



SGI® UV™ CMC Software User Guide

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New Features in this Guide

Added a procedure that explains how to flash the BIOS on an SGI UV 2000 computer system.

Additional updates for the SGI Foundation Software 2.11 release include miscellaneous editorial corrections.

Record of Revision

Version	Description
001	June 2010 Initial release.
002	June 2010 Added information for SGI Altix UV 100 systems.
003	October 2010 Updated to support the SGI Foundation Software 2.2 release.
004	February 2011 Updated to support SGI Foundation Software 2.3 release.
005	April 2011 Updated to support SGI Foundation Software 2.4 release.
006	November 2012 Updated for distribution with the SGI Foundation Software 2.7 release.
007	November 2013 Supports the SGI Foundation Software 2.9 release.
007	November 2014 Supports the SGI Foundation Software 2.11 release.

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About This Guide

You can use the chassis manager controller (CMC) commands to monitor and manage the following SGI UV systems:

- SGI UV 2000 systems
- SGI UV 1000 systems
- SGI UV 100 systems

You can issue CMC commands from the CMC itself, or you can issue CMC commands from the system management node (SMN). If your SGI UV system includes an SMN, you may have an additional option for system management, which is the SGI Management Center (SMC) graphical user interface. The SMC interface runs on an SMN.

This guide describes how to use the CMC commands to monitor and manage SGI UV systems. This guide assumes that you are familiar with the information in the SGI UV system hardware guides.

Note: The SGI UV CMC commands described in this manual do not apply to SGI UV 10 systems or SGI UV 20 systems.

Related Publications

The SGI Foundation Software release notes and the SGI Performance Suite release notes contain information about the specific software packages provided in those products. The release notes also list SGI publications that provide information about the products. The release notes are available in the following locations:

- Online at Supportfolio. After you log into Supportfolio, you can access the release notes. The SGI Foundation Software release notes are posted to the following website:

https://support.sgi.com/content_request/194480/index.html

The SGI Performance Suite release notes are posted to the following website:

https://support.sgi.com/content_request/786853/index.html

Note: You must sign into Supportfolio, at <https://support.sgi.com/login>, in order for the preceding links to work.

- On the product media. The release notes reside in a text file in the `/docs` directory on the product media. For example, `/docs/SGI-MPI-1.x-readme.txt`.
- On the system. After installation, the release notes and other product documentation reside in the `/usr/share/doc/packages/product` directory.

All SGI publications are available on the Technical Publications Library at the following website:

<http://docs.sgi.com>

The following publications might be useful to you:

- *SGI UV System Software Installation and Configuration Guide*
- *SGI UV System Management Node Administrator Guide*
- *SGI Management Center (SMC) Installation and Configuration*
- *SGI Management Center (SMC) System Administrator Guide*
- SGI hardware documentation.

SGI creates hardware manuals that are specific to each product line. The hardware documentation typically includes a system architecture overview and describes the major components. It also provides the standard procedures for powering on and powering off the system, basic troubleshooting information, and important safety and regulatory specifications.

The following procedure explains how to retrieve a list of hardware manuals for your system.

Procedure 0-1 To retrieve hardware documentation

1. Type the following URL into the address bar of your browser:

`docs.sgi.com`

2. In the search box on the Techpubs Library, narrow your search as follows:
 - In the **search** field, type the model of your SGI system.

For example, type one of the following: "UV 2000", "ICE X", Rackable.

Remember to enclose hardware model names in quotation marks (" ") if the hardware model name includes a space character.

- Check **Search only titles**.
- Check **Show only 1 hit/book**.
- Click **search**.

Obtaining Publications

You can obtain SGI documentation in the following ways:

- You can access the SGI Technical Publications Library at the following website:

<http://docs.sgi.com>

Various formats are available. This library contains the most recent and most comprehensive set of online books, release notes, man pages, and other information.

- You can view man pages by typing `man title` at a command line.

Conventions

The following conventions are used throughout this publication:

Convention	Meaning
[]	Brackets enclose optional portions of a command or directive line.
command	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
...	Ellipses indicate that a preceding element can be repeated.
manpage(x)	Man page section identifiers appear in parentheses after man page names.

user input This bold, fixed-space font denotes literal items that the user enters in interactive sessions. Output is shown in nonbold, fixed-space font.

variable Italic typeface denotes variable entries and words or concepts being defined.

Reader Comments

If you have comments about the technical accuracy, content, or organization of this publication, contact SGI. Be sure to include the title and document number of the publication with your comments. (Online, the document number is located in the front matter of the publication. In printed publications, the document number is located at the bottom of each page.)

You can contact SGI in either of the following ways:

- Send e-mail to the following address:

`techpubs@sgi.com`

- Contact your customer service representative and ask that an incident be filed in the SGI incident tracking system:

`http://www.sgi.com/support/supportcenters.html`

SGI values your comments and will respond to them promptly.

Overview

This chapter includes the following topics:

- "System Management Component Overview" on page 1
- "Chassis Management Controller (CMC) Overview" on page 2

System Management Component Overview

SGI[®] UV[™] system components provide a single system control network. The network is the control point for system power up, initialization, booting, and maintenance. The components are as follows:

- The baseboard management controller (BMC) on the node boards. This is a standard component for all SGI UV systems.
- The chassis management controller (CMC) in the rear of the individual rack unit (IRU). This is a standard component for all SGI UV systems. This manual describes the CMC commands.
- The system management node (SMN). If your SGI UV system includes two or more IRUs, the system includes an SMN. SMNs are not required on SGI UV systems that include only one IRU. The SMN is a gateway between the SGI UV system control network and the other networks at your site.

The SGI Management Center (SMC) graphical user interface runs only on the SMN. You can configure, operate, and monitor your SGI UV system through the SMC interface. On systems with an SMN, you can use the SMC software as an alternative to, or in addition to, the CMC commands. For more information, see the *SGI Management Center (SMC) System Administrator Guide*.

Note: The system control network is a private, closed network. Do not reconfigure it from the standard SGI UV installation. Do not directly connect it to any other network. The SGI UV system control network does not accommodate additional network traffic, routing, address naming other than its own schema, and DHCP controls other than its own configuration. The system control network is not security hardened and is not tolerant of heavy network traffic, so it is vulnerable to denial-of-service attacks.

Chassis Management Controller (CMC) Overview

The CMC performs several functions. Many functions are common across both IRUs and routers, but some functions are specific to the type of enclosure. The CMC functions are as follows:

- Manages power control and sequencing
- Provides environmental control and monitoring
- Initiates system resets
- Stores identification and configuration information
- Provides a console interface for diagnostics and scans

The CMC accepts direction from the SMN and sends operational requests to the BMC on each compute blade upon request. A CMC can communicate with the blade BMCs and other CMCs in an IRU if they are linked together as a single system image (SSI), also called a *partition*.

On SGI UV 2000 systems, a port from each CMC connects to a dedicated Ethernet switch that provides a synchronous clock signal to all of the CMCs and the SSI. On SGI UV 1000 systems and on SGI UV 100 systems, a port from each CMC connects the CMCs together in an ethernet string.

Each CMC shares its information with the SMN as well as other CMCs within the SSI. The SMN, optional mass storage units, and PCIe expansion enclosures do not have a CMC installed.

Chassis Management Controller Tasks

This chapter contains the following topics:

- "Accessing the CMC on an SGI UV 2000 System Through a Serial Connection" on page 4
- "Accessing the CMC on an SGI UV 1000 System Through a Serial Connection" on page 6
- "Accessing the CMC on an SGI UV 100 System Through a Serial Connection" on page 8
- "Accessing the Chassis Management Controller (CMC) Through a Network Connection and Logging In" on page 9
- "Creating Boot Options" on page 12
- "Powering On and Booting an SGI UV System From a Complete Power Off" on page 17
- "Powering Off an SGI UV System" on page 18
- "Accessing `kdump` (RHEL Platforms Only)" on page 19
- "Accessing the `kdb` Kernel Debugger (SLES Platforms Only)" on page 19
- "Enabling the Auto-Power Capability" on page 20
- "Retrieving System Configuration Information" on page 21
- "Setting Hardware Configuration Overrides" on page 23
- "Upgrading the System Basic Input/Output System (BIOS)" on page 28
- "Enabling Hyper-Threading" on page 34
- "Adding an Accessory" on page 31
- "Creating a Message of the Day (SGI UV 2000 Systems Only)" on page 37

Accessing the CMC on an SGI UV 2000 System Through a Serial Connection

You can use the procedure in this topic to connect to the CMC on an SGI UV 2000 system if the following conditions exist:

- You do not know the address of the CMC and there is no SMN.
- The SMN is down or unavailable.

The following procedure explains how to establish a serial connection from a dumb terminal to a CMC in an SGI UV 2000 system.

Procedure 2-1 To establish a serial connection to an SGI UV 2000 system

1. Locate the CMC on the SGI UV 2000 system.

Figure 2-1 on page 5 shows the location of the CMC.

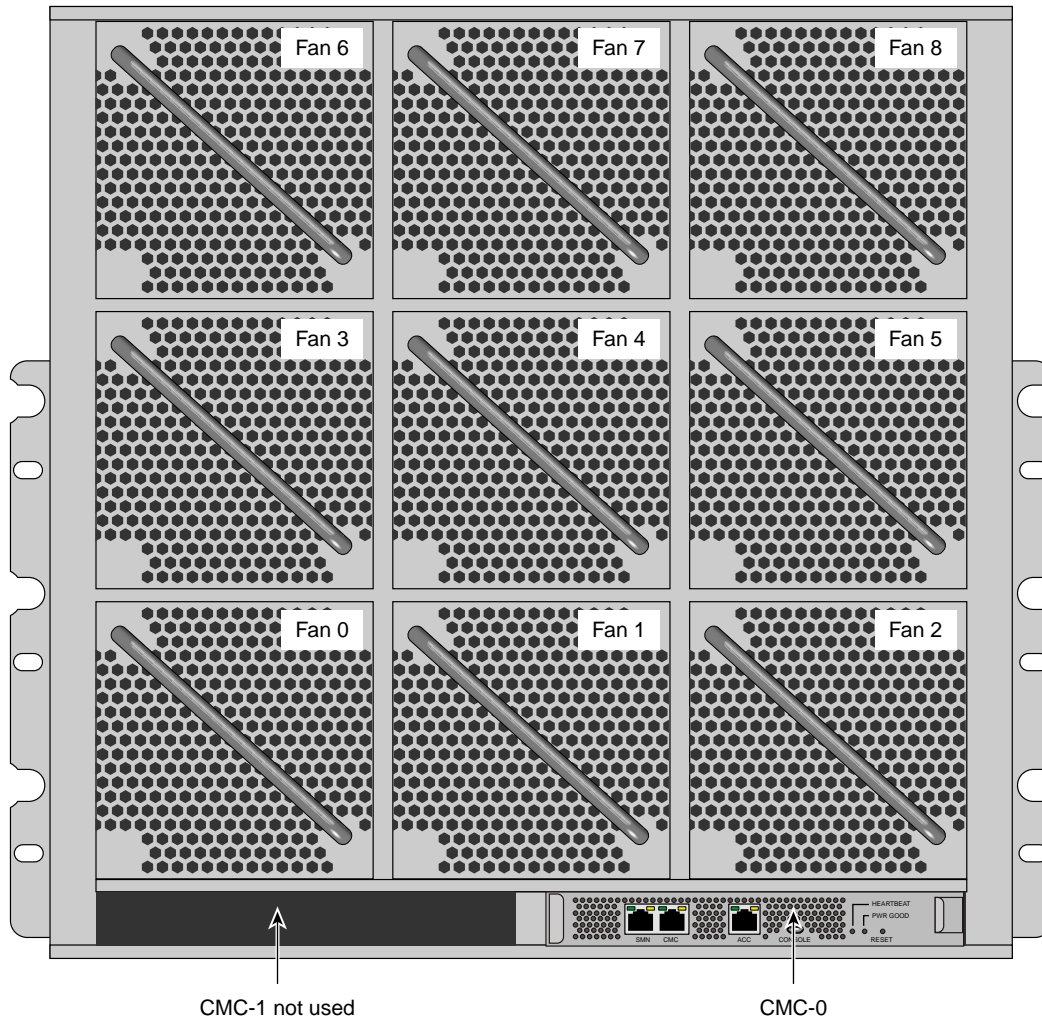


Figure 2-1 SGI UV 2000 CMC Location

2. Use a micro-USB serial cable to connect the terminal to the CONSOLE port connector on the CMC board of the IRU.

Typically, you connect a serial console to the first (bottom) IRU in any single rack configuration. Figure 2-2 on page 6 shows the CONSOLE port.

