

Oracle® Server CLI Tools for Oracle Solaris 11.2 User's Guide

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Using This Documentation

This section describes how to get the latest documentation and support for Oracle Hardware Management Pack (HMP) for Oracle Solaris. It also provides feedback links and a document change history.

- [“About Oracle Hardware Management Pack for Oracle Solaris” on page 11](#)
- [“Documentation and Feedback” on page 11](#)
- [“About This Documentation” on page 12](#)
- [“Support and Training” on page 12](#)
- [“Contributing Authors” on page 12](#)
- [“Change History” on page 12](#)

About Oracle Hardware Management Pack for Oracle Solaris

Oracle Hardware Management Pack for Oracle Solaris is a set of commands and agents that help you manage your Oracle servers and is part of the Oracle Solaris operating system starting with Oracle Solaris 11.2.

If you have an earlier version of Oracle Solaris, you can obtain the standalone version of Oracle Hardware Management Pack through the Oracle Support site.

Documentation and Feedback

The following documentation is available related to the Oracle Hardware Management Pack for Oracle Solaris.

Documentation	Link
All Oracle products	http://docs.oracle.com
Oracle Hardware Management Pack for Oracle Solaris	http://www.oracle.com/goto/ohmp/solarisdocs

Documentation	Link
Oracle ILOM	http://www.oracle.com/goto/ilom/docs

Provide feedback on this documentation at:

<http://www.oracle.com/goto/docfeedback>.

About This Documentation

This documentation 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, appendixes, or section numbering.

Support and Training

These web sites provide additional resources:

- Support: <https://support.oracle.com>
- Training: <http://education.oracle.com>

Contributing Authors

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Change History

The following changes have been made to the document.

- July 2014. Initial publication.
- December 2014. Updated *Release Notes* to document bug 19462769.
- January 2015. Updated the *Management Agent User's Guide* to correct the name of the hardware management agent service for Solaris 11.2 and later.
- March 2015. Updated *CLI User's Guide* and *Installation Guide* to add the `nvmeadm` command. Updated *CLI User's Guide* to add error codes for the `ubiosconfig` command. Made general editorial improvements and other minor technical updates.

- May 2015. Updated the *Release Notes* to document bug 20364298. Updated *CLI User's Guide* to add warnings about creating RAID volumes on available disks using the `raidconfig` command.
- June 2015. Updated the *Release Notes* to document bug 21098717. Updated *CLI User's Guide* to describe new `raidconfig` read/write cache options. Updated *Management Agent User's Guide* to add section on enhanced disk diagnostic events. Made general editorial improvements and other minor technical updates.
- September 2015. Updated the *Release Notes* to document bugs 18048467, 21563538, 21622963 and 21787319. Updated *CLI User's Guide* to describe manual power cycle requirement for remote service processor firmware updates.
- November 2015. Updated the *Release Notes* to add information about feature releases and bug fixes per release. Updated the *CLI User's Guide* to add `nvmeadm` error codes.

Oracle Server CLI Tools Overview

Note - This documentation applies to servers running Oracle Solaris 11.2 and later versions.

Beginning with Oracle Solaris 11.2, Oracle Hardware Management Pack for Oracle Solaris has become an integrated component of the operating system. Do not download and use other versions of Oracle Hardware Management Pack that are not specifically qualified for the Oracle Solaris 11.2 (and later) operating system. If you have Oracle Solaris 11.1 or earlier or other operating systems, continue to use Oracle Hardware Management Pack, available as a separate download from <https://support.oracle.com>.

Oracle Hardware Management Pack for Oracle Solaris includes Oracle Server Command Line Interface (CLI) Tools used to configure and monitor server hardware. These tools are run from the host operating system.

For information on installing Oracle Hardware Management Pack for Oracle Solaris components, refer to the [Oracle Hardware Management Pack for Oracle Solaris 11.2 Installation Guide](#).

The following table lists the available Oracle Server CLI Tools.

Tool	Description	Link
biosconfig	Configure your server's BIOS CMOS settings and host boot order. This tool is only available for systems that <i>do not</i> have UEFI-enabled BIOS.	"Using biosconfig to Update the BIOS"
fwupdate	Update, query, and validate the firmware for Oracle server devices.	"Using fwupdate to Update Firmware"
hwmgmtcli	Get system information from the Oracle ILOM service processor.	"Using hwmgmtcli to Display Hardware Information"
ilomconfig	Manage Oracle ILOM configurations.	"Using ilomconfig to Configure Oracle ILOM"
nvmeadm	Modify the controller and device configuration on an NVM Express (NVMe) subsystem.	"Using nvmeadm to Configure an NVM Express Device"
raidconfig	Configure RAID volumes.	"Using raidconfig to Configure RAID"
ubiosconfig	Import and export your server's UEFI BIOS settings to an XML file. This tool is only available for systems that <i>have</i> UEFI-enabled BIOS.	"Using ubiosconfig to Update the UEFI BIOS"

For more information on other Oracle Hardware Management Pack for Oracle Solaris features, see [Oracle Hardware Management Pack for Oracle Solaris 11.2 Installation Guide](#) and [Oracle Server Management Agent for Oracle Solaris 11.2 User's Guide](#).

For late-breaking issues and information about the CLI Tools, refer to the [Oracle Hardware Management Pack for Oracle Solaris 11.2 Release Notes](#).

Host-to-ILOM Interconnect

With Oracle ILOM 3.0.12 and later, a Host-to-ILOM Interconnect communication channel is available to enable you to communicate locally with Oracle ILOM from the host operating system (OS) without the use of a network management connection (NET MGT) to the server.

Note - The Oracle Hardware Management Pack refers to this feature as Host-to-ILOM Interconnect. The Oracle ILOM interface refers to this feature as Local Host Interconnect.

The Host-to-ILOM Interconnect is available on the latest Oracle servers and the can provide a more reliable and potentially faster data transfer rate for Oracle Hardware Management Pack CLI tools than traditional KCS interfaces.

Accessing the service processor using the Host-to-ILOM Interconnect requires that you either provide credentials manually or set up a host credentials cache using `ilomconfig`. For more information, see [“Providing Host Credentials to the Service Processor” on page 79](#).

The Host-to-ILOM Interconnect is enabled by default in Oracle Solaris 11.2 and later.

CLI Tools Command Syntax and Conventions

The following table shows that information covered in this section.

Description	Links
Shows the syntax to use for CLI commands.	“CLI Tools Command Syntax” on page 19
Describes the CLI tools naming convention for devices.	“CLI Tools Device-Naming Convention” on page 20

CLI Tools Command Syntax

Most CLI tools commands 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 biosconfig to Update the BIOS”](#) for more information.

The following table describes the command fields.

Command Field	Description	Examples
<i>command</i>	The action that you want to perform. Identifies that CLI tool that you are using. 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>

Command Field	Description	Examples
<i>target</i>	Describes the object or target that is being acted upon by the subcommand. Application specific.	<code>all, disk, expander, bridge, controller, user, snmp-community</code>
<i>option</i>	Modifies the command or subcommand and can be optional or mandatory depending on the command or subcommand. There are long and short options that have identical functionality and are provided for ease of use: Short-option is a hyphen followed by a single letter. Long-option is two hyphens followed by a string.	<code>-n</code> or <code>--device_name</code> <code>-f</code> or <code>--filename</code> <code>-r</code> or <code>--reset</code>

The following options apply to all CLI Tools commands.

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

When using a command option 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`

CLI Tools Device-Naming Convention

The following device names are used with the CLI Tools commands. The single characters represent all of the nodes that make up the device as shown in the following table.

Character	Description
<code>c</code>	The controller, using a unique logical ID.
<code>r</code>	The RAID Volume (logical disk), using the logical ID name of the volume or disk.

Character	Description
d	The disk, using the physical disk logical ID name.
x	The expander, using the unique expander logical ID name.
j	The chassis, using the unique chassis logical ID name.

All integers used to represent the device are 0 based. Disks are represented by logical ID names assigned by the tool at initialization. The disks are sorted by expander and slot ID to create unique numerical identifiers.

The following 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.

The following is an example of a `raidconfig` command when you create a RAID volume with three disks:

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

The following example 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

Using biosconfig to Update the BIOS

`biosconfig` configures the BIOS CMOS settings, host boot order, and some service processor settings.

Oracle Solaris OS `biosconfig` consists of an Oracle Solaris OS `biosdrv` driver and the `biosconfig` application.

Note - The `biosconfig` tool is available on supported Oracle x86 servers. Servers that support UEFI BIOS must use the `ubiosconfig` tool. See [“Using ubiosconfig to Update the UEFI BIOS”](#).

For a list of the tools and the systems that support them, refer to:

<http://www.oracle.com/goto/ohmp>

`biosconfig` allows you to manipulate BIOS configurations from the OS command line.

The following table shows that information covered in this section.

Description	Links
Learn about the <code>biosconfig</code> command	“biosconfig Command Overview” on page 23
Display information about <code>biosconfig</code>	“Viewing biosconfig Command Options and Version Information” on page 26
Configure device boot order	“Configuring the Device Boot Order” on page 28
Configure the BIOS CMOS	“Configuring the BIOS CMOS” on page 33
Learn about extraneous command output	“Commands That Produce Unrelated, Innocuous, Extra Output” on page 38

`biosconfig` Command Overview

This section covers the following information:

- [“biosconfig Requirements” on page 24](#)
- [“biosconfig Device Terminology ” on page 24](#)
- [“Editing XML Files” on page 25](#)
- [“biosconfig Command Syntax” on page 25](#)

biosconfig Requirements

- You must run biosconfig as root, because it needs to use drivers that are in read- and write-protected physical address space.
- Close all other applications and quiesce your system before running biosconfig.

biosconfig Device Terminology

The following notes explain how biosconfig describes devices:

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

Device Name Examples

The device name examples listed in the following table are used in XML file output in this chapter.

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)

Editing XML Files

`biosconfig` enables you to configure settings across multiple similar servers using a common XML configuration file. However, if the configuration that is being modified includes a peripheral or component that is not on both systems, then you need to customize the XML file. The BIOS firmware of systems you are exporting from or importing to does not have to be at the same version.

Note - The XML tag definitions are determined by the current system BIOS. These values can vary by system type and it is not recommended that you use the XML file to update the BIOS configuration across different system types.

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.



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 XML file editing. The process of editing the BIOS includes using `biosconfig` to do the following tasks:

1. To obtain the BIOS configuration settings in XML, type:

```
biosconfig -get filename.xml
```

If an XML file name is specified with the `-get` option, the BIOS configuration is saved to the XML file. If an XML file is not specified, the output is written to the terminal.

2. Review the XML file and modify it, as required.

You can modify the XML files in a editor of your choice, such as `vi`.

3. To implement the changes, type:

```
biosconfig -set filename.xml
```

You can use the same XML file to modify multiple systems of the same type.

biosconfig Command Syntax

The `biosconfig` command uses the following command syntax:

```
biosconfig [-v] option [filename]
```

When a command fails, it returns one of the failure codes listed in [“biosconfig Error Codes” on page 126](#).

The following table lists the available biosconfig options and their descriptions.

Option	Description
-get_version	Get version of this tool.
-get_boot_order	Get the boot devices list.
-set_boot_order	Set the boot devices list.
-set_boot_override	Set the first boot device for the next boot.
-get_bios_settings	Get setup configuration from BIOS.
-set_bios_settings	Get setup configuration to BIOS ROM.
-get_CMOS_dump	Get 256 bytes CMOS of set up data from BIOS.
-set_CMOS_dump	Set 256 bytes of CMOS set up data to BIOS.
-v	Verbose mode. Only supported with the <i>filename</i> option.

The following table lists examples of how the -get and -set command options affect input and output.

Command	Description
# biosconfig -get_version	Outputs to screen.
# biosconfig -get_version <i>filename.xml</i>	Outputs to <i>filename.xml</i> .
# biosconfig -get_version > <i>filename.xml</i>	Outputs to <i>filename.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>filename.xml</i>	Takes input from <i>filename.xml</i> .
# biosconfig -set_bios_settings < <i>filename.xml</i>	Takes input from <i>filename.xml</i> .

Note - In the output examples in this chapter, all white space outside the XML elements, such as indentation, is optional. For example, see the output in [“Make a Persistent Change to Boot Order” on page 31](#).

Viewing biosconfig Command Options and Version Information

This section covers the following information:

- [“View biosconfig Command Options” on page 27](#)
- [“View biosconfig Version Information” on page 27](#)

▼ View biosconfig Command Options

- To view the help output, execute the biosconfig command without arguments.
Type:

```
biosconfig
```

For example:

```
# 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
```

▼ View biosconfig Version Information

1. To view version information, type:

```
biosconfig -get_version filename.xml
```

For example:

```
# 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 *filename.xml* file.

The following is an example of the version information in an .xml file.

```
<?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>
```

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 presented as a boot list, which is the ordered list of bootable devices.

`biosconfig` enables you to configure the first device to boot at the next reboot or to configure the entire boot order. `biosconfig` does this by reading the boot-related tables that the BIOS stores in NVRAM and then manipulating the contents of CMOS where the boot order is stored.

This section covers the following information:

- [“Methods for Changing the Boot List” on page 29](#)
- [“Set the First Boot Device for the Next Boot” on page 29](#)
- [“Make a Persistent Change to Boot Order” on page 31](#)
- [“Change Boot Order Based on the PCI Bus, Device, or Function” on page 32](#)

Methods for Changing the Boot List

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

- Change the order in BIOS setup utility.
- Reorder 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.
- Change the boot order using `biosconfig`. This manipulates the contents of CMOS and the BIOS boot block structures stored in NVRAM, which is a dedicated part of the BIOS ROM.

This chapter contains instructions for changing the boot order using `biosconfig`.

Note - This boot list changes dynamically when devices such as disk drives, USB devices, and PCIe cards are installed and removed. The boot list also changes when `javaConsole` floppy and CD redirection is started and stopped.

▼ Set the First Boot Device for the Next Boot

This procedure shows how to set the first boot device for the next boot only. To change the boot device for successive boots, see [“Make a Persistent Change to Boot Order” on page 31](#).

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. **To create an XML file containing the current boot order of your system, type:**

```
biosconfig -get_boot_order filename.xml
```

2. Edit XML text so that the device that you want to boot first is between the <FIRST> tags.

In this example, the PXE device is the first boot device.

The following is an example of the resulting XML file.

