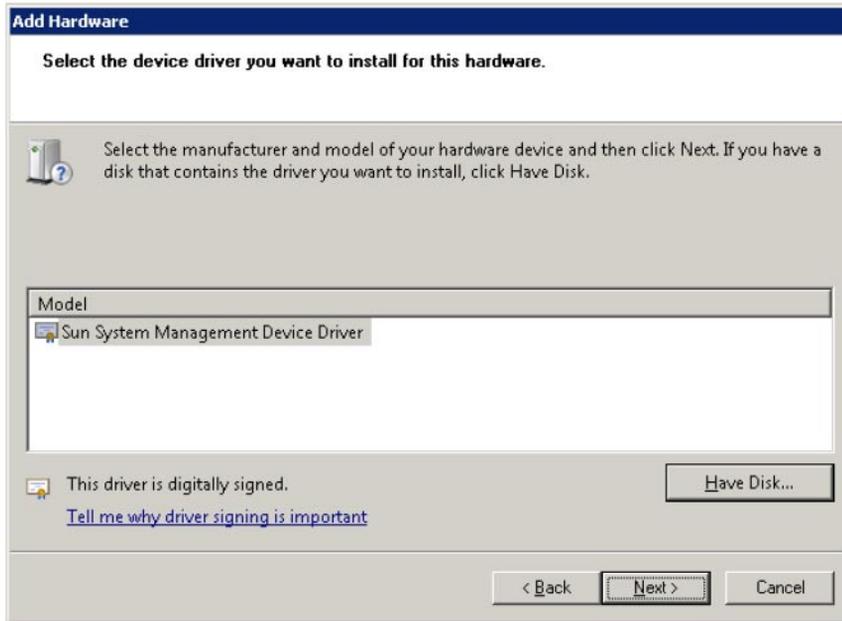


5 Select the path of the driver you want and click OK.

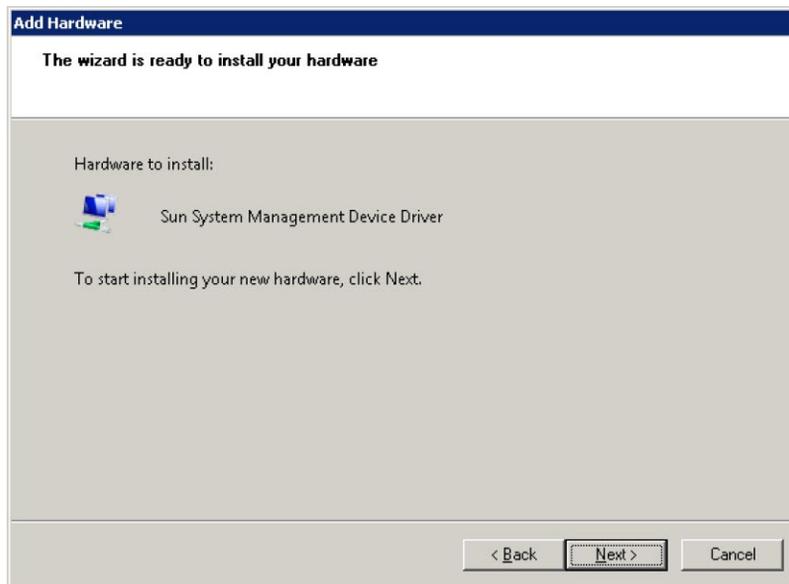
The driver is located in the 2008_xx2_x64 directory in the biosconfig installation directory. Use the 2008_R2_x64 directory for Windows Server 2008 R2, and the 2008_SP2_x64 directory is for Windows Server 2008 SP2 64-bit.



6 Select the Oracle System Manager Device Driver, and click Next.



7 Click Next to start installing.



8 When the installation is complete, click Finish.



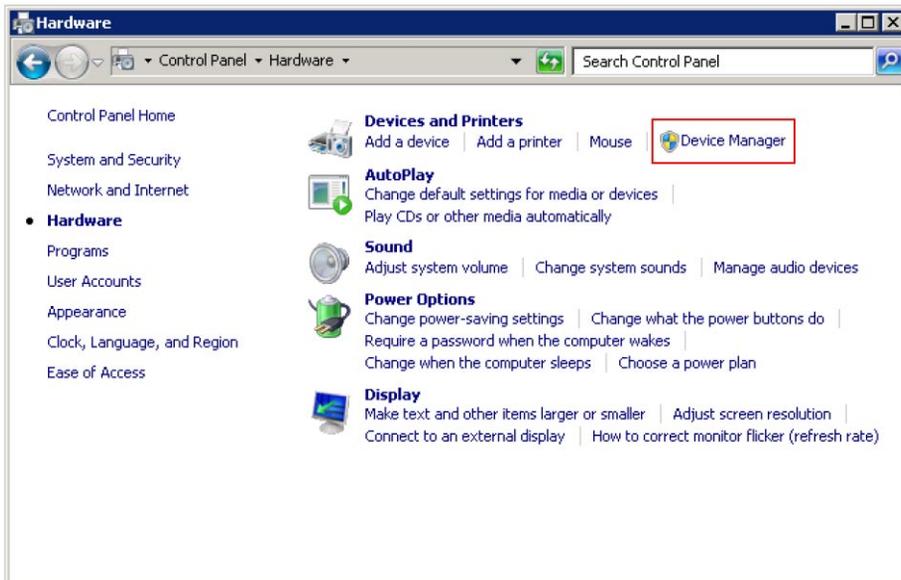
Next Steps [“biosconfig Command Overview” on page 54](#)

▼ How to Uninstall the biosconfig Oracle System Management Driver on Windows 2008 R2 and Windows 2008 64-bit

- 1 Open the Windows Control Panel and select Hardware.



- 2 In the hardware window, select Device Manager.



- 3 Right click on the Oracle System management Device Driver and select Uninstall.



- 4 Check Delete the driver software for this device and click OK.



The driver is removed from the system.

biosconfig Command Overview

The biosconfig command can be used to get current configuration settings or set configuration settings. When used to get configuration settings, biosconfig generates XML output showing the configuration. When used to set configuration settings, biosconfig reads XML input describing the configuration settings to be made.

Examples of biosconfig commands and their outputs are shown in the following table:

Command	Description
# biosconfig -get_version	Outputs to screen.
# biosconfig -get_version <i>file.xml</i>	Outputs to <i>file.xml</i> .
# biosconfig -get_versions > <i>file.xml</i>	Outputs to <i>file.xml</i> .
# biosconfig -get_version <i>some-command</i>	Pipes the output to another command.
# biosconfig -set_bios_settings	Takes input from standard in.
# biosconfig -set_bios_settings <i>file.xml</i>	Takes input from <i>file.xml</i> .
# biosconfig -set_bios_settings < <i>file.xml</i>	Takes input from <i>file.xml</i> .

When a command fails, it returns one of several failure codes listed in “[biosconfig Error Codes](#)” on page 114.

See also:

▼ How to View biosconfig Command Options

If you run biosconfig without arguments, you get the help output including the biosconfig command options:

- **Issue the biosconfig command without arguments:**

```
# biosconfig
Copyright (C) SUN Microsystems 2009.
BIOSconfig Utility Version 2.2.5
Build Date: Jan 11 2010
Build Time: 01:22:05
```

```
BIOSconfig Specification Version 2.4
```

```
Usage: biosconfig [-v] option [filename]
Example: biosconfig -get_version output.xml
```

```
[-v] Verbose on. Only valid if a xml input/output filename is provided
[filename] Name of the XML output (or input) file for get (or set)
command (optional).
```

get commands will output to the console if the filename is not provided
 set commands will get input from the console if the filename is not provided

Available options (Required):

- get_version Get version of this tool
- get_boot_order Get the BOOT Devices list
- set_boot_order Set the BOOT Devices list
- get_bios_settings Get setup configuration from BIOS
- set_bios_settings Set setup configuration to BIOS ROM
- get_CMOS_dump Get 256 bytes CMOS setup data from BIOS
- set_CMOS_dump Set 256 bytes of CMOS setup data to BIOS

Note – When a command is used with a -get option, the information is output as standard I/O. When the -set option is used, the information is output to a file.

See Also ▪ [“How to View biosconfig Version Information” on page 55](#)

▼ How to View biosconfig Version Information

1 Run biosconfig -get_version ver.xml, to get the following output:

```
# biosconfig -get_version ver.xml

Copyright (C) SUN Microsystems 2009.
BIOSconfig Utility Version 2.1
Build Date: Jul 16 2009
Build Time: 15:55:12

BIOSconfig Specification Version 2.4

Success
```

2 View the created ver.xml file, for example:

```
<?xml version="1.0" encoding="UTF-8"?>
<BIOSCONFIG>
  <BIOSCONFIG_VERSION>2.1</BIOSCONFIG_VERSION>
  <SPEC_VERSION>2.4</SPEC_VERSION>
  <SP_NETWORK_CONFIG>
    <DISCOVERY></DISCOVERY>
    <IP></IP>
    <NETMASK></NETMASK>
    <GATEWAY></GATEWAY>
  </SP_NETWORK_CONFIG>
  <PASSWORD_CONFIG>
    <PASSWORD></PASSWORD>
  </PASSWORD_CONFIG>
  <BOOT_ORDER_OVERRIDE>
    <HELP_STRING>FIRST=Choose one of: pxe, cdrom, disk,
floppy, bios, none</HELP_STRING>
    <FIRST></FIRST>
    <HELP_STRING>CLEAR_CMOS=Choose Yes, No or leave it
```

```
empty, em....</HELP_STRING>
  <CLEAR_CMOS></CLEAR_CMOS>
  </BOOT_ORDER_OVERRIDE>
  <BOOT_DEVICE_PRIORITY>
    <B0>
      <DEVICE_NAME></DEVICE_NAME>
      <PCI-B-D-F></PCI-B-D-F>
    </B0>
  </BOOT_DEVICE_PRIORITY>
</BIOSCONFIG>
```

See Also ■ [“How to View biosconfig Command Options” on page 54](#)

What Changes the Boot List

The boot list can be changed in any of the following ways:

- Changing the order in BIOS setup.
- When changing the boot order using `biosconfig` manipulates the contents of CMOS and the BIOS boot block structures stored in NVRAM, which is a dedicated part of the BIOS ROM.
- Reordering the categories using the IPMI bootflags that the SP offers to the (compatible) BIOS during POST. The default priority order for categories is CD/DVD, disk, removable, and network.

See also:

- [“Important Notes on Devices” on page 56](#)

Important Notes on Devices

There are a few important `biosconfig` notes on devices:

- Floppy means whatever the BIOS considers a removable device. For example, this could be a USB flash drive.
- A USB flash drive bigger than 512 MB defaults to being a disk.
- A USB/CD-ROM is classed as a CD and not a removable device.
- PXE means a bootable network device, for example, an Ethernet controller, or an InfiniBand interface that has booting support in its expansion ROM.

See also:

- [“Configuring the Device Boot Order” on page 57](#)

Configuring the Device Boot Order

During BIOS power-on self-test (POST), BIOS scans the hardware and accumulates a list of bootable devices. That list is then ordered into categories and presented as a boot list, which is the ordered list of bootable devices on which a boot is attempted.

This boot list changes as devices are installed and removed, for example, when you are doing the following:

- Changing a disk drive, which might change the string used to represent that bootable device.
- Installing and removing USB devices.
- Starting and stopping the javaConsole floppy and CD redirection.
- Adding or removing PCI cards or express modules.

This section covers the following topics:

- [“How to Set the First Boot Device for the Next Boot” on page 57](#)
- [“How to Make a Persistent Change to Boot Order” on page 58](#)
- [“How to Switch Boot Devices” on page 59](#)
- [“How to Specify a Subset of Strings and a Subset of the Boot List” on page 61](#)
- [“How to Move Boot List Entries” on page 61](#)
- [“How to Change Boot Order Based on the PCI Bus, Device, or Function” on page 62](#)

▼ How to Set the First Boot Device for the Next Boot

`biosconfig` enables you to configure the first device to boot at the next reboot. `biosconfig` can manipulate the bootable devices individually (not by category) through specification of (subsets of) the strings that BIOS expansion ROMs use to identify their devices. `biosconfig` does this by reading the boot-related tables that the BIOS stores in NVRAM, which is a dedicated part of the BIOS ROM, and then by manipulating the contents of CMOS where the boot order is stored.