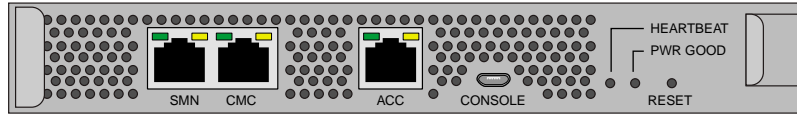


Figure 2-2 SGI UV 2000 Ports

3. Set the terminal to the following functional modes:
 - Baud rate of 115,200
 - 8 data bits
 - One stop bit, no parity
 - No hardware flow control (RTS/CTS)

Accessing the CMC on an SGI UV 1000 System Through a Serial Connection

You can use the procedure in this topic to connect to the CMC on an SGI UV 1000 system if the following conditions exist:

- You do not know the address of the CMC and there is no SMN.
- The SMN is down or unavailable.

The following procedure explains how to establish a serial connection from a dumb terminal to a CMC in an SGI UV 1000 system.

Procedure 2-2 To establish a serial connection to an SGI UV 1000 system

1. Locate the CMC on the SGI UV 1000 system.

Figure 2-3 on page 7 shows the location of the CMC.

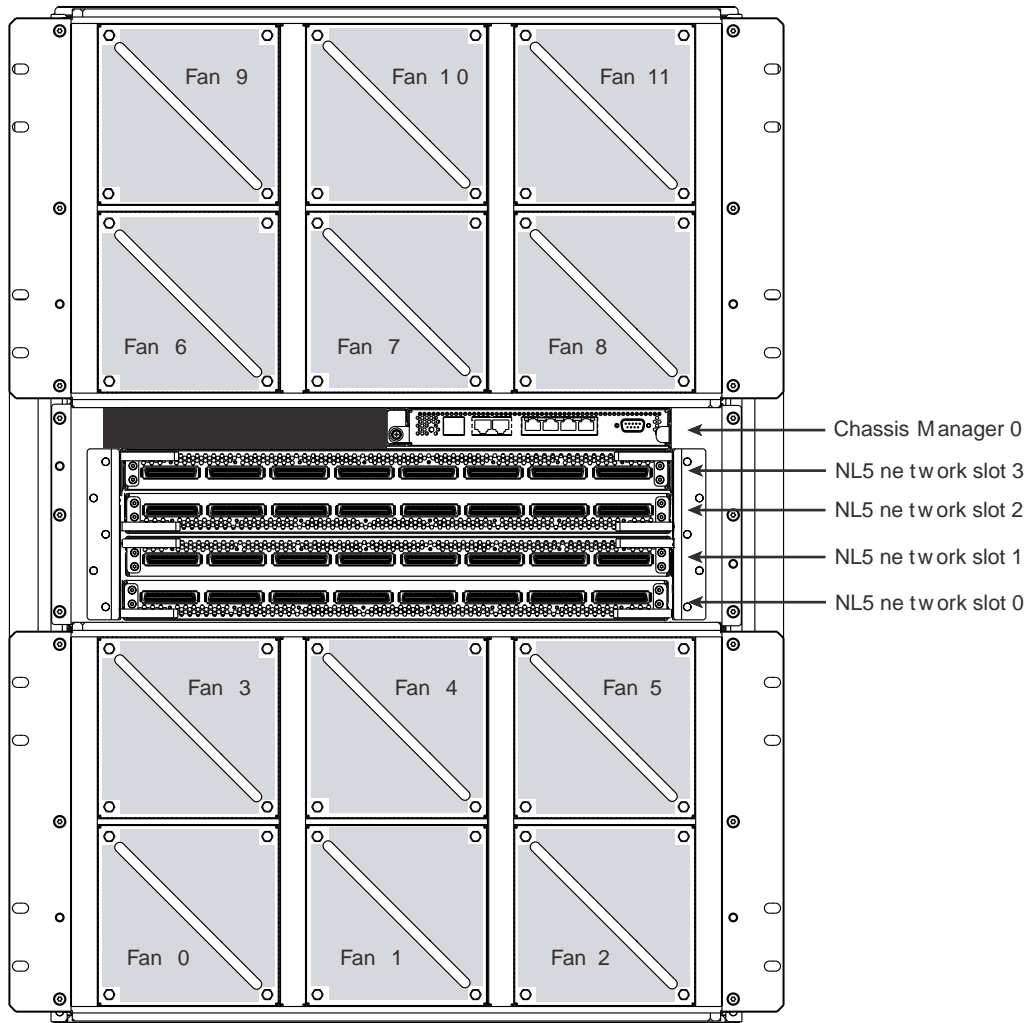


Figure 2-3 SGI UV 1000 CMC Location

2. Use a serial cable to connect the terminal to the (DB-9) RS-232-style console port connector on the CMC.

Typically, you connect a serial console to the first (bottom) IRU in any single rack configuration. Figure 2-4 on page 8 shows the `CONSOLE` port.

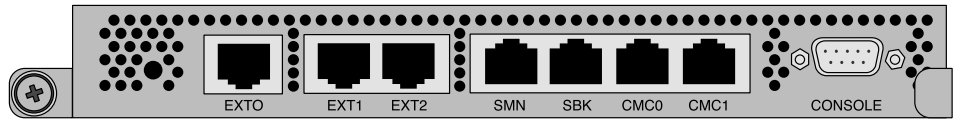


Figure 2-4 SGI UV 1000 Ports

3. Set the terminal to the following functional modes:
 - Baud rate of 115,200
 - 8 data bits
 - One stop bit, no parity
 - No hardware flow control (RTS/CTS)

Accessing the CMC on an SGI UV 100 System Through a Serial Connection

You can use the procedure in this topic to connect to the CMC on an SGI UV 100 system if the following conditions exist:

- You do not know the address of the CMC and there is no SMN.
- The SMN is down or unavailable.

The following procedure explains how to establish a serial connection from a dumb terminal to a CMC in an SGI UV 100 system.

Procedure 2-3 To establish a serial connection to an SGI UV 100 system

1. Locate the CMC and the `Console` port on the SGI UV 100 system.

Figure 2-5 on page 9 shows the location of the CMC and the port.

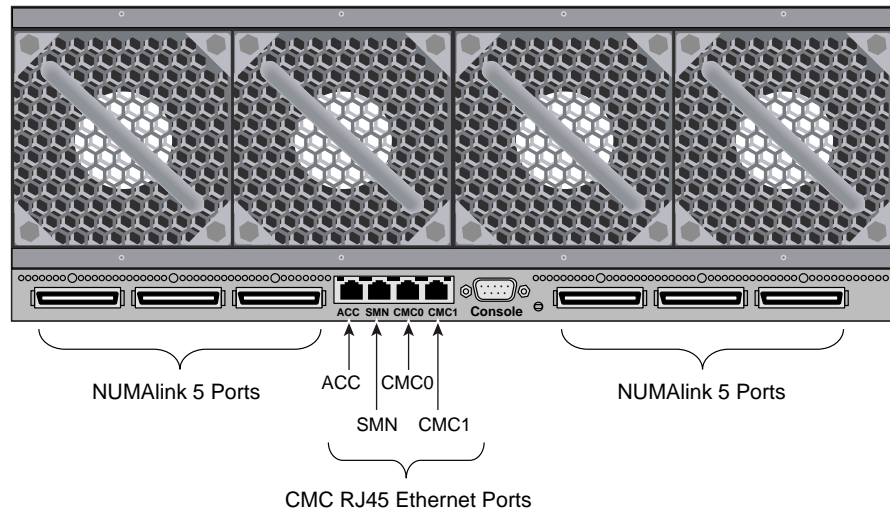


Figure 2-5 SGI UV 100 System CMC and Ports

2. Use a serial cable to connect the terminal to the (DB-9) RS-232-style console port connector on the CMC.

Typically, you connect a serial console to the first (bottom) IRU in any single rack configuration.

3. Set the terminal to the following functional modes:
 - Baud rate of 115,200
 - 8 data bits
 - One stop bit, no parity
 - No hardware flow control (RTS/CTS)

Accessing the Chassis Management Controller (CMC) Through a Network Connection and Logging In

An SGI UV 2000 system or an SGI UV 1000 system can have more than one CMC. If the system includes a system management node (SMN) and there are multiple CMCs,

some might be attached to the SMN, and some might not be attached to the SMN. In a troubleshooting situation, your SMN might be down.

If an SMN is present, the CMC is configured to request an IP address from the SMN via dynamic host configuration protocol (DHCP). This is the default behavior.

If an SMN is not present, the CMC might be configured with a static IP address.

The following notes pertain to the procedures in this topic:

- If your SGI UV system is configured to use `telnet(1)`, you can use either `ssh(1)` or `telnet(1)` to log in. The procedures and examples generally use only the `ssh(1)` command.
- The CMC password is always `root`. Do not change this password.
- You can log into the CMC by using the CMC's IP address or by using the CMC's hostname. The procedures and examples generally use the IP address.

The following procedures explain how to establish a network connection and log in to a CMC when an SMN is available and when an SMN is not available.

Procedure 2-4 To connect to a CMC from an SMN

1. Use the `ssh(1)` command to log in to the SMN as the root user.

Obtain the SMN's address from your system administrator or the network administrator.

For example:

```
# ssh root@ip_address
```

2. Type the `cmclist` command to retrieve the IP addresses of the CMCs that are attached to this SMN.

The SMN acts as both a DNS and a DHCP server to the CMCs.

For example, the following output shows one CMC, and the CMC's IP address is 172.19.1.1:

```
[root@uv48-smn]# cmclist
# SYSCO discovered CMC(s)
# Hostname                IP Address
s UV-00000048:r001i01c    172.19.1.1
```


3. (Optional) Type the `config -v` command to retrieve the identifiers for other CMCs attached to this SMN.

For example, the following output shows 4 CMCs in the SGI UV system, but only one is attached to the SMN:

```
[root@uv48-smn]# config -v
SSN: UV-00000048

CMCs:          16
r001i01c UV1000 SMN
r001i23c UV1000
r001q42c UVQCR
r001q43c UVQCR
```

...

output truncated for inclusion in this manual

The preceding output identifies the CMCs on this system according to rack number and IRU. For example, `r001i01c` refers to rack 001, IRU 01, and `c` identifies a CMC.