```
<?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>
```

3. To set the boot order, type:

```
biosconfig -set_boot_override filename.xml
```

▼ Make a Persistent Change to Boot Order

To make a persistent change to the boot order, modify the order of devices between the `BOOT_DEVICE_PRIORITY` tags of the XML file.

The following example shows an XML file 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.

1. To create an XML file containing the current boot order of your system, type:

```
biosconfig -get_boot_order filename.xml
```

The following is an example of the output of the XML file:

```
<?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>
```

2. **Edit the device names displayed between the <DEVICE_NAME> tags so that the devices are listed in the desired boot order.**

3. **To set the boot order, type:**

```
biosconfig -set_boot_order filename.xml
```

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

The `biosconfig` command can alter the boot order based on the PCI bus, device, or function if the boot order list contains that information.

1. **To create an XML file containing the current boot order of your system, type:**

```
biosconfig -get_boot_order filename.xml
```

2. **Edit the devices listed between the <PCI-B-D-F> tags so that they are in the desired order.**

For example:

```
<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>
```

3. **To set the boot order, type:**

```
biosconfig -set_boot_order filename.xml
```


Configuring the BIOS CMOS

The BIOS configuration information is stored in the CMOS memory in the host's chipset. You can use `biosconfig` to modify these settings with a program on the host OS. Alternatively, you can configure many of the CMOS settings through the BIOS setup interface at BIOS POST.

`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 information:

- [“Capture the BIOS CMOS Golden Image” on page 33](#)
- [“Apply the BIOS CMOS Golden Image” on page 35](#)
- [“Configuring Individual CMOS Settings” on page 35](#)

▼ Capture the BIOS CMOS Golden 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.

1. **To generate a golden (known reliable) CMOS image, use the BIOS Setup Utility to configure the BIOS settings.**
2. **To capture the 256 bytes of CMOS containing the configuration information, type:**

```
biosconfig -get_CMOS_dump filename.xml
```

The following display shows an example of the output.

```
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
```

The following example shows an XML file containing the CMOS configuration information:

```
<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>00.00.00.00.00.00.00.00.00.00.00.00.00.00.00.00.</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>

```

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

▼ Apply the BIOS CMOS Golden Image

You can apply the golden image to identical hardware by copying the golden image from your source system to a destination system with the same BIOS revision, as shown using `-set_CMOS_dump`.

1. **Copy the *filename.xml* image from your source system to a destination system.**
2. **To apply the golden image to the destination system, type:**

```
biosconfig -set_CMOS_dump filename.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
```

Configuring Individual CMOS Settings

`biosconfig` provides two commands to manage individual CMOS settings:

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

To use these commands:

1. Use `-get_bios_settings filename.xml` to generate an XML file that describes the current settings.
2. Edit that XML file to change the settings.
3. Use `set_bios_settings filename.xml` to apply the settings to CMOS.

You can provide a subset of the XML file to include only the settings that you want to change with the `-get_bios_settings` command. The XML file must be valid, so you must remove entire option sets from the XML file.

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.

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>
```

Static and Dynamic CMOS Settings

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

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

▼ Configure a Static CMOS Setting

The following procedure describes how to set static CMOS settings. The XML samples shown are subsets of the output XML file.

1. To get the CMOS settings, type:

```
biosconfig -get_bios_settings filename.xml
```

2. View the XML file.

For example:

```
<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>

```

3. Modify the value in the <SELECTED_OPTION> tags, as needed.

The options listed below the <SELECTED_OPTION> tags display the available values.

For example, the options for the Quick Boot setting are Disabled and Enabled

4. To set the static CMOS values, type:

```
biosconfig -set_bios_settings filename.xml
```

▼ Configure a Dynamic Setting

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

- 1. Enter the BIOS Setup utility.**
- 2. Configure the settings manually and save the configuration.**
- 3. To examine the resulting XML output to find the value that the BIOS is using for the setting you wish to specify, type:**

```
biosconfig -get_bios_settings filename.xml
```

This is an example of a dynamic CMOS setting as displayed in the XML file:

```

<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. To set the BIOS configuration, type:

```
biosconfig -set_bios_settings filename.xml
```

Use this XML file to configure dynamic CMOS settings on machines of the same model.

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>
```


Using fwupdate to Update Firmware

fwupdate is a cross-OS utility that enables you to update, query, and validate the firmware of Oracle server devices such as storage and network adapters, Oracle Integrated Lights Out Manager (ILOM) service processor, BIOS, SAS expanders, SAS controllers, and different types of disk drives.

The following table shows the information covered in this section.

Description	Links
Learn about the fwupdate command	“fwupdate Command Overview” on page 41
Display component information	“Listing Component Firmware Information” on page 45
Update component firmware	“Update Component Firmware (Automatic Mode)” on page 54
Use fwupdate to update Oracle ILOM firmware	“Update an Oracle ILOM Service Processor Using fwupdate ” on page 55
View execution summary information	“Execution Summary” on page 58

fwupdate Command Overview

This section covers the following information:

- [“fwupdate Features” on page 41](#)
- [“fwupdate Command Prerequisites” on page 42](#)
- [“Downloading Firmware Files” on page 43](#)
- [“fwupdate and Service Processor Access” on page 43](#)
- [“fwupdate Command Syntax” on page 44](#)

fwupdate Features

fwupdate enables you to update firmware for the following components:

- Disk drives (spinning media and flash drives)
- Oracle ILOM service processor and BIOS
- HBA and embedded storage controllers, SAS1, SAS2 and SAS3
- LSI SAS expander devices, SAS1, SAS2 and SAS3
- Emulex and QLogic Fiber Channel controllers

Note - Updating Emulex and QLogic Fiber Channel controller firmware using `fwupdate` requires the Emulex and QLogic vendor tools. If these packages are not already installed, install them as described in the *Oracle Hardware Management Pack for Oracle Solaris Installation Guide*.

- Mellanox InfiniBand controllers
- Intel LOM (LAN on Motherboard)
- Intel Network Interface Cards (NICs)

You can use `fwupdate` to do the following:

- Examine firmware information for devices in a server
- Check firmware file compatibility
- Update device firmware using an automated XML metadata file

fwupdate Command Prerequisites

- Before using the `fwupdate` command to update device firmware, you must quiesce the device.



Caution - System hang or data loss. Before updating device firmware, make sure that the device is quiesced.

For example, when updating the firmware on a hard drive:

- Make sure that the operating system is not accessing the disk (for example, the system boot disk).
- Make sure that an application is not accessing the disk (for example, a database application).
- If hardware RAID is being used on the system, make sure that the RAID controller is not accessing the disk (for example, if it is rebuilding an array or is in a degraded state). You can use `raidconfig` to check the state of the arrays.
- Updating Emulex and QLogic Fiber Channel controller firmware using `fwupdate` requires the Emulex and QLogic vendor tools provided with Oracle Hardware Management Pack

for Oracle Solaris. If they are not installed, you need to install them, refer to the *Oracle Hardware Management Pack for Oracle Solaris Installation Guide*.

Downloading Firmware Files

Download firmware files from <https://support.oracle.com>.

Search for the product that you want to update and download the latest firmware package available for that product.

fwupdate and Service Processor Access

When accessing a service processor, fwupdate can be used over a local Host-to-ILOM interconnect or a remote Ethernet network connection. When issuing a fwupdate command that accesses the service processor, credentials are not required when using the Host-to-ILOM interconnect, but they are required for a network connection.

Note - For systems with an Oracle ILOM version earlier than 3.2.4, to use a LAN interface (either the Host-to-ILOM interconnect or Ethernet network connection) you must manually include credentials using the -H and -U options for commands that access a service processor. If credentials are not provided the commands will default to the slower local KCS interface to access the local service processor.

The credential options listed in the following table are supported for fwupdate when accessing a service processor over a network connection.

Short Option	Long Options	Description
-H	--remote-hostname	This option is followed by the host name or IP address of a remote service processor.
-U	--remote-username	This option is followed by the user name with root access used to log in to a remote service processor.

When using these options to access a service processor over a network connection, you must use both options together.

Note - The password required by the network connection can be piped in on stdin for scripting use.

fwupdate Command Syntax

The fwupdate command uses the following command syntax:

fwupdate *subcommand target [options]*

When a command fails, it returns one of the failure codes listed in [“fwupdate Error Codes” on page 126](#).

The options listed in the following table apply to all CLI Tools commands, including fwupdate.

Short Option	Long Option	Description
-?	--help	Displays help information.
-V	--version	Displays the tool version.

One subcommand is mandatory unless you use the --help or --version options.

fwupdate supports the subcommands listed in the following table.

Subcommand	Description
list	Provides firmware information about a device or a file.
update	Updates a single component based on command-line directives. Devices can be updated automatically using an xml file.

The subcommands are described in the following sections.

Device naming of target devices 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 20](#).

Using fwupdate Automatic Mode

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

The following prerequisites must be met before using the fwupdate command in automatic mode:

- You must have root permission to run `fwupdate` command.
- An XML metadata file containing information on platform firmware must be available. Check the firmware release notes to see if this file is available.
- For Oracle Solaris systems, after hot-plugging a 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 126](#).

Note - Running the command without subcommands displays help.

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 following.

Subcommand	Description
<code>list</code>	Provides firmware information about a device or a file.
<code>update</code>	Updates a single component based on command-line directives.

Listing Component Firmware Information

This section covers the following information:

- [“list Subcommand Overview” on page 45](#)
- [“List Specific Component Firmware Information” on page 51](#)

list Subcommand Overview

The `list` command does the following:

- Displays the version of firmware for all components
- Tells you whether the target device can be updated with the XML metadata file
- Saves the configuration information to a specified XML file

This information can be used to check the state of a device before executing a firmware upgrade and can be used to verify that a firmware update has been successful.

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

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

The `list` command has two types of targets: the first lists the configuration of devices on the system or supported by a file, and the second lists the features supported by `fwupdate`.

The following supported targets for the `list` subcommand represent all of the supported component types that can be upgraded by `fwupdate`:

- all
- disk
- expander
- controller
- bridge
- sp_bios

For example, use the `all` option to view all of the devices that can be updated using the XML metadata file.

The following supported targets for the `list` command represent the devices that can be upgraded by `fwupdate`:

- supported-targets
- supported-images
- error-codes

For example, use the `supported-targets` option to view all of the types of target device that can be updated using `fwupdate`.

The following information is displayed with the `list` command for the following targets. Items marked with an asterisk (*) are displayed in verbose listing.

- SP BIOS

- ID
- Product Name
- ILOM Version
- BIOS/OBP Version
- XML Support
- Controllers
 - ID
 - Type
 - Manufacturer
 - Mode
 - Product Name
 - Firmware (F/W) Version
 - BIOS version
 - EFI Version
 - FCODE Version
 - Package Version
 - NVDATA Version
 - XML Support
 - NODE ID*
 - Part Number*
 - PCI Address*
 - PCI Vendor ID*
 - WWN*
- Disk
 - ID
 - Manufacturer
 - Model
 - Chassis
 - Slot
 - Type
 - Media
 - Size
 - Firmware (FW) Version
 - XML Support
 - NODE ID*
 - WWN*
- Expander
 - ID

- Chassis
- Slot
- Manufacturer
- Model
- Expander Name
- Firmware (F/W) Version
- XML Support
- NODE ID*
- Product Revision*
- WWN*
- Bridge
 - ID
 - Chassis
 - Slot
 - Manufacturer
 - Model
 - Firmware (F/W) Version
 - Att FW Version
 - XML Support
 - NODE ID*
 - WWN*

▼ List All Component Firmware Information

- To list all component firmware information on the system, type:

```
fwupdate list all -v
```

The following is sample output from this command:

Note - The output for the c1 controller shows the NVMe controller type and the c2 and c3 controllers show NIC controller type.

```
=====
SP + BIOS
=====
ID: sp_bios
  Product Name: SUN SERVER X4-4
  ILOM Version: v3.2.2.10 r86071
  BIOS/OBP Version: 24010200
  XML Support: N/A
```


=====
CONTROLLER
=====

ID: c0
Node ID: mpt2sas:01:00.0
Type: SAS
Manufacturer: LSI Logic
Model: 0x0072
Product Name: SGX-SAS6-INT-Z
FW Version: 11.05.02.00
BIOS Version: 07.21.04.00
EFI Version: 07.18.02.11
PCI Address: 01:00.0
PCI Vendor ID: 0x1000
WWN: 0x500605b00452c5f0
Serial Number: 500605b00452c5f0
NVDATA Version: 10.03.00.26
XML Support: N/A
NAC Name: /SYS/MB/PCI2/SAS2

DISKS
=====

ID: c0d0
Manufacturer: HGST
Model: H101212SESUN1.2T
Slot: 0
Node ID: PDS:5000cca01d04e311
Type: sas
Media: HDD
Size (GB): 1200
Serial Number: 001304D2P9VD KZG2P9VD
FW Version: A447
XML Support: N/A
NAC Name: /SYS/HDD0

ID: c0d1
Manufacturer: HGST
Model: H101212SESUN1.2T
Slot: 1
Node ID: PDS:5000cca01d049199
Type: sas
Media: HDD
Size (GB): 1200
Serial Number: 001304D2HWND KZG2HWND
FW Version: A447
XML Support: N/A
NAC Name: /SYS/HDD1

=====
CONTROLLER
=====

List All Component Firmware Information

ID: c1
Node ID: nvme:81:00.00
Type: NVMe
Manufacturer: Intel
Model: 0x0953
Product Name: INTEL SSDPEDME016T4S
FW Version: 8DV1RA02
PCI Address: 81:00.0
PCI Vendor ID: 0x8086
Serial Number: CVMD4166002J1P6DGN
XML Support: N/A
NAC Name: /SYS/MB/PCI6/NVMe4

DISKS

=====

ID: c1d0
Manufacturer: INTEL
Model: SSDPEDME016T4S
Node ID: PDD:/dev/nvme0n1
Media: NVME
Size (GB): 200
Serial Number: CVMD4166002J1P6DGN
XML Support: N/A

=====

CONTROLLER

=====

ID: c2
Node ID: Generic WWN:00:10:E0:3B:F8:AC
Type: NET
Manufacturer: Intel
Model: 0x1528
Product Name: Intel(R) Ethernet Controller X540-AT2
EFI Version:
FCODE Version:
Package Version: 800004BE
PXE Version:
CLP Version:
FCOE Version:
ISCSI Version:
PCI Address: a0:00.0
PCI Vendor ID: 0x8086
Sequence Number: 0
XML Support: N/A
NAC Name: /SYS/MB/NET0

=====

CONTROLLER

=====

ID: c3
Node ID: Generic WWN:00:10:E0:3B:F8:AE

```

Type: NET
Manufacturer: Intel
Model: 0x1528
Product Name: Intel(R) Ethernet Controller X540-AT2
EFI Version:
FCODE Version:
Package Version: 800004BF
PXE Version:
CLP Version:
FCOE Version:
ISCSI Version:
PCI Address: b0:00.0
PCI Vendor ID: 0x8086
Sequence Number: 1
XML Support: N/A
NAC Name: /SYS/MB/NET2

```

▼ List Specific Component Firmware Information

- To list component firmware information, type;

fwupdate list *target options*

The following are some examples of the output for `fwupdate list` commands:

fwupdate list disk -v

```

=====
CONTROLLER
=====
ID: c0
Node ID: mptir2:40:00.0
Type: SAS
Manufacturer: LSI Logic
Model: 0x0072
Product Name: SGX-SAS6-REM-Z
FW Version: 11.05.02.00
BIOS Version: 07.21.04.00
EFI Version: 07.18.02.13
FCODE Version: 01.00.60.00
PCI Address: 40:00.0
PCI Vendor ID: 0x1000
WWN: 0x500605b005243000
NVDATA Version: 10.03.00.26 (default) 10.03.00.27 (persistent)
XML Support: N/A

DISKS
=====
ID: c0d0
Manufacturer: HITACHI
Model: H106030SDSUN300G