Here is an example of using the `-set_boot_override` command that specifies the first boot device as the PXE server on only the next boot:

- 1 **Determine the current boot order of your system by using the `biosconfig -get_boot_order` command option.**
- 2 **Modify the boot order by using the `biosconfig -set_boot_override` command. Set XML text similar to the following:**

```
<?xml version="1.0" encoding="UTF-8"?>
<BIOSCONFIG>
  <BIOSCONFIG_VERSION>2.1</BIOSCONFIG_VERSION>
  <SPEC_VERSION>2.4</SPEC_VERSION>
  <SP_NETWORK_CONFIG>
    <DISCOVERY></DISCOVERY>
    <IP></IP>
```

```

        <NETMASK></NETMASK>
        <GATEWAY></GATEWAY>
    </SP_NETWORK_CONFIG>
    <PASSWORD_CONFIG>
        <PASSWORD></PASSWORD>
    </PASSWORD_CONFIG>
    <BOOT_ORDER_OVERRIDE>
        <HELP_STRING>FIRST=Choose one of: pxe, cdrom, disk,
floppy, bios, none</HELP_STRING>
        <FIRST>pxe</FIRST>
        <HELP_STRING>CLEAR_CMOS=Choose Yes, No or leave it
empty, ....</HELP_STRING>
        <CLEAR_CMOS></CLEAR_CMOS>
    </BOOT_ORDER_OVERRIDE>
    <BOOT_DEVICE_PRIORITY>
    <Boot_Device_01>
        <DEVICE_NAME>USB:Port1:Memorex DVD+-RAM 510L v1</DEVICE_NAME>
    </Boot_Device_01>
    <Boot_Device_02>
        <DEVICE_NAME>SATA:3M-MRVLRD 200254-01SUN24G 0801</DEVICE_NAME>
    </Boot_Device_02>
    <Boot_Device_03>
        <DEVICE_NAME>USB:Port0:SanDisk Cruzer Contour</DEVICE_NAME>
    </Boot_Device_03>
    <Boot_Device_04>
        <DEVICE_NAME>IB:Slot2.F0:PXE:MLNX HCA IB 1.9.972 (PCI 07:00.
</DEVICE_NAME>
        <PCI-B-D-F>07,00,00</PCI-B-D-F>
    </Boot_Device_04>
    <Boot_Device_05>
        <DEVICE_NAME>PXE:IBA GE Slot 00C8 v1324</DEVICE_NAME>
        <PCI-B-D-F>00,19,00</PCI-B-D-F>
    </Boot_Device_05>
    </BOOT_DEVICE_PRIORITY>
</BIOSCONFIG>

```

- See Also**
- [“How to Make a Persistent Change to Boot Order” on page 58](#)
 - [“How to Switch Boot Devices” on page 59](#)
 - [“How to Specify a Subset of Strings and a Subset of the Boot List” on page 61](#)
 - [“How to Move Boot List Entries” on page 61](#)
 - [“How to Change Boot Order Based on the PCI Bus, Device, or Function” on page 62](#)

▼ How to Make a Persistent Change to Boot Order

`biosconfig` can manipulate the bootable devices individually (not by category) through specification of (subsets of) the strings that BIOS expansion ROMs use to identify their devices. `biosconfig` does this by reading the boot-related tables that the BIOS stores in NVRAM, which is a dedicated part of the BIOS ROM, and then by manipulating the contents of CMOS where the boot order is stored.

Here is an example output of the `-get_boot_order` command option from a Sun Blade X6275 server module (which has a built-in bootable InfiniBand interface) set to optimal defaults with a 1-GByte USB flash, a USB CD, and a dual Gig-Ethernet Express Module plugged in:

- **Set XML text similar to the following:**

```
<?xml version="1.0" encoding="UTF-8"?>
<BIOSCONFIG>
  <BIOSCONFIG_VERSION>2.1</BIOSCONFIG_VERSION>
  <SPEC_VERSION>2.4</SPEC_VERSION>
  <SP_NETWORK_CONFIG>
    <DISCOVERY></DISCOVERY>
    <IP></IP>
    <NETMASK></NETMASK>
    <GATEWAY></GATEWAY>
  </SP_NETWORK_CONFIG>
  <PASSWORD_CONFIG>
    <PASSWORD></PASSWORD>
  </PASSWORD_CONFIG>
  <BOOT_ORDER_OVERRIDE>
    <HELP_STRING>FIRST=Choose one of: pxe, cdrom, disk,
floppy, bios, none</HELP_STRING>
    <FIRST></FIRST>
    <HELP_STRING>CLEAR_CMOS=Choose Yes, No or leave it
empty, ....</HELP_STRING>
    <CLEAR_CMOS></CLEAR_CMOS>
  </BOOT_ORDER_OVERRIDE>
  <BOOT_DEVICE_PRIORITY>
    <Boot_Device_01>
      <DEVICE_NAME>USB:Port1:Memorex DVD+-RAM 510L v1</DEVICE_NAME>
    </Boot_Device_01>
    <Boot_Device_02>
      <DEVICE_NAME>SATA:3M-MRVLRD 200254-01SUN24G 0801</DEVICE_NAME>
    </Boot_Device_02>
    <Boot_Device_03>
      <DEVICE_NAME>USB:Port0:SanDisk Cruzer Contour</DEVICE_NAME>
    </Boot_Device_03>
    <Boot_Device_04>
      <DEVICE_NAME>IB:Slot2.F0:PXE:MLNX HCA IB 1.9.972 (PCI 07:00.
</DEVICE_NAME>
      <PCI-B-D-F>07,00,00</PCI-B-D-F>
    </Boot_Device_04>
    <Boot_Device_05>
      <DEVICE_NAME>PXE:IBA GE Slot 00C8 v1324</DEVICE_NAME>
      <PCI-B-D-F>00,19,00</PCI-B-D-F>
    </Boot_Device_05>
  </BOOT_DEVICE_PRIORITY>
</BIOSCONFIG>
```

- See Also**
- [“How to Set the First Boot Device for the Next Boot” on page 57](#)
 - [“How to Switch Boot Devices” on page 59](#)
 - [“How to Specify a Subset of Strings and a Subset of the Boot List” on page 61](#)
 - [“How to Move Boot List Entries” on page 61](#)
 - [“How to Change Boot Order Based on the PCI Bus, Device, or Function” on page 62](#)

▼ How to Switch Boot Devices

You can switching boot device 1 and 2 by using the `-set_boot_order` command with this XML input.

Note – The boot order is sent by the boot device tag number and not in the order in which the devices appear in this file, for example, `Boot_Device_01` boots before `Boot_Device_02`).

- **View the following XML code:**

```
<BIOSCONFIG>
  <BOOT_DEVICE_PRIORITY>
    <Boot_Device_01>
      <DEVICE_NAME>SATA:3M-MRVLRD 200254-01SUN24G 0801 </DEVICE_NAME>
    </Boot_Device_01>
    <Boot_Device_02>
      <DEVICE_NAME>USB:Port1:Memorex DVD+-RAM 510L </DEVICE_NAME>
    </Boot_Device_02>
    <Boot_Device_03>
      <DEVICE_NAME>USB:Port0:SanDisk Cruzer Contour </DEVICE_NAME>
    </Boot_Device_03>
    <Boot_Device_04>
      <DEVICE_NAME>IB:Slot2.F0:PXE:MLNX HCA IB 1.9.972 (PCI 07:00.
</DEVICE_NAME>
      <PCI-B-D-F>07,00,00</PCI-B-D-F>
    </Boot_Device_04>
    <Boot_Device_05>
      <DEVICE_NAME>PXE:IBA GE Slot 00C8 v1324 </DEVICE_NAME>
      <PCI-B-D-F>00,19,00</PCI-B-D-F>
    </Boot_Device_05>
  </BOOT_DEVICE_PRIORITY>
</BIOSCONFIG>
```

- **In the previous output, the specified hardware is described as follows:**

Output Text	Description of Hardware
SATA:3M-MRVLRD 200254-01SUN24G 0801	Flash mini-DIMM SATA (which is disk-like)
USB:Port1:Memorex DVD+-RAM 510L	USB DVD drive (which is CD-like)
USB:Port0:SanDisk Cruzer Contour	1 GB USB flash drive (which is disk-like)
IB:Slot2.F0:PXE:MLNX HCA IB 1.9.972	InfiniBand PXE (which is network-like)
PXE:IBA GE Slot 00C8 v1324	On-board GigEthernet NIC (which is a network interface)

- See Also**
- [“How to Set the First Boot Device for the Next Boot” on page 57](#)
 - [“How to Make a Persistent Change to Boot Order” on page 58](#)
 - [“How to Specify a Subset of Strings and a Subset of the Boot List” on page 61](#)
 - [“How to Move Boot List Entries” on page 61](#)
 - [“How to Change Boot Order Based on the PCI Bus, Device, or Function” on page 62](#)

▼ How to Specify a Subset of Strings and a Subset of the Boot List

biosconfig permits specifying a subset of the strings and a subset of the boot list. For example, using biosconfig -set_boot_order with this XML input results in moving the InfiniBand device boot list entry number to number 1.

- **Set XML code similar to the following:**

```
<BIOSCONFIG>
  <BOOT_DEVICE_PRIORITY>
    <Boot_Device_01>
      <DEVICE_NAME>MLNX HCA IB</DEVICE_NAME>
    </Boot_Device_01>
  </BOOT_DEVICE_PRIORITY>
</BIOSCONFIG>
```

- See Also**
- “How to Set the First Boot Device for the Next Boot” on page 57
 - “How to Make a Persistent Change to Boot Order” on page 58
 - “How to Switch Boot Devices” on page 59
 - “How to Move Boot List Entries” on page 61
 - “How to Change Boot Order Based on the PCI Bus, Device, or Function” on page 62

▼ How to Move Boot List Entries

The biosconfig -set_boot_order command also moves down the other boot list entries so that the boot list order becomes as follows:

- **Set similar XML code:**

```
<BOOT_DEVICE_PRIORITY>
  <Boot_Device_01>
    <DEVICE_NAME>IB:Slot2.F0:PXE:MLNX HCA IB 1.9.972 (PCI 07:00.
  </DEVICE_NAME>
    <PCI-B-D-F>07,00,00</PCI-B-D-F>
  </Boot_Device_01>
  <Boot_Device_02>
    <DEVICE_NAME>PXE:IBA GE Slot 00C8 v1324</DEVICE_NAME>
    <PCI-B-D-F>00,19,00</PCI-B-D-F>
  </Boot_Device_02>
  <Boot_Device_03>
    <DEVICE_NAME>USB:Port1:Memorex DVD+-RAM 510L v1</DEVICE_NAME>
  </Boot_Device_03>
  <Boot_Device_04>
    <DEVICE_NAME>USB:Port0:SanDisk Cruzer Contour</DEVICE_NAME>
  </Boot_Device_04>
  <Boot_Device_05>
    <DEVICE_NAME>SATA:3M-MRVLRD 200254-01SUN24G 0801</DEVICE_NAME>
  </Boot_Device_05>
</BOOT_DEVICE_PRIORITY>
```

- See Also**
- “How to Set the First Boot Device for the Next Boot” on page 57
 - “How to Make a Persistent Change to Boot Order” on page 58

- “How to Switch Boot Devices” on page 59
- “How to Specify a Subset of Strings and a Subset of the Boot List” on page 61
- “How to Change Boot Order Based on the PCI Bus, Device, or Function” on page 62

▼ How to Change Boot Order Based on the PCI Bus, Device, or Function

biosconfig alters the boot order based on the PCI bus, device, or function if the boot order list contains that information. (USB devices do not have this information, but PCI devices do.)

For example, using biosconfig -set_boot_order with this XML input moves the specified Ethernet NIC to the top of the boot list:

● Set similar XML code:

```
<BIOSCONFIG>
  <BOOT_DEVICE_PRIORITY>
    <Boot_Device_01>
      <PCI-B-D-F>00,19,00</PCI-B-D-F>
    </Boot_Device_01>
  </BOOT_DEVICE_PRIORITY>
</BIOSCONFIG>
```

▪ As a result, the boot list now becomes:

```
<BOOT_DEVICE_PRIORITY>
  <Boot_Device_01>
    <DEVICE_NAME>PXE:IBA GE Slot 00C8 v1324</DEVICE_NAME>
    <PCI-B-D-F>00,19,00</PCI-B-D-F>
  </Boot_Device_01>
  <Boot_Device_02>
    <DEVICE_NAME>IB:Slot2.F0:PXE:MLNX HCA IB 1.9.972 (PCI 07:00.
</DEVICE_NAME>
    <PCI-B-D-F>07,00,00</PCI-B-D-F>
  </Boot_Device_02>
  <Boot_Device_03>
    <DEVICE_NAME>USB:Port1:Memorex DVD+-RAM 510L v1</DEVICE_NAME>
  </Boot_Device_03>
  <Boot_Device_04>
    <DEVICE_NAME>USB:Port0:SanDisk Cruzer Contour</DEVICE_NAME>
  </Boot_Device_04>
  <Boot_Device_05>
    <DEVICE_NAME>SATA:3M-MRVLRD 200254-01SUN24G 0801</DEVICE_NAME>
  </Boot_Device_05>
</BOOT_DEVICE_PRIORITY>
```

- See Also**
- “How to Set the First Boot Device for the Next Boot” on page 57
 - “How to Make a Persistent Change to Boot Order” on page 58
 - “How to Switch Boot Devices” on page 59
 - “How to Specify a Subset of Strings and a Subset of the Boot List” on page 61
 - “How to Move Boot List Entries” on page 61

BIOS CMOS Configuration

The BIOS configuration information is stored in the CMOS memory, battery back-up, in the host's chipset. Through the BIOS setup interface at BIOS POST, you can configure many of the CMOS settings. `biosconfig` is an alternative interface to modify these settings with a program on the host OS. `biosconfig` configures the BIOS CMOS settings using two methods:

- Copying and using a golden (known reliable) image
- Controlling each setting individually

This section covers the following topics:

- “How to Configure the BIOS CMOS Using a Golden CMOS Image” on page 63
- “How to Apply the Golden Image” on page 64
- “Configuring Individual CMOS Settings” on page 65

▼ How to Configure the BIOS CMOS Using a Golden CMOS Image

The BIOS configuration consists of the contents of the CMOS and the boot tables in the NVRAM. The command `biosconfig -get_CMOS_dump` captures the 256 bytes of CMOS, but it does not gather the boot table information from NVRAM. So this command might not capture the boot-order information, unless the bootable I/O configurations for the source and destination machines are the same. To generate a golden (known reliable) CMOS image, use BIOS setup to configure the host as you want.