4. Use the `ssh(1)` command to connect to the CMC with the IP address shown in the `cmclist` output.

For example:

```
[root@uv48-smn]# ssh 172.19.1.1
```

The root user is the only user configured on the CMC, so log in as `root`. Type `root` for the CMC password.

The following procedure explains how to establish a network connection to a CMC without logging into an SMN first. Use this procedure if there is no SMN, if the SMN is down, or if you want to log into a CMC from another CMC.

Procedure 2-5 To connect to a CMC without an SMN

1. Determine the IP address of the CMC to which you want to connect.

Use one of the following methods:

- Obtain the CMC's address from your system administrator or network administrator.

If you do not have the CMC's address, you need to make a serial connection to the CMC. See one of the following topics:

- "Accessing the CMC on an SGI UV 2000 System Through a Serial Connection" on page 4
 - "Accessing the CMC on an SGI UV 1000 System Through a Serial Connection" on page 6
 - "Accessing the CMC on an SGI UV 100 System Through a Serial Connection" on page 8
2. Use the `ssh(1)` command to log in to the CMC.

For example:

```
# ssh ip_address
```

The root user is the only user configured on the CMC, so log in as `root`. Type `root` for the CMC password.

Creating Boot Options

SGI supports your ability to install more than one operating system, or operating system release level, on an SGI UV system. The following procedure explains how to create a boot option so you can boot any operating system.

Procedure 2-6 To create boot options for nondefault operating system boots

1. Establish a connection to the CMC and log in.

Use one of the following procedures:

- "Accessing the CMC on an SGI UV 2000 System Through a Serial Connection" on page 4
 - "Accessing the CMC on an SGI UV 1000 System Through a Serial Connection" on page 6
 - "Accessing the CMC on an SGI UV 100 System Through a Serial Connection" on page 8
 - "Accessing the Chassis Management Controller (CMC) Through a Network Connection and Logging In" on page 9
2. Type the `uvcon` command, and monitor the power-on process.

Depending upon the size of your system, it can take 5 to 10 minutes for the SGI UV system to power on.

3. When the power-on process completes, type `CTRL-] q` to exit the console.
4. When the `Shell>` prompt appears, type `exit` to access the BIOS manager.
5. Use the arrow keys to select **Boot Maintenance Manager**, and press Enter.
6. On the **Boot Maintenance Manager** screen, select **Boot Options**.
7. On the **Boot Options** screen, select **Add Boot Option**.
8. On the **File Explorer** screen, complete the following steps:
 - Select the disk from which you want to boot.

For example:

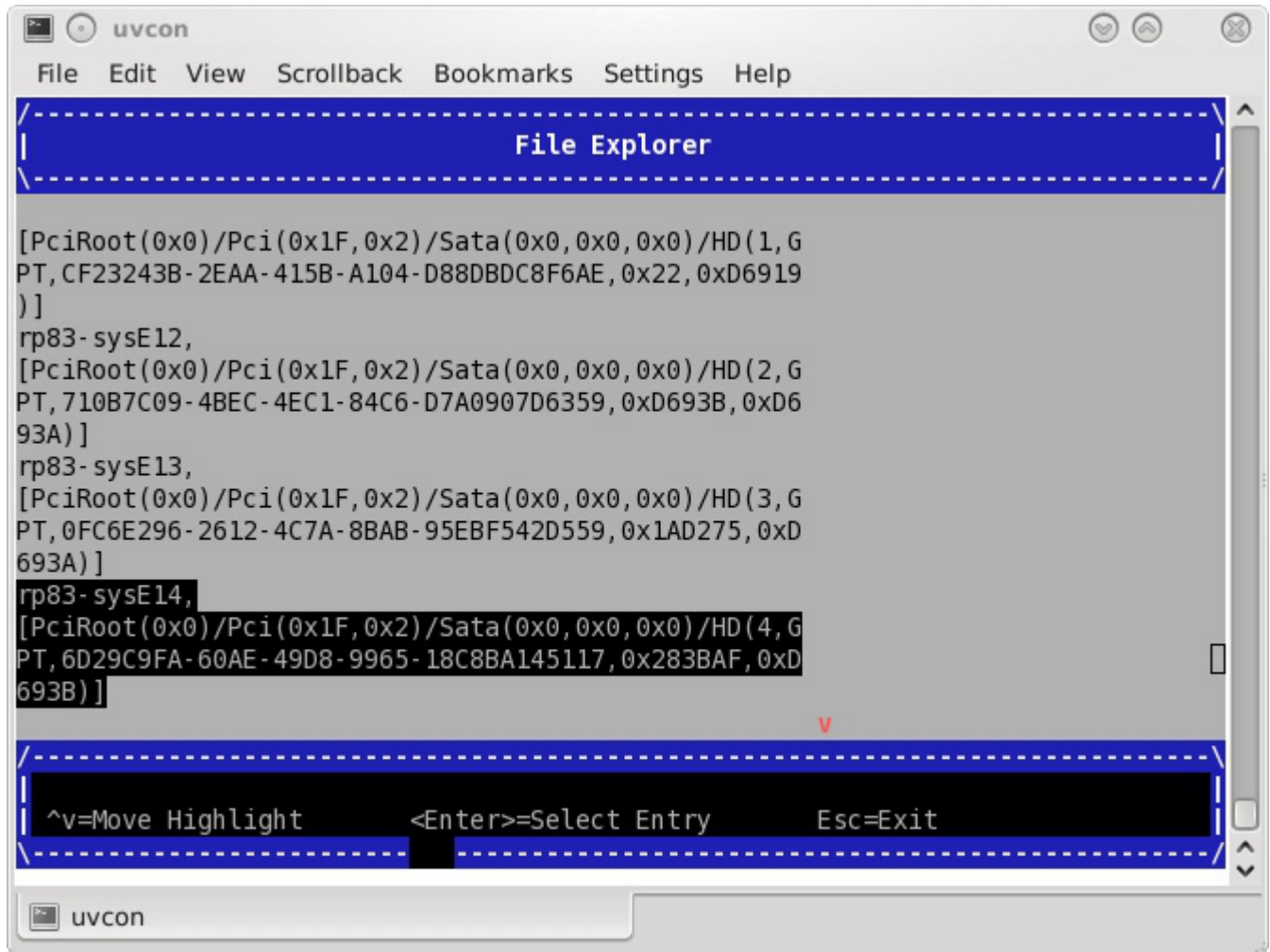


Figure 2-6 File Explorer Screen

- Peruse the directory system, from the disk you selected, through <redhat> or SUSE, until you find grub.efi (RHEL) or elio.efi (SLES).
 - Select grub.efi (RHEL) or elio.efi (SLES).
9. On the **Modify Boot Option Description** screen, complete the following steps:

- In the **Please type in your data** popup, type a name for this boot option. For example, RHEL 6.4 or SLES11 SP2.
 - Select **Commit Changes and Exit**.
10. On the **Boot Maintenance Manager** screen, select **Boot Options**.
 11. On the **Boot Options** screen, select **Change Boot Order**.
 12. On the **Change Boot Order** screen, complete the following steps:
 - Select the boot order entries.
For example:

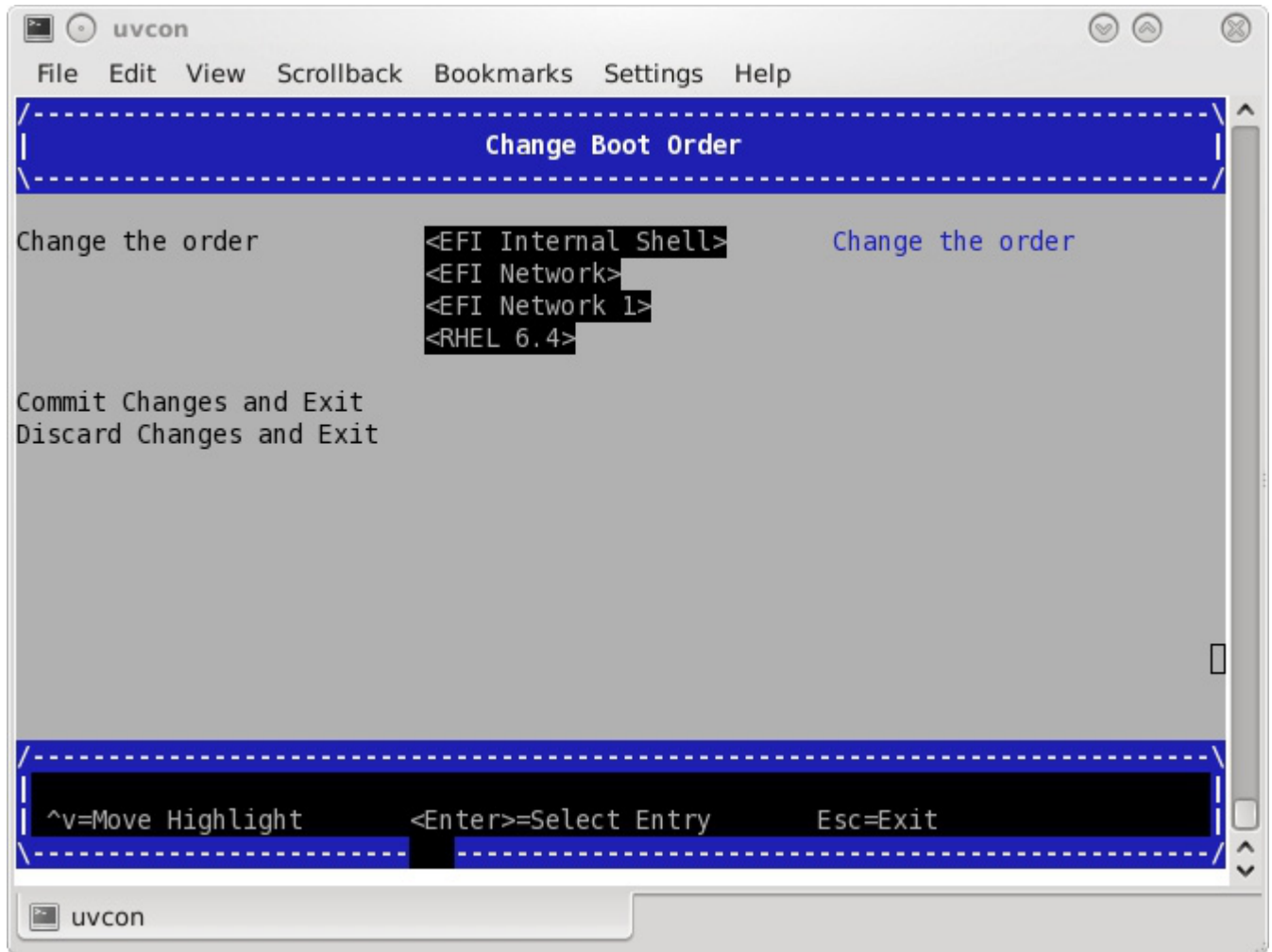


Figure 2-7 Change Boot Order Screen

- On the popup that appears, select the boot option you created earlier in this procedure.
- Press the + key to move the recently created boot option to the top of the list.
- Press `Enter` to commit this step's changes.

- Select **Commit Changes and Exit**.
13. Press the space bar to return to the BIOS manager.
 14. Notify all system administrators of the current boot order.

SGI supports the ability to change the default boot order, but some system administration tasks might assume that the default boot option is still **EFI Internal Shell**. You might need to change the boot order in order to access the EFI shell in the process of performing other tasks that this chapter describes. If you need to change the boot order, complete this procedure again and select one of the other boot options.