```

Slot: 2
 Node ID: PDS:5000cca02515b089
 Type: sas
 Media: HDD
 Size (GB): 300
 FW Version: A2B0
 XML Support: N/A

ID: c0d1
 Manufacturer: HITACHI
 Model: H106030SDSUN300G
 Slot: 3
 Node ID: PDS:5000cca025143f79
 Type: sas
 Media: HDD
 Size (GB): 300
 FW Version: A2B0
 XML Support: N/A

fwupdate list sp_bios -x metadata_3.1.2.10.b.xml

SP + BIOS

```
=====
```

ID	Product Name	ILOM Version	BIOS/OBP Version	XML Support
sp_bios	SUN FIRE X4170 M3	v3.1.2.10.a r75921	17030100	Yes

fwupdate list controller -n c0 -v

CONTROLLER

```
=====
```

ID: c0
 Node ID: mptmega:41:00.0
 Type: SAS
 Manufacturer: LSI Logic
 Model: 0x0079
 Product Name: LSI MegaRAID SAS 9261-8i
 FW Version: 2.130.353-1803
 BIOS Version: 3.24.00
 EFI Version: 4.12.05.00
 FCODE Version:
 PCI Address: 41:00.0
 PCI Vendor ID: 0x1000
 XML Support: N/A

fwupdate list disk -n c2d0

DISK

```
=====
```

ID	Manufacturer	Model	Chassis Slot	Type	Media	Size (GB)	FW Version
c2d0	ATA	3E128-TS2-550B01	-	-	sata SSD	100	TI35

N/A

```
fwupdate list disk -n c2d0 -v
```

```
DISK
=====
ID: c2d0
Manufacturer: ATA
Model: 3E128-TS2-550B01
Node ID: PDD:/dev/sg3
Type: sata
Media: SSD
Size (GB): 100
FW Version: TI35
XML Support: N/A
```

```
fwupdate list expander -n c1x0
```

```
EXPANDER
=====
ID      Chassis Slot Manufacturer  Model      Expander Name  FW Version  XML Support
-----
c1x0   0      -    ORACLE      DE2-24P    Primary      0010      N/A
```

```
fwupdate list expander -n c1x0 -v
```

```
EXPANDER
=====
ID: c1x0
Chassis: 0
Manufacturer: ORACLE
Model: DE2-24P
Expander Name: Primary
FW Version: 0010
Product Revision: 0010
Node ID: EC:mpt2sas:30:00.0:5080020001431f3e
XML Support: N/A
```

Updating Component Firmware

The following topics are covered in this section.

- [“Update Component Firmware \(Automatic Mode\)” on page 54](#)
- [“Update an Oracle ILOM Service Processor Using fwupdate ” on page 55](#)

▼ Update Component Firmware (Automatic Mode)

Solaris 11.2 supports `fwupdate` automatic mode, which updates the specified target device by using the firmware update information contained in a metadata XML file provided in the platform firmware download. This is the most accurate method to use.

● To update firmware, type:

```
fwupdate update target -x filename.xml options
```

When using an XML metadata file, the `update` subcommand supports the following targets:

- `all`
- `expander`
- `disk`
- `bridge`
- `controller`
- `sp_bios`

For example:

- **`fwupdate update all -x filename.xml`**

This updates all devices in the system for all target device types specified in the metadata file. This is the recommended and safest method for updating devices.

Use the `all` target to update all of the installed devices that can be updated using the XML metadata file. For example, if there are three NVMe devices installed in the system, specifying `fwupdate update all` with the NVMe metadata file will update all three NVMe devices.

- **`fwupdate update disk -x filename.xml`**

This updates all disks in the system whose target device types are specified in the metadata file.

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

This updates only disk `c0d1`, and only if the `c0d1` disk drive target device type is specified in the metadata file.

Options for the `update` subcommand in automatic mode are listed in the following table.

Short Option	Long Option	Descriptions
<code>-n</code>	<code>--device_name</code>	Precedes name of the device to update. The name is the mapped name, which you can retrieve by using the <code>fwupdate list</code> command. This option is mandatory for single component mode, but optional when used with an XML file.

Short Option	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.
-x	--xml= <i>filename.xml</i>	If the firmware package contains a metadata XML file, this command provides the path to <i>filename.xml</i> .
-o	--output= <i>filename</i>	Logs all actions in the specified file.
-p	--priority= <i>value</i>	Starts processing input metadata from an XML file at a given priority level, skipping all lower levels.
-q	--quiet	Suppresses informational message output and only returns error codes.
n/a	--silent-reboot	Enables a reboot to update the firmware without a prompt. Reboot happens automatically.
n/a	--silent-no-reboot	Enables no-reboot option without a prompt. User is not prompted, and a reboot does not take place. Note - The system might need to be rebooted to complete the firmware update.

▼ Update an Oracle ILOM Service Processor Using fwupdate

The following example shows how to use fwupdate to update an Oracle ILOM service processor and system BIOS or OBP with new firmware. You can use fwupdate to update either the local service processor or a remote service processor. When using local update, fwupdate uses the fastest local interface available. If a Host-to-ILOM connection is available, then this fast connection is used, otherwise the KCS interface is used.



Caution - Loss of server functionality. Updating the service processor firmware incorrectly might damage the service processor.

Before You Begin

- Ensure the Host-to-ILOM Interconnect or the KCS interface is correctly configured to communicate with the target Oracle ILOM service processor.
- Download the service processor updates from <https://support.oracle.com>.
These include the metadata or firmware file for the target Oracle ILOM service processor.
- To make sure that the firmware is compatible with the target service processor, read all documentation and release notes included with the firmware file before proceeding.

1. To display information about the service processor and system BIOS firmware, do one of the following:

- To list information about the local Oracle ILOM service processor and the system BIOS firmware, type the following command:

```
fwupdate list sp_bios
```

- **To list information about an Oracle ILOM service processor and system BIOS firmware using a network connection, type:**

```
fwupdate list sp_bios -H sp_ip -U username
```

where *sp_ip* is the IP address of the service processor and *username* is the user name for logging in to the Oracle ILOM service processor.

Enter the Oracle ILOM password when prompted.

Output related to the target is displayed. For example the output from this command is similar to:

```
=====
SP + BIOS
=====
ID      Product Name          ILOM Version    BIOS/OBP Version XML Support
-----
sp_bios SUN FIRE X4270 SERVER v3.0.12.0 r64525 07060223      N/A
```

Note - When the Oracle ILOM service processor and OBP are updated on a SPARC system, the system reboots the host automatically. Shut down cannot be disabled with the `silent-no-reboot` option.

2. To update the Oracle ILOM service processor, choose the local or remote option:

- **Local:** To update the local Oracle ILOM service processor, choose one of these steps:
 - **If a metadata XML file is available, type this command to use automatic mode:**

```
fwupdate update sp_bios -x metadata.xml
```

where *metadata.xml* is the path to the metadata file.

Note - For x86 systems, you can also use the `--silent-reboot` or `--silent-no-reboot` options after the `.xml` metadata file option to either automatically reboot or not reboot the server after the firmware update.

- **If a metadata XML file is not available, type this command to use manual mode:**

```
fwupdate update sp-bios-firmware -n sp_bios -f sp-bios-firmware-package-file.pkg
```

where *sp-bios-firmware-package-file.pkg* is the path to the firmware file for your server's Oracle ILOM service processor.

- **Remote: To update an Oracle ILOM service processor using a network connection, do one of the following:**
 - **If a metadata XML file is available, type this command to use automatic mode:**

```
fwupdate update sp_bios -x metadata.xml -H sp_ip -U username
```

where `metadata.xml` is the path to the metadata file for your server's Oracle ILOM service processor.

Note - If you are running Oracle Solaris 11.2 with SRU 14 or later, for x86 systems you can also use the `--silent-reboot` or `--silent-no-reboot` options after the `.xml` metadata file option to either automatically reboot or not automatically reboot the server after the firmware update.

If you are running an earlier version of Oracle Solaris 11.2, you must manually power cycle the remote system after the update.

- **If a metadata XML file is not available, type this command to use manual mode:**

```
fwupdate update sp-bios-firmware -n sp_bios -f sp-bios-firmware-package-file.pkg -H sp_ip -U username
```

where `sp-bios-firmware-package-file.pkg` is the path to the firmware file for your server's Oracle ILOM service processor.

The Oracle ILOM service processor is updated.

3. Reboot the host server to initialize the BIOS update.

- **For SPARC systems, the host is automatically rebooted.**
- **For x86 systems:**
 - **If the metadata file is available and you used the `--silent-reboot` option with the `fwupdate` command, the system automatically reboots.**
 - **If the metadata file is available and the system does not automatically reboot, type `y` at the prompt:**

```
Do you wish to automatically reboot now? [y/n]?
```
 - **If no metadata XML file is available or the metadata file does not contain the reboot instructions, reboot the host server manually.**

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 examples show the possible execution summary messages:

- Message printed after a successful 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 server needs to be reset, or that other instructions need to be followed. Consult your product release notes for instructions on how to update the version number.
- Upgrade failed:
Upgrade of *device_name* failed: *error_message*

The variables in the previous output represent the following:

- *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.

Using `hwmgmtcli` to Display Hardware Information

`hwmgmtcli` displays hardware configuration information and the status of your Oracle servers.

Note - There are some limitations to using `hwmgmtcli` tool for SPARC M5-32 and M6-32 servers. Refer to the Release Notes for more information.

The following table shows that information covered in this section.

Description	Links
Learn about the <code>hwmgmtcli</code> command.	“hwmgmtcli Command Syntax” on page 59
Display subsystem information.	“List Subsystem Information” on page 61
Display open problems with the system.	“View Open Problems” on page 61
Export subsystem information.	“Export Subsystem Information” on page 61

`hwmgmtcli` Command Syntax

The `hwmgmtcli` commands use the following command syntax:

`hwmgmtcli subcommand [subsystem] [option]`

The options listed in the following table apply to all CLI Tools commands, including `hwmgmtcli`.

Short Option	Long Option	Description
-?	--help	Help—Displays help information.
-V	--version	Version—Displays the tool version.

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

hwmgmtcli supports the subcommands shown in the following table.

Command	Function
list <i>subsystem</i>	Show details of one or all subsystems.
export <i>subsystem</i>	Export details of all subsystems to an XML file.

You can choose to show all available information or you can choose a subsystem. The available subsystems are listed in the following table.

Subsystem	Description
all	Show all subsystems available.
server	Show details of server subsystem.
cooling	Show details of cooling subsystem.
processor	Show details of processor subsystem.
memory	Show details of memory subsystem.
power	Show details of power subsystem.
storage	Show details of storage subsystem.
network	Show details of network subsystem.
firmware	Show details of firmware subsystem.
device	Show details of the device subsystem.
bios	Show details of BIOS sub-system.
iomodule	Show details of IO module sub-system.
open_problems	Show all SP diagnosed open problems (ILOM 3.1 or newer).
dcu	Show details of dcu sub-system (only available on multi-domained systems)

The list *subsystem* subcommand supports the option listed in the following table.

Short Option	Long Option	Description
-d	--details	Show all of the properties and components for the subsystem in detail.

The option listed in the following table is supported for the export *subsystem* subcommand.

Short Option	Long Option	Description
-f	--filename	Export the subsystem information to <i>filename</i> .

▼ List Subsystem Information

The `list` subcommand displays the current hardware configuration and status information of a server and its subsystems.

- **To list subsystem information, type:**

```
hwmgmtcli list subsystem
```

where *subsystem* is one of the subsystems listed in “[hwmgmtcli Command Syntax](#)” on page 59.

The current subsystem information is listed.

▼ View Open Problems

The `open_problems` subsystem displays information about logged system events.

- **To view open server problems, type:**

```
hwmgmtcli list open_problems
```

The following display shows sample output from this command:

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

▼ Export Subsystem Information

The following procedure describes how to use the `export subsystem` subcommand to save the current hardware configuration and status information of a server and its subsystems to a file.

Note - The only subsystem available for the `export` subcommand is `all`.

- **To export subsystem information, type:**

```
hwmgmtcli export all --filename filename.xml
```

where *filename* is the file to which you want to export the current system or subsystem information.

The current information is exported to the specified *filename.xml* file.

Using `ilomconfig` to Configure Oracle ILOM

`ilomconfig` allows you to configure Oracle ILOM service processors from the host OS without having to connect to the management network. You can target `ilomconfig` changes to either the local or a remote Oracle ILOM service processor.

`ilomconfig` also functions as an *XML builder* by either exporting the configuration of an Oracle ILOM service processor to an existing XML file, or creating a new XML file. These XML files can then be used for subsequent restore operations on compatible Oracle ILOM service processors.

You can also use `ilomconfig` to configure a Host-to-ILOM Interconnect on platforms that support this configuration. For more information on Host-to-ILOM Interconnect, see [“Configuring the Host-to-ILOM Interconnect” on page 78](#).

Note - There are some limitations to using `ilomconfig` tool for SPARC M5-32 and M6-32 servers. Refer to the Release Notes for more information.

The following table shows the information covered in this section.

Description	Links
Learn about the <code>ilomconfig</code> command	“<code>ilomconfig</code> Command Overview” on page 63
Import or Export XML configurations	“Importing and Exporting XML Configurations” on page 67
View system and SP information	“Listing System and SP Information” on page 70
Modify Oracle ILOM configurations	“Modifying Oracle ILOM Configurations” on page 73
Configure the Host-to-ILOM Interconnect	“Configuring the Host-to-ILOM Interconnect” on page 78

`ilomconfig` Command Overview

This section covers the following information:

- [“ilomconfig Features” on page 64](#)
- [“Restoring and Modifying Oracle ILOM XML Configuration Files” on page 64](#)
- [“ilomconfig Command Syntax” on page 65](#)

ilomconfig Features

The `ilomconfig` commands can be directed at a local or remote Oracle ILOM service processor, or an XML configuration file. This file can then be used as a golden image to make changes to multiple Oracle ILOM service processors. You can either export the configuration of an Oracle ILOM service processor or create a new XML configuration file.

`ilomconfig` provides the following functions:

- Back up and restore from an Oracle ILOM XML file
- Modify the XML file using sub-commands
- Set the network, including DHCP and sideband
- List and configure identification information, including hostname, contact, location, and description
- List and configure DNS
- List and configure clock including time zone
- List and configure user management
- List and configure SNMP community

Restoring and Modifying Oracle ILOM XML Configuration Files

Starting with Hardware Management Pack 2.1, `ilomconfig` can generate a backup of an Oracle ILOM service processor's configuration to an XML file with the `export config` command. The `create` or `modify` subcommands can be used to create or modify XML files.

By default, `ilomconfig` commands are executed on the local Oracle ILOM service processor. When you use the `--xmlfile=config.xml` option, the `ilomconfig` commands operate on the specified XML file.

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

Note - Ensure that when you create a new setting in an XML file, your target Oracle ILOM service processor supports the setting.