1 Use the `biosconfig -get_CMOS_dump` to capture the 256 bytes of CMOS holding the configuration information:

```
# biosconfig -get_CMOS_dump golden.xml
Copyright (C) SUN Microsystems 2009.
BIOSconfig Utility Version 2.1
Build Date: Jul 16 2009
Build Time: 15:55:12
BIOSconfig Specification Version 2.4
Success
```

2 To view the XML file, type:

Note – The data between the `<CMOS_DUMP>` element tags contains raw CMOS data.

```
<BIOSCONFIG>
  <BIOSCONFIG_VERSION>2.1</BIOSCONFIG_VERSION>
  <SPEC_VERSION>2.4</SPEC_VERSION>
  <SP_NETWORK_CONFIG>
    <DISCOVERY></DISCOVERY>
    <IP></IP>
    <NETMASK></NETMASK>
    <GATEWAY></GATEWAY>
  </SP_NETWORK_CONFIG>
```

```

<PASSWORD_CONFIG>
  <PASSWORD></PASSWORD>
</PASSWORD_CONFIG>
<BOOT_ORDER_OVERRIDE>
  <HELP_STRING>FIRST=Choose one of: pxe, cdrom, disk, floppy,
bios, none</HELP_STRING>
  <FIRST></FIRST>
  <HELP_STRING>CLEAR_CMOS=Choose Yes, No or leave it empty,
</HELP_STRING>
  <CLEAR_CMOS></CLEAR_CMOS>
</BOOT_ORDER_OVERRIDE>
<BOOT_DEVICE_PRIORITY>
  <B0>
    <DEVICE_NAME></DEVICE_NAME>
    <PCI-B-D-F></PCI-B-D-F>
  </B0>
</BOOT_DEVICE_PRIORITY>
<CMOS_DUMP>
<OFFSET_00>00.00.00.00.00.00.00.00.00.00.00.00.00.00.00.00.</OFFSET_00>
<OFFSET_10>00.30.00.30.0E.80.02.FF.FF.00.00.00.00.00.00.00.</OFFSET_10>
<OFFSET_20>00.00.00.00.00.00.00.00.00.30.47.47.47.47.04.3A.</OFFSET_20>
<OFFSET_30>FF.FF.20.85.90.F7.07.00.00.03.00.17.00.00.1F.3A.</OFFSET_30>
<OFFSET_40>00.00.00.00.00.00.00.00.00.00.00.00.00.00.00.</OFFSET_40>
<OFFSET_50>00.00.FF.00.13.00.00.01.80.30.30.30.30.30.00.00.</OFFSET_50>
<OFFSET_60>EF.40.41.42.43.44.45.46.47.08.09.0A.18.00.00.0B.</OFFSET_60>
<OFFSET_70>00.03.0C.0D.0E.0F.10.11.00.00.00.00.12.13.14.15.</OFFSET_70>
<OFFSET_80>11.24.26.06.46.14.00.16.02.00.F8.23.C8.17.20.07.</OFFSET_80>
<OFFSET_90>18.20.19.1A.1B.1C.1D.9E.DF.9E.DE.21.02.03.04.05.</OFFSET_90>
<OFFSET_A0>06.07.08.09.EA.2B.0B.0B.0B.4B.00.01.0F.00.0C.00.</OFFSET_A0>
<OFFSET_B0>00.00.00.00.10.32.54.76.10.32.54.76.14.00.00.00.</OFFSET_B0>
<OFFSET_C0>00.46.BC.00.00.00.00.00.00.80.C0.10.42.F9.FF.FF.</OFFSET_C0>
<OFFSET_D0>83.00.80.9C.DE.1F.40.02.FA.52.55.E0.F1.F3.E7.FF.</OFFSET_D0>
<OFFSET_E0>7C.00.01.04.00.00.05.04.03.04.00.02.07.02.17.00.</OFFSET_E0>
<OFFSET_F0>17.03.01.05.08.01.03.04.00.03.00.09.01.00.05.00.</OFFSET_F0>
</CMOS_DUMP>
</BIOSCONFIG>

```

See Also ■ [“How to Apply the Golden Image” on page 64](#)

▼ How to Apply the Golden Image

You can apply the golden image to similar hardware by copying the golden image from your system to a second system with the same BIOS revision, as shown using `set_cmos_dump`:

- **Use the following command:**

```
# biosconfig -set_cmos_dump golden.xml
```

```
Copyright (C) SUN Microsystems 2009.
BIOSconfig Utility Version 2.1
Build Date: Jul 16 2009
Build Time: 15:55:12
```

```
BIOSconfig Specification Version 2.4
```

```
Processing Input BIOS Data....
```

Success

- See Also** ■ [“How to Configure the BIOS CMOS Using a Golden CMOS Image” on page 63](#)

Configuring Individual CMOS Settings

biosconfig provides two commands to manage individual CMOS settings:

- `-get_bios_settings`
Gets CMOS settings from the platform.
- `-set_bios_settings`
Sets CMOS settings on the platform.

To use these commands you can:

1. Use `-get_bios_settings` to generate an XML file that describes the current settings.
2. Edit that XML file so that it specifies the settings.
3. Use `-set_bios_settings` to change settings in CMOS.

Note – Values for the settings vary depending on your server type. biosconfig reads the host's BIOS image and the platform's CMOS to find the setup questions (the strings displayed in BIOS setup), the optimal default values, the current settings, and the permitted settings. The XML file structure matches the menu hierarchy in BIOS setup. When using `-set_bios_settings`, you can provide a subset of the XML file output by using `-get_bios_settings` so that it includes only the settings that you wish to make.

The names in the output XML file match the names in the setup menus; the only difference is that the spaces are replaced with underscores (_). For example, the Quick Boot entry in the Boot Settings Configuration submenu in the Boot menu of BIOS setup is specified like this:

```
<BIOSCONFIG>
  <SETUP_CONFIG>
    <Boot>
      <Boot_Settings_Configuration>
        <Quick_Boot>
```

This section includes the following procedures:

- [“How to Retrieve Static CMOS Settings” on page 66](#)
- [“How to Configure a Dynamic Setting” on page 67](#)
- [“How to Configure NET0_Option_ROM” on page 68](#)
- [“How to View Chipset-Related Settings” on page 68](#)
- [“How to Configure System Powered Off” on page 69](#)

- “How to Turn Off Quick Boot and Power Off Options” on page 69

▼ How to Retrieve Static CMOS Settings

There are two types of CMOS settings: static and dynamic. The following static settings are determined at runtime by the BIOS:

- The value in CMOS
- The behavior determined by that value
- The BIOS setup strings displayed

For example, for the BIOS setup question in the Quick Boot, in the Boot Settings Configuration menu, under the Boot menu, there are two choices, Enabled and Disabled, and the optimal default is Enabled.

The following are subsets of the output XML file:

● View the following XML code examples:

```
<BIOSCONFIG>
  <SETUP_CONFIG>
    <Boot>
      <Boot_Settings_Configuration>
        <Quick_Boot>
          <HELP_STRING>Allows BIOS to skip certain...
        </HELP_STRING>
        <DEFAULT_OPTION>Enabled</DEFAULT_OPTION>
        <SELECTED_OPTION>Enabled</SELECTED_OPTION>
        <OPTION-0>Disabled</OPTION-0>
        <OPTION-1>Enabled</OPTION-1>
        </Quick_Boot>
        <Onboard_IB_gPXE_boot_first_>
          <HELP_STRING>Set Onboard Infiniband gPXE ....
        </HELP_STRING>
        <DEFAULT_OPTION>Disabled</DEFAULT_OPTION>
        <SELECTED_OPTION>Disabled</DEFAULT_OPTION>
        <OPTION-0>Disabled</OPTION-0>
        <OPTION-1>Enabled</OPTION-2>
        </Onboard_IB_gPXE_boot_first_>
      </Boot_Settings_Configuration>
    </Boot>
  </SETUP_CONFIG>
</BIOSCONFIG>
```

or

```
<BIOSCONFIG>
  <SETUP_CONFIG>
    <Chipset>
      <South_Bridge_Configuration>
        <Restore_on_AC_Power_Loss>
          <HELP_STRING></HELP_STRING>
          <DEFAULT_OPTION>Power On</DEFAULT_OPTION>
          <SELECTED_OPTION>Power On</SELECTED_OPTION>
          <OPTION-0>Power Off</OPTION-0>
```

```

        <OPTION-1>Power On</OPTION-1>
        <OPTION-2>Last State</OPTION-2>
    </Restore_on_AC_Power_Loss>
</South_Bridge_Configuration>
</Chipset>
</SETUP_CONFIG>
</BIOSCONFIG>

```

- See Also**
- [“How to Configure a Dynamic Setting” on page 67](#)
 - [“How to Configure NET0_Option_ROM” on page 68](#)
 - [“How to View Chipset-Related Settings” on page 68](#)
 - [“How to Configure System Powered Off” on page 69](#)
 - [“How to Turn Off Quick Boot and Power Off Options” on page 69](#)

▼ How to Configure a Dynamic Setting

There are two types of CMOS settings: static and dynamic. The following dynamic settings are determined at runtime by the BIOS:

- Value in CMOS
- Behavior determined by that value
- BIOS setup strings displayed

biosconfig cannot retrieve the strings and the mapping between the values in CMOS. This behavior is BIOS dependent; the ability to retrieve this information depends on the BIOS revision and the platform type.

To configure dynamic settings, you need to discover the setting that you wish to use by following these steps:

- 1 **Enter the BIOS setup.**
- 2 **Configure this setting manually and save.**
- 3 **Run biosconfig-get_bios_settings and examine the resulting XML output to find the value that the BIOS is using for the setting you wish to specify.**

This is an example of a dynamic CMOS setting:

```

<BIOSCONFIG>
  <SETUP_CONFIG>
    <Boot>
      <Option_ROM_Enable>
        <NET0_Option_ROM_>
          <HELP_STRING>This Option enables execut...
</HELP_STRING>
          <DEFAULT_OPTION> 0000 </DEFAULT_OPTION>
          <SELECTED_OPTION> 0000 </SELECTED_OPTION>
          <OPTION_RANGE> 0000 - 0001 </OPTION_RANGE>
          <OPTION-0>Not Available</OPTION-0>
        </NET0_Option_ROM_>

```

```

        </Option_ROM_Enable>
    </Boot>
</SETUP_CONFIG>
</BIOSCONFIG>

```

In the preceding code, there are no string-to-value mappings offered by the biosconfig output.

4 Use this setting with `-set_bios_settings` to configure other machines.

- See Also**
- “How to Configure NET0_Option_ROM” on page 68
 - “How to Retrieve Static CMOS Settings” on page 66
 - “How to View Chipset-Related Settings” on page 68
 - “How to Configure System Powered Off” on page 69
 - “How to Turn Off Quick Boot and Power Off Options” on page 69

▼ How to Configure NET0_Option_ROM

If you do this, for this particular entry, the optimal default is Enabled which has the value 0. Disabled has the value 1.

● Set the following XML code:

```

<BIOSCONFIG>
  <SETUP_CONFIG>
    <Boot>
      <Option_ROM_Enable>
        <NET0_Option_ROM_>
          <SELECTED_OPTION> 1 </SELECTED_OPTION>
        </NET0_Option_ROM_>
      </Option_ROM_Enable>
    </Boot>
  </SETUP_CONFIG>
</BIOSCONFIG>

```

- See Also**
- “How to View Chipset-Related Settings” on page 68
 - “How to Retrieve Static CMOS Settings” on page 66
 - “How to Configure a Dynamic Setting” on page 67
 - “How to Configure System Powered Off” on page 69
 - “How to Turn Off Quick Boot and Power Off Options” on page 69

▼ How to View Chipset-Related Settings

During BIOS development, many chipset-related settings that are not relevant to the platform under development are hidden in the BIOS setup; however, some of those appear in the biosconfig `-get_setup_config` output.

● To view chipset-related settings, use the biosconfig `-get_setup_config` command:

```

<BIOSCONFIG>
  <NET1_Option_ROM_>
    <HELP_STRING>This Option enables execution of the .....

```

```

</HELP_STRING>
  <DEFAULT_OPTION>Enabled</DEFAULT_OPTION>
  <SELECTED_OPTION>Enabled</SELECTED_OPTION>
  <OPTION-0>Disabled</OPTION-0>
  <OPTION-1>Enabled</OPTION-1>
</NET1_Option_ROM_>
</BIOSCONFIG>

```

This example describes an on-board network interface card (NIC) that is not used. To avoid confusion, look in the BIOS setup to determine the name of options that you can control.

- See Also**
- “How to Configure System Powered Off” on page 69
 - “How to Retrieve Static CMOS Settings” on page 66
 - “How to Configure a Dynamic Setting” on page 67
 - “How to Configure NET0_Option_ROM” on page 68
 - “How to Turn Off Quick Boot and Power Off Options” on page 69

▼ How to Configure System Powered Off

To change the behavior of the system so that it remains off after AC power is restored, you can use this minimal XML file to change the setting from the default of Power On to Power Off:

- **Set the following XML code:**

```

<BIOSCONFIG>
  <SETUP_CONFIG>
    <Chipset>
      <South_Bridge_Configuration>
        <Restore_on_AC_Power_Loss>
          <SELECTED_OPTION>Power Off</SELECTED_OPTION>
        </Restore_on_AC_Power_Loss>
      </South_Bridge_Configuration>
    </Chipset>
  </SETUP_CONFIG>
</BIOSCONFIG>

```

- See Also**
- “How to Turn Off Quick Boot and Power Off Options” on page 69
 - “How to Retrieve Static CMOS Settings” on page 66
 - “How to Configure a Dynamic Setting” on page 67
 - “How to Configure NET0_Option_ROM” on page 68
 - “How to View Chipset-Related Settings” on page 68

▼ How to Turn Off Quick Boot and Power Off Options

You can combine changes into a single file. For example, to turn off Quick Boot and Power Off after AC power is restored you could use this:

- **Set the following XML code:**

```

<BIOSCONFIG>
  <SETUP_CONFIG>

```

```

    <Chipset>
      <South_Bridge_Configuration>
        <Restore_on_AC_Power_Loss>
          <SELECTED_OPTION>Power Off</SELECTED_OPTION>
        </Restore_on_AC_Power_Loss>
      </South_Bridge_Configuration>
    </Chipset>
  </Boot>
    <Boot_Settings_Configuration>
      <Quick_Boot>
        <SELECTED_OPTION>Disabled</SELECTED_OPTION>
      </Quick_Boot>
    </Boot_Settings_Configuration>
  </Boot>
</SETUP_CONFIG>
</BIOSCONFIG>

```

- See Also**
- [“How to Retrieve Static CMOS Settings” on page 66](#)
 - [“How to Configure a Dynamic Setting” on page 67](#)
 - [“How to Configure NET0_Option_ROM” on page 68](#)
 - [“How to View Chipset-Related Settings” on page 68](#)
 - [“How to Configure System Powered Off” on page 69](#)

Commands That Produce Unrelated, Innocuous, Extra Output

The following is a known issue with biosconfig.