Powering On and Booting an SGI UV System From a Complete Power Off

The following procedure explains how to power on an SGI UV system from a complete power off.

Procedure 2-7 To power on or boot an SGI UV system

1. Visually inspect the system and make sure that the power breakers are on.
2. Establish a connection to the CMC and log in.

Use one of the following procedures:

- "Accessing the CMC on an SGI UV 2000 System Through a Serial Connection" on page 4
 - "Accessing the CMC on an SGI UV 1000 System Through a Serial Connection" on page 6
 - "Accessing the CMC on an SGI UV 100 System Through a Serial Connection" on page 8
 - "Accessing the Chassis Management Controller (CMC) Through a Network Connection and Logging In" on page 9
3. Type the `power on` command to power up the SGI UV system.

Depending upon the size of your system, it can take 5 to 10 minutes for the SGI UV system to power on.

For example:

```
CMC:r001i01c> power on
```

4. (Conditional) Use SMN commands to monitor the boot process.

Complete the following steps only if your SGI UV system includes an SMN:

- Type the following command to open a console from which you can monitor the power-on process:

```
uvcon
```

- Monitor the boot process.
- When the power-on process completes, type the following command to close the console:

```
CTRL-J q
```

5. Type the following command to access the EFI shell commands:

```
CMC:r001i01c> uvcon
```

6. When the `Shell>` prompt appears, type `fs0:` to access the boot partition.

For example:

```
Shell> fs0:
```

7. Boot the system.

Use one of the following commands:

- On Red Hat Enterprise Linux CMCs, type the following command:

```
fs0:\> EFI\redhat\grub
```

- On SUSE Linux Enterprise Server CMCs, type the following command:

```
fs0:\> \efi\SuSE\elilo
```

Powering Off an SGI UV System

The following procedure explains how to power off an SGI UV system.

Procedure 2-8 To power off an SGI UV system

1. Log into the SGI UV system as the root user, and type the following command to stop the operating system:

```
# halt
```

2. On the CMC, type the `power off` command to power off the SGI UV system.

For example:

```
CMC:r1i1c> power off
==== r001i01c (PRI) ====
```

3. Type the `power status` command to verify that the system has powered down.

For example:

```
CMC:r1i1c> power status
==== r001i01c (PRI) ====
on: 0, off: 32, unknown: 0, disabled: 0
```

Accessing `kdump` (RHEL Platforms Only)

The following procedure explains how to send a nonmaskable interrupt (NMI) signal and invoke the `kdump` crash recovery service.

Procedure 2-9 To send an NMI signal and invoke `kdump`

1. Log into the SGI UV system as root, and type the following commands to start `kdump`:

```
# chkconfig kdump on
# service kdump start
```

2. On the CMC, type the following command to enter `kdump`:

```
CMC:r1i1c> power nmi
```

Accessing the `kdb` Kernel Debugger (SLES Platforms Only)

The following procedure explains how to send a nonmaskable interrupt (NMI) signal and invoke the `kdb` kernel debugger.

Procedure 2-10 To send an NMI signal and invoke kdb

1. On the CMC, type the following command:

```
CMC:r1i1c> power nmi
Entering kdb (current=0xffff8aa3fe11c040, pid 0) on processor 7 due to NonMaskable Interrupt @ 0xffffffff8100ad42
r15 = 0x0000000000000000      r14 = 0x0000000000000000
r13 = 0x0000000000000000      r12 = 0x0000000000000000
bp  = 0xffffffff81927380      bx  = 0xffff8ac1ff11dfd8
r11 = 0xffffffff8101a2c0      r10 = 0xffff88000bee7fd8
r9   = 0x00000000ffffffff      r8  = 0x0000000000000000
ax   = 0x0000000000000000      cx  = 0x0000000000000000
dx   = 0x0000000000000000      si  = 0xffff8ac1ff11dfd8
di   = 0xffffffff81a2b308      orig_ax = 0xffffffffffffffff
ip   = 0xffffffff8100ad42      cs  = 0x0000000000000010
flags = 0x0000000000000246      sp  = 0xffff88000bee7ff0
ss   = 0x0000000000000018      &regs = 0xffff88000bee7f58
[7]kdb>
```

2. Type kdb commands at the kdb> prompt.

Enabling the Auto-Power Capability

The auto-power capability allows your system to power up automatically when power is applied after a power outage:

- To determine if the auto-power capability is enabled on your system, use the `autopower` command without options. For example, the following output shows that the feature is currently disabled:

```
uv44-cmc CMC:r001i01c> autopower
==== r001i01c (PRI) ====
auto-power on is disabled
```

- To enable auto-power, use the `-e` option:

```
uv44-cmc CMC:r001i01c> autopower -e
==== r001i01c (PRI) ====
auto-power on enabled (120 second delay)
```

- To disable auto-power, use the `-d` option:

```
uv44-cmc CMC:r001i01c> autopower -d
==== r001i01c (PRI) ====
auto-power on disabled
```

The default delay before a `power on` command is issued after auxiliary power is supplied to CMCs and BMCs is two minutes. This allows for the system controller configuration to stabilize (complete CMC and BMC detection).

Only the lowest numbered (rack and u-position) CMC initiates the power-on sequence. Because this is a CMC-based feature, the maximum size of the supported system configuration supported is 16 or fewer racks.

Note: On SGI UV 1000 and SGI UV 100 systems, the auto-power capability requires CMC 1.2.7 or later firmware. You can use the `version` command from the CMC prompt to determine the CMC firmware version, as follows:

```
uv44-cmc CMC:r001i01c> version
SGI Chassis Manager Controller, Firmware Rev. 1.3.16 [Bootloader 0.6.0]
```

Flashing the CMC 1.2.7 or later firmware only adds support for the auto-power capability; it does not enable it. To enable it, type the `autopower -e` command at the CMC prompt after the system controller configuration has stabilized.

For more information, see "autopower" on page 44.

Retrieving System Configuration Information

You can use the `config -v` command to view your system configuration. In the command output, `r001i01b00` refers to rack 0, IRU 1, and blade 0.

Example 1. The following is configuration information from an SGI UV 2000 system:

```
CMC:r001i01c> config -v

SSN: UV2-00000082

CMCs:                2
  r001i01c UV2000
  r001i11c UV2000
```

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```
BMCs:          16
r001i01b00 IP109-BASEIO
r001i01b01 IP109
r001i01b02 IP109
r001i01b03 IP109
r001i01b04 IP109
r001i01b05 IP109
r001i01b06 IP109
r001i01b07 IP109
r001i11b00 IP109-BASEIO   IORISER-DISABLED
r001i11b01 IP109
r001i11b02 IP109
r001i11b03 IP109
r001i11b04 IP109
r001i11b05 IP109
r001i11b06 IP109
r001i11b07 IP109
```

```
Partitions:    1
partition000 BMCs:  16
```

```
Accessories:   0
```

Example 2. The following is configuration information from an SGI UV 1000 system:

```
CMC:rlilc> config -v
```

```
CMCs:          2
r001i01c UV1000
r001i02c UV1000

BMCs:          32
r001i01b00 IP93-BASEIO
r001i01b01 IP93-DISK
r001i01b02 IP93-EXTPCIE
r001i01b03 IP93-EXTPCIE
r001i01b04 IP93
r001i01b05 IP93
r001i01b06 IP93
r001i01b07 IP93
r001i01b08 IP93
r001i01b09 IP93
```

```
r001i01b10 IP93
r001i01b11 IP93
r001i01b12 IP93
r001i01b13 IP93
r001i01b14 IP93
r001i01b15 IP93
r001i02b00 IP93-BASEIO
r001i02b01 IP93-EXTPCIE
r001i02b02 IP93-DISK
r001i02b03 IP93-EXTPCIE
r001i02b04 IP93-EXTPCIE
r001i02b05 IP93-EXTPCIE
r001i02b06 IP93-EXTPCIE
r001i02b07 IP93-EXTPCIE
r001i02b08 IP93-INTPCIE
r001i02b09 IP93-INTPCIE
r001i02b10 IP93-INTPCIE
r001i02b11 IP93-INTPCIE
r001i02b12 IP93-INTPCIE
r001i02b13 IP93-INTPCIE
r001i02b14 IP93-INTPCIE
r001i02b15 IP93-INTPCIE
```

```
Partitions:      1
partition000 BMCs:  32
```

Setting Hardware Configuration Overrides

The `hwcfg` command lets you view and set hardware configuration overrides. Many of the hardware overrides available on early SGI UV systems are no longer necessary due to firmware enhancements and hardware changes. Most of these overrides are still available but have been suppressed. To expose them, use the `-h` or `--hidden` flag.

The following are a series of examples that show `hwcfg` output:

- To see a list of current override settings, use the `hwcfg` command without options. This shows all overrides set on any blades in the system. If any overrides are set

on some blades and not on others, the output shows a count of blades where the override is set. For example:

```
CMC:r001i01c> hwcfg
DEBUG_SW=0x4
IORSER_DISABLE=yes ..... 1/2 BMC(s)
NL6_ENABLE=0x808
```

- To see a list of blades where each override is set, use the `-v` option. For example:

```
harp10-cmc CMC:r001i01c> hwcfg -v
DEBUG_SW=0x4
    all targeted BMC(s)
IORSER_DISABLE=yes ..... 1/2 BMC(s)
    r001i02b00
NL6_ENABLE=0x808
    all targeted BMC(s)
```

- To see an individual list of blades and their overrides, use the `-vv` option. For example:

```
harp10-cmc CMC:r001i01c> hwcfg -vv
==== r001i01b00 ====
DEBUG_SW=0x4
NL6_ENABLE=0x808
==== r001i02b00 ====
IORSER_DISABLE=yes
DEBUG_SW=0x4
NL6_ENABLE=0x808
```

- To set one or more overrides, use the following command:

```
hwcfg name=value [name=value ...]
```

For example:

```
CMC:r001i01c> hwcfg DEBUG_SW=0x4
```

- To clear overrides, use the `-c` option. For example:

```
CMC:r001i01c> hwcfg -c
```

- To clear all overrides, including hidden overrides, use both the `-c` and `-a` options.