Oracle ILOM settings can be restored from an XML file starting with Oracle ILOM 3.0.12. Oracle ILOM settings that can be restored include:

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

ilomconfig Command Syntax

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

`ilomconfig subcommand type [option]`

When a command fails, it returns one of several failure codes listed in [“ilomconfig Error Codes” on page 128](#).

Options

The following table lists the options available to all CLI Tools commands, including `ilomconfig`.

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

When accessing a service processor, `ilomconfig` can be used over a local Host-to-ILOM interconnect or a remote Ethernet network connection. When issuing an `ilomconfig` command that accesses the service processor, credentials are not required when using the Host-to-ILOM interconnect, but they are required for a network connection.

Note - For systems with an Oracle ILOM version earlier than 3.2.4, to use a LAN interface (either the Host-to-ILOM interconnect or Ethernet network connection) you must manually include credentials using the -H and -U options for commands that access a service processor. If credentials are not provided the commands will default to the slower local KCS interface to access the local service processor.

The options listed in the following table are supported for `ilomconfig` over a network connection.

Short Option	Long Options	Description
-H	--remote-hostname	This option is followed by the host name or IP address of the remote service processor.
-U	--remote-username	This option is followed by the user name with root access used to log in to the remote service processor.

Use these options to make changes to a remote service processor, rather than the local service processor. When using these options to access a remote service processor, you must use both options together. For example:

```
ilomconfig list system-summary --remote-hostname=sp_ip --remote-username=username
```

where *sp_ip* is the remote host name or IP address (in `xx.xx.xx.xx` format) of the target server's service processor, and *username* is the user name with login access rights to perform the operation.

Note - The `enable/disable interconnect` and `create/delete credential` subcommands can not be used on remote service processors.

You are prompted for the password for this user name when accessing the remote Oracle ILOM service processor.

Note - The password required by the remote user name can be piped in on `stdin` for scripting use.

The option listed in the following table applies to using `ilomconfig` on a local XML file.

Long Options	Description
--xmlfile	This option is followed by the path to the file you want to modify.

Use this option to make changes to a local XML file, rather than a local or remote service processor.

Subcommands

The available `ilomconfig` subcommands are listed in the following table.

Subcommand	Description
<code>list</code>	Show Oracle ILOM settings, users, SNMP communities, and system summary.
<code>create</code>	Create users and SNMP communities.
<code>delete</code>	Delete users and SNMP communities.
<code>modify</code>	Modify Oracle ILOM settings.
<code>import</code>	Restore Oracle ILOM settings from an XML file.
<code>export</code>	Backup Oracle ILOM settings to an XML file.
<code>reset</code>	Reset Oracle ILOM to factory defaults.
<code>enable</code>	Enable Host-to-ILOM interconnect.
<code>disable</code>	Disable Host-to-ILOM interconnect.

Importing and Exporting XML Configurations

This section covers the following information:

- [“Export an XML Configuration” on page 67](#)
- [“Import an XML Configuration” on page 69](#)

▼ Export an XML Configuration

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

Note - Exit or close all active ILOM login sessions before proceeding. The `ilomconfig export file` command enables exports of the current Oracle ILOM configuration. Before an export operation can be executed, all active open sessions must be closed. There must be no active ILOM sessions logged in to `/SP/console` during the export operation.

- **Do one of the following:**
 - **To export an XML configuration using a passphrase, choose one of the following commands:**
 - **To get a prompt asking whether you want to enter a passphrase:**

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

where *filename.xml* represents the file to which you are exporting the ILOM configuration.

For example:

```
# ilomconfig export config --xmlfile=config.xml
Do you want to enter a passphrase to back up sensitive data? [y/n]? y
Enter passphrase: *****
Wrote backup of ILOM configuration to 'config.xml'.
```

- **To set up a passphrase to be used with an automated script, provide a passphrase or a file containing the passphrase as follows:**

```
echo passphrase | ilomconfig export config --xmlfile=filename.xml
```

where *passphrase* is the passphrase that you want to use.

or

```
cat file_with_passphrase | ilomconfig export config --xmlfile=filename.xml
```

where *file_with_passphrase* is the file containing the passphrase.

For example:

```
# echo passphrase | ilomconfig export config --xmlfile=config.xml
Enter passphrase: *****
Wrote backup of ILOM configuration to 'config.xml'.
```

The passphrase is automatically passed through the command line.

- **To export an XML configuration without using a passphrase:**

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

where *filename.xml* represents the file to which you are exporting the ILOM configuration.

For example:

```
# ilomconfig export config --xmlfile=config.xml -y
Wrote backup of ILOM configuration to 'config.xml'.
```

This option exports the ILOM configuration without using a passphrase.

▼ Import an XML Configuration

To import an XML configuration file to configure Oracle ILOM, use the `ilomconfig import config` command. You can also use this command to restore the system configuration by importing a known reliable XML file.

Note - Exit or close all active ILOM login sessions before proceeding. The `ilomconfig import file` command imports the current Oracle ILOM configuration. Before an import operation can be executed, all active open sessions must be closed. There must be no active ILOM sessions logged in to `/SP/console` during the import operation.

- **Do one of the following:**

- **To import an XML configuration using a passphrase, choose one of the following commands.**

- **To get a prompt asking whether you want to enter a passphrase, type:**

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

where *filename.xml* represents the file from which you are importing the ILOM configuration.

For example:

```
# ilomconfig import config --xmlfile=config.xml
Are you sure you want to import the settings from the XML file to ILOM? [y/n]? y
Do you want to enter a passphrase to restore sensitive data? [y/n]? y
Enter passphrase: *****
Preparing to restore XML file to ILOM...
Done preparing to restore XML file ILOM.
Restoring configuration (allow several minutes).....
.....Done.
```

- **To set up a passphrase to be used with an automated script, provide a passphrase or a file containing the passphrase as follows:**

```
echo passphrase | ilomconfig import config --xmlfile=filename.xml
```

where *passphrase* is passphrase that you want to use.

or

```
cat file_with_passphrase | ilomconfig import config --xmlfile=filename.xml
```

where *file_with_passphrase* is the file containing the passphrase.

For example:

```
# echo passphrase | ilomconfig import config --xmlfile=config.xml
Enter passphrase: *****
Preparing to restore XML file to ILOM...
Done preparing to restore XML file ILOM.
Restoring configuration (allow several minutes).....
.....Done.
```

The passphrase is automatically passed in through the command line.

■ **To import an XML configuration without using a passphrase, type:**

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

where *filename.xml* represents the file from which you are importing the ILOM configuration.

For example:

```
# ilomconfig import config --xmlfile=config.xml -y
Preparing to restore XML file to ILOM...
Done preparing to restore XML file ILOM.
Restoring configuration (allow several minutes).....
.....Done.
```

This option imports the ILOM configuration without using a passphrase.

Listing System and SP Information

This section covers the following information:

- [“List System Summary Information” on page 71](#)
- [“List Users” on page 71](#)
- [“List an SNMP Community” on page 72](#)
- [“List IPv4 Network Settings” on page 72](#)
- [“List IPv6 Network Settings” on page 72](#)
- [“List Service Processor Identification Information” on page 72](#)
- [“List DNS Information” on page 73](#)
- [“List Clock Information” on page 73](#)

▼ List System Summary Information

Use the `ilomconfig list` sub command to list system summary information including the product name, part number, serial number, Oracle ILOM host name, and Oracle ILOM version information. Use the `ilomconfig list system-summary` command to lists the same information as the Summary tab in the Oracle ILOM web interface.

- **Choose one of these procedures depending on where the system summary details are:**
 - **To view the system summary of the local Oracle ILOM service processor, type:**

```
ilomconfig list system-summary
```

- **To view the system summary information from a remote Oracle ILOM service processor, type:**

```
ilomconfig list system-summary --remote-hostname=sp_ip --remote-username=username
```

where *sp_ip* is the IP address of the remote server's service processor and *username* the valid user account with privileges to view system summary information.

For example:

```
ilomconfig list system-summary --remote-hostname=192.168.1.10 --remote-username=root
```

Oracle ILOM prompts for the root account password.

▼ List Users

To list one or all users, use the `ilomconfig list user username` command. If *username* is specified then only that user is listed. If *username* is blank, then all users are listed.

When you specify an XML file name, the command is run on information available in the exported service processor configuration XML file rather than querying Oracle ILOM.

- **To list users, type:**

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

where *username* is the user to list and *filename.xml* is the name of the service processor configuration XML file.

▼ List an SNMP Community

To list one or all SNMP communities, use the `ilomconfig snmp-community` command. When you specify an XML file name, the command lists SNMP communities defined in the exported service processor configuration XML file rather than querying Oracle ILOM.

- **To list SNMP communities, type:**

```
ilomconfig list snmp-community [communityname] [--xmlfile=filename.xml]
```

where *communityname* is the name of the SNMP community you are interested in and *filename.xml* is the name of the service processor configuration XML file.

▼ List IPv4 Network Settings

To list IPv4 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 IPv4 network settings defined in the exported service processor configuration XML file rather than querying Oracle ILOM.

- **To list IPv4 network settings, type:**

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

▼ List IPv6 Network Settings

To list IPv6 network settings, use the `ilomconfig list network-ipv6` command. This command lists IP address, gateway, autoconfig, link local IP address, dynamic IP address and interface state. When you specify an XML file name, this command lists IPv6 network settings defined in the exported service processor configuration XML file rather than querying Oracle ILOM.

- **To list IPv6 network settings, type:**

```
ilomconfig list network-ipv6 [--xmlfile=filename.xml]
```

▼ List Service Processor Identification Information

To list identification information for the service processor, use the `ilomconfig list identification` command. This command lists service processor 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 exported service processor configuration XML file rather than querying Oracle ILOM.

- **To list service processor identification information, type:**

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

▼ List DNS Information

To list DNS information, use the `ilomconfig list dns` command. If you specify an XML file name, the command lists DNS information defined in the exported service processor configuration XML file rather than querying Oracle ILOM itself.

- **To list DNS information, type:**

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

▼ 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 exported service processor configuration XML file rather than querying Oracle ILOM.

- **To list clock information, type:**

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

Modifying Oracle ILOM Configurations

This section covers the following information:

- [“Restore Oracle ILOM to Defaults”](#) on page 74
- [“Create a User”](#) on page 74
- [“Delete a User”](#) on page 74
- [“Modify a User Password or Role”](#) on page 75
- [“Create an SNMP Community”](#) on page 75
- [“Modify IPv4 Network Settings”](#) on page 75

- [“Modify IPv6 Network Settings” on page 76](#)
- [“Modify Identification Information” on page 77](#)
- [“Modify DNS Information” on page 77](#)
- [“Modify Clock Information” on page 78](#)

▼ Restore Oracle ILOM to Defaults

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

- **To restore Oracle ILOM to defaults, type:**

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

▼ 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 information defined in the exported service processor configuration XML file rather than modifying Oracle ILOM.

1. **To create a user, type:**

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

where *username* is the user to modify, `-role` is the role of the Oracle ILOM user and *filename.xml* is the name of the exported service processor configuration XML file to modify.

2. **At the prompt, enter the password for the user.**

▼ Delete a User

To delete a user, use the `ilomconfig delete user` command. The `-y` option prevents the yes or no confirmation prompt. When you specify an XML file name, the command modifies information defined in the exported service processor configuration XML file rather than modifying Oracle ILOM.

- **To delete a user, type:**

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

where *username* is the user to delete and *filename.xml* is the name of the exported service processor configuration XML file to modify.

▼ 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 information defined in the exported service processor configuration XML file rather than modifying Oracle ILOM.

- To modify a user password or role, type:

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

where *username* is the user to modify, `-p` prompts for the user's password, `-role` is the role of the Oracle ILOM user and *filename.xml* is the name of the exported service processor configuration XML file to modify.

▼ 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 information defined in the exported service processor configuration XML file rather than modifying Oracle ILOM.

- To create an SNMP community, type:

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

where *communityname* is the SNMP community you are creating, `--permission` is either read-only or read-write (*ro|rw*), and *filename.xml* is the name of the exported service processor configuration XML file to modify.

▼ Modify IPv4 Network Settings

To modify settings, use the `ilomconfig modify network` command. This command modifies IP address, netmask, gateway, DHCP settings, and sideband. When you specify an XML file name, the command modifies information defined in the exported service processor configuration XML file rather than modifying Oracle ILOM.

● **To modify IPv4 network settings, type:**

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

Option	Description	Example
--ipdiscovery	Network discovery mechanism. Can be either static or DHCP.	static or dhcp
--ipaddress	Oracle ILOM IP address.	255.255.255.0
--netmask	Oracle ILOM netmask.	255.255.255.0
--gateway	Oracle ILOM gateway.	255.255.255.0
--state	Oracle ILOM management port state.	enabled or disabled
--mgmtport	Oracle ILOM management port path.	/SYS/SP/NET0 or SYS/MB/SP/NETMGMT
--xmlfile	Modify specified XML file rather than local Oracle ILOM service processor. Must be followed by = and the pathname to the file.	file.xml

▼ **Modify IPv6 Network Settings**

To modify IPv6 settings, use the `ilomconfig modify network-ipv6` command. This command lists IP address, netmask, gateway, DHCP settings, and sideband. When you specify an XML file name, the command modifies information defined in the exported service processor configuration XML file rather than modifying Oracle ILOM.

● **To modify IPv6 network settings, type:**

```
ilomconfig modify network-ipv6 [--static-ipaddress=IPv6_address] [--autoconfig=disabled|stateless|dhcpv6_stateful|dhcpv6_stateless] [--state=enabled|disabled] [--xmlfile=filename.xml]
```

Option	Description	Example
--static-ipaddress	Oracle ILOM IPv6 static address.	2001:0db0:0000:82a1:0000:0000:1234:abcd
--autoconfig	Oracle ILOM IPv6 autoconfiguration state.	When using Oracle ILOM 3.0.12.x: disabled, stateless_only When using Oracle ILOM 3.0.14.x: disabled, stateless, dhcpv6_stateful, dhcpv6_stateless

Option	Description	Example
--state	Oracle ILOM IPv6 administrative state.	enabled or disabled
--xmlfile	Modify specified XML file rather than local Oracle ILOM service processor. Must be followed by = and the pathname to the file.	file.txt

▼ 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 information defined in the exported service processor configuration XML file rather than modifying Oracle ILOM.

- **To modify identification information, type:**

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

Option	Description	Example
--hostname	Oracle ILOM host name.	service-processor. domain.com
--system-contact	Oracle ILOM system contact field.	user
--system-location	Oracle ILOM system location field.	west
--system-identifier	Oracle ILOM system identifier field.	x4800
--xmlfile	Modify specified XML file rather than local Oracle ILOM service processor. Must be followed by = and the pathname to the file.	file.xml

▼ Modify DNS Information

To modify DNS information, use the `ilomconfig modify dns` command. When you specify an XML file name, the command modifies information defined in the exported service processor configuration XML file rather than modifying Oracle ILOM.