Some commands have extraneous output in the XML file. For example, the following is the extra output from `-get_cmos_dump`.

```

<SP_NETWORK_CONFIG>
  <DISCOVERY></DISCOVERY>
  <IP></IP>
  <NETMASK></NETMASK>
  <GATEWAY></GATEWAY>
</SP_NETWORK_CONFIG>
<PASSWORD_CONFIG>
  <PASSWORD></PASSWORD>
</PASSWORD_CONFIG>
<BOOT_ORDER_OVERRIDE>
  <HELP_STRING>FIRST=Choose one of: pxe, cdrom, disk,
floppy, bios, none</HELP_STRING>
  <FIRST></FIRST>
  <HELP_STRING>CLEAR_CMOS=Choose Yes, No or leave it
empty, empty means No</HELP_STRING>
  <CLEAR_CMOS></CLEAR_CMOS>
</BOOT_ORDER_OVERRIDE>
<BOOT_DEVICE_PRIORITY>
  <B0>
    <DEVICE_NAME></DEVICE_NAME>
    <PCI-B-D-F></PCI-B-D-F>
  </B0>
</BOOT_DEVICE_PRIORITY>

```

See also:

- “How to Retrieve Static CMOS Settings” on page 66
- “How to Configure a Dynamic Setting” on page 67
- “How to Configure NET0_Option_ROM” on page 68
- “How to View Chipset-Related Settings” on page 68
- “How to Configure System Powered Off” on page 69
- “How to Turn Off Quick Boot and Power Off Options” on page 69

Using the fwupdate Tool

The fwupdate tool is one of the CLI components of the Oracle Hardware Management Pack. fwupdate is a cross-OS utility that enables you to query, update, and validate the firmware of storage devices such as HBA, expanders, and disks on Oracle servers. fwupdate is supported on Linux, the Solaris OS, and Windows for x86 servers and Solaris OS for SPARC servers.

The fwupdate tool updates a storage component's (SAS controller, SAS expander, disk drive, SAS bridge) firmware images when an update is made to that firmware. The tool displays the inventory of storage components that can be seen by a host and can show all of the available firmware versions.

The fwupdate tool uses a general-purpose cross-OS storage management library to access specific hardware information and provides exploration, monitoring, and configuration of on-board (local disks) and external storage resources (JBODs) connected to the host system.

With Oracle Hardware Management Pack 2.1, there are two modes available for the fwupdate tool: automatic mode and manual mode.

- Automatic mode uses information from the XML metadata file that is packaged with the platform firmware downloads to update the storage device firmware. This is the most accurate method to use, and it is recommended by Oracle.
- Manual mode allows you to update the firmware directly. This mode should only be used if the XML metadata file is not available for the platform that you want to update.

Check the documentation and release notes for your product to determine whether or not an XML metadata file is available. The product release notes will also contain upgrade information that is specific to the platform.

The fwupdate CLI commands are run on the host machine and supports the target devices. fwupdate supports the following storage subsystems:

- Disk drives (spinning media and Flash drives)
- HBA and embedded storage controllers, SAS1 and SAS2
- LSI SAS expander devices, SAS1 and SAS2

This section covers the following topics:

- [“fwupdate Command-Line Interface” on page 74](#)
- [“list Subcommand” on page 79](#)

- [“update Subcommand” on page 76](#)
- [“reset Subcommand” on page 80](#)
- [“Device-Naming Convention” on page 81](#)
- [“Execution Summary” on page 81](#)

fwupdate Command-Line Interface

This section covers the following topics:

- [“Automatic Mode fwupdate Command-Line Interface” on page 74](#)
- [“Manual Mode fwupdate Command-Line Interface” on page 75](#)

Automatic Mode fwupdate Command-Line Interface

Automatic command-line mode uses an XML metadata file that is included in the platform firmware downloads.

The following restrictions apply when using the fwupdate command:

- You must be in root permission level to run fwupdate commands on Unix-based platforms, or administrator permission level for Windows platforms.
- An XML metadata file containing information on platform firmware must be available. Check your firmware release notes for information on availability of the metadata file.
- For Solaris systems, after hot-plugging any device, run the `devfsadm -C` command to reenumerate all of the system device nodes before running the fwupdate command.

When a command fails, it returns one of several failure codes listed in [“fwupdate Error Codes” on page 117](#).

Note – Default (noarg) behavior of the tool lists the help options. Incomplete command-line arguments result in an error, and context-sensitive help is displayed.

Automatic fwupdate mode uses the following syntax:

fwupdate *subcommand target -x filename .xml options*

where *target* is the type of device that is being listed or updated, *filename* is the .xml file that contains the firmware update metadata, and *subcommand* is one of the options shown in the following table.

Subcommand	Description
update	Update mode allows updating a single component based on command-line directives.

See also:

- [“update Subcommand” on page 76](#)
- [“list Subcommand” on page 79](#)
- [“reset Subcommand” on page 80](#)

Manual Mode fwupdate Command-Line Interface

Manual command-line mode is designed to update a single component with a user-specified firmware file.

The following restrictions apply when using the fwupdate command:

- You must be in root permission level to run fwupdate commands on Unix-based platforms, or administrator permission level for Windows platforms.
- Only one target device can be upgraded per command-line execution.
- Only one file type and file may be specified by the command line.
- Components with multiple and different firmware files require a separate command-line execution to be upgraded.
- For Solaris systems, after hot-plugging any device, run the `devfsadm -C` command to reenumerate all of the system device nodes before running the fwupdate command.

When a command fails, it returns one of several failure codes listed in [“fwupdate Error Codes” on page 117](#).

Note – Default (noarg) behavior of the tool lists the help options. Incomplete command-line arguments result in an error, and context-sensitive help is displayed.

The tool uses the following syntax:

fwupdate *subcommand target options*

where *target* is the type of device that is being listed or updated, *options* are options specific to the subcommand, and *subcommand* is one of the options shown in the following table.

Subcommand	Description
list	Listing mode displays system data and helps select components for upgrade.
update	Update mode allows updating a single component based on command-line directives.
reset	Reset mode allows resetting of individual components.

See also:

- [“update Subcommand” on page 76](#)
- [“list Subcommand” on page 79](#)
- [“reset Subcommand” on page 80](#)

update Subcommand

The following topics are covered in this section:

- [“Automatic Mode update Subcommand” on page 76](#)
- [“Manual Mode update Subcommand” on page 77](#)

Automatic Mode update Subcommand

The automatic mode update command updates the specified target device by using the firmware update information contained in the XML metadata file provided in the platform firmware download.

The update subcommand supports the following targets:

- all
- expander
- disk
- bridge
- controller
- expander-firmware
- expander-manufacturing_image
- disk-firmware
- sas-bridge-firmware
- sas-controller-firmware
- sas-controller-bios
- sas-controller-fcode

Options for the update subcommand are shown in the following table.

Short Options	Long Option	Descriptions
-n	--device_name	A mandatory option, with a mandatory parameter, to designate the device to update. The name is the mapped name, which you can retrieve by using the <code>list</code> command.
-o	--filename <i>filename</i>	A mandatory option, with a mandatory parameter, designating the name of the firmware image file that is to be applied.
-r	--reset	Do not use this option. If you need to reset, use the <code>reset</code> subcommand. See “reset Subcommand” on page 80 .

Short Options	Long Option	Descriptions
-d	--dry-run	Optional. Checks all input, executes an available dry-run check command on the firmware and component, but makes no permanent changes.

The following are automatic mode update command examples:

- **fwupdate update all -x filename.xml**
- **fwupdate update disk -x filename.xml -n c0d1**

The following is example output from the **fwupdate update all -x filename.xml** command:

The following components will be upgraded as shown:

```
=====
```

ID	Priority	Action	Status	Old Firmware Ver.	Proposed Ver.	New Firmware Ver.	System Reboot
c0d0	1	Check FW	Success	0768	0868	N/A	None
c0d1	1	Check FW	Success	0768	0868	N/A	None
c0d2	1	Check FW	Success	0768	0868	N/A	None
c0d3	1	Check FW	Success	0768	0868	N/A	None

Do you wish to process all of the above component upgrades? [y/n]?

If you want to update the listed components, type **y** when prompted.

As the firmware updates, you will see output similar to the following:

```
Updating c0d0: Success
Updating c0d1: Success
Updating c0d2: Success
Updating c0d3: Success
Verifying all priority 1 updates
```

Execution Summary

```
=====
```

ID	Priority	Action	Status	Old Firmware Ver.	Proposed Ver.	New Firmware Ver.	System Reboot
c0d0	1	Validate	Success	0768	0868	0868	None
c0d1	1	Validate	Success	0768	0868	0868	None
c0d2	1	Validate	Success	0768	0868	0868	None
c0d3	1	Validate	Success	0768	0868	0868	None

See also:

- [“Manual Mode update Subcommand” on page 77](#)
- [“list Subcommand” on page 79](#)
- [“reset Subcommand” on page 80](#)

Manual Mode update Subcommand

The target set for the update command maps one target to one supported firmware image type that is supported by the tool.

The update subcommand supports the following targets:

- `expander-firmware`
- `expander-manufacturing_image`
- `disk-firmware`
- `sas-bridge-firmware`
- `sas-controller-firmware`
- `sas-controller-bios`
- `sas-controller-fcode`

Only one firmware image and one component can be specified per execution of this command.

Options for the update subcommand are shown in the following table.

Short Options	Long Option	Descriptions
-n	--device_name	A mandatory option, with a mandatory parameter, to designate the device to update. The name is the mapped name, which you can retrieve by using the <code>list</code> command.
-o	--filename <i>filename</i>	A mandatory option, with a mandatory parameter, designating the name of the firmware image file that is to be applied.
-r	--reset	Do not use this option. If you need to reset, use the reset subcommand. See “reset Subcommand” on page 80 .
-d	--dry-run	Optional. Checks all input, executes an available dry-run check command on the firmware and component, but makes no permanent changes.

The following are update command examples:

- **`fwupdate update disk-firmware -n c1d1 -f diskfirmware.file`**
- **`fwupdate update expander-fpga -n c1x2 -f expander.fpga -d -r`**

Note – Only one device can be specified per `fwupdate` execution. Every device that needs to be updated will have to be run as a separate `fwupdate` command.

See also:

- [“Automatic Mode update Subcommand” on page 76](#)
- [“list Subcommand” on page 79](#)
- [“reset Subcommand” on page 80](#)

List Subcommand

The `list` command displays the version of firmware for all components, tells you whether the target device can be updated with the XML metadata file, or prints the configuration information to a specified XML file.

The `list` options are shown in the following table.

Short Option	Long Option	Description
-n	-device_name	These options must have a mandatory parameter to designate a single device to list. The <code>--device_name</code> option is the common-mapped device name.
-v	-verbose	Displays much more information about each component listed. Verbose is off by default.
-x	-xml=file	Uses the provided XML metadata file to determine which components are supported.
-o	-output_xml=file	Prints the configuration information in XML format to the given file.

The supported targets for the `list` command are:

- all
- disk
- expander
- controller
- bridge

These targets represent all of the supported component types that can be upgraded by this tool. Use the `all` option to view all of the devices that can be updated using the XML metadata file.

The following are `fwupdate list` command examples:

- **fwupdate list disk**
Executes a listing of all the disks on the system.
- **fwupdate list expander -n c1x0 -v**
Shows verbose information about the expander mapped to `c1x0`.
- **fwupdate list all -x filename.xml**

The following is sample output for the `fwupdate list all -x filename.xml` command:

```
=====
CONTROLLER
=====
```

ID	Manufacturer	Model	Product Name	FW Version	BIOS Version	XML Support
c0	LSI Logic	0x0072	-	-	-	No

EXPANDERS

ID	Chassis Slot	Manufacturer	Model	Expander Name	FW Version	XML Support
c0x0	0	5	SUN	Blade Storage II Master	5.3.5.0	No
c0x1	1	0	SUN	NEM Hydra II Master	5.3.6.0	No
c0x2	2	0	SUN	Blade Storage II Master	5.3.5.0	No
c0x3	3	3	SUN	Blade Storage II Master	5.3.5.0	No

DISKS

ID	Manufacturer	Model	Chassis Slot	Type	Media	Size (GB)	FW Version	XML Support	
c0d0	SEAGATE	ST914603SSUN146G	-	0	-	HDD	146	0768	Yes
c0d1	SEAGATE	ST914603SSUN146G	-	1	-	HDD	146	0768	Yes
c0d2	SEAGATE	ST914603SSUN146G	-	2	-	HDD	146	0768	Yes
c0d3	SEAGATE	ST914603SSUN146G	-	3	-	HDD	146	0768	Yes
c0d4	HITACHI	H103014SCSUN146G	0	4	sas	HDD	146	A160	No
c0d5	HITACHI	H103030SCSUN300G	2	0	sas	HDD	299	A160	No
c0d6	SEAGATE	ST930003SSUN300G	3	0	sas	HDD	299	0868	No

See also:

- [“update Subcommand” on page 761](#)
- [“reset Subcommand” on page 80](#)

reset Subcommand

After firmware for a device has been updated, the device might need to be reset. This requirement is different with each device; therefore, the reset functionality might be part of the update procedure or a separate function. To determine if your device requires a reset after a firmware upgrade, consult the release notes of your firmware.

The supported targets for the fwupdate reset command are:

- all
- disk
- expander
- bridge
- controller

Options for the update subcommand are shown in the following table.

Short Option	Long Option	Description
-n	--device_name	A mandatory option, with a mandatory parameter, to designate a single device to show. <i>device_name</i> is the common-mapped device name.

The following is a `fwupdate reset disk` subcommand example. This example resets the disk mapped to `c2d2`.

```
# fwupdate reset disk -n c2d2
```

See also:

- [“update Subcommand” on page 761](#)
- [“list Subcommand” on page 79](#)

Device-Naming Convention

Device naming is shared with other CLI tools based on the storage library.