```
CMC:r001i01c> hwcfg -c -a
```

- To clear one or more specific variables, use the following command:

```
hwcfg -c name [... name ]
```

- To show a list of hwcfg variables available, use the --list option.

Example for an SGI UV 2000 system:

```
CMC:r001i01c> hwcfg -l
==== 16/16 BMC(s) ====
SOCKET_DISABLE=yes|no| Partition number for this blade

MAX_CORES= Maximum number of cores allowed (per socket)

BLADE_DISABLE=yes|no
  Disable this blade

IORISER_DISABLE=yes|no
  Disable the I/O riser on this blade

DEBUG_SW=<32-bit value>
  Software debug switches (see "hwcfg --help DEBUG_SW" for details)

BIOS_FILE=Alternate BIOS image file

NL6_ENABLE=yes|no| Enable NL6 links

ROUTER_TYPE=ordinary|repeater|meta0|meta1|meta2|meta3
  Override the default NL6R Router Type
```

Example for an SGI UV 1000 system:

```
CMC:r1i1c> hwcfg --list
==== 4/4 BMC(s) ====
SOCKET_DISABLE=yes|no|<socket bitmask>
  Socket 0 disable

PARTITION=<numeric value 0-65535>
  Partition number for this blade

SMT_ENABLE=yes|no
  SMT (HyperThread) enable
```

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MAX_CORES=<numeric value 0-255, 0=no limit>
Maximum number of cores allowed (per node)

BLADE_DISABLE=yes|no
Disable this blade

IORISER_DISABLE=yes|no
Disable the I/O riser on this blade

ICH_DISABLE=yes|no
Disable ICH10 on this BaseIO

DEBUG_SW=<32-bit value>
Software debug switches (see "hwcfg --help DEBUG_SW" for details)

HUB_CORE_SPEED=320|367|375|383|400
Clock frequency of the HUB

NL5_ENABLE=yes|no|<NL5 port bitmask>
Enable NL5 links

NL5_RATE=1.25|2.5|3.125|5.0|6.25
NL5 transfer rate

NL5_CABLE_ENABLE=yes|no
Enable cabled NL5 links

NL5_NEAR_LB=yes|no
Configure NL5 channels in near loopback

NL5_SCRAMBLE=yes|no|<NL5 port bitmask>
Enable scramble mode on NL5 links

NL5_HUB2_WAR=yes|no
Enable the NL5 PHY/BIST war for Hub2.0

- To show all variables, regardless of state, use the `--all` option. For example, for an SGI UV 1000 system:

```
CMC:r111c> hwcfg --all  
BLADE_DISABLE=no
```



```

DEBUG_SW=0x0
HUB_CORE_SPEED=375
ICH_DISABLE=no
IORISER_DISABLE=no
MAX_CORES=0
NL5_CABLE_ENABLE=yes
NL5_ENABLE=yes
NL5_HUB2_WAR=yes
NL5_NEAR_LB=no
NL5_RATE=6.25
NL5_SCRAMBLE=0x0
PARTITION=0
SMT_ENABLE=no
SOCKET_DISABLE=no

```

- To show a list of hidden hardware overrides:

```
uv44-cmc:~ # hwcfg --hidden --all
```

For example, for SGI UV 2000:

```

CMC:r001i01c> hwcfg --hidden --all
BACKPLANE_TYPE=default
BIOS_FILE=/common/bios.fd
BLADE_DISABLE=no
DEBUG_SW=0x4
IORISER_DISABLE=no ..... 1/2 BMC(s)
IORISER_DISABLE=yes ..... 1/2 BMC(s)
MAX_CORES=0
NL6_ENABLE=0x808
PARTITION=0
ROUTER_TYPE=ordinary
SOCKET_DISABLE=no
{HIDDEN} BIOS_HOLD=no
{HIDDEN} BMCINIT0=
{HIDDEN} BMCINIT1=
{HIDDEN} BMC_RESET_DBG=0x0
{HIDDEN} BOOTMODE=QPI
{HIDDEN} CLOCK_MUX_SPREAD_SPECTRUM=no
{HIDDEN} CONSOLE_TO_DB9=no
{HIDDEN} FORCE_LOCAL_CLOCK=no

```

```
{HIDDEN} HARP_MEM_REPAIR_DISABLE=no
{HIDDEN} HARP_RESET_OPTS=
{HIDDEN} HARP_VDD_MARGIN=default
{HIDDEN} HUB_CORE_SPEED=375
{HIDDEN} HUB_DISABLE=no
{HIDDEN} HUB_XDP=no
{HIDDEN} IORISER_FORCE=no
{HIDDEN} IO_XDP=no
{HIDDEN} NL6INIT_OPTS=
{HIDDEN} NL6_8B10B=no
{HIDDEN} NL6_NEAR_LB=no
{HIDDEN} NL6_RATE=12.5
{HIDDEN} NL6_SPICO_FILE=
{HIDDEN} NL6_TUNE_ENABLE=yes
{HIDDEN} NL6_TX_EMPHASIS=0x0
{HIDDEN} QPI_SPEED=8.0
{HIDDEN} QPI_SPICO_FILE=
{HIDDEN} QPI_TUNE_ENABLE=yes
{HIDDEN} SNBCFG_OPTS=
```

Upgrading the System Basic Input/Output System (BIOS)

The following platform-specific procedures explain how to flash the system BIOS on SGI systems:

- "Flashing the BIOS on an SGI UV 2000 System" on page 28
- "Flashing the BIOS on an SGI UV 1000 System or an SGI UV 100 System" on page 30

Flashing the BIOS on an SGI UV 2000 System

The following procedure explains how to upgrade the compute blade BIOS on an SGI UV 2000 system.

Procedure 2-11 To upgrade the compute blade BIOS on an SGI UV 2000 system

1. Download a new BIOS file from SGI Supportfolio.

The Supportfolio login page is at the following URL:

<https://support.sgi.com/login>

2. Back up your existing BIOS file.

For example:

```
> cd /work/bmc/common
> mv bios.fd bios.fd.old
```

3. Use the following command to copy the new BIOS file to the correct directory on the CMC:

```
cp sgi-uv2-bios-version.fd /work/bmc/common/bios.fd
```

For *version*, specify the version you downloaded.

For example:

```
> cp sgi-uv2-bios-REL_3.1.04-2014-07-09_14.28.20.fd /work/bmc/common/bios.fd
```

4. Type the following command to copy the new BIOS file to all the CMCs:

```
> cmcpush /common/bios.fd
```

5. In another window, log into the SGI UV system as the root user, and type the following command to boot the operating system:

```
# reboot
```

6. On the CMC, type the following command, and wait for Linux to shut down completely:

```
> uvcon
```

7. When Linux has shut down completely, type CTRL-] q to exit the console.

8. Type the following command to activate the new BIOS:

```
> power -c reset
```

Note: The `power -c reset` command clears the BIOS and EFI settings, such as settings changed in the BIOS menu and the EFI settings set by `efibootmgr`. If you customized BIOS or EFI settings at your site, make sure to reset these values after you run the `power -c reset` command.

Flashing the BIOS on an SGI UV 1000 System or an SGI UV 100 System

The following flashing commands are available on the SMN for flashing the firmware on an entire SGI UV system:

```
flashcmc  
flashbmc  
flashiobmc
```

The following procedure explains how to upgrade the compute blade BIOS on an SGI UV 1000 system or an SGI UV 100 system.

Procedure 2-12 To upgrade the BIOS an SGI UV 1000 system or an SGI UV 100 system

1. Type the following command to display the current PROM level:

```
CMC:r1ilc> bios
```

For example, for SGI UV 1000:

```
CMC:r1ilc> bios  
Flashed on Sat May 1 14:14:45 UTC 2010 was bios.latest.fd (20100429_1603)
```

2. Contact your SGI representative, and request that they obtain the the newest PROM image for you from Supportfolio™.

The Supportfolio online website is as follows:

<http://support.sgi.com/>

Note: Upgrading to SGI UV BIOS 2.00 release (or later) from a pre-2.00 SGI UV BIOS release requires the set-up variables to be cleared using either of the following CMC commands:

```
flashbios -e  
power -c reset
```

These commands also clear any site-specific settings, such as M/N values and Extensible Firmware Interface (EFI) boot menu changes. These site-specific settings must be reconfigured on the 2.00 boot menu.

3. Copy the latest BIOS to a directory on the CMC in `/work/bmc/common/`.

For example:

```
CMC:r1i1c> ls
bios.latest.fd flashbios
```

4. Use the `flashbios` command to rewrite (or *flash*) the compute blade BIOS.

For example:

```
CMC:r1i1c> flashbios
Using default bios: bios.latest.fd
Checking processor status on all nodes...
Done. System is read for BIOS flash update
Flashing bios bios.lastest.fd (20100429_1603) This will take several minutes.
...
```

Adding an Accessory

SGI supports the Magma™ PCI Express® PCIe Expansion chassis. Power control affects only I/O accessories, such as this accessory. When the IRU chassis power is turned on, turned off, or cycled, the accessories are also turned on, turned off, or cycled. If necessary, use the `noio` option on the `CMC power on|off|cycle` commands to exclude the I/O accessories from the power operation.

The following procedure explains how to add an accessory to an SGI UV CMC.

Procedure 2-13 To connect an accessory

1. Use the accessory's documentation to configure the accessory to use DHCP.

When in use, the DHCP server on the CMC assigns an IP address to the accessory.

2. Connect a cable from the accessory's SNMP port to an open accessory jack on the CMC.

The accessory jacks are labeled as follows:

- On an SGI UV 2000 system, the accessory jack is labeled ACC. For a diagram that shows this jack, see the following:

Figure 2-2 on page 6

- On an SGI UV 1000 system or an SGI UV 100 system, the accessory jacks are labeled EXT0, EXT1, and EXT2. For diagrams that show these jacks, see the following:

Figure 2-4 on page 8

Figure 2-5 on page 9

If you have more accessories than available jacks, use an external switch.

3. Type the `config -v` command to display information about the accessory.

After you attach the accessory, the CMC queries the accessory's SMNP `sysName.0` object identifier (OID) to determine the accessory type. The content of the OID identifies the accessory. For example, Magma Chassis is assumed to be a Magma PCIe expansion chassis.

The CMC's DHCP server assigned an IP address to the accessory in the range of `10.rack.upos.100` — `10.rack.upos.199` range, where *rack* and *upos* are the rack and u-position of the CMC. This is the CMC's VACC virtual local area network (VLAN).

For example:

```
uvl4-cmc CMC:rlilc> config -v
CMCs:          1
    r001i01c UV1000
BMCs:          4
    r001i01b00 IP93-BASEIO
    r001i01b01 IP93-DISK
    r001i01b02 IP93
    r001i01b03 IP93
Partitions:    1
    partition000 BMCs: 4
Accessories:   1
    undefined   10.1.1.101 (Magma PCIE Expansion)
```

4. Specify the accessory's location.

To specify the location, type the `config` command in the following format:

```
config -acc ip_addr@rack.upos
```

The arguments are as follows:

<i>ip_addr</i>	Specify the IP address of the accessory.
<i>rack</i>	Specify the rack number. Racks are numbered sequentially with a three-digit number starting at 001. A rack contains IRU enclosures. In a single compute rack system, the rack number is always 001.
<i>upos</i>	For a Magma PCI Express PCIe Expansion chassis, specify the individual rack unit (IRU) position. IRU locations within a rack are identified by the bottom unit in which the IRU resides. For example, in a 42U rack, specify 1 as the <i>upos</i> for an IRU in the range U01 through U10.

For example:

```
uv14-cmc CMC:r1i1c> config --acc 10.1.1.101@1.30
==== r001i01c (PRI) ====
10.1.1.101 (Magma Chassis) configured as r001u30io
```

5. Use the `config -v` command to verify the accessory's location.

For example:

```
uv14-cmc CMC:r1i1c> config -v
CMCs:          1
  r001i01c UV1000
BMCs:          4
  r001i01b00 IP93-BASEIO
  r001i01b01 IP93-DISK
  r001i01b02 IP93
  r001i01b03 IP93
Partitions:    1
  partition000 BMCs: 4
Accessories:   1
  r001u30io      10.1.1.101 (Magma PCIE Expansion)
```

The preceding output shows `r001u30io` as the location for the accessory. For a Magma PCIe Expansion chassis, the format is `rrackuuposio`.

Enabling Hyper-Threading

Threading in a software application splits instructions into multiple streams so that multiple processors can act on them.

Intel® Hyper-threading (HT) technology provides thread-level parallelism on each processor, resulting in more efficient use of processor resources, higher processing throughput, and improved performance. One physical CPU can appear as two logical CPUs by having additional registers to overlap two instruction streams or a single processor can have dual-cores executing instructions in parallel.

The following procedures explain how to enable HT on an SGI UV systems. The procedure is the same for SGI UV 1000 and SGI UV 100 systems. The procedure is different for SGI UV 2000 systems.

Procedure 2-14 To enable HT on SGI UV 1000 or SGI UV 100 systems

1. To enable HT, type the following:

```
CMC:r001i01c> hwcfg SMT_ENABLE=yes
```

Procedure 2-15 To disable HT on SGI UV 1000 or SGI UV 100 systems

1. To disable HT, type the following:

```
CMC:r001i01c> hwcfg SMT_ENABLE=no
```

Procedure 2-16 To enable or disable HT on SGI UV 2000 systems

1. Prepare the system.

This step differs, depending on whether your SGI UV system is powered on or powered off.

If your system is powered off, complete the following procedure: "Powering On and Booting an SGI UV System From a Complete Power Off" on page 17

If your system is powered on, complete the following steps:

- Establish a connection to the CMC and log in.

Use one of the following procedures:

- "Accessing the CMC on an SGI UV 2000 System Through a Serial Connection" on page 4
- "Accessing the Chassis Management Controller (CMC) Through a Network Connection and Logging In" on page 9

- Type the `uvcon` command to access the system console.
 - Log into the system, and reboot.
2. When the `Shell>` prompt appears, type `exit` to access the BIOS manager.
 3. On the BIOS manager's main screen, use the arrow keys to select **Continue**, and press `Enter`.
 4. On the **Device Manager** screen, select **Platform Driver Override selection**.
 5. On the **Advanced** screen, select **Processor Configuration**.
 6. On the **Processor Configuration** screen, in the **Hyper-Threading** line, select the current status indicator, which can be either **Disable** or **Enable**.
 7. On the popup that appears, select the Hyper-Threading status that you want.
 8. Press the `Esc` key until the screen shown in Figure 2-8 on page 36 appears:

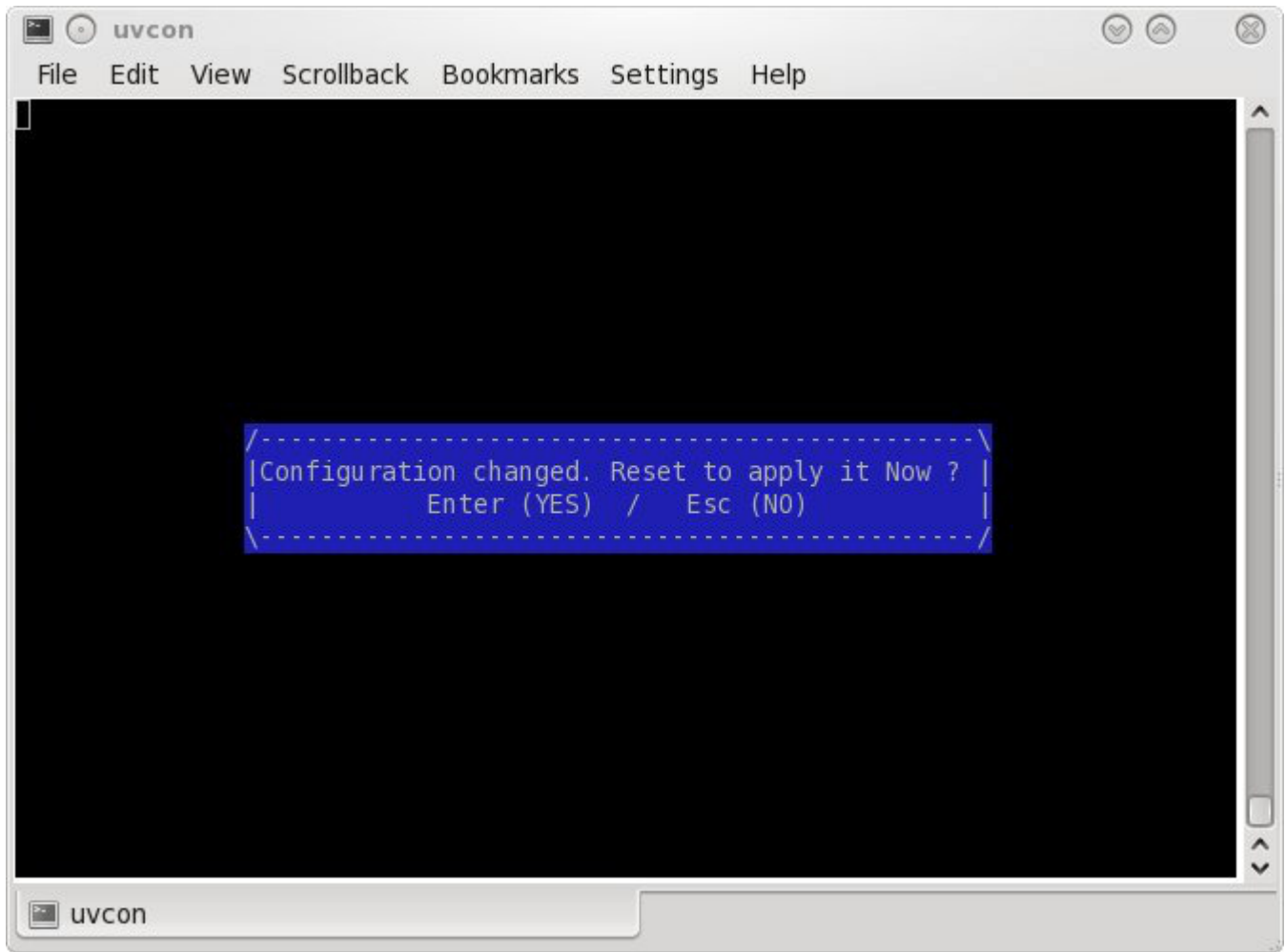


Figure 2-8 Reset Screen

9. Press `Enter` to confirm your choice, or press `Esc` to quit without confirming your choice.
10. Press the space bar to return to the BIOS manager.

For more information about using HT, see the *SGI Cpuset Software Guide*.

Creating a Message of the Day (SGI UV 2000 Systems Only)

The following procedure explains how to create a message of the day on SGI UV 2000 systems.

Procedure 2-17 To create a message of the day

1. Type the following command to verify the CMC's firmware version:

```
> version
```

Make sure the output indicates that the firmware version is 0.8.0 or higher. Lower firmware versions do not support the ability to create a message of the day.

2. Type the following command to stop the `motd` daemon:

```
> /etc/init.d/s40_gen_motd stop
```

3. Type the following command to start the `motd` daemon:

```
> /etc/init.d/s40_gen_motd start
```

4. Log out of the CMC, and log back in again.
5. Use a text editor, such as `vi(1)`, to edit file `/etc/sysconfig/motd` and add the message you want to display.

Chassis Management Controller (CMC) Command Reference

This chapter discusses the following:

- "CMC Commands Overview" on page 39
- "Chassis Management Controller (CMC) and Baseboard Management Controller (BMC) Command Targets" on page 41
- "auth" on page 43
- "autopower" on page 44
- "bios" on page 45
- "bmc" on page 46
- "cmc" on page 46
- "config" on page 47
- "console" on page 49
- "flashbios (SGI UV 1000 Systems and SGI UV 100 Systems Only)" on page 52
- "hel" on page 52
- "hwcfg" on page 53
- "log" on page 55
- "power" on page 56
- "sensor" on page 58
- "version" on page 58

CMC Commands Overview

The chassis management controller (CMC) commands perform the following functions:

- Control and monitor individual rack unit (IRU) and router fan speeds
- Read system identification (ID) PROMs
- Monitor voltage levels and reports failures
- Monitor and controls warning LEDs on the enclosure
- Create multiple system partitions running their own operating systems
- Flash system BIOS

You can use the CMC commands from the CMC command line or from the SGI Management Node (SMN) command line. The commands typically use the following format:

```
command [command_parameters] [target [ target ... ]]
```

The following information pertains to the *target* parameter:

- If no *target* parameters appear on a command line, the command operates on all BMCs or CMCs. You might have to enclose some *target* specifications in quotation marks (`` ``) to avoid wild card expansion in the shell. Use a space to separate individual *target* parameters. The system does not support the ability to specify a range of targets.
- If you specify *r** for the *target*, the command operates on all racks.
- If you specify *i** for the *target*, the command operates on all IRUs.
- You can specify a decimal number to replace the asterisk (*) to narrow the *target* specification.

The commands are located in `/sysco/bin` on both the SMN and CMC. For a list of available commands, enter the following at the SMN or CMC system prompt:

```
> /sysco/bin/help -t
```

Most of the commands (`bios`, `bmc`, `cmc`, `config`, `hwcfg`, `log`, `power`, and `console`) are available at both the CMC prompt (as user `root`) and at the SMN prompt (as user `sysco`).

For a list of parameters available with each command, type:

```
> command --help
```

Chassis Management Controller (CMC) and Baseboard Management Controller (BMC) Command Targets

Many CMC commands accept a *target* argument that you can use to direct the command to operate on a group of CMCs or BMCs. The syntax lets you specify one target, multiple targets, or a range of targets. If you do not specify a target, the command operates on all BMCs or CMCs, as appropriate for a command.

The table in this topic shows how to specify groups of targets. You might need to quote some *target* arguments to avoid wild card expansion by the SMN/CMC shell. The table uses the following notation:

Notation	Meaning
Any	In the table, <i>Any</i> refers to all racks, all U-positions, or all slots. <i>Any</i> also appears if you can use the command for all BMC types and for all CMC types.
<i>upos</i>	The U-position of the component in the rack. Some command output uses <i>u</i> , rather than <i>upos</i> ; these terms are equivalent.
<i>rack</i>	The rack in which the component is housed.
*	All values in that position. For example, <i>r*</i> references all racks, and <i>i*</i> references all IRUs.
	You can use a decimal number to narrow the target selection in place of any asterisk. The commands do not support ranges, but you can specify a space-separated list of targets.
BMC Type	One of the following: <ul style="list-style-type: none"> • Any. Applies to all BMC types. • IRUCOMP, as follows: <ul style="list-style-type: none"> – On an SGI UV 2000, IRUCOMP describes computer blade slots 0 through 7. – On an SGI UV 1000, IRUCOMP describes computer blade slots 0 through 15. – On an SGI UV 100, IRUCOMP describes computer blade slots 0 through 2. • IRUIO, IRU computer blades with an I/O riser, as follows:

- On an SGI UV 2000, IRUIO describes computer blade slots 0 through 7.
- On an SGI UV 1000, IRUIO describes computer blade slots 0 through 15.
- On an SGI UV 100, computer blade slots 0 through 2.
- IRURTR. IRU router blades (router slots 0 through 3).
- EXTRTR, as follows:
 - On Quad Compact Router (QCR) router blades, slots 0 through 3.
 - On Optical Character Recognition (OCR) router blades, slots 0 through 7.

CMC
Type

One of the following:

- Any. Applies to all CMC types.
- QCR. External. Applies to an SGI UV 1000 system.
- IRU. Applies to an SGI UV 2000, an SGI UV 1000, or SGI UV 100 chassis.
- ORC. External. Applies to an SGI UV 2000 system.

Table 3-1 CMC Command *target* Specifications

<i>target</i> Syntax	BMC <i>rack, upos, slot</i> — BMC Type	CMC <i>rack, upos</i> — CMC Type
<i>*</i> , all	Any, Any, Any — Any	Any, Any — Any
<i>r*</i>	<i>rack</i> , Any, Any — Any	<i>rack</i> , Any — Any
<i>r*i*</i>	<i>rack, upos</i> , Any — IRURTR, IRUCOMP	<i>rack, upos</i> — IRU
<i>r*q*</i>	<i>rack, upos</i> , Any — EXTRTR	<i>rack, upos</i> — QCR
<i>r*o*</i>	<i>rack, upos</i> , Any — EXTRTR	<i>rack, upos</i> — ORC
<i>r*i*b*</i>	<i>rack, upos, slot</i> — IRUCOMP	N/A
<i>r*i*r*</i>	<i>rack, upos, slot</i> — IRURTR	N/A

<i>target Syntax</i>	BMC <i>rack, upos, slot</i> — BMC Type	CMC <i>rack, upos</i> — CMC Type
<i>r*q*r*</i>	<i>rack, upos, slot</i> — EXTRTR	N/A
<i>r*o*r*</i>	<i>rack, upos, slot</i> — EXTRTR	N/A
<i>*c</i>	N/A	Any, Any — Any
<i>r*i*c</i>	N/A	<i>rack, upos</i> — IRU
<i>r*q*c</i>	N/A	<i>rack, upos</i> — QCR
<i>r*o*c</i>	N/A	<i>rack, upos</i> — ORC
<i>allb, allc, computes</i>	Any, Any, Any — IRUCOMP	N/A
<i>allbi, allci</i>	Any, Any, Any — IRUIO	N/A
<i>alli</i>	Any, Any, Any — IRUCOMP, IRURTR	N/A
<i>allr, routers</i>	Any, Any, Any — IRURTR, EXTRTR	N/A
<i>allri</i>	Any, Any, Any — IRURTR	N/A
<i>allre</i>	Any, Any, Any — EXTRTR	N/A
<i>r*u*io, allio</i>	Accessory I/O	N/A
<i>p*</i>	All IRUCOMPs with matching partitions. This is a partition target.	N/A

Chassis Management Controller (CMC) and Baseboard Management Controller (BMC) Commands

The following topics describe the CMC and BMC commands.

auth

The `auth` command sets the average peak performance in weighted teraflops (APPWT) limit for export compliance. You can obtain the key and reset the limit if needed.

To see the usage statement:

```
CMC:r014i01c> auth --help
```

```
usage: auth [-ard] [-s <SSN>] <key> [<key>]... [--help] [TARGET]...
-s, --ssn=<SSN>          system serial number change
-a, --appwt              APPWT change
-r, --reset              set learn mode
-d, --disable            disable authentication
<key>                   authentication keys
--help                  display this help and exit
```

autopower

The `autopower` command allows your system to power up automatically when power is applied after a power outage. Issuing the `autopower` command without any argument acts as a query, with the results displaying the current state (enabled/disabled) and (if enabled) the current delay time and the results of the last attempted automatic power on.

To determine if autopower is enabled:

```
CMC:r001i01c> autopower
==== r001i01c (PRI) ====
auto-power on is enabled (120 second delay), aborted (power already on).
```

To disable auto-power:

```
uv44-cmc CMC:r001i01c> autopower -d
==== r001i01c (PRI) ====
auto-power on disabled
```

To see the usage statement:

```
CMC:r001i01c> autopower --help
```

```
usage: autopower [-edc] [-t <seconds>] [--help]
-e, --reset            enable auto-power on
-t, --time=<seconds>  time (seconds) to delay auto-power on
-d, --disable         disable auto-power on
-c, --cancel          cancel auto-power on
--help                display this help and exit
```

bios

The `bios` command displays BIOS information for the system after it is powered on.

To see the usage statement:

```
CMC:r1i1c> bios --help
```

```
usage: bios [-rsuv] [--help] [TARGET]...
-r, --revision          display last BIOS revision banner
-s, --state             display current BIOS state
-u, --uptime           display time since last BIOS reset
-v, --verbose          verbose output
--help                 display this help and exit
```

Example 1. The following shows `bios` command usage on an SGI UV 2000:

```
CMC:r001i01c> bios
==== 8/8 BMC(s) ====
h0: Last booted: SGI BIOS 2.1.0 built in romley0tmp by habeck on Oct  1 2012 at 11:52:44
h1: Last booted: SGI BIOS 2.1.0 built in romley0tmp by habeck on Oct  1 2012 at 11:52:44

harp35-cmc CMC:r001i01c>
harp35-cmc CMC:r001i01c>
harp35-cmc CMC:r001i01c>
CMC:r001i01c> bios -s
==== 7/8 BMC(s) ====
h0: [S:0x02,DF:0x001e01] Sleeping      - Handoff (SlaveHandoff)
h1: [S:0x02,DF:0x001e01] Sleeping      - Handoff (SlaveHandoff)
==== 1/8 BMC(s) [r001i01b00] ====
h0: [S:0x04,DF:0x00aa00] EFI Shell     - Shell
h1: [S:0x02,DF:0x001e01] Sleeping      - Handoff (SlaveHandoff)
harp35-cmc CMC:r001i01c>
```

Example 2. The following shows `bios` command usage on an SGI UV 1000:

```
CMC:r1i1c> bios
==== 4/4 BMC(s) ====
Last booted: SGI BIOS Version 2 Revision 0 built in 20101012_1502 by ajm on Oct 12 2010 at 15:08:29
```

bmc

The `bmc` command sends a command to one or more BMCs. It is a shell command similar in behavior to the `ssh` command.

To see the usage statement:

```
CMC:rlilc> bmc --help
```

```
usage: bmc [-t] exec <command> [--timeout=<seconds>] [TARGET]...
```

```
exec                executes command on BMC(s)
```

```
<command>          command to execute
```

```
--timeout=<seconds>  timeout value
```

```
-t, --terse         terse mode
```

```
usage: bmc list [TARGET]...
```

```
list                list active shells on BMC(s)
```

```
usage: bmc kill [TARGET]...
```

```
kill                kill all active shells on BMC(s)
```

```
usage: bmc [-v] runtime [TARGET]...
```

```
runtime             show daemon run time
```

```
-v, --verbose       verbose mode
```

```
usage: bmc reboot [TARGET]...
```

```
reboot              initiates controller reboot
```

```
usage: bmc --help
```

```
--help              display this help and exit
```

cmc

The `cmc` command sends a command to one or more CMCs. It is a shell command similar in behavior to the `ssh` command.

To see the usage statement:

```
CMC:rlilc> cmc --help
```

```
usage: cmc [-t] exec <command> [--timeout=<seconds>] [TARGET]...
```

```

exec                executes command on CMC(s)
<command>          command to execute
--timeout=<seconds> timeout value
-t, --terse         terse mode

usage: cmc list [TARGET]...
list                list active shells on CMC(s)

usage: cmc kill [TARGET]...
kill                kill all active shells on CMC(s)

usage: cmc [-v] runtime [TARGET]...
runtime             show daemon run time
-v, --verbose       verbose mode

usage: cmc reboot [TARGET]...
reboot              initiates controller reboot

usage: cmc --help
--help              display this help and exit

```

config

The `config` command shows your system configuration. For example:

```

CMC:r1l1c> config -v

CMCs:                1
                    r001i01c UV1000 SMN

BMCs:                4
                    r001i01b00 IP93-BASEIO
                    r001i01b01 IP93-DISK
                    r001i01b02 IP93
                    r001i01b03 IP93

Partitions:          1
                    partition000 BMCs:    4

Accessories:         0

```

To see the usage statement:

```
CMC:rlilc> config --help
usage: config [-tvd] [-a <ip>@<location>] [--pcheck] [--plist] [<TARGET>]... [--help]
-t, --terse           terse output
-v, --verbose         verbose output
-d, --debug           debug output
-a, --acc=<ip>@<location>
    configure accessory location
    <location> is <rack>.<uposition> for IO
    <location> is <rack>.<0|1> for PDUs (0=left, 1=right)

--pcheck              check for targets crossing partitions
--plist               list partitions targeted
--help                display this help and exit
```

The -t/--terse parameter produces a terse configuration report:

- On an SGI UV 2000, it produces a terse configuration report similar to the following:

```
CMC:r001i01c> config -t

SSN: UV2-00000010, CMCs: 2, BMCs 2/2, Partitions: 1, Accessories: 0
r001i01c b-00-
r001i02c b-00-
```

- On an SGI UV 100 system with two IRUs, it produces a terse configuration report similar to the following:

```
SSN: UVL-00000001, CMCs: 2, BMCs 4/4, Partitions: 1, Accessories: 0
r001i01c b-00-01
r001i02c b-00-01
```

- For a single SGI UV 1000 IRU without blades in slots 0 through 7 (or router blades), this output shows the “holes” for blades not present, similar to the following:

```
SSN: UV-00000021, CMCs: 1, BMCs 8/8, Partitions: 1, Accessories: 2
r001i01c b- - - - - - - - -08-09-10-11-12-13-14-15 r- - - -
```

On VT100-compliant terminals, it will use the following character attributes:

```
Reverse red - blade is connected, but not configured
```

Reverse yellow - blade is disabled (see hwcfg command)

- On an SGI UV 100 system with eight IRUs, it produces a terse configuration report similar to the following:

```
SSN: UV-00000048, CMCs: 16, BMCs 192/192, Partitions: 5, Accessories: 0
r001i01c b-00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15 r-00-01-02-03
r001i23c b-00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15 r-00-01-02-03
r001q42c r-00-01-02-03
r001q43c r-00-01-02-03
r002i01c b-00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15 r-00-01-02-03
r002i23c b-00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15 r-00-01-02-03
r002q42c r-00-01-02-03
r002q43c r-00-01-02-03
r003i01c b-00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15 r-00-01-02-03
r003i23c b-00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15 r-00-01-02-03
r003q42c r-00-01-02-03
r003q43c r-00-01-02-03
r004i01c b-00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15 r-00-01-02-03
r004i23c b-00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15 r-00-01-02-03
r004q42c r-00-01-02-03
```

console

The `console` command opens a console window on the CMC, BMC, or compute blade. Use CTRL -] q to exit the console.

Note: The `console` command supersedes the `uvcon` command. The `uvcon` command is an alias to the `console` command.

To see the usage statement for SGI UV 2000:

```
CMC:r001i01c> console --help
```

```
usage: console [-bnd23] [--steal] [--spy] [--kill] [--notty] [--nocache] [--clear] [--full] [--quiet]
[--timestamp] [TARGET]
-b, --baseio                specifies baseio bmc console
-n, -0, --normal            specifies node BMC console (normal channel)
-d, -1, --debug            specifies node BMC console (debug channel)
-2, --chan2                specifies node BMC console (channel 2)
```

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```
-3, --chan3          specifies node BMC console (channel 3)
--steal              steal the console
--spy                spy the console
--kill               kill all other uvcon sessions
--notty              disables tty interventions
--nocache            don't return cached output
--clear              clear cached output
--full               full output (default is since last reset)
--quiet              quiet mode (only system I/O, implies --notty --nocache)
--timestamp          prefix timestamp to output lines
TARGET               console target
```

escape codes:

```
ctrl-] s    steal console
ctrl-] r    release console
ctrl-] c    connection status
ctrl-] q    quit (if active console)
ctrl-] ?|h  this help
```

usage: console -d[band23cCft] [-l] [TARGET]...

```
-d, --dump          dump cached console output
-b, --baseio        specifies baseio bmc console
-a, --all           all node BMC consoles
-n, -0, --normal    specifies node BMC console (normal channel)
-d, -1, --debug     specifies node BMC console (debug channel)
-2, --chan2         specifies node BMC console (channel 2)
-3, --chan3         specifies node BMC console (channel 3)
-l, --lines=        limit output to last lines
-c, --clear         clear cached output after dumping
-C, --CLEAR         clear cached output without dumping
-f, --full          full dump (default is since last reset)
-t, --tag           prefix each line with source
TARGET              console target
```

usage: console -i [TARGET]...

```
-i, --input=        backdoor baseio console input
TARGET              console target
```

usage: console --help

```
--help              display this help and exit
```

```
harpl0-cmc CMC:r001i01c>
```