- **To modify DNS information, type:**

```
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 Oracle ILOM separated by commas.	10.168.1.10
--auto-dns	Oracle 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 local Oracle ILOM service processor. Must be followed by = and the pathname to the file.	file.xml

▼ Modify Clock Information

To modify clock information, use the `ilomconfig modify clock` command. When you specify an XML file name, the command modifies information defined in the exported service processor configuration XML file rather than modifying Oracle ILOM.

- **To modify clock information, type:**

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

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

Configuring the Host-to-ILOM Interconnect

The Host-to-ILOM Interconnect enables you to communicate locally with Oracle ILOM from the host operating system (OS) without the use of a network management connection (NET MGT) to the server.

This section covers the following information:

- [“Providing Host Credentials to the Service Processor” on page 79](#)
- [“Enable the Host-to-ILOM Interconnect” on page 79](#)
- [“Disable the Host-to-ILOM Interconnect” on page 80](#)
- [“Modify the Host-to-ILOM Interconnect” on page 80](#)
- [“List the Host-to-ILOM Interconnect Settings” on page 81](#)
- [“Verify the Host-to-ILOM Interconnect Settings” on page 81](#)
- [“Set Up a Credential Cache on the Host” on page 81](#)
- [“Delete a Credential Cache on the Host” on page 82](#)

Providing Host Credentials to the Service Processor

Accessing the service processor using the Host-to-ILOM Interconnect requires that you either provide credentials manually or set up a host credentials cache using `ilomconfig`:

- For information on setting credentials using `ilomconfig`, see [“Set Up a Credential Cache on the Host” on page 81](#).
- To provide credentials manually, provide the Oracle ILOM login credentials when running a command over a network. For example:

```
#fwupdate update sp_bios -x metadata.xml --remote-username=root --remote-
hostname=169.254.182.76
```

```
#ubiosconfig list status -U root -H 169.254.182.76
```

▼ Enable the Host-to-ILOM Interconnect

The Host-to-ILOM interconnect is automatically enabled by Solaris 11.2 and later during system boot. Use the `ilomconfig enable interconnect` command to enable the Host-to-ILOM interconnect if it has been disabled.

Note - 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.

- **To enable the Host-to-ILOM Interconnect, type:**

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

Option	Description	Example
--ipaddress	Oracle ILOM IP address. This address must be in the format: 169.254.x.x	169.254.175.72
--netmask	Oracle ILOM netmask.	255.255.255.0
--hostipaddress	Host IP address. This address must be in the format: 169.254.x.x	169.254.175.73

▼ Disable the Host-to-ILOM Interconnect

To disable the Host-to-ILOM Interconnect, use the `ilomconfig disable interconnect` command.

- To disable the Host-to-ILOM interconnect, type:

```
ilomconfig disable interconnect
```

▼ Modify the Host-to-ILOM Interconnect

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

- To modify the Host-to-ILOM Interconnect, type:

```
ilomconfig modify interconnect [--ipaddress=ipaddress] [--netmask=netmask] [--hostipaddress=hostipaddress]
```

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

▼ List the Host-to-ILOM Interconnect Settings

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

- **To list the Host-to-ILOM interconnect settings, type:**
`ilomconfig list interconnect`

▼ Verify the Host-to-ILOM Interconnect Settings

To verify if the Host-to-ILOM Interconnect is up and running do the following:

1. **To verify the Host-to-ILOM interconnect settings, type:**
`ilomconfig list interconnect`

The following is example output for this command.

```
Interconnect
=====
State: enabled
Type: USB Ethernet
SP Interconnect IP Address: 169.254.182.76
Host Interconnect IP Address: 169.254.182.77
Interconnect Netmask: 255.255.255.0
SP Interconnect MAC Address: 02:21:28:57:47:16
Host Interconnect MAC Address: 02:21:28:57:47:17
```

2. **Make sure that you can ping the SP Interconnect IP Address. For example:**
`ping 169.254.182.76`

▼ Set Up a Credential Cache on the Host

As of Oracle Solaris 11.2 SRU 14, this feature has been disabled. Refer to the Release Notes for more information.

The host local credential cache contains the username and password required to access Oracle ILOM via the Host-to-ILOM Interconnect.

The username and password for the credential cache must match the Oracle ILOM service processor's username and password (for example as shown by `ilomconfig list user`).

Note - The credentials provided must have root privileges.

- **To set up a credential cache on the host, type:**

```
ilomconfig create credential --username=username
```

where *username* is a valid user account name used to log in to Oracle ILOM.

▼ Delete a Credential Cache on the Host

To remove an existing host local credential cache, for example when you have changed the username used to access Oracle ILOM via the Host-to-ILOM Interconnect, delete the host local credential cache.

- **To delete a credential cache on the host, type:**

```
ilomconfig delete credential --username=username
```

where *username* is a valid user account name used to log in to Oracle ILOM.

Using nvmeadm to Configure an NVM Express Device

The nvmeadm utility collects and modifies the NVMe device configuration. An NVMe solid state drive (SSD) device includes the NVMe controller and flash memory modules.

The following information is covered in this section:

- [“nvmeadm Command Overview” on page 83](#)
- [“List NVMe Controllers” on page 85](#)
- [“List NVMe Namespaces” on page 86](#)
- [“List the Supported LBA Format” on page 86](#)
- [“List NVMe Controller Log Pages ” on page 87](#)
- [“List NVMe Features of the Controller” on page 88](#)
- [“Format All Namespaces on the Controller” on page 89](#)
- [“Erase All Namespaces” on page 89](#)
- [“Offline a Namespace” on page 89](#)
- [“Online a Namespace” on page 89](#)
- [“Export an SSD Disk Configuration” on page 90](#)
- [“Import an SSD Disk Configuration” on page 90](#)

nvmeadm Command Overview

The nvmeadm commands use the following syntax:

```
nvmeadm subcommand [option] [controller_name]
```

Note - If a controller name is not specified for a command, the required information for all controllers is returned.

When a command fails, it returns one of several failure codes listed in [“nvmeadm Error Codes” on page 129](#).

The nvmeadm command supports the subcommands listed in the following table.

Subcommand	Function
list	Lists information for the specified controller.
namespace	Lists information for the namespaces of the specified controller.
getlog	Lists NVMe log pages of the controller. There are three log pages: SMART/Health, Error, and Intel information.
getfeature	Lists NVMe features of the controller.
format	Low-level formats specified namespaces, which changes the LBA (Logical Block Address) and metadata size for the controller. All data is destroyed after a low level format. Note - Stop all IO to the NVMe device before attempting to format it. This is not necessary if you are simply obtaining format details using the format -l or --list option.
erase	Erases the NVMe namespace media for the controller. Note - Stop all IO to the NVMe device before attempting this action.
export	Exports the SSD configuration to a file.
import	Imports block size and metadata size configuration from a file. Note - Stop all IO to the NVMe device before attempting this action.
offline	Take the namespace(s) of the specified controller (or all controllers) offline.
online	Bring the namespace(s) of the specified controller (or all controllers) online.

The nvmeadm command supports the options shown in the following table.

Short Option	Long Option	Subcommands Used With	Description
-?	--help	All	Displays usage information.
-V	n/a	All	Displays version information.
-a	--all	format, erase, offline, online	Selects all namespaces on the controller.
-b	--blocksize	format	Specifies the LBA data size of a namespace on the controller. This option requires an argument for blocksize. Supported block sizes depend on the controller (see “List the Supported LBA Format” on page 86).
-e	--error	getlog	Retrieves the extended error information.

Short Option	Long Option	Subcommands Used With	Description
-f	--format	format	Formats the NVM namespace media on the controller to the logical block size and metadata size specified by -b, -m, -a and -n options.
-f	--filename	export, import	Writes the data to or reads the data from the specified file name.
-h	--health	getlog	Retrieves the SMART/health information of the controller. The information is over the life of the controller and is retained across power cycles.
-l	--list	format	Lists the LBA formats supported by the controller. Each LBA format contains LBA size and metadata size.
-m	--metadatasize	format	Specifies the metadata size of a namespace on the controller. This option requires an argument for metadata size. Supported metadata sizes depend on the supported block sizes (see “List the Supported LBA Format” on page 86).
-n	--namespace	format, namespace, erase, offline, online	Selects the namespace on the controller.
-s	--vendor_specific	getlog	Gets the vendor log. This option requires a directory to which the log information is saved.
-v	--verbose	list, namespace	Displays detailed information of a controller or device/namespace, based on the invoked subcommand.

▼ List NVMe Controllers

- To list NVMe controllers in the system, do one of the following:

- To list all NVMe controllers on the host, type:

```
nvmeadm list
```

```
SUNW-NVME-1
```

- To list all NVMe controllers with details, type:

```
nvmeadm list -v
```

```
SUNW-NVME-1
  PCI Vendor ID:          1111
  Serial Number:         1111111111
  Model Number:          11111111111111
  Firmware Revision:     1.1.1
  Number of Namespaces:  1
```

- To list details for a specific controller, type:

```
nvmeadm list -v controller_name
```

For example:

```
nvmeadm list -v SUNW-NVME-1
```

```
SUNW-NVME-1
  PCI Vendor ID:          1111
  Serial Number:         1111111111
  Model Number:          111111111111
  Firmware Revision:     1.1.1
  Number of Namespaces:  1
```

▼ List NVMe Namespaces

- To list an NVMe namespace, type:

```
nvmeadm namespace [-n] [namespace] [-v] [controller_name]
```

For example:

- To list namespaces on all NVMe controllers:

```
nvmeadm namespace
```

```
SUNW-NVME-1
  Namespace: 1
```

- For details on namespace 1 on controller SUNW-NVME-1:

```
nvmeadm namespace -n 1 -v SUNW-NVME-1
```

```
SUNW-NVME-1
  Namespace: 1
  Block Size:          512
  Capacity:            786146787328
  Metadata Size:      0
  Block Device Name:   /dev/rdisk/c5t0d0s2
  Status:              online
```

▼ List the Supported LBA Format

- To list the supported LBA formats on an NVMe controller, type:

```
nvmeadm format -l [controller_name]
```

For example:

```
nvmeadm format -l SUNW-NVME-1
```

```
SUNW-NVME-1
  LBA Format: 1
    Block Size:          512
    Metadata Size:      0
  LBA Format: 2
    Block Size:          512
    Metadata Size:      8
  LBA Format: 3
    Block Size:          512
    Metadata Size:     16
  LBA Format: 4
    Block Size:         4096
    Metadata Size:      0
  LBA Format: 5
    Block Size:         4096
    Metadata Size:      8
  LBA Format: 6
    Block Size:         4096
    Metadata Size:     64
```

▼ List NVMe Controller Log Pages

There are three NVMe controller log pages as follows:

- **SMART/health information** is gathered over the life of the controller and is retained across power cycles. It includes critical warnings about the controller and device status, such as temperature threshold, available spare, device life status, and various I/O statistics used for calculating I/O performance.
- **Error information** is extended error information for commands. A number, which designates the error ID, must be specified with this command.
- **Vendor Log information** is the vendor-specific NVMe log implementation. Use this log when working with Oracle Service to troubleshoot errors.

- **Do one of the following:**

- **To list SMART/health information, type:**

```
nvmeadm getlog -h [controller_name]
```

- **To list error information, type:**

```
nvmeadm getlog -e error_id [controller_name]
```

- **To save vendor log information to a specified file name, type:**

```
nvmeadm getlog -s directory [controller_name]
```

The following is an example for the `nvmeadm getlog -h` command:

```
nvmeadm getlog -h SUNW-NVME-1
```

```
SUNW-NVME-1
SMART/Health Information:
  Critical Warning: 0
  Temperature: 300 Kelvin
  Available Spare: 100 percent
  Available Spare Threshold: 10 percent
  Percentage Used: 0 percent
  Data Unit Read: 0x746da4 of 512k bytes.
  Data Unit Written: 0x2d0 of 512k bytes.
  Number of Host Read Commands: 0xeacba
  Number of Host Write Commands: 0x27
  Controller Busy Time in Minutes: 0x0
  Number of Power Cycle: 0x10d
  Number of Power On Hours: 0x3c8
  Number of Unsafe Shutdown: 0xfa
  Number of Media Errors: 0x0
  Number of Error Info Log Entries: 0x0
```

▼ List NVMe Features of the Controller

- To list NVMe features of the controller, type:

```
nvmeadm getfeature [controller_name]
```

For example:

```
nvmeadm getfeature SUNW-NVME-1
```

```
SUNW-NVME-1
Command Arbitration:
  Arbitration Burst: 0
  Low Priority Weight: 0
  Medium Priority Weight: 0
  High Priority Weight: 0
Power State: 0
Temperature Threshold: 358 Kelvin
Time Limited Error Recovery: 0 of 100 milliseconds
Number of I/O submission queues allocated: 30
Number of I/O completion queues allocated: 30
Interrupt Coalescing Aggregation Time: 0 of 100 micro seconds
Interrupt Coalescing Configuration:
  Interrupt Vector: 0
  Coalescing Disable: NO
Write Atomicity Required: YES
```


▼ Format All Namespaces on the Controller

The controller does not support the format of a single namespace. Use the `-a` option to confirm the format of all namespaces. For supported metadata and block size information, see [“List the Supported LBA Format” on page 86](#).



Caution - All data is destroyed after a low-level format.

Before You Begin Stop all IO to the NVMe device before attempting format it.

- **To format all namespaces on a controller, type:**

```
nvmeadm format -f -a -m metadata_size -b block_size controller_name
```

For example:

```
nvmeadm format -f -a -m 0 -b 4096 SUNW-NVME-1
```

▼ Erase All Namespaces

The controller does not support the erase of a single namespace. Use the `-a` option to confirm the erase of all namespaces.



Caution - All data will be destroyed after an erase.

Before You Begin Stop all IO to the NVMe device before attempting this action.

- **To erase all namespaces, type:**

```
nvmeadm erase -a controller_name
```

For example:

```
nvmeadm erase -a SUNW-NVME-1
```

▼ Offline a Namespace

- **To take offline a namespace of a given controller, type:**

```
nvmeadm offLine -n namespace controller_name
```

▼ Online a Namespace

- **To bring online a namespace of a given controller, type:**

```
nvmeadm online -n namespace controller_name
```

▼ Export an SSD Disk Configuration

- To export an SSD disk configuration to a file, type:

```
nvmeadm export -f filename.xml controller_name
```

For example:

```
nvmeadm export -f format.xml SUNW-NVME-1
```

▼ Import an SSD Disk Configuration

Only block size and metadata size information can be imported.

Before You Begin Stop all IO to the NVMe device before attempting this action.

- To import an SSD disk configuration from a file, type:

```
nvmeadm import -f filename.xml controller_name
```

For example:

```
nvmeadm import -f format.xml SUNW-NVME-2
```

Using `raidconfig` to Configure RAID

`raidconfig` uses a general-purpose cross-OS storage management library to configure RAID volumes using an XML file.

The following table shows the information covered in this section.

Description	Links
Learn about the <code>raidconfig</code> command.	“<code>raidconfig</code> Command Overview” on page 91
Display controller, RAID, and disk information	“Listing Controller, RAID and Disk Information” on page 94
Create or delete RAID volumes	“Creating and Deleting RAID Volumes” on page 99
Modify a RAID or controller configuration	“Modifying a RAID Volume or Controller” on page 104
Start or stop a disk or RAID task	“Starting or Stopping a Task on a Disk or RAID” on page 108
Restore and clear a RAID controller configuration	“Restoring or Clearing a RAID Controller Configuration” on page 110
Export or import a RAID volume configuration	“Exporting or Importing a RAID Volume Configuration” on page 112
Create a RAID volume with partial disks	“Creating RAID Volumes With Partial Disks” on page 113

`raidconfig` Command Overview

This section covers the following information:

- [“`raidconfig` Features” on page 92](#)
- [“`raidconfig` Requirements” on page 92](#)
- [“`raidconfig` Command Syntax” on page 93](#)

raidconfig Features

raidconfig allows you to explore, monitor, and configure storage resources connected to the system.

Note - To use raidconfig on storage in a system, the controller that the storage is connected to must support RAID. For a list of supported controllers, see the support matrix at: <http://www.oracle.com/goto/ohmp>.

raidconfig provides 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.
- 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 particular adapters based on data retrieved from the API.
- Creates nested RAID volumes depending on the controller.

raidconfig Requirements

Before running raidconfig, note the following requirements:



Caution - raidconfig can scan your controllers and connected disks and list disks that are either already in a RAID volume, or available to be included in a RAID volume. However, raidconfig cannot tell if an available disk has data on it, or if a disk is otherwise used as either a boot disk or logical disk for an application.

Before using raidconfig to create volumes (which will overwrite any existing data), use operating system tools to take an inventory of attached disks, their enumeration, and whether they contain data that you want to preserve.

- Root permissions are required to run raidconfig commands on Unix-based platforms.
- On Oracle Solaris, raidconfig is not compatible with the raidctl CLI tool. raidconfig supports SAS2 and SAS3, but the raidctl tool does not.

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

raidconfig Command Syntax

The `raidconfig` commands use the following command syntax:

```
raidconfig subcommand type|task -option(s)
```

When a command fails, it returns one of several failure codes listed in [“raidconfig Error Codes” on page 129](#).

The options shown in the following table apply to all CLI Tools commands including `raidconfig`.

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

The `raidconfig` command requires subcommands unless used with the `--help` or `--version` options.

The following table lists the `raidconfig` subcommands.

Subcommand	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>	Creates a RAID volume.
<code>delete</code>	Deletes a RAID volume.
<code>add</code>	Adds a specified disk or spare.
<code>remove</code>	Removes a specified disk or spare.
<code>modify</code>	Modifies a RAID volume or a disk.
<code>start</code>	Starts a maintenance task.
<code>stop</code>	Stops a maintenance task.
<code>restore</code>	Finds the RAID configuration saved on a disk and restores it.

Subcommand	Function
clear	Clears the RAID configuration saved on the disks of a defined controller.
export	Generates an XML file from a RAID configuration.
import	Reads in a RAID configuration from an XML file and creates RAID volumes and spares.

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 20](#).

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

Listing Controller, RAID and Disk Information

This section covers the following information:

- [“list Subcommand Overview” on page 94](#)
- [“Display a Brief Listing of All Devices” on page 97](#)
- [“Display a Brief Listing of a Device” on page 98](#)
- [“Display a Detailed Listing of a Device” on page 98](#)

list Subcommand Overview

The `list` subcommand displays controller, RAID volume, and disk data. The device types for the `raidconfig list` are listed in the following table.

Type	Description
all	Shows details on all controllers, physical disks, and RAID volumes.
controller	Shows details on all controllers.
disk	Shows the physical disks.
raid	Shows all RAID details.

The `raidconfig list` command supports options listed in the following table.

Short Option	Long Option	Description
-c	--controller	Shows details about a particular controller. This option is followed by the controller ID string.

Short Option	Long Option	Description
-r	--raid	Shows details about a particular RAID volume. This option is followed by the RAID ID string.
-d	--disks	Shows details about particular disk(s). This option is followed by a comma-separated list of the disk ID strings.
-v	--verbose	Lists all fields. By default, a brief listing shows only a subset of the fields.

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

Controllers:

- Node ID
- Manufacturer*
- Model*
- Part number
- Firmware(F/W) version*
- Serial Number
- RAID Volumes*
- Disks*
- Disks in use by another controller
- PCI address
- PCI vendor ID
- PCI device ID
- PCI subvendor ID
- PCI subdevice ID
- Battery backup status
- Maximum RAID volumes
- Maximum disks per RAID volume
- Supported RAID levels
- Maximum dedicated spares
- Maximum global spares
- Stripe size minimum
- Stripe size maximum
- Disable Auto Rebuild

Disks:

- ID*
- Chassis ID*

- Slot ID*
- Node ID
- Mapped to host OS (true/false)
- Device
- Disabled (true/false)
- In use by another controller
- RAID ID*
- Status*
- Type*
- Media*
- Manufacturer
- Model
- Size
- Serial number
- NAC name
- Spare state (global, dedicated, or N/A)*
- Current task
- Stoppable tasks
- Startable tasks
- Task state
- Task completion percent

RAID volumes:

- Logical ID (0-based)*
- Node ID
- Device name*
- Name (user assigned)*
- Status*
- RAID level*
- Number of disks*
- Capacity*
- Mounted
- Stripe size
- Leg size
- Read cache
- Write cache
- Current task
- Task state

- Task completion percent
- Stoppable tasks
- Startable tasks
- BIOS Boot Target

▼ Display a Brief Listing of All Devices

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

`raidconfig list all`

The following shows sample output from this command.

```

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
    
```

The following table lists the possible RAID statuses that can be displayed with the `raidconfig list all` command.

Status	Meaning
OK	The status of the RAID volume is OK.
DEGRADED	The RAID volume has been degraded.
FAILED	The RAID volume has failed.

Status	Meaning
MISSING	The controller is reporting that it has a RAID volume is configured but the actual configuration settings aren't available. This status is rare.

The following table lists the possible disk statuses that can be displayed with the `raidconfig list all` command.

Status	Meaning
OK	The status of the disk is OK.
OFFLINE	The disk is offline.
FAILED	The disk has failed.
MISSING	The disk has been removed from a RAID.
INIT	The disk has been initialized.
SPARE	The disk is a spare.

▼ Display a Brief Listing of a Device

- To display a brief listing of a device, type:

`raidconfig list subcommand option device`

For example:

```
raidconfig list disk -d c0d0
```

```
DISKS Available
=====
ID      Chassis  Slot  RAID ID  Status  Type  Media  Spare  Size (GiB)
-----
c0d0    0         0     -        -       sas   HDD    -       279
```

▼ Display a Detailed Listing of a Device

- To show a detailed listing of a device, type:

`raidconfig list device option devicename -v`

For example:

```
raidconfig list disk -d=c0d0 -v
```

```
Disk c0d0
=====
ID: c0d0
```

```

Chassis: 0
Slot: 0
Node ID: PDS:5000cca0257dbac1
Mapped to Host OS: true
Device: 5000CCA0257DBAC0
Disabled: false
Type: sas
Media: HDD
Manufacturer: HITACHI
Model: H106030SDSUN300G
Size (GiB): 279
Serial Number: 001214N74K2B      PQJ74K2B
NAC Name: /SYS/SASBP/HDD0
Current Task: none

```

Creating and Deleting RAID Volumes

This section covers the following information:

- [“Create a RAID Volume” on page 99](#)
- [“Delete a RAID Volume” on page 100](#)

▼ Create a RAID Volume

Before You Begin Before using `raidconfig` to create volumes (which will overwrite any existing data on selected disks), use operating system tools to take an inventory of attached disks, their enumeration, and whether they contain data that you want to preserve. Be careful not to overwrite your OS boot disk or other logical disks used by applications.

- **To create a RAID volume, type:**

```
raidconfig create raid options -d disks
```

For example, to create a RAID 0 volume with a stripe size of 128 Kb and read-ahead caching enabled on controller 1, type the following command:

```
raidconfig create raid --stripe-size=128 --read-cache=enabled -d c1d0,c1d1
```

The `create raid` subcommand must take the `-d` option in addition to one or more of the options shown in the following table.

Short Option	Long Option	Description
-d	--disks	Specifies a list of disks with a comma separating the disk ID numbers.

Short Option	Long Option	Description
N/A	--level	Specifies the RAID level of the volume e.g. 0, 1, 1E, 5, 10, 50, 60 etc. The levels supported for a particular controller can be seen in the controller 'Supported RAID Levels' field from the list command. If this option is not supplied, a level of '0' is used.
N/A	--name	Assigns the user-defined name that identifies the RAID volume. This name can be set to an empty string ("").
N/A	--read-cache	Read cache can be one of the following: disabled – Disables RAID read caching enabled – Enables RAID read ahead caching enabled_adaptive – Enables RAID read adaptive caching Note - Only supported with the Sun Storage 6 Gb SAS RAID PCIe HBA, Internal (SGX-SAS6-R-INT-Z, SG-SAS6-R-INT-Z) and Oracle Storage 12 Gb SAS RAID PCIe HBA, Internal (7110116, 7110117).
N/A	--stripe-size	Specifies the stripe size, in kilobytes, of the RAID volume to be created. If this option is not supplied, the controller uses a default size.
N/A	--subarrays	For nested RAID levels (10, 50), specifies the size of the RAID components in number of physical disks.
N/A	--subdisk-size	See “Creating RAID Volumes With Partial Disks” on page 113.
N/A	--write-cache	Write cache can be one of the following: disabled – Disables RAID write caching. enabled – Enables RAID write caching. enabled_protect – Enables caching only if the battery is available. Note - Only supported with the Sun Storage 6 Gb SAS RAID PCIe HBA, Internal (SGX-SAS6-R-INT-Z, SG-SAS6-R-INT-Z) and Oracle Storage 12 Gb SAS RAID PCIe HBA, Internal (7110116, 7110117).

The maximum capacity of the RAID volume is not configurable. You can create RAID from partial disks if the HBA or controller support it, and all the disks are of the same size.

▼ Delete a RAID Volume

- To delete a RAID volume, type:

```
raidconfig delete raid option
```

For example:

- To delete RAID volume 1 created on controller 1, type:

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

- To delete all RAID volumes, type:

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

The `delete raid` requires one of the options shown in the following table.

Short Option	Long Option	Description
-r	--raid	Deletes the volume listed by ID number.
N/A	--all	Deletes all RAID volumes on all controllers. <code>RAIDconfig</code> 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.

Adding and Removing Disks and RAID Volumes

This section covers the following information:

- [“Add a Disk to a RAID Configuration” on page 101](#)
- [“Remove a Disk from a RAID Volume” on page 102](#)
- [“Add Spare Disks” on page 102](#)
- [“Remove a Spare Disk or a RAID Volume” on page 103](#)

▼ Add a Disk to a RAID Configuration

The `add disk` subcommand adds a specified disk to a RAID configuration.

Only certain RAID levels, such as RAID 5 or 6, allow disks to be added to their configuration when in a non-degraded (healthy) state. Only RAID levels that support redundancy allow disks to be added.

● To add a specific disk to a RAID volume, type:

```
raidconfig add disk -d disk -r raidvolume
```

For example:

```
raidconfig add disk -d c0d2 -r c0r1
```

Note - If you list the disk's properties after adding a disk, the RAID ID is not updated to reflect that it has been added to a RAID volume until the add process is complete.

The `add disk` subcommand requires the options shown in the following table.

Short Option	Long Option	Description
-d	--disks	Specifies the list of disks that you want to add to the RAID volume.
-r	--raid	Specifies the RAID volume ID number that you want to add the disk to.

▼ Remove a Disk from a RAID Volume

The `remove disk` subcommand removes a disk from a RAID volume. Only RAID levels that support redundancy allow for disks to be removed.

- **To remove a specific disk from a RAID volume, type:**

```
raidconfig remove disk -d disk -r raidvolume
```

For example:

```
raidconfig remove disk -d c0d0 -r c0r1
```

This subcommand requires the options shown in the following table.

Short Option	Long Option	Description
-d	--disks	Specifies the disk that you want to remove from the RAID volume.
-r	--raid	Specifies the RAID volume ID you want to remove the disk from.

▼ Add Spare Disks

The `add spare` subcommand adds global or dedicated spare disks:

1. **To create two global spares using the specified disks, type:**

```
raidconfig add spare -d disk,disk
```

For example:

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

2. **To create two dedicated spares on a RAID volume using the specified disks, type:**

```
raidconfig add spare -d disk,disk -r raidvolume
```

For example:

```
raidconfig add spare -d c1d0,c1d1 -r c1r0
```

The `add spare` subcommand requires one of the options shown in the following table.

Short Option	Long Option	Description
-d	--disks	This <i>mandatory option</i> specifies a list of disk ID numbers, separated by commas. If the <code>-r</code> option is not used, the disks are added as global spares.
-r	--raid	Only used when working with dedicated spares. 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 might fail.

▼ Remove a Spare Disk or a RAID Volume

The `remove spare` subcommand removes disks global spares or as dedicated spares on a RAID volume.

- Do one of the following:

- To remove two disks as global spares, type:

```
raidconfig remove spare -d disk,disk
```

For example:

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

- To remove two disks as dedicated spares on a RAID volume, type:

```
raidconfig remove spare -d disk,disk -r raidvolume
```

For example:

```
raidconfig remove spare -d c1d0,c1d1 -r c1r0
```

This subcommand requires the options shown in the following table.

Short Option	Long Option	Description
-d	--disks	Specifies disks to remove. Disk ID numbers are separated by commas. If the <code>-r</code> option is not defined, the disks are removed as global spares.
-r	--raid	If a RAID volume ID is specified, the disks should be removed as dedicated spares from this RAID volume.

Modifying a RAID Volume or Controller

This section covers the following information:

- [“Modify a RAID Volume” on page 104](#)
- [“Modify a Controller” on page 105](#)
- [“Modify the BIOS Boot Target” on page 106](#)
- [“Disable Auto Rebuild” on page 106](#)
- [“Modify a RAID Volume Name” on page 106](#)
- [“Enable or Disable JBOD Mode” on page 106](#)

▼ Modify a RAID Volume

The `modify raid` subcommand modifies the attributes of a RAID volume.

- **To modify a RAID volume, type:**

```
raidconfig modify raid -r raidvolume option
```

For example:

```
raidconfig modify raid -r c0r0 --write-cache=disabled
```

The `modify raid` subcommand requires the option shown in the following table.

Short Option	Long Option	Description
-r	--raid	Specifies the RAID volume to modify. This is required for the <code>modify raid</code> subcommand.

The following table lists additional options for the `modify raid` subcommand.

Option	Description
--name	Specifies the user-defined name to identify the RAID volume. Can be set to an empty string ("").
--read-cache	Read cache can be one of the following: disabled – Disables RAID read caching enabled – Enables RAID read caching enabled_adaptive – Enables RAID read adaptive caching
--write-cache	Write cache can be one of the following:

Option	Description
	disabled – Disables RAID write caching.
	enabled – Enables RAID write caching.
	enabled_protect – Enables caching only if the battery is available.
--bios-boot-target=true	Sets the boot target. When this option is set to true for a specific RAID volume, that RAID volume becomes the BIOS boot target.

▼ Modify a Controller

The `modify controller` command modifies certain controller attributes.

- **To modify a controller, type:**