For a full description of the naming convention, see: [“CLI Tools Device-Naming Convention” on page 40](#).

Execution Summary

After the `fwupdate` tool is used to upgrade firmware, an execution summary provides information on whether or not the upgrade was successful. This information is also written to the log file.

The following are examples of the possible execution summary messages:

- Message printed after successful a dry-run/check function:
Check firmware successful for device: *device_name*
- The upgrade was successful, but no firmware version information is available for this component:
Upgrade of firmware for *device_name* succeeded. Version information was not available.
Consult your product release notes for information on how to verify the upgrade.
- Upgrade was successful:
Upgrade of *device_name* from *old_fw* to *new_fw* succeeded.
- The version number of the software did not change after a successful upgrade:
Upgrade of *device_name* from *old_fw* succeeded, but is not yet active.
This might mean that the machine needs to be reset, or other instructions need to be followed. Consult your product release notes for information on what needs to be done to update the version number.
- Upgrade failed:

Upgrade of *device_name* failed: *error_message*

Where:

- *device_name* is the logical name of the device that is being upgraded.
- *old_fw* is the old firmware version.
- *new_fw* is the new firmware version.
- *error_message* is the error message that explains why the firmware update did not succeed.

See also:

- [“update Subcommand” on page 76](#)
- [“list Subcommand” on page 79](#)
- [“reset Subcommand” on page 80](#)

Using the `raidconfig` Tool

`raidconfig` is part of the Oracle Hardware Management Pack and uses a general-purpose cross-OS storage management library to configure attributes to RAID volumes using XML files.

This section covers the following topics:

- “`raidconfig` Overview” on page 83
- “`raidconfig` Command Overview” on page 84
- “`list` Subcommand” on page 85
- “`create raid` Subcommand” on page 89
- “`delete raid` Subcommand” on page 90
- “`add spare` Subcommand” on page 91
- “`remove spare` Subcommand and Options” on page 92
- “`modify` Subcommand” on page 93
- “`export` Subcommand” on page 94
- “`raidconfig export` Options” on page 94
- “`import` Subcommand” on page 95

`raidconfig` Overview

`raidconfig` provides exploration, monitoring, and configuration of on-board (local disks) and external storage resources (JBODs) connected to the system. It uses a set of storage libraries to access specific information about the host system. These libraries and packages are distributed and installed automatically with `raidconfig`. Supported components of `raidconfig` include those devices supported by the library. `raidconfig` is supported on Linux, the Solaris OS, and Windows platforms. `raidconfig` is capable of the following functions:

- Shows, creates, deletes, and modifies RAID volumes.
- Facilitates scripting by using command-line options.
- Configures many similar and dissimilar platforms in a data center. This is accomplished by the ability to read from an XML file based on a command-line option. The XML file can be edited to fit various platform configurations. The tool allows the configuration to be easily written to a file in XML format.
- Displays the current RAID configuration and writes it to an XML file so it can be edited and used to configure the same or a different platform.

- Represents a logical disk in a portable manner. For example, using a unique enumeration per controller, instead of a SAS address, facilitates moving the XML file to other platforms.
- Provides a super-set of all configuration options provided by the Adaptec and LSI CLI commands.
- Uses capability checking, for example, on supported RAID types, for particular adapters based on data retrieved from the API.

raidconfig has the following restrictions:

- You must be in root permission level to run raidconfig commands on Unix-based platforms, or Administrator permission level for Windows platforms.
- raidconfig cannot create nested RAID volumes (a RAID volume as part of another RAID volume).
- On Oracle Solaris, raidconfig is not compatible with the raidctl CLI tool. (raidconfig supports SAS2, but the raidctl tool does not.)

See also “[raidconfig Command Overview](#)” on page 84.

raidconfig Command Overview

The raidconfig commands adhere to the following command syntax:

raidconfig *subcommand device-type -option(s)*

For Solaris, after hot-plugging any device, run the **devfsadm -C** command to reenumerate all of the system device nodes before running the raidconfig command.

When a command fails, it returns one of several failure codes listed in “[raidconfig Error Codes](#)” on page 115.

The following options apply to all CLI tools commands including raidconfig:

Short Option	Long Option	Description
-?	--help	Help—Displays help information.
-V	--version	Version—Displays the tool version.
-q	--quiet	Quiet—Suppress informational message output and only returns error codes.
-y	--yes	Yes—Confirms operation. Does not prompt user for confirmation on the operation when running.

If you use the --help or --version options, the raidconfig command does not require subcommands, otherwise one or more subcommands are mandatory to the raidconfig command.

The following are subcommands for `raidconfig`:

Command	Function
<code>list</code>	Lists information on controllers, RAID Volumes and disks, including disks not in a RAID volume. Specific devices can be selected for display.
<code>create</code>	Create a RAID volume.
<code>delete</code>	Delete a RAID volume.
<code>modify</code>	Modify a RAID volume or a disk.
<code>add</code>	Add a spare disk.
<code>remove</code>	Remove a spare disk.
<code>export</code>	Generate an XML file from a RAID configuration.
<code>import</code>	Read in a RAID configuration and create RAID volumes and spares.

The subcommands are discussed below. Whenever devices (controllers, RAID volumes, and disks) are used with commands, they must be uniquely identified. For information on how to do so, see the device-naming scheme at [“CLI Tools Device-Naming Convention” on page 40](#).

Device naming is shared with other CLI tools based on the storage library.

See also [“CLI Tools Command Syntax and Conventions” on page 39](#).

list Subcommand

This section covers the following topics:

- [“listSubcommand Overview” on page 85](#)
- [“list Options” on page 87](#)
- [“How To Show a Brief Listing” on page 88](#)
- [“How To Show a Detailed Listing” on page 88](#)
- [“How To Show a Brief Listing of a Disk” on page 89](#)

listSubcommand Overview

The `list` subcommand displays controller, RAID volume, and disk data. The following subcommands are available to the `list` subcommand:

The following are command options to the `raidconfig list` command:

Subcommand	Description
all	All — Shows details on all controllers, physical disks, and RAID volumes.
controller	Controller — Shows details on all controllers. Use the -c option for details on a specific controller.
disk	Disks — Shows the physical disks.
raid	RAID — Shows all RAID details.

The following data is displayed. Items marked with an asterisk (*) show a brief listing; all other items show a verbose listing:

Controllers:

- Logical ID (0-based)
- Node ID
- Manufacturer*
- Model*
- Firmware version*
- PCI address
- PCI vendor ID
- RAID levels supported
- Current number of RAID volumes*
- Current number of disks*
- Max disks
- Max RAID volumes
- Dedicated spares (per RAID volume)
- Max global spares
- Stripe size minimum
- Stripe size minimum
- PCI device ID
- PCI subvendor ID
- PCI subdevice ID
- Battery backup status

Disks:

- Logical ID (0-based)*
- Node ID
- Chassis ID*
- Slot ID*
- Device name
- Disable
- Disk type*
- Mapped (true/false)

- Status*
- Capacity*
- Manufacturer
- Model
- Serial number
- RAID volumes that the `disk*` is part of.
- Spare state (global, dedicated, or N/A)*
- Media*

RAID volumes:

- Logical ID (0-based)*
- Node ID
- Device name*
- Name (user assigned)*
- Status*
- In-resync (true/false)
- RAID level*
- Number of disks*
- Capacity*
- Mounted
- Stripe size
- Leg size
- Read-cache
- Write-cache

See also:

- [“list Options” on page 87](#)

List Options

The following options apply to the `raidconfig list` command:

Short Option	Long Option	Description
-c	--controller	Controller ID — This option is followed by the controller ID string. Shows details about a particular controller.
-r	--raid	RAID ID — This option is followed by the RAID ID string. Shows details about a particular RAID volume.
-d	--disks	Disk ID Numbers – This option is followed by the disk ID string(s). Comma-separated list of disks using the disk's ID. Shows details about particular disk(s). Valid only when using the <code>raidconfig list disk data</code> command.

Short Option	Long Option	Description
-v	--verbose	Verbose — Lists all fields. By default, a brief listing shows only a subset of the fields.

See also:

- [“list Subcommand” on page 85](#)

▼ How To Show a Brief Listing

To show a brief listing of all available controllers, RAID volumes, disks in use, and available disks:

- Issue the following command:

```
# ./raidconfig list all
CONTROLLER c0
=====
Manufacturer  Model      F/W Version  RAID Volumes  Disks
-----
Adaptec       0x0285     5.2-0        4              8
RAID Volumes
=====
ID            Name                Device        Status          Num Disks  Level  Size (GB)
-----
c0r0         0919XF5017-0       /dev/sda     OK              1          Simple 146
c0r1         raid1              /dev/sdb     OK              2          0      293
c0r2         raid2              /dev/sdc     OK              3          10     146
c0r3         noname             /dev/sdd     OK              2          0      293
DISKS In Use
=====
ID            Chassis  Slot  RAID ID  Status  Type  Media  Spare  Size (GB)
-----
c0d0         0        0     c0r0    OK      sas  HDD   -      146
c0d1         0        1     c0r2    OK      sas  HDD   -      146
c0d2         0        2     c0r3    OK      sas  HDD   -      146
c0d3         0        3     c0r3    OK      sas  HDD   -      146
c0d4         0        4     c0r2    OK      sas  HDD   -      146
c0d5         0        5     c0r2    -       sas  HDD   Dedicated 146
c0d6         0        6     c0r1    OK      sas  HDD   -      146
c0d7         0        7     c0r1    OK      sas  HDD   -      146
```

- See Also**
- [“list Subcommand” on page 85](#)
 - [“list Options” on page 87](#)

▼ How To Show a Detailed Listing

To show a detailed listing of RAID volume 1 in controller 1, along with the disks that this volume is using:

- Issue the following command:
`raidconfig list raid -v -r c1r1`

- See Also**
- “list Subcommand” on page 85
 - “list Options” on page 87

▼ How To Show a Brief Listing of a Disk

To show a brief listing of disk 2 on controller 1:

- Issue the following command:
`raidconfig list disks -d c1d2`

- See Also**
- “list Subcommand” on page 85
 - “list Options” on page 87

create raid Subcommand

The create raid subcommand can be used to create RAID volumes. This subcommand must take at least one of the following required options:

Short Option	Long Option	Description
-d	--disks	List of disks — A list of disks with a comma separating the disk ID numbers.
-c	--controller	The controller ID number — When specific disks are not supplied, this option indicates which controller to use.
-n	--number-disks	Number of disks — The number of disks in the array. The tool chooses from the available disks. If there are not enough disks available to match the number, the command fails.
N/A	--level	Level — The RAID level supported by the controller. For example, 0, 1, 1E, 5, 10, 50, 60, etc. The levels supported for a particular controller can be seen in the <code>raid levels supported</code> field of the <code>show</code> command. Not all controllers support all RAID levels. For example, Adaptec supports 0, 1, 5, 10, and 50. Since any RAID level can be set, it is possible that the command results in an error if the RAID level is not supported. If no RAID level is supplied, level 0 is assumed.
N/A	--stripe-size	Stripe size — In kilobytes, the stripe size of the RAID volume to be created. If this option is not supplied, a stripe size of 128 K is used.
N/A	--legs	Leg size in number of disks — For nested RAID levels (10, 50), specifies the size of the RAID components in number of physical disks.

Short Option	Long Option	Description
N/A	--name	Name — The user-defined name that identifies the RAID volume. This name can be set to an empty string ("").

The maximum capacity of the RAID volume is not configurable. The storage library does not currently support configuring RAID from partial disks. You can only create RAID volumes from full disks not partial and the disks must all be of the same size.

▼ How To Create a RAID Volume

The following are command examples for the create subcommand:

- 1 To create a RAID 0 volume with capacity 2 Gb and stripe size 128K on controller 1, issue the following command:

```
raidconfig create raid --stripe-size 128 -d c1d0,c1d1
```
- 2 To create a RAID 1 volume on controller 2 using 2 available disks, issue the following command:

```
raidconfig create raid -c c2 --raid-level 1 --number-disks 2
```

See Also [“create raid Subcommand” on page 89](#)

delete raid Subcommand

The delete raid subcommand can be used to delete RAID volumes. This subcommand must take at least one of the following required options:

Short Option	Long Option	Description
-r	--raid	The RAID volume ID number — Deletes the volume listed by ID number.
N/A	-all	All Volumes — Deletes all RAID volumes on all controllers. RAIDconfig queries the storage management library to determine if the RAID disks have been mounted. If so, it generates a warning message to the user and queries the user to delete the RAID volume.

▼ How To Delete a RAID Volume

The following are command examples for the delete subcommand:

- 1 To delete RAID volume 1 created on controller 1, issue the following command:

```
raidconfig delete raid -r c1r1
```

- To delete all RAID volumes, issue the following command:

```
raidconfig delete raid --all
```

See Also ■ [“delete raid Subcommand” on page 90](#)

add spare Subcommand

The add spare subcommand can be used to add global or dedicated spare disks:

```
#raidconfig add spare
```

This section covers the following topics:

- [“add spare Options” on page 91](#)
- [“How to Add a Spare” on page 91](#)

add spare Options

The add spare subcommand takes one of the following required options:

Short Option	Long Option	Description
-d	--disks	List of disks — Adds disks where a list of disk ID numbers are separated by commas. If the -r option is not defined, the disks are added as global spares.
-c	--controller	Controllers — Identifies which controller the disks are with so that the disk can be identified and added. Whenever the specific disks are not specified, this option specifies the controller to use.
-n	--number-disks	Number of disks — The number of disks to be added as spares. The tool chooses from the available disks. If not enough disks are available to match the number, the command fails. If the -r command option is not defined, the disks are added as global spares.
-r	--raid	RAID volume ID number — If a RAID Volume ID is specified, the spares should be added as dedicated spares for this RAID Volume. Note that some controllers do not support dedicated spares and the command may fail because of this reason.

▼ How to Add a Spare

The following are command examples for the add spare subcommand.