To see a usage statement for SGI UV 100 or SGI UV 1000:

```
CMC:r014i01c> console --help
```

```
usage: console [-bnd23] [--steal] [--spy] [--kill] [--notty] [--nocache] [--clear] [TARGET]
-b, --baseio          specifies baseio bmc console
-n, -0, --normal      specifies node BMC console (normal channel)
-d, -1, --debug       specifies node BMC console (debug channel)
-2, --chan2           specifies node BMC console (channel 2)
-3, --chan3           specifies node BMC console (channel 3)
--steal               steal the console
--spy                 spy the console
--kill                kill all other uvcon sessions
--notty               disables tty interventions
--nocache             don't return cached output
--clear               clear cached output
TARGET                console target
```

escape codes:

```
ctrl-] s    steal console
ctrl-] r    release console
ctrl-] c    connection status
ctrl-] ?|h  this help
```

```
usage: console -d[band23cCft] [-l <count>] [TARGET]...
-d, --dump          dump cached console output
-b, --baseio        specifies baseio bmc console
-a, --all           all node BMC consoles
-n, -0, --normal    specifies node BMC console (normal channel)
-d, -1, --debug     specifies node BMC console (debug channel)
-2, --chan2         specifies node BMC console (channel 2)
-3, --chan3         specifies node BMC console (channel 3)
-l, --lines=<count> limit output to last <count> lines
-c, --clear         clear cached output after dumping
-C, --CLEAR         clear cached output without dumping
-f, --full          full dump (default is since last reset)
-t, --tag           prefix each line with source
TARGET              console target
```

```
usage: console [-bnd23] -i <input> [TARGET]...
```

```
-i, --input=<input>      backdoor console input
-b, --baseio             specifies baseio bmc console
-n, -0, --normal        specifies node BMC console (normal channel)
-d, -1, --debug         specifies node BMC console (debug channel)
-2, --chan2             specifies node BMC console (channel 2)
-3, --chan3             specifies node BMC console (channel 3)
TARGET                  console target

usage: console --help
--help                  display this help and exit
```

Note: The following character sequences are available interactively after a console session is started:

```
console: escape codes:
console:  ctrl-] s      steal console
console:  ctrl-] r      release console
console:  ctrl-] c      connection status
console:  ctrl-] ?|h    this help
```

flashbios (SGI UV 1000 Systems and SGI UV 100 Systems Only)

The `flashbios` command rewrites (flashes) the latest BIOS located in the `/work/bmc/common` directory on the CMC of an SGI UV 1000 system or an SGI UV 100 system.

"Flashing the BIOS on an SGI UV 1000 System or an SGI UV 100 System" on page 30 explains how to use this command to flash the BIOS on an SGI UV 1000 system or an SGI UV 100 system.

"Flashing the BIOS on an SGI UV 2000 System" on page 28 explains how to flash the BIOS on an SGI UV 2000 system.

hel

The `hel` command displays the hardware error logs.

To get a usage statement:

```
CMC:r001i01c> hel --help

usage: hel [-cax] [--help] [TARGET]...
-c, --clear          clear log
-a, --all            show all errors (default is since last reset)
-x, --hex           hexadecimal dump
--help              display this help and exit
```

hwcfg

The `hwcfg` command displays and sets hardware override variables.

For information about how to use the `hwcfg` command to partition an SGI UV system, see the *SGI UV System Software Installation and Configuration Guide*.

For example, for SGI UV 1000:

```
CMC:r1i1c> hwcfg -a -v
BLADE_DISABLE=no
DEBUG_SW=0x0
HUB_CORE_SPEED=400
ICH_DISABLE=no
IORSER_DISABLE=no
MAX_CORES=0
NL5_CABLE_ENABLE=yes
NL5_ENABLE=yes
NL5_HUB2_WAR=no
NL5_NEAR_LB=no
NL5_RATE=6.25
NL5_SCRAMBLE=0x0
PARTITION=0
SMT_ENABLE=no
SOCKET_DISABLE=no
```

For example, for SGI UV 1000 showing a system with four partitions:

```
CMC:r1i1c> hwcfg -a -v
NL5_RATE=5.0
PARTITION=1 ..... 16/64 BMC(s)
```

```
PARTITION=2 ..... 16/64 BMC(s)
PARTITION=3 ..... 16/64 BMC(s)
PARTITION=4 ..... 16/64 BMC(s)
```

You can use `hwcfg -c` to clear the four partitions, as follows:

```
CMC:rlilc> hwcfg -c partition
PARTITION=0 <PENDING RESET>
```

For example, for SGI UV 2000:

```
CMC:r001i01c> hwcfg -a -v
BIOS_FILE=/common/bios.fd
    all targeted BMC(s)
BLADE_DISABLE=no
    all targeted BMC(s)
DEBUG_SW=0x4
    all targeted BMC(s)
IORISER_DISABLE=no ..... 1/2 BMC(s)
    r001i01b00
IORISER_DISABLE=yes ..... 1/2 BMC(s)
    r001i02b00
MAX_CORES=0
    all targeted BMC(s)
NL6_ENABLE=0x808
    all targeted BMC(s)
PARTITION=0
    all targeted BMC(s)
ROUTER_TYPE=ordinary
    all targeted BMC(s)
SOCKET_DISABLE=no
    all targeted BMC(s)
```

To see the usage statement:

```
CMC:rlilc> hwcfg --help
```

```
usage: hwcfg [-lhadcv] [var[=val]]... [--help] [TARGET]...
```

```
var[=val]          variable [and value to set]
-l, --list         list variables available
-h, --hidden       include hidden variables
-a, --all          show variable(s) regardless of override state
```

-d, --default	show variable(s) default value if overridden
-c, --clear	clear overridden variable(s) to default value
-v, --verbose	show per BMC output, repeat for maximum verbosity
--help	display this help and exit, use with variable(s) to get specific help

leds

The `leds` command displays system LED values.

To see the usage statement:

```
CMC:r001i01c> leds --help
```

```
usage: leds [-sv] [-c <index>] [-d <value>] [--help] [TARGET]...
```

-c, --cpu=<index>	index of cpu to display
-d, --delay=<value>	sample delay value in seconds
-s, --summary	show shorter LED history
-v, --verbose	show longer LED history
--help	display this help and exit

log

The `log` command provides a log of various operations performed on the CMC.

To see the usage statement:

```
CMC:r001i01c> log --help
```

```
usage: log [-pacewnidmr] [--help] [TARGET]...
```

-p, --panic	select log type
-a, --alert	select log type
-c, --critical	select log type
-e, --error	select log type
-w, --warning	select log type
-n, --notice	select log type
-i, --info	select log type
-d, --debug	select log type

-m, --merge	prevent merging of selected logs
-r, --reset	reset log
--help	display this help and exit

power

The `power` command lets you power on, power off, reset, cycle, get status, and invoke the kernel debugger (KDB).

When you use the `power` command, you do not have to power up the IRU. When the `power` command runs, it checks to see if the IRU is powered on. If the IRU is not powered on, it powers up the IRU, and it then powers up the compute blades.

To see the usage statement:

```
CMC:rlilc> power --help
```

```
usage: power [-vchosw] on|up [bmc] [--noio] [TARGET]...
on|up          turn power on
bmc           turn aux power on
--noio        do not power on accessories (IO)
-v, --verbose verbose output
-c, --clear   clear EFI variables (system/partition targets only)
-h, --hold    hold in reset
-o, --override override partition check
-s, --single  single node boot
-w, --watch   watch boot progress

usage: power [-vo] off|down [bmc] [--noio] [--nochassis] [TARGET]...
off|down      turn power off
bmc          turn aux power off
--noio       do not power off accessories (IO)
--nochassis  do not power off chassis power
-v, --verbose verbose output
-o, --override override partition check

usage: power [-vchosw] reset [bmc|iobmc] [TARGET]...
reset        system reset
bmc|iobmc   BMC reset
-v, --verbose verbose output
-c, --clear  clear EFI variables (system/partition targets only)
```

```
-h, --hold                hold in reset
-o, --override            override partition check
-s, --single              single node boot
-w, --watch               watch boot progress

usage: power [-vchosw] cycle [bmc] [--noio] [--nochassis] [TARGET]...
cycle
bmc
--noio                    do not power cycle accessories (IO)
--nochassis               do not power cycle chassis power
-v, --verbose             verbose output
-c, --clear               clear EFI variables (system/partition targets only)
-h, --hold                hold in reset
-o, --override            override partition check
-s, --single              single node boot
-w, --watch               watch boot progress

usage: power [-v10ud] [status] [TARGET]...
status
-v, --verbose             verbose output
-l, --on                  show only blades with on status
-0, --off                 show only blades with off status
-u, --unknown             show only blades with unknown status
-d, --disabled            show only blades with disabled status

usage: power [-ov] nmi|debug [TARGET]...
nmi|debug                 issue NMI
-o, --override            override partition check
-v, --verbose             verbose output

usage: power [-v] margin [high|low|norm|<value>] [TARGET]...
margin
high|low|norm|<value>    power margin control
-v, --verbose             verbose output

usage: power cancel [TARGET]...
cancel                    cancel outstanding power action

usage: power --help
--help                    display this help and exit
```

sensor

The `sensor` command is normally used remotely by SMN-based applications. However, you can use the `sensor` command to get system temperatures, fan speed, and voltage information, as follows:

```
CMC:r1i1c> sensor
```

Use the command from the `cmc` or `bmc` shell, as follows:

```
cmc sensor  
bmc sensor
```

The BMCs on SGI UV 2000 systems do not support the `sensor` command.

version

The `version` command displays the CMC firmware version. For example:

```
uv44-cmc CMC:r001i01c> version  
SGI Chassis Manager Controller, Firmware Rev. 1.3.16 [Bootloader 0.6.0]
```

You can use the `version` command to determine the BMC firmware version, as follows:

```
uv44-cmc CMC:r001i01c> bmc version  
==== r001i01b00 ====  
SGI UV BMC, Firmware Rev. 1.3.20 [Bootloader 0.5.0, FPGA Rev. 0x41]  
==== r001i01b01 ====  
SGI UV BMC, Firmware Rev. 1.3.20 [Bootloader 0.5.0, FPGA Rev. 0x41]
```

You can access the BMC using `ssh` and then use the `version` command, as follows:

```
uv44-cmc CMC:r001i01c> ssh bmc0  
  
SGI UV BMC, Firmware Rev. 1.3.20  
  
BMC:r001i01b00> version  
SGI UV BMC, Firmware Rev. 1.3.20 [Bootloader 0.5.0, FPGA Rev. 0x41]
```

You can access the Base I/O blade BMC using `ssh` and then use the `version` command, as follows:


```
uv44-cmc CMC:r001i01c> ssh ibmc0
```

```
SGI UV BMC, Firmware Rev. 1.3.9
```

```
r001i01b00i> version
```

```
SGI Chassis Manager Controller, Firmware Rev. 1.3.9 [Bootloader 0.3.0]
```

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