```
raidconfig modify controller -c controller option
```

For example:

```
raidconfig modify controller -c c1 --disable-auto-rebuild=true
```

The `modify controller` subcommand requires the option shown in the following table.

Short Option	Long Option	Description
-c	--controller	Specifies the controller to modify. This is required for the <code>modify controller</code> subcommand.

The following table lists an additional option for the `modify controller` subcommand.

Option	Description
--disable-auto-rebuild=true false	Disables auto rebuild. When this option is set to true for a specific controller, auto rebuild will be disabled. If the option is set to false, a hot spare can automatically replace a faulty disk, in which case a long running background task is started.

Note - Not all controllers support modifications of `--disable-auto-rebuild`.

▼ Modify the BIOS Boot Target

The RAID volume with ID 0 is the default boot target. If you want to change the boot target, use the `--bios-boot-target` option.

- **To change the bios boot target, type:**

```
raidconfig modify raid -r raidvolume --bios-boot-target=true
```

For example:

```
raidconfig modify raid -r c0r0 --bios-boot-target=true
```

▼ Disable Auto Rebuild

When a hotspare disk replaces a faulty disk, it will start autobuilding the volume to use the hotspare disk if auto rebuild is enabled. If you do not want to start the long-running background task automatically, you can disable this feature.

- **To disable auto rebuild, type:**

```
raidconfig modify controller -c controller id --disable-auto-rebuild=true
```

For example:

```
raidconfig modify controller -c c0 --disable-auto-rebuild=true
```

▼ 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, type:**

```
raidconfig modify raid -r raidvolume --name name
```

For example:

```
raidconfig modify raid -r c0r0 --name engineering
```

▼ Enable or Disable JBOD Mode

For a system with an Oracle Storage 12 Gb SAS RAID PCIe HBA, Internal (7110116, 7110117) installed, you have the option to enable JBOD mode so that the underlying operating system can

have the access to a disk directly without creating a RAID volume first. If JBOD mode is not enabled, the underlying operating system is not able to see the disk until the disk is included in a RAID volume,

You can enable JBOD mode on either a disk or controller. If you enable JBOD mode on the controller, all the disks on that controller will be in JBOD mode.

Note - Do not disable JBOD mode on the controller or individual disk if a disk in JBOD mode has the OS installed on it.

- **Do one of the following:**

- **To enable or disable the JBOD feature on a disk, type:**

```
raidconfig modify disk -d disk --jbod enabled|disabled
```

- **To enable or disable the JBOD feature on a controller, type:**

```
raidconfig modify controller -c controller --jbod enabled|disabled
```

The following example shows output for JBOD mode enabled on c0, then disabled on just disk 7.

```
CONTROLLER c0
=====
Manufacturer  Model                      F/W Version  RAID Volumes  Disks
-----
LSI Logic     MegaRAID 9361-8i           4.220.20-3050  1              8

RAID Volumes
=====
ID    Name      Device          Status  Num Disks  Level  Size (GiB)
-----
c0r1  OEL       /dev/sda        OK      1           0      465

DISKS In Use
=====
ID    Chassis  Slot  RAID ID  Status  Type  Media  Spare  Size (GiB)
-----
c0d0  0        0    c0r1    OK      sata  HDD   -      465

DISKS Available
=====
ID    Chassis  Slot  RAID ID  Status  Type  Media  Spare  Size (GiB)
-----
c0d1  0        1    -        JBOD   sas   HDD   -      137
c0d2  0        2    -        JBOD   sas   HDD   -      137
c0d3  0        3    -        JBOD   sas   HDD   -      137
c0d4  0        4    -        JBOD   sas   HDD   -      137
c0d5  0        5    -        JBOD   sas   HDD   -      137
c0d6  0        6    -        JBOD   sata  HDD   -      466
c0d7  0        7    -        OK   sata HDD -      466
```

Starting or Stopping a Task on a Disk or RAID

The `start task` and `stop task` subcommands controls the execution of maintenance tasks on a disk or RAID volume.

See the following procedure : [“Start or Stop a Task on a Disk or RAID Volume” on page 108.](#)

▼ Start or Stop a Task on a Disk or RAID Volume

The `start task` and `stop task` subcommands control the execution of maintenance tasks on a disk or RAID volume.

- **Do one of the following:**

- **To start a task on a disk or RAID volume, type:**

```
raidconfig start task -t taskname [-d|-r]
```

- **To stop a task on a disk or RAID volume, type:**

```
raidconfig stop task -t taskname [-d|-r]
```

The following are command examples for the `start task` and `stop task` subcommands:

- A RAID ID must be provided for the verify check (`verify`) and initialization task (`init`).

- To start the `verify` task on a specified RAID volume, type:

```
raidconfig start task -t verify -r=raidvolume
```

For example:

```
raidconfig start task -t verify -r=c0r1
```

- To stop the `init` task on a specified RAID volume, type:

```
raidconfig stop task -t init -r=raidvolume
```

For example:

```
raidconfig stop task -t init -r=c0r1
```

- A disk must be provided for the rebuild and clear tasks.

- To start the `rebuild` task on a specified disk, type:

```
raidconfig start task -t rebuild -d=disk
```

For example:

```
raidconfig start task -t rebuild -d=c0d1
```

Note - This can only be run on a disk that is part of a RAID volume.

- To start the `clear` task on a specified disk, type:

```
raidconfig start task -t clear -d=disk
```

For example:

```
raidconfig start task -t clear -d=c0d1
```

Note - This can only be run on a disk that is not part of a RAID volume.

- Source and destination disks must be provided for the copy task.

To start the copy task from one disk to another, type:

```
raidconfig start -task -t copy --src-disk=source_disk --dst-disk=destination_disk
```

For example:

```
raidconfig start -task -t copy --src-disk=c0d2 --dst-disk=c0d3
```

Note - The source disk must be in a RAID volume. The destination disk cannot be in a RAID volume.

The available background tasks are shown in the following table.

Task	Description
<code>verify</code>	Checks the validity of the RAID volume redundant data.
<code>init</code>	Initializes the RAID volume to write out the initial parity values. The initialization goes over the entire volume and initializes the parity data.
<code>copy</code>	Copies and moves an online physical disk onto a hotspare or unconfigured good drive. The copy is performed while the volume is online. Once completed, the destination disk is added to the logical volume configuration while the original source disk is removed from it.
<code>rebuild</code>	Regenerates the data of a single physical disk that is part of a logical volume with data redundancy. The physical disk is reconstructed from another physical disk and/or parity disks. A disk rebuild typically occurs after a disk replacement or repair.
<code>clear</code>	Clears a physical disk by writing zeroes over the entire disk.

Note - Not all devices support all tasks. To check the tasks a device supports, use the list subcommand and check the output under Startable tasks. If this field is blank, the device does not support any tasks.

The `start task` and `stop task` subcommands accept the options shown in the following table.

Short Option	Long Option	Description
-t	--task	Specifies the type of task to execute. Possible options are <code>verify</code> , <code>init</code> , <code>rebuild</code> , <code>clear</code> , or <code>copy</code> .
-d	--disk	Specifies the disk to execute the task on. Required by the <code>rebuild</code> and <code>clear</code> tasks.
-r	--raid	Specifies the RAID volume to execute the task on. Required by the <code>verify</code> and <code>init</code> tasks.
n/a	--src-disk	Specifies the source disk to use in a copy task.
n/a	--dst-disk	Specifies the destination disk to use in copy task.

Restoring or Clearing a RAID Controller Configuration

This section covers the following information:

- [“Check to See If a Controller Configuration Exists” on page 110](#)
- [“Restore a RAID Controller Configuration” on page 111](#)
- [“Clear a RAID Controller Configuration” on page 111](#)

▼ Check to See If a Controller Configuration Exists

1. **To determine if an old configuration exists on the disks, view the controller's verbose properties. Type:**

```
raidconfig list controller -v
```

The controller's properties are listed.

2. **View the property `Disks In Use by Another Controller`.**
 - a. **If the `Disks In Use by Another Controller` property is set to `True`, then an old configuration exists. This can be either restored or cleared.**
 - b. **If the `Disks In Use by Another Controller` property is set to `False`, then an old configuration does not exist.**

Note - If an old configuration does not exist and you attempt to run the `restore config` or `clear config` subcommands, `raidconfig` displays an error.

▼ Restore a RAID Controller Configuration

The `restore config` subcommand finds a RAID configuration stored on disks and restores this configuration to the destination controller.

- **To restore a RAID configuration saved on disks to a defined controller, type:**

```
raidconfig restore config -c=controller_id
```

where *controller_id* is the controller the RAID configuration is restored to.

The `restore config` subcommand requires the options shown in the following table.

Short Option	Long Option	Description
-c	--controller	Specifies the controller ID.

▼ Clear a RAID Controller Configuration

The `clear config` subcommand finds a RAID configuration stored on disks and removes this configuration.

- **To clear a RAID configuration saved on disks, type:**

```
raidconfig clear config -c=controller_id
```

where *controller_id* is the controller the RAID configuration is cleared from.

The `clear config` subcommand requires the options shown in the following table.

Short Option	Long Option	Description
-c	--controller	Specifies the controller ID.

Exporting or Importing a RAID Volume Configuration

This section covers the following information:

- [“Export a RAID Volume Configuration” on page 112](#)
- [“Import a RAID Volume Configuration” on page 112](#)

▼ Export a RAID Volume Configuration

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

The `export` subcommand requires a 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.

● **To export the inventory or a configuration and write it to a file, do one of the following:**

- **To export the inventory data and write it to a file, type:**

```
raidconfig export inventory filename.xml
```

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

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

This subcommand requires at least one of the types shown in the following table.

Option	Description
<code>inventory</code>	Exports and writes all controller, RAID volume, and physical disk information to an XML file.
<code>config</code>	Exports and writes only configuration fields that can be imported to another system to an XML file.

▼ Import a RAID Volume Configuration

The `import` subcommand reads an XML-formatted configuration file and configures RAID volumes based on the file. If the creation of a specific RAID volume fails, the error is logged and the next RAID volume in the file is created.

The `import` subcommand requires the `config` type and a file name for the XML file.

Note - You cannot import a configuration into a system if the configuration includes disks that are already defined in a RAID volume or as a spares.

- **To configure the RAID volumes according to a configuration file, type:**

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

Creating RAID Volumes With Partial Disks

The `--subdisk-size` option is available for the `raidconfig create` command to define the size of RAID volumes. This option is used to define the size of the partial disks to be used in a RAID volume.

This section covers the following information:

- [“Guidelines for Using the RAID Volume Size Option” on page 113](#)
- [“Partial Disk Properties in XML File ” on page 114](#)
- [“Create a RAID Volume with Partial Disks” on page 115](#)
- [“Adding or Removing a Partial Disk” on page 115](#)

Guidelines for Using the RAID Volume Size Option

Keep the following guidelines in mind when using the RAID volume `--subdisk-size`:

- The total sizes for the RAID volumes designated in the `--subdisk-size` option cannot exceed the available size for any of the disks. The total size can be less than or equal to the disk size, but it cannot be larger.
- You cannot create a RAID volume using a partial disk on a disk that is configured as part of a RAID volume. Once a disk has been included in a RAID volume, the disk is marked as "In Use" and cannot be used to create another RAID volume, even if just a part of the disk is used.

For example, the following sequence of commands is not allowed:

```
# raidconfig create raid --disk=c0d0,c0d2 --subdisk-size=50
```

```
# raidconfig create raid --disk=c0d0,c0d2 --subdisk-size=100
```

The second command results in an error.

- When creating multiple RAID volumes at the same time using the `--subdisk-size` option, all of the RAID volumes are configured with the same name if the `--name` option is used. If this occurs, you can rename the volumes using the `raidconfig modify` command.
- You can delete a RAID volume on a partial disk, but if the partial disk is used in another RAID volume, the disk will be marked as "In Use". You will not be able to create another RAID volume using that disk.

Disk Display

The `raidconfig list all` command indicates that a disk is part of more than one RAID volume. A row is added for each disk/raid combination under the `DISKS In Use` list.

The `Size` column shows the size of the subdisk used to create the RAID volume.

The following is an example of the `Disks In Use` output:

```
DISKS In Use
=====
```

ID	Chassis	Slot	RAID ID	Status	Type	Media	Spare	Size (GiB)
c0d0	0	17	c0r0	OK	sas	HDD	-	50
c0d0	0	17	c0r1	OK	sas	HDD	-	100
c0d0	0	17	c0r2	OK	sas	HDD	-	200
c0d2	0	18	c0r0	OK	sas	HDD	-	50
c0d2	0	18	c0r1	OK	sas	HDD	-	100
c0d2	0	18	c0r2	OK	sas	HDD	-	200

Partial Disk Properties in XML File

If a RAID volume was created using partial disks, `raidconfig` stores the size of the sub-disk in the XML output generated by the `export` command. An example of a disk property is shown below:

```
<disk>
<chassis_id>0</chassis_id>
<slot_id>1</slot_id>
<subdisk_size>100</subdisk_size>
</disk>
```

▼ Create a RAID Volume with Partial Disks

Use the `--subdisk-size` option with the `raidconfig create` to create a RAID volume with partial disks:

- **To create a RAID volume with partial disks, type:**

```
raidconfig create raid --disk=disks --subdisk-size=sizes
```

For example, the following command creates three RAID volumes with subdisks within disks `c0d0` and `c0d2` sized at 50, 75, and 100 GB:

```
raidconfig create raid --disk=c0d0,c0d1 --subdisk-size=50,75,100
```

```
Create RAID level 0 volumes using disk sizes 50, 75, 100 from the
following disk(s):
```

```
Disk c0d0 (controller 0 slot 0)
Disk c0d1 (controller 0 slot 1) [y/n]? y
RAID created successfully
```

If the `--subdisk-size` option is not used, the `raidconfig create` command creates a single RAID volume from the defined disks.

Adding or Removing a Partial Disk

The `raidconfig add` and `raidconfig remove` features are supported for partial disks. If a disk contains multiple RAID volumes, they can be added and removed. For information on using the `raidconfig add` and `remove` commands, see [“Adding and Removing Disks and RAID Volumes” on page 101](#).

Note - When the disk supports multiple RAID volumes, only use the first RAID volume in the `add` and `remove` commands.

An example of removing a disk is shown below:

```
raidconfig remove disk -r=c0r4 -d=c0d0
```

```
Removing the following disk(s) from RAID c0r4:
Disk c0d0 (controller 0 slot 0) [y/n]? y
Successfully removed disk from RAID
```

```
raidconfig list all
```

```
CONTROLLER c0
=====
Manufacturer  Model      F/W Version  RAID Volumes  Disks
```

```

-----
LSI Logic      0x0079    2.130.353-1803 6          7

RAID Volumes
=====
ID      Name          Device          Status    Num Disks Level  Size (GiB)
-----
c0r0    0              c3t0d0p0       OK        1      0     558
c0r1              c3t1d0p0       OK        1      0     278
c0r2              c3t2d0p0       OK        1      0     136
c0r3              c3t3d0p0       OK        1      0      70
c0r4              c3t4d0p0       DEGRADED  2      1      50
c0r5              c3t5d0p0       DEGRADED  2      1     100