- To create two global spares using the specified disks, issue the following command:

```
raidconfig add spare -d c1d0,c1d1
```

- 2 To create two global spares from available disks on controller 1, issue the following command:
`raidconfig add spare -c c1 --number-disks 2`
- 3 To create two dedicated spares on RAID volume 0 using the specified disks, issue the following command:
`raidconfig add spare -d c1d0,c1d1 -r c1r0`

- See Also**
- [“add spare Subcommand” on page 91](#)
 - [“add spare Options” on page 91](#)

remove spare Subcommand and Options

The remove spare subcommand can be used to remove disks as spares or RAID volumes. This subcommand takes the following required options:

Short Option	Long Option	Description
-d	--disks	List of disks — Adds disks where ID numbers are separated by commas. If the --r option is not defined, the disks are added as global spares.
-r	--raid	RAID volume ID — If a RAID volume ID is specified, the disks should be removed as dedicated spares from this RAID volume.

See also:

[“How to Remove a Spare Disk or a RAID Volume” on page 92](#)

▼ How to Remove a Spare Disk or a RAID Volume

- 1 To remove two disks as global spares, issue the following command:
`raidconfig remove spare -d c1d0,c1d1`
- 2 To remove two disks as dedicated spares on RAID volume 0, issue the following command:
`raidconfig remove spare -d c1d0,c1d1 -r c1r0`

- See Also**
- [“remove spare Subcommand and Options” on page 92](#)

modify Subcommand

The `modify` subcommand is used to modify the attributes of a RAID volume. The `modify` subcommand must take the following required option:

Short Option	Long Option	Description
<code>-r</code>	<code>--raid</code>	RAID volume — The RAID volume to modify.

This section covers the following topics:

- [“modify Options” on page 93](#)
- [“How to Modify a RAID Volume Name” on page 94](#)

modify Options

Option	Description
<code>--raid</code>	RAID volume — Specifies the RAID volume to modify.
<code>--name</code>	Name — The user-defined name to identify the RAID volume. Can be set to an empty string ("").
<code>--read-cache</code>	Read cache — Disabled or enabled. Enables or disables RAID read caching.
<code>--write-cache</code>	Write cache: disabled – Disables RAID write caching. enabled – Enables RAID write caching. enabled_protect — Enables caching only if the battery is available.

See also:

- [“How to Modify a RAID Volume Name” on page 94](#)

▼ How to Modify a RAID Volume Name

To modify the user-specified name of a RAID volume:

- To change the user-specified name of a RAID volume, issue the following command:
raidconfig modify raid -r c0r0 --name engineering

See Also ▪ [“modify Options” on page 93](#)

export Subcommand

The export subcommand can be used to write XML-formatted configuration or inventory data to a file. Configuration data contains only settable attributes that can be imported onto another system to configure that system's RAID volumes in the same manner. Inventory data is a snapshot of all the fields for the controllers, RAID volumes, and disks.

The export subcommand takes a required file name as a modifier. If a file by that name exists, the tool prompts to overwrite the file (unless the -y option is used). If the hyphen (“-”) is given for the filename, then the XML-formatted configuration is written to the screen.

See also:

- [“raidconfig export Options” on page 94](#)
- [“How to Export an Inventory to a File” on page 95](#)

raidconfig export Options

The export subcommand can be used to write the inventory or configuration to an XML file.

This subcommand must take at least one of the following required subcommands:

Option	Description
inventory	Inventory — Exports and writes all controller, RAID volume, and physical disk information to an XML file.
config	Configuration — Exports and writes only configuration fields to an XML file in a format that can be imported.

This subcommand must take one or more of the following required options:

Option	Description
- -use-number-disks	Number of disks in a volume — For configuration data, instead of listing each disk in a RAID volume, the XML file can contain the number of disks in each RAID volume.

▼ How to Export an Inventory to a File

To export the inventory or a configuration and write it to a file:

- 1 To export the inventory and write it to a file, issue the following command:

```
raidconfig export inventory raid_inv.xml
```

- 2 To export a configuration and write it to a file, issue the following command:

```
raidconfig export config raid_config.xml
```

- See Also**
- “export Subcommand” on page 94
 - “raidconfig export Options” on page 94

import Subcommand

The `import` subcommand is used to read an XML-formatted configuration file and to configure RAID volumes based on the file. If creating a specific RAID volume fails, the error is logged and the next RAID volume in the file is created. The `import` subcommand takes the `config` type and a required file name as the operand (modifier).

See also:

- “How to Configure RAID Volumes from a File” on page 95

▼ How to Configure RAID Volumes from a File

The following is an example command to read the RAID configuration from a file and configure the RAID volumes according to that file:

- To configure the RAID volumes according to a configuration file, issue the following command:

```
raidconfig import config raid_config.xml
```

- See Also** “import Subcommand” on page 95

Using the `ilomconfig` Tool

`ilomconfig` allows you to configure ILOM from the host OS without having to first connect to the management network. It also serves as an *XML builder* as it helps you construct an XML file for a subsequent restore operation.

You can also use `ilomconfig` to configure a high-speed USB interconnect to ILOM.

This section covers the following topics:

- [“`ilomconfig` Overview” on page 97](#)
- [“`ilomconfig` Commands” on page 99](#)

`ilomconfig` Overview

This section covers the following topics:

- [“Restoring and Modifying ILOM XML Configuration Files” on page 97](#)
- [“Local Interconnect Interface \(LAN over USB\)” on page 99](#)

Restoring and Modifying ILOM XML Configuration Files

`ilomconfig` can restore configuration (with some limitations) from an XML file and allows parameters to be specified using the command line. `ilomconfig` can modify an XML file that has been generated from the ILOM backup feature; Starting with Hardware Management Pack 2.1, `ilomconfig` can generate a backup ILOM configuration file with the `export config` command. Use the `create` or `modify` subcommand to create or modify XML files.

You must be in root permission level to run `ilomconfig` commands on Unix-based platforms, or Administrator permission level for Windows platforms.

In summary, `ilomconfig` can perform the following functions:

- Backs up and restores from an ILOM backup XML file.
- Modifies the XML file using convenience sub-commands.
- Sets the network, including DHCP and sideband.

- Lists and configures identification information, including hostname, contact, location, and description.
- Lists and configures DNS.
- Lists and configures clock including time zone.
- Lists and configures user management.
- Lists and configures SNMP community.

You can use an XML file to perform either one of the following functions:

- Create a new XML file for functions that have an `ilomconfig` command.
- Modify an existing XML file that was generated by ILOM; however, some parts of the XML file cannot be restored.

The `ilomconfig` subcommands can modify already existing settings in the XML file or create new settings.

The `list` commands, with the `--xmlfile` argument, can be used to view the contents of the XML file.

Note – If the `--xmlfile` option is specified, the commands operate on that XML file. If the XML file option is omitted, the changes are made directly to the ILOM.

All ILOM settings can be restored from an XML file starting with Management Pack 2.1 and ILOM 3.0.12. ILOM settings that can be restored include:

- SSH private keys
- User SSH keys
- SSL cert
- COD license
- LDAP and AD certs
- Platform binary data (currently limited to SPARC LDOMS config)
- User passwords
- SNMP users
- LDAP/LDAPSSL/RADIUS passwords
- Servicetag passphrase

See also:

- [“XML File Configuration Commands” on page 100](#)
- [“ilomconfig Error Codes” on page 116](#)

Local Interconnect Interface (LAN over USB)

Local Interconnect Interface is a new feature in Management Pack 2.1 that provides an interface to the host, which allows the host to communicate with ILOM over a high-speed channel.

Note – In the ILOM interface, this feature is referred to as “Local Host Interconnect”. In the Oracle Hardware Management Pack Installer interface, this feature is referred to as the “Local ILOM Interconnect”.

The assignment of the IP address for the internal USB Ethernet device (host IP address) can be automatically configured when you install the Oracle Hardware Management Pack 2.1 or later. Alternatively, you can configure the host IP address at any time using the `ilomconfig` tool from the Management Pack. The Local Interconnect can also be configured through ILOM, but this is considered advanced configuration. Oracle Hardware Management Pack is the recommended tool for configuring this feature.

See the following documentation for more information on enabling the Local Interconnect Interface:

- For further information on this feature and instructions on enabling it during the Oracle Hardware Management Pack installation, see “[Enabling the Local Interconnect Interface](#)” in *Oracle Hardware Management Pack 2.1 Installation Guide*.
- For instructions on enabling this feature through ILOM, refer to the ILOM 3.0 documentation collection at: <http://download.oracle.com/docs/cd/E19860-01/index.html>
- For instructions on manually configuring Local Interconnect Interface using `ilomconfig` commands, see “[Local ILOM Interconnect Configuration Commands](#)” on page 107.

ilomconfig Commands

This section covers the following topics:

- “[ilomconfig Command Usage](#)” on page 99
- “[XML File Configuration Commands](#)” on page 100
- “[Local ILOM Interconnect Configuration Commands](#)” on page 107

ilomconfig Command Usage

The `ilomconfig` commands must be run in administrator mode.

When a command fails, it returns one of several failure codes listed in “[ilomconfig Error Codes](#)” on page 116.

The following options are available to all CLI tools commands including `ilomconfig`:

Short Option	Long Option	Description
-?	--help	Help — Displays help information.
-V	--version	Version — Displays the tool version.
-q	--quiet	Quiet — Suppresses informational message output and returns only error codes.
-y	--yes	Yes — Confirms operation. Does not prompt user for confirmation on the operation when running.

XML File Configuration Commands

This section covers the following topics:

- “How to Import an XML Configuration” on page 100
- “How to Export an XML Configuration” on page 101
- “How to Restore ILOM to Defaults by Using an XML Configuration” on page 101
- “How to List a System Summary” on page 101
- “How to Create a User” on page 102
- “How to Delete a User” on page 102
- “How to Modify a User Password or Role” on page 102
- “How to List Users” on page 102
- “How to List an SNMP Community” on page 103
- “How to Create an SNMP Community” on page 103
- “How to List Network Settings” on page 103
- “How to Modify Network Settings” on page 104
- “How to List SP Identification Information” on page 104
- “How to Modify Identification Information” on page 105
- “How to List DNS Information” on page 105
- “How to Modify DNS Information” on page 105
- “How to List Clock Information” on page 106
- “How to Modify Clock Information” on page 106

▼ How to Import an XML Configuration

To import an XML configuration file to configure ILOM, use the `ilomconfig import config` command. Use the `-y` option to bypass the yes/no confirmation prompt.

You can also use this command to restore the system configuration by importing a known reliable XML file.

- **Issue one of the following commands:**

- **If an encryption phrase was used to generate the XML file:**

```
ilomconfig import config [--xmlfile file_name] [--passphrase passphrase] [-y]
```

- **If an encryption phrase was not used to generate the XML file:**

```
ilomconfig import config [--xmlfile file_name] [-y]
```

Where *file_name* is the name of the XML configuration file you want to use to configure ILOM and *passphrase* is the encryption phrase used to generate the XML file.

See Also ▪ [“How to Restore ILOM to Defaults by Using an XML Configuration” on page 101](#)

▼ **How to Export an XML Configuration**

To export an entire config to XML, use the `ilomconfig export config` command.

- **Issue the following command:**

```
ilomconfig export config [--xmlfile file_name] [--passphrase passphrase]
```

Where *file_name* is the name of the XML configuration file you want to use to configure ILOM and *passphrase* is the encryption phrase used to generate the XML file.

See Also ▪ [“How to Restore ILOM to Defaults by Using an XML Configuration” on page 101](#)

▼ **How to Restore ILOM to Defaults by Using an XML Configuration**

To restore the ILOM configuration to the factory defaults, use the `ilomconfig reset config` command. Use the `-y` option to bypass the yes/no confirmation prompt. This results in the reboot of the ILOM.

- **Issue the following command:**

```
ilomconfig reset config [-y]
```

See Also ▪ [“How to Import an XML Configuration” on page 100](#)

▼ **How to List a System Summary**

To list system summary information including the product name, part number, serial number, ILOM host name, and ILOM version information, use the `ilomconfig list system-summary` command. This functionality is equivalent to the Summary tab in the web interface.

- **Issue the following command:**

```
ilomconfig list system-summary
```

See Also ■ [“How to Import an XML Configuration” on page 100](#)

▼ **How to Create a User**

To create a user, use the `ilomconfig create user` command. The `-y` option prevents the yes/no confirmation prompt. When you specify an XML file name, the command modifies the XML file accordingly rather than modifying ILOM itself.

● **Issue the following command:**

```
ilomconfig create user [username] [--password password] [--role role] [--xmlfile filename.xml]
```

where `--role` is the role of the ILOM user.

See Also ■ [“How to Delete a User” on page 102](#)

▼ **How to Delete a User**

To delete a user, use the `ilomconfig delete user` command. The `-y` option prevents the yes/no confirmation prompt. When you specify an XML file name, the command modifies the XML file accordingly rather than modifying ILOM itself.

● **Issue the following command:**

```
ilomconfig delete user [username] [-y] [--xmlfile filename.xml]
```

See Also ■ [“How to Create a User” on page 102](#)

▼ **How to Modify a User Password or Role**

To modify a user password or role, use the `ilomconfig modify user` command. When you specify an XML file name, the command modifies the XML file accordingly rather than modifying ILOM itself.

● **Issue the following command:**

```
ilomconfig modify user [username] [--password password] [--role role] [--xmlfile filename.xml]
```

See Also ■ [“How to List Users” on page 102](#)

▼ **How to List Users**

To list one or all users, use the `ilomconfig list user` command. When you specify an XML file name, this command lists users defined in the XML file rather than querying ILOM itself.

- **Issue the following command:**

```
ilomconfig list user [username] [--xmlfile filename.xml]
```

See Also ▪ [“How to Modify a User Password or Role” on page 102](#)

▼ **How to List an SNMP Community**

To list one or all SNMP communities, use the `ilomconfig snmp-community` command. If an XML filename is specified, the command lists SNMP communities defined in the XML file rather than querying ILOM itself.

- **Issue the following command:**

```
ilomconfig list snmp-community [communityname] [--xmlfile filename]
```

See Also ▪ [“How to Create an SNMP Community” on page 103](#)

▼ **How to Create an SNMP Community**

To create an SNMP community, use the `ilomconfig create snmp-community` command. When you specify an XML file name, the command modifies the XML file accordingly rather than modifying ILOM itself.

- **Issue the following command:**

```
ilomconfig create snmp-community [communityname] [--permission ro|rw]
[--xmlfile filename.xml]
```

where `--permission` is either read-only or read-write (`ro|rw`).

See Also ▪ [“How to List an SNMP Community” on page 103](#)

▼ **How to List Network Settings**

To list network settings, use the `ilomconfig list network` command. This command lists IP address, netmask, gateway, DHCP settings, sideband, and MAC. When you specify an XML file name, this command lists users defined in the XML file rather than querying ILOM itself.

- **Issue the following command:**

```
ilomconfig list network [--xmlfile filename.xml]
```

See Also ▪ [“How to Modify Network Settings” on page 104](#)

▼ How to Modify Network Settings

To modify settings, use the `ilomconfig modify network` command. This command lists IP address, netmask, gateway, DHCP settings, and sideband. When you specify an XML file name, the command modifies the XML file accordingly rather than modifying ILOM itself.

- **Issue the following command:**

```
ilomconfig modify network [--ipdiscovery static|dhcp] [--ipaddress ipaddress]
[--netmask netmask] [--gateway gateway] [--state enabled|disabled] [--mgmtport
port] [--xmlfile filename.xml]
```

Option	Description	Example
<code>--ipdiscovery</code>	Network discovery mechanism. Can be either static or DHCP.	ro or rw
<code>--ipaddress</code>	ILOM IP address.	255.255.255.0
<code>--netmask</code>	ILOM netmask.	255.255.255.0
<code>--gateway</code>	ILOM gateway.	255.255.255.0
<code>--state</code>	ILOM management port path.	/SP/SP/NET0
<code>--mgmtport</code>	ILOM management port state.	enabled or disabled
<code>--xmlfile</code>	Modify specified XML file rather than ILOM.	file.xml

See Also ▪ [“How to List Network Settings” on page 103](#)

▼ How to List SP Identification Information

To list identification information for the SP, use the `ilomconfig list identification` command. This command lists SP host name, system contact, system location, and system description, which is equivalent to the Identification tab on web interface. When you specify an XML file name, the command lists identification information defined in the XML file rather than querying ILOM itself.

- **Issue the following command:**

```
ilomconfig list identification [--xmlfile filename.xml]
```

See Also ▪ [“How to Modify Identification Information” on page 105](#)

▼ How to Modify Identification Information

To modify identification information, use the `ilomconfig modify identification` command. This command modifies the host name, system contact, system location, and system description. When you specify an XML file name, the command modifies the XML file accordingly rather than modifying ILOM itself.

● Issue the following command:

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

Option	Description	Example
--hostname	ILOM host name.	ro or rw
--system-contact	ILOM system contact field.	user
--system-location	ILOM system location field.	west
--system-identifier	ILOM system identifier field.	x4800
--xmlfile	Modify specified XML file rather than ILOM.	file.xml

See Also ■ [“How to List DNS Information” on page 105](#)

▼ How to List DNS Information

To list DNS information, use the `ilomconfig list dns` command. If an XML file name is specified, the command lists DNS information defined in the XML file rather than querying ILOM itself.

● Issue the following command:

```
ilomconfig list dns [--xmlfile filename.xml]
```

See Also ■ [“How to Modify DNS Information” on page 105](#)

▼ How to Modify DNS Information

To modify DNS information, use the `ilomconfig modify dns` command. If an XML file name is specified, the command modifies the XML file accordingly rather than modifying ILOM itself.

- **Issue the following command:**

```
ilomconfig modify dns [--nameservers nameserverlist] [--autodns enabled|disabled]
[--retries retries] [--searchpath searchpathlist] [--timeout timeout] [--xmlfile
filename.xml]
```

Option	Description	Example
--nameservers	List of DNS nameserver IP addresses for ILOM separated by commas.	ro or rw
--auto-dns	ILOM Auto-DNS state.	enabled or disabled
--searchpath	List of search suffixes in preferred order and separated by commas.	
--retries	Number of retry attempts for DNS.	Integer between 0 and 5.
--timeout	Number of seconds to wait for a DNS response. This can be used with up to six search suffixes, each separated by a comma.	2
--xmlfile	Modify specified XML file rather than ILOM.	file.xml

See Also ▪ [“How to List DNS Information” on page 105](#)

▼ How to List Clock Information

To list clock information, use the `ilomconfig list clock` command. When you specify an XML file name, the command lists clock information defined in the XML file rather than querying ILOM itself.

- **Issue the following command:**

```
ilomconfig list clock [--xmlfile filename.xml]
```

See Also ▪ [“How to Modify Clock Information” on page 106](#)

▼ How to Modify Clock Information

To modify clock information, use the `ilomconfig modify clock` command. When you specify an XML file name, the command modifies the XML file accordingly rather than modifying ILOM itself.

- **Issue the following command:**

```
ilomconfig modify clock [--datetime datetime] [--timezone timezone] [--usntp
enabled|disabled] [--ntp-server1 ntpserver1] [--ntp-server2 ntpserver2] [--xmlfile
filename.xml]
```

Option	Description	Example
- -datetime	ILOM date in <i>MMDDhhmmYYYY</i> format or <i>MMDDhhmmYYYY.ss</i> format.	032514272010
- -timezone	ILOM clock time zone, such as GMT.	enabled or disabled
- -usntp	ILOM NTP client state.	enabled or disabled
- -ntp-server1	ILOM NTP server 1 IP address.	<i>aaa.bbb.ccc.ddd</i>
- -ntp-server2	ILOM NTP server 2 IP address.	<i>aaa.bbb.ccc.ddd</i>
- -xmlfile	Modify specified XML file rather than ILOM.	file.xml

See Also ■ [“How to List Clock Information” on page 106](#)

Local ILOM Interconnect Configuration Commands

The following procedures are covered in this section:

- [“How to Enable the Local Interconnect Interface” on page 107](#)
- [“How to Disable the Local Interconnect Interface” on page 108](#)
- [“How to Modify the Local Interconnect Interface” on page 108](#)
- [“How to List the Local Interconnect Interface Settings” on page 108](#)

▼ How to Enable the Local Interconnect Interface

Local Interconnect Interface (known as Local ILOM Interconnect in the Installer interface) can be enabled when the Hardware Management Pack is installed. To enable the Local ILOM Interconnect manually, use the **ilomconfig enable interconnect** command. See [“Enabling the Local Interconnect Interface” in *Oracle Hardware Management Pack 2.1 Installation Guide*](#) for a further description of this feature.

It is recommended that you use this command without any arguments and let the command choose the settings. You can override the defaults with different IP and netmask addresses, but this is for advanced users only.

- **Issue the following command:**

```
ilomconfig enable interconnect [--ipaddress ipaddress ] [--netmask netmask ]
[--hostipaddress hostipaddress ]
```

Option	Description	Example
- -ipaddress	ILOM IP address. This address must be in the format: 169.254.x.x	169.254.175.72

Option	Description	Example
<code>--netmask</code>	ILOM netmask.	255.255.255.0
<code>--hostipaddress</code>	Host IP address. This address must be in the format: 169.254.x.x	169.254.175.73

▼ How to Disable the Local Interconnect Interface

To disable the LAN interconnect between the host and ILOM, use the `ilomconfig disable interconnect` command.

- Issue the following command:
`ilomconfig disable interconnect`

▼ How to Modify the Local Interconnect Interface

To modify the LAN interconnect between the host and ILOM, use the `ilomconfig modify interconnect` command. This works only when the interconnect is enabled. At least one option must be specified.

- Issue the following command:
`ilomconfig enable interconnect [--ipaddress ipaddress] [--netmask netmask] [--hostipaddress hostipaddress]`

Option	Description	Example
<code>--ipaddress</code>	ILOM IP address. This address must be in the format: 169.254.x.x	169.254.175.72
<code>--netmask</code>	ILOM netmask.	255.255.255.0
<code>--hostipaddress</code>	Host IP address. This address must be in the format: 169.254.x.x	169.254.175.72

▼ How to List the Local Interconnect Interface Settings

To list the interconnect state and IP settings on both the ILOM and host side of the interconnect, use `ilomconfig list interconnect`.

- Issue the following command:
`ilomconfig list interconnect`

Using `ipmitool` for Windows

This section describes `ipmitool` and how to install `ipmitool` on systems running the Windows operating system.

Before beginning the procedures in this section, you must complete the following procedures:

- Install the Microsoft Windows Server 2003 or Windows Server 2008 operating system.
- Download `Windows.zip` and extracted `InstallPack_x_x_x.exe`
- Run `InstallPack_x_x_x.exe` to install supplemental software on the server

This section covers the following topics:

- [“`ipmitool` Overview” on page 109](#)
- [“Sun IPMI System Management Driver 2.1” on page 110](#)
- [“Using `ipmitool` for Configuration Tasks” on page 110](#)

`ipmitool` Overview

IPMI configuration CLI tool (`ipmitool`), as part of the Oracle Hardware Management Pack, is a utility that reads the sensor data repository (SDR) and displays the following information:

- Sensor values
- System event log (SEL)
- Field-replaceable unit (FRU) information
- Inventory information

`ipmitool` also gets and sets LAN configuration parameters, and performs chassis power control operations through the server’s service processor.

`ipmitool` is supplemental software that you can install using the server’s Tools and Drivers CD or using the `Installpack_x_x_x.exe` executable file, where the `_x_x_x` number identifies the version of the package (for example, `InstallPack_1_1_4.zip`).

For information about using `ipmitool` with the Management Agents, see [“Generating SNMP Traps” in *Oracle Server Management Agents 2.1 User’s Guide*](#).

Sun IPMI System Management Driver 2.1

Note – See the OS support matrix in [“Installing Components Using the Oracle Hardware Management Pack Installer”](#) on page 9 to determine if you need this driver.

The Sun IPMI System Management Driver 2.1 allows communication between the Microsoft Windows host operating system and the ILOM service processor over an internal Keyboard Controller Style (KCS) interface. This driver is required for Microsoft Windows Server 2003 SP2 and earlier.

For later OS versions (including Microsoft Windows Server 2003 R2) the Microsoft-provided IPMI driver included in their Hardware Management Module provides the same functionality.

This driver must be installed before installing `ipmitool`. Refer to [“Installing the Sun IPMI System Management Driver 2.1”](#) in *Oracle Hardware Management Pack 2.1 Installation Guide* for information on installing the driver.

Using `ipmitool` for Configuration Tasks

The following procedures are included in this section:

- [“How to Configure for PXE to Boot First”](#) on page 110
- [“How to Configure for Any CD/DVD to Boot First”](#) on page 111
- [“How to Configure for Any Floppy or Removable Media to Boot First”](#) on page 111
- [“How to Configure for the Hard Drive to Boot First”](#) on page 112

▼ **How to Configure for PXE to Boot First**

On some platforms, the alternative to using `biosconfig` to control the boot order is IPMI commands, which can also make persistent changes to the boot order through the service processor. This interface can specify which is the highest-priority category of boot device. This operation is equivalent to entering BIOS setup and moving an entire category of devices to the top of the boot list (for example, moving all disks to boot before CD-ROMs).

The following `ipmitool` raw commands work like the `ipmitool chassis bootdev` commands. During BIOS POST, the BIOS asks the SP for boot flags. The raw commands have an extra bit set (the persistent bit), which causes the BIOS to reorder the boot list and save that order in CMOS. These `ipmitool` commands can also be issued through the host SP Keyboard Controller Style (KCS) interface if you have the IPMI drivers installed on a host Linux system.

● **Use the following command:**

```
ipmitool -H ... -U root -P ... raw 0x0 0x8 0x5 0xC0 0x4 0x0 0x0
```

The BIOS boot order changes so that PXE attempts to boot first. Sun Blade X6275 has both IB and Gigabit Ethernet interfaces, and this moves both to the top of the boot list with the InfiniBand gPXE first followed by GE if IB fails over. The BIOS setup reflects the change in the boot order.

- See Also**
- [“How to Configure for the Hard Drive to Boot First” on page 112](#)
 - [“How to Configure for Any CD/DVD to Boot First” on page 111](#)
 - [“How to Configure for Any Floppy or Removable Media to Boot First” on page 111](#)

▼ How to Configure for Any CD/DVD to Boot First

On some platforms, the alternative to using `biosconfig` to control the boot order is IPMI commands, which can also make persistent changes to the boot order through the service processor. This interface can only specify which is the highest priority category of boot devices. This operation is equivalent to entering BIOS setup and moving an entire category of devices to the top of the boot list (for example, moving all disks to boot before CD-ROMs).

The following `ipmitool` raw commands work just like the `ipmitool chassis bootdev` commands. During BIOS POST, the BIOS asks the SP for boot flags. The raw commands have just one extra bit set (the persistent bit), which causes the BIOS to reorder the boot list and save that order in CMOS. These `ipmitool` commands can also be issued through the host SP Keyboard Controller Style (KCS) interface if you have the IPMI drivers installed on the host Linux system.

● Use the following command:

```
ipmitool -H ... -U root -P ... raw 0x0 0x8 0x5 0xC0 0x14 0x0 0x0
```

The BIOS boot order changes so that any CD/DVD attempts to boot first. On Sun Blade X6275 this could be a USB external CD/DVD-ROM drive or a JavaConsole-redirected CD. The BIOS setup reflects the change in the boot order.