DISKS In Use
=====
ID      Chassis  Slot  RAID ID  Status  Type  Media Spare  Size (GiB)
-----
c0d1    0        1    c0r4    OK      sas  HDD -        50
c0d1    0        1    c0r5    OK      sas  HDD -       100
c0d3    0        3    c0r0    OK      sas  HDD -       558
c0d4    0        4    c0r1    OK      sas  HDD -       278
c0d5    0        6    c0r3    OK      sas  HDD -      70
c0d6    0        7    c0r2    OK      sas  HDD -       136

DISKS Available
=====
ID      Chassis  Slot  RAID ID  Status  Type  Media Spare  Size (GiB)
-----
c0d0    0        0    -        OK      sas  HDD -       279
c0d2    0        2    -        OK      sas  HDD -       279

```

The following is an example of adding a disk:

```
raidconfig add disk -r=c0r4 -d=c0d2
```

```

Adding the following disk(s) to RAID c0r4:
Disk c0d2 (controller 0 slot 2) [y/n]? y
Successfully added disk to RAID

```

```
raidconfig list all
```

```

CONTROLLER c0
=====
Manufacturer  Model      F/W Version  RAID Volumes  Disks
-----
LSI Logic     0x0079    2.130.353-1803 6          7

RAID Volumes
=====
ID      Name          Device          Status    Num Disks Level  Size (GiB)
-----
c0r0    0              c3t0d0p0       OK        1      0     558
c0r1              c3t1d0p0       OK        1      0     278
c0r2              c3t2d0p0       OK        1      0     136

```

```

c0r3          c3t3d0p0      OK          1  0          70
c0r4          c3t4d0p0      DEGRADED   2  1          50
c0r5          c3t5d0p0      DEGRADED   2  1         100
    
```

DISKS In Use

=====

ID	Chassis	Slot	RAID ID	Status	Type	Media	Spare	Size (GiB)
c0d1	0	1	c0r4	OK	sas	HDD	-	50
c0d1	0	1	c0r5	OK	sas	HDD	-	100
c0d2	0	2	c0r4	INIT	sas	HDD	-	50
c0d2	0	2	c0r5	INIT	sas	HDD	-	100
c0d3	0	3	c0r0	OK	sas	HDD	-	558
c0d4	0	4	c0r1	OK	sas	HDD	-	278
c0d5	0	6	c0r3	OK	sas	HDD	-	70
c0d6	0	7	c0r2	OK	sas	HDD	-	136

DISKS Available

=====

ID	Chassis	Slot	RAID ID	Status	Type	Media	Spare	Size (GiB)
c0d0	0	0	-	OK	sas	HDD	-	279

Using ubiosconfig to Update the UEFI BIOS

ubiosconfig provides a CLI tool for configuring BIOS on Oracle x86 servers that support UEFI BIOS. For other x86 systems, use the biosconfig tool. See [“Using biosconfig to Update the BIOS”](#).

ubiosconfig enables you to save server UEFI BIOS settings to an XML file, then load the settings from the XML file to configure UEFI BIOS settings on another server. For more information on UEFI BIOS, see your server documentation.

For information on the systems supported for each tool, refer to the support matrix at:

<http://www.oracle.com/goto/ohmp>

The following table shows the information covered in this section.

Description	Links
Overview of the ubiosconfig command syntax	“ubiosconfig Command Syntax” on page 119
Export UEFI settings	“Export UEFI Settings to an XML File” on page 121
Import UEFI BIOS settings	“Import UEFI BIOS Settings to a Server” on page 121
Display changes to UEFI BIOS settings	“Display Information on Changes to UEFI BIOS Settings” on page 122
Cancel pending UEFI BIOS settings	“Cancel Pending Changes to UEFI BIOS Settings” on page 122
Reset the UEFI BIOS settings	“Reset the UEFI BIOS Settings to Factory Default” on page 123

ubiosconfig Command Syntax

The ubiosconfig commands use the following command syntax:

ubiosconfig *subcommand type [option]*

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

When a command fails, it returns one of several failure codes listed in [“ubiosconfig Error Codes” on page 131](#).

The options listed in the following table apply to all CLI Tools commands including `ubiosconfig`.

Short Option	Long Option	Description
-?	--help	Displays help information.
-V	--version	Displays the tool version.

When accessing a service processor, `ubiosconfig` can be used over a local Host-to-ILOM interconnect or a remote Ethernet network connection. When issuing a `ubiosconfig` command that accesses the service processor, credentials are not required when using the Host-to-ILOM interconnect, but they are required for a network connection.

Note - For systems with an Oracle ILOM version earlier than 3.2.4, to use a LAN interface (either the Host-to-ILOM interconnect or Ethernet network connection) you must manually include credentials using the `-H` and `-U` options for commands that access a service processor. If credentials are not provided the commands will default to the slower local KCS interface to access the local Oracle ILOM service processor.

The options listed in the following table are supported for `ubiosconfig` over a network connection.

Short Option	Long Options	Description
-H	--remote_hostname	This option is followed by the host name or IP address of the remote service processor.
-U	--remote_username	This option is followed by a valid username for logon credentials.

For example:

```
ubiosconfig export all --remote_hostname=address --remote_username=username
```

where *address* is the remote host name or IP address (in `xx.xx.xx.xx` format) of the target server's service processor, and *username* is the user name with login access rights to perform the operation.

You are prompted for the password for this user name when accessing the remote Oracle ILOM service processor.

`ubiosconfig` supports the subcommands listed in the following table.

Subcommand	Function
import	Import a configuration XML file that will be applied to the server's UEFI BIOS at next boot.
export	Export the server's UEFI BIOS configuration to a local XML file.
cancel	Cancel pending UEFI BIOS configuration changes.
list	List status information regarding pending UEFI BIOS import or export operations.
reset	Reset the server's UEFI BIOS configuration to factory default at next boot.

▼ Export UEFI Settings to an XML File

The export subcommand exports a server's UEFI BIOS settings to an XML file.

- To export UEFI BIOS settings to an XML file, type:

```
ubiosconfig export type -x filename.xml option
```

where *type* is the supported type described below, *filename* is the optional path, and *option* is one of the options described below.

The supported type for export is listed in the following table.

Type	Description
all	Export all current server UEFI BIOS settings.

The supported options for export are listed in the following table.

Short Option	Long Option	Description
-x	--xml_file	The path to the XML file. Without this option, settings are displayed on the screen.
-f	--force	Ignore safeguards, and export BIOS XML file regardless of current system state.

Note - There is no guarantee of accuracy in the data when using the --force option.

▼ Import UEFI BIOS Settings to a Server

The import subcommand imports UEFI BIOS settings stored in an XML file to the server at next boot.

- **To import UEFI BIOS settings stored in an XML file, type:**

`ubiosconfig import type -x filename.xml option`

where *type* is one of the options described below, *filename* is the path to the XML file you want to import settings from and *option* is one of the options described below.

The supported types of import are listed in the following table.

Type	Description
all	Import all options from the XML file to the server's BIOS at next boot.
boot	Import only boot options from the XML file to the server's BIOS at next boot.
config	Import only configuration options from the XML file to the server's BIOS at next boot.

The possible option for the import is listed in the following table.

Short Option	Long Option	Description
-f	--force	Ignore safeguards, and import BIOS XML file regardless of current system state. Potentially dangerous and not recommended.

Note - There is no guarantee of accuracy in the data when using the --force option.

▼ Display Information on Changes to UEFI BIOS Settings

The `list` subcommand in conjunction with `type status` displays information about pending changes to UEFI BIOS settings at the next server boot.

- **To display information on UEFI BIOS setting changes, type:**

`ubiosconfig list status`

▼ Cancel Pending Changes to UEFI BIOS Settings

The `cancel` subcommand in conjunction with `type config` cancels any pending changes to UEFI BIOS settings.

- **To cancel pending changes to UEFI BIOS settings, type:**

`ubiosconfig cancel config`

▼ Reset the UEFI BIOS Settings to Factory Default

The `reset` subcommand resets the UEFI BIOS settings to factory defaults at the next server boot.

- To reset the UEFI BIOS settings to factory default, type:

`ubiosconfig reset type`

where *type* is one of the supported types listed in the following table.

Type	Description
<code>config</code>	Reset the server's UEFI BIOS to factory defaults at next power cycle. Any pending UEFI BIOS changes from <code>ubiosconfig</code> are added to the factory defaults.
<code>cancel</code>	Cancel any pending reset change to the server's UEFI BIOS settings.

CLI Tools Error Codes

The following table shows the information covered in this section.

Description	Links
View error codes common to all CLI tools	“Common Error Codes” on page 125
View error codes for biosconfig	“biosconfig Error Codes” on page 126
View error codes for fwupdate	“fwupdate Error Codes” on page 126
View error codes for hwmgmtcli	“hwmgmtcli Error Codes” on page 128
View error codes for ilomconfig	“ilomconfig Error Codes” on page 128
View error codes for nvmeadm	“nvmeadm Error Codes” on page 129
View error codes for raidconfig	“raidconfig Error Codes” on page 129
View error codes for ubiosconfig	“ubiosconfig Error Codes” on page 131

Common Error Codes

The following table lists the 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.

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.

Code Number	Error Description
11	Option not supported.
12	Storage library initialization failure.
13	Entered name is too long.
14	Invalid name after subcommand.
15	XML filename required.
16	Invalid argument.
17	Failure writing XML file.
18	Device is busy, command cannot be completed.
19	User terminated by pressing ctrl-c.
20	Insufficient privilege to execute command.
21	One or more arguments are missing.
22	Unsupported XML file. Please see errors.
23	XML parse failure.
24	Cannot find XML file.
25	XML file contains no records.
26	The current directory is not writeable.
27	Invalid type.
28	The prerequisite criteria fails priority requirement.
29	Prerequisite criteria causes forever loop.
30	IPMI timeout. Wait a few sections and try again.
31	Installation issues detected.

biosconfig Error Codes

The following table lists the biosconfig errors and the actions to take when they occur.

Error Number (s)	Description
Error 64	Execute biosconfig as root. Note - 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.

fwupdate Error Codes

The following table lists the fwupdate command error codes.

You can also list the error codes using the `fwupdate list error-codes` command. See [“list Subcommand Overview” on page 45](#) for more information.

Code Number	Error Description
200	Invalid device type.
201	Invalid device target type..
202	Invalid device ID, please run <code>fwupdate list all</code> to verify id.
203	Reset of component failed.
204	Firmware check failed for component.
205	Firmware download failed for component.
206	Specified component and specified image type do not match.
207	Must specify an image file name when doing an update.
208	Could not read specified image file.
209	Reset of this component type is not supported.
210	Specified component type does not match devices type.
211	Must specify device to update.
212	Update canceled by user.
213	Firmware version information not available. Reset necessary to activate new firmware.
214	Version verification failed.
215	Final version is being reported the same as the starting version. Update may have succeeded, please check update documentation.
216	Missing or corrupt firmware file referenced by firmware metadata file.
217	Metadata file invalid or corrupt.
218	Metadata error. Prerequisite and priority settings conflict.
219	Power control option is not supported for pre-application.
220	Power control option is not supported for post-application.
221	Power Control option is not supported.
222	Requested component not available.
223	Can't verify version information, no XML provided.
224	Metadata does not include support for this host.
225	Could not identify host type.
226	A valid subcommand required.
227	Invalid option entered.
228	Must specify device to reset.
229	Cannot open file to write XML output.
230	Metadata XML file is required.
231	Invalid priority level entered.
232	Cannot read firmware metadata XML file.

hwmgmtcli Error Codes

The following table lists the hwmgmtcli command error codes.

Code Number	Error Description
242	Initialize HDL library failure.
243	HDL library command failure.

ilomconfig Error Codes

The following table lists the ilomconfig error codes.

Code Number	Error Description
50	Cannot connect to BMC interface.
51	Missing -username option.
52	Missing -password option.
53	User already exists.
54	Missing -communityname option.
55	Specified community already exists.
56	User does not exist.
57	Community name does not exist.
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	Oracle ILOM error occurred.

Code Number	Error Description
73	Cannot modify interconnect when disabled (use enable command).
74	ILOM not reachable over internal LAN.
75	Credential Failure.
76	Cannot manage interconnect when hostmanaged is set to false.
77	Could not connect to remote SP by LAN with supplied credentials.
78	Specified Command can not be used with a remote connection.
79	Oracle ILOM version does not support LAN over USB.
80	ILOM Interconnect required for fault forwarding.
81	SNMP timeout occurred while setting up fault forwarding.
82	Failed to configure ILOM SNMP correctly.
83	Service Processor has conflicting configuration. Refer to release notes for resolution.

nvmeadm Error Codes

The following table lists the nvmeadm error codes.

Code Number	Error Description
190	Invalid namespace.
191	Invalid controller.
192	Invalid block size and/or metadata size.
193	Command failed on one or more device(s).
194	Invalid directory name.
195	Operation canceled.

raidconfig Error Codes

Errors might be returned if you attempt to configure the RAID entry for 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 following table lists the error codes and strings specific to this tool.

Code Number	Error Description
100	No controllers available.

Code Number	Error Description
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 number of subarrays.
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.
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.
135	Import could not create RAID volumes or spares - disks may be in use.
136	Subarrays option is required for this RAID level.
137	Incomplete command, no options have been supplied.
138	Number of disks requested exceeds the number of available disks with the same capacity.
139	RAID configuration does not have enough disks for the requested RAID level.
140	RAID configuration has too many disks for the requested RAID level.
141	Disk detected as in use by another controller. Use raidconfig restore or clear command.

Code Number	Error Description
142	The number of spares exceeds the maximum allowed by controller.
143	This command does not support the number-disks option.
144	Task type is invalid.
145	Task type must be defined.
146	Task type is only valid for disks.
147	Task type is only valid for RAID Volumes.
148	For this task, disk must not be in use.
149	For this task, disk must be in a RAID Volume.
150	Command currently cannot be executed.
151	The source disk must be in a RAID Volume.
152	The destination disk must not be in a RAID Volume.
153	The source and destination cannot be the same disk.
154	No foreign configuration detected for controller.
155	Unable to add disk to RAID Volume.
156	Task cannot be started, make sure task is listed in Startable Tasks.
157	Task cannot be stopped, make sure task is listed in Stoppable Tasks.
158	Invalid command, filename must come before options.
159	All disks must be the same size.
160	Command is not valid for this RAID level.
161	Subdisk sizes must be less than disk capacity.
162	Could not restore controller configuration.

ubiosconfig Error Codes

The following table lists the ubiosconfig errors.

Code Number	Error Description
50	Cannot connect to IPMI bmc device.
84, 85	Cannot update BIOS, update in progress.
86	Invalid configuration file provided.
87	Invalid boot configuration provided.
88	Invalid boot and configuration provided.
89	Failed to update BIOS.
90	BIOS partially updated.
91	BIOS out of sync.

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