- See Also**
- [“How to Configure for PXE to Boot First” on page 110](#)
 - [“How to Configure for the Hard Drive to Boot First” on page 112](#)
 - [“How to Configure for Any Floppy or Removable Media to Boot First” on page 111](#)

▼ How to Configure for Any Floppy or Removable Media to Boot First

On some platforms, the alternative to using `biosconfig` to control the boot order is IPMI commands, which can also make persistent changes to the boot order through the service processor. This interface can only specify which is the highest priority category of boot devices. This operation is equivalent to entering BIOS setup and moving an entire category of devices to the top of the boot list (for example, moving all disks to boot before CD-ROMs).

The following `ipmitool` raw commands work just like the `ipmitool chassis bootdev` commands. During BIOS POST, the BIOS asks the SP for boot flags. The raw commands have

just one extra bit set (the persistent bit), which causes the BIOS to reorder the boot list and save that order in CMOS. These `ipmitool` commands can also be issued through the host SP Keyboard Controller Style (KCS) interface if you have the IPMI drivers installed on the host Linux system.

- **Use the following command:**

```
ipmitool -H ... -U root -P ... raw 0x0 0x8 0x5 0xC0 0x3C 0x0 0x0
```

The BIOS boot order changes so that any floppy or removable media (such as USB flash) attempts to boot first. On Sun Blade X6275 this could be a USB flash drive or a JavaConsole-redirected floppy. The BIOS setup reflects the change in the boot order.

- See Also**
- [“How to Configure for PXE to Boot First” on page 110](#)
 - [“How to Configure for the Hard Drive to Boot First” on page 112](#)
 - [“How to Configure for Any CD/DVD to Boot First” on page 111](#)

▼ How to Configure for the Hard Drive to Boot First

On some platforms, the alternative to using `biosconfig` to control the boot order is IPMI commands, which can also make persistent changes to the boot order through the service processor. This interface can only specify which is the highest priority category of boot devices. This operation is equivalent to entering BIOS setup and moving an entire category of devices to the top of the boot list (for example, moving all disks to boot before CD-ROMs).

The following `ipmitool raw` commands work just like the `ipmitool chassis bootdev` commands. During BIOS POST, the BIOS asks the SP for boot flags. The raw commands have just one extra bit set (the persistent bit), which causes the BIOS to reorder the boot list and save that order in CMOS. These `ipmitool` commands can also be issued through the host SP Keyboard Controller Style (KCS) interface if you have the IPMI drivers installed on the host Linux system.

- **Use the following command:**

```
ipmitool -H ... -U root -P ... raw 0x0 0x8 0x5 0xC0 0x8 0x0 0x0
```

The BIOS boot order changes so that the hard drive attempts to boot first. Sun Blade X6275 has a flash mini-DIMM SATA that boots first. The BIOS setup reflects the change in the boot order.

- See Also**
- [“How to Configure for PXE to Boot First” on page 110](#)
 - [“How to Configure for Any CD/DVD to Boot First” on page 111](#)
 - [“How to Configure for Any Floppy or Removable Media to Boot First” on page 111](#)

CLI Tools Error Codes

This section covers the following topics:

- “Common Error Codes” on page 113
- “biosconfig Error Codes” on page 114
- “raidconfig Error Codes” on page 115
- “ilomconfig Error Codes” on page 116
- “fwupdate Error Codes” on page 117

Common Error Codes

The following is the list of common command error codes. Each error code has a string associated with it. The error code is printed to the log file and to the stdout file.

TABLE 1 Common Error Codes

Code Number	Error Description
0	OK.
1	Invalid option.
2	Invalid subcommand.
3	Subcommand not supported.
4	Invalid device format.
5	Cannot create XML file.
6	Cannot read XML file.
7	Cannot retrieve application data.
8	Internal error.
9	Insufficient memory.
10	Invalid boolean argument.
11	Option not supported.

TABLE 1 Common Error Codes (Continued)

Code Number	Error Description
12	Storage init failed.
13	Name too long.
14	Invalid string after subcommand.
15	XML filename required.
16	Invalid argument.
17	Failure writing XML file.
18	Device is busy, command cannot be completed.

See also:

- [“biosconfig Error Codes” on page 114](#)
- [“raidconfig Error Codes” on page 115](#)
- [“ilomconfig Error Codes” on page 116](#)
- [“fwupdate Error Codes” on page 117](#)

biosconfig Error Codes

This sections lists possible biosconfig errors and action to take when they occur.

Error Number(s)	Description
Errors 36-49	<p>Verify that either Microsoft IPMI driver (2003 R2) or Sun ISM driver (Pre-2003 R2) is installed correctly.</p> <p>For information about how to install one of these drivers onto your system, refer to your system's Windows OS documentation on updating your specific driver, or go to your systems software download site.</p>
Errors 57-63	<p>Verify that either Microsoft IPMI driver (2003 R2) or Sun ISM driver (Pre 2003 R2) is installed correctly. Verify that only one of these is installed on your system.</p>
Error 64	<p>Execute biosconfig as root on Linux/Solaris or as Administrator on Windows.</p> <p>Do not run more than one instance of biosconfig at the same time. There are no locks in place (for any OS) to allow for multiple simultaneous accesses.</p>

See also:

- [“Using biosconfig” on page 45](#)
- [“biosconfig Command Overview” on page 54](#)

raidconfig Error Codes

Errors might be returned if you are attempting to configure the RAID entry to an unsupported parameter. For example, if the RAID controller does not support the configured RAID level, the CLI displays a user-friendly error string identifying the misconfiguration and returns a matching error code.

The list of error codes and strings specific to this tool are show in the following table.

TABLE 2 raidconfig Error Codes

Code Number	Error Description
100	No controllers available.
101	Controller does not support RAID.
102	No physical disks associated with controller.
103	Invalid controller.
104	Invalid disk.
105	Invalid RAID volume.
106	RAID level not supported by controller.
107	Default RAID level not supported.
108	A defined disk is in use.
109	Number of disks exceeds allowed number for this level.
110	Failure retrieving internal data.
111	Number of disks requested exceeds the number of available disks.
112	Cannot define both actual and requested number of disks.
113	Option not supported by controller.
114	Invalid stripe size for controller.
115	Invalid leg size for controller.
116	Cannot retrieve RAID data.
118	RAID creation failure.
119	RAID deletion failure.
120	Disk defined multiple times.
121	Disks must be in the same controller.

TABLE 2 raidconfig Error Codes (Continued)

Code Number	Error Description
122	The maximum number of RAID Volumes has been created.
123	Invalid RAID configuration.
124	The RAID Volume is in use.
125	Incomplete RAID configuration.
126	Failure writing internal data.
127	Command requires disks to be entered.
128	Disk is not a dedicated spare.
129	Disk is not a global spare.
130	Controller does not support dedicated spares.
131	Controller does not support global spares.
132	Command requires disks or RAID volume to be entered.
133	A defined disk is not in a RAID volume.
134	Cannot set both read and write cache in same command.

See also:

- [“Using the raidconfig Tool” on page 83](#)

ilomconfig Error Codes

The following are ilomconfig error codes:

TABLE 3 ilomconfig Error Codes

Code Number	Error Description
50	Cannot connect to BMC.
51	Missing -username option.
52	Missing -password option.
54	Missing -communityname option.
55	Specified community already exists.
57	Community name does not exist.

TABLE 3 i lomconfig Error Codes (Continued)

Code Number	Error Description
58	Delete failed.
59	Failures occurred during restore.
60	Must specify option to modify.
61	No such property.
62	Invalid user name length.
63	Invalid role value.
64	Invalid permission value.
65	Invalid password length.
66	Invalid IP discovery value.
67	Invalid IP state value.
68	Invalid IP address.
69	Invalid auto DNS value.
70	Invalid Use NTP value.
71	Product serial number does not match current system.
72	User does not exist.
72	User already exists.
72	ILOM error occurred.

See also:

- [“Common Error Codes” on page 113](#)
- [“Using the i lomconfig Tool” on page 97](#)

fwupdate Error Codes

The following is the list of fwupdate command error codes. Each error code has a string associated with it. The error code is printed to the log file and to the stdout file.

TABLE 4 fwupdate Error Codes

Code Number	Error Description
200	Invalid device type.

TABLE 4 fwupdate Error Codes *(Continued)*

Code Number	Error Description
201	Invalid image type.
202	Invalid device ID.
203	Reset failed.
204	Firmware check failed.
205	Firmware download failed.
206	Component mismatch.
207	No file name.
208	Invalid image file.
209	Cannot reset.
210	Reset mismatch.
211	No device specified.
212	Update canceled.

See also:

- [“Common Error Codes” on page 113](#)
- [“Using the fwupdate Tool” on page 73](#)

Index

A

- add spare subcommand, `raidconfig`, 91
- adding a spare disk, 91–92
- automatic mode
 - `fwupdate`
 - command-line interface, 74
 - update subcommand, 76, 77

B

- `biosconfig`
 - commands, 54
 - dependencies, 44
 - switching boot devices, 59–60
- `biosconfig` terminology, 44
- BMC driver, 46
- boot list, 57
- boot list entries, moving, 61–62
- boot order, 62
 - configuring, 57

C

- CD/DVD boot order, 111
- changing boot order, 62
- chipset-related settings, 68–69
- clock information
 - listing, 106
 - modifying, 106–107
- CMOS, 44, 57

CMOS (*Continued*)

- configuring, 65
 - golden image
 - applying, 64–65
 - configuring, 63–64
- CMOS settings, 66–67
- CMOS values, 67–68
- command usage, `ilomconfig`, 99
- configuring boot order
 - CD/DVD, 111
 - floppy, 111–112
 - hard drive, 112
 - persistent change, 58–59
 - PXE, 110–111
- configuring RAID volumes, from file, 95
- console mode installation, 29–34
- console mode uninstall, 34–35
- creating a RAID volume, 90
- creating an ILOM user, using an XML file, 102
- creating an SNMP community, using an XML file, 103

D

- `delete raid` subcommand, `raidconfig`, 90
- deleting a RAID volume, 90–91
- deleting an ILOM user, using an XML file, 102
- device naming, `fwupdate`, 81
- devices, 57
- DNS information
 - listing, 105
 - modifying, 105–106

documentation links, 5
driver, Windows 2003 SP1, 110
dynamic setting, 67–68

E

error codes
 biosconfig, 114
 common, 113
 fwupdate, 117
 ilomconfig, 116
 raidconfig, 115
export subcommand, raidconfig, 94
exporting an inventory, 95

F

feedback, 5
floppy boot order, 111–112
FRUs, 109
functions, 109
fwupdate
 automatic mode
 command-line interface, 74
 manual mode
 command-line interface, 75

G

golden CMOS image
 applying, 64–65
 configuring, 63–64
GUI mode installation, 12–22
GUI mode uninstall, 22–29

H

hard drive boot order, 112

I

ILOM defaults, restoring, 101
ILOM ID information, modifying, 105
ILOM network settings, modifying, 104
ILOM password, modifying, 102
ILOM user
 creating, 102
 deleting, 102
ILOM users, listing, 102–103
ilomconfig, command usage, 99
import subcommand, raidconfig, 95
InfiniBand, 58–59
Installer
 getting software, 11
 prerequisites, 9
installing
 Hardware Management Pack
 using console mode, 29–34
 using GUI mode, 12–22
 using silent mode, 35–36
 system management driver, 48–51
inventory, 109
 exporting to a file, 95
IPMI, 44
ipmitool, requirements, 109–112
ipmitool driver, installing for Windows 2003 SP1, 110

K

KCS interface, 110–111, 111, 112
known issues, 70
 OpenSolaris, 46

L

LAN over USB, *See* local interconnect interface
list
 clock information, 106
 DNS information, 105
 ILOM users, 102–103
 network settings, 103
 SNMP community, 103
 SP information, 104

list (*Continued*)

- system summary, 101–102

list subcommand

- fwupdate, 79
- raidconfig, 85, 89

local ILOM interconnect, *See* local interconnect interface

local interconnect interface

- description, 99
- disabling, 108
- enabling, 107–108
- listing, 108
- modifying, 108

M

management library, fwupdate, 73–82

manual mode

- fwupdate
 - command-line interface, 75

modify subcommand, raidconfig, 93

modifying a RAID volume, 94

modifying with XML file

- clock information, 106–107
- description, 97
- DNS information, 105–106
- ILOM ID information, 105
- ILOM network settings, 104
- ILOM password, 102

N

network settings, listing, 103

next boot, 57–58

O

on-board network interface card (NIC), 68–69

OpenSolaris, 45

P

PCI Bus, 62

PCI devices, 58–59

POST, 57

power off, 69

Prerequisites for installation, 9

PXE, 56

PXE boot order, 110–111

Q

quick boot, 69–70

R

RAID volume

- creating, 90
- deleting, 90–91
- modifying, 94
- removing, 92

RAID volumes, configuring from a file, 95

raidconfig

- command overview, 84
- overview, 83

remove spare subcommand, raidconfig, 92

removing a RAID volume, 92

removing a spare disk, 92

reset subcommand, fwupdate, 80

restore ILOM defaults, using XML configuration, 101

restoring ILOM XML configuration files,

- description, 97

S

SAS, fwupdate, 73–82

SEL log, 109

sensor values, 109

setup strings, 67–68

silent mode installation, 35–36

silent mode installation options, 35

silent mode uninstall, 37

- SNMP community
 - listing, 103
 - modifying, 103
- Solaris SUNWssm, 45
- SP information, listing, 104
- spare disk
 - adding, 91–92
 - removing, 92
- static settings, 66–67
- subset of strings, 61
- subset of the boot list, 61
- switching boot devices, 59–60
- system management driver
 - installing, 48–51
 - uninstalling, 52–53

U

- uninstalling
 - Hardware Management Pack
 - using console mode, 34–35
 - using GUI mode, 22–29
 - using silent mode, 37
 - system management driver, 52–53
- update subcommand
 - fwupdate
 - automatic mode, 76, 77
- USB/CD-ROM, 56
- USB devices, 58–59
- USB flash drive, 56

V

- ver.xml, 55–56
- view version, 55–56

W

- Windows, ipmitool, 109–112

X

- XML configuration
 - exporting from ILOM, 101
 - importing to ILOM, 100–101