SGI® UV™ RMC Software User Guide

007–6361–001

New Features in this Guide

This new manual describes rack management controller (RMC) operations on SGI UV 300 systems and on SGI UV for SAP HANA® systems.

Record of Revision

Version	Description
001	December 2014 Initial release.

Contents

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About This Guide

You can use the rack management controller (RMC) commands and open source `ipmitool` commands to monitor and manage SGI® UV™ 300 computer systems and SGI UV for SAP HANA® systems.

This guide assumes that you are familiar with the information in the SGI UV 300 system hardware guides. The information in this guide applies to both SGI UV 300 systems and SGI UV for SAP HANA systems. The few topics in this guide that apply only to SGI UV 300 platforms are noted as such in the topic title.

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 http://docs.sgi.com. The following publications might be useful to you:

- *SGI UV System Software Installation and Configuration 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.

Getting Started

This chapter includes the following topics:

About Getting Started With the SGI UV 300 System

The SGI UV 300 system includes a rack management controller (RMC). The RMC provides the top layer of system control for an SGI UV 300 system. This 1U-high, rack-mount chassis is a standalone controller that performs the following capabilities:

- System control for an SGI UV 300 system that is up to two racks (16 chassis) in size.
- Booting and maintenance.
- Environment monitoring.
- Time synchronization, provided through a synchronous Ethernet connection to each SGI UV 300 chassis baseboard management controller (BMC).
- SGI UV 300 system failure analysis, using the `uv3dmp` command.
- Command-based control, both local and remote, as follows:
  - For local management, you can use the platform-specific RMC commands.

– For remote management, you can use the open source `ipmitool` command. SGI supports a subset of the open source intelligent platform management interface (IPMI) protocol's specification.

The following topics explain how to configure the RMC on your site network:

- "Obtaining Network Information for the RMC" on page 2
- "(Conditional) Setting the Position of the RMC Within its Rack" on page 3
- "Adding Your Site Network Information to the RMC" on page 7

Obtaining Network Information for the RMC

The following procedure explains the information you need to obtain from your site network administrator in order to configure a static IP address on the RMC of the SGI UV 300 system.

Procedure 1-1 To obtain network information

1. Consult your network administrator, and obtain the following information for the SGI UV 300 system:

Information Needed	Information for this SGI UV 300's RMC
IP address	_____
Network mask	_____
Hostname	_____
(Optional) Site gateway	_____

You can use the second column record the network information for your SGI UV 300 computer system's RMC.

Note: You can reference the RMC by its hostname or by its IP address. SGI documentation uses the hostname in all example, and SGI recommends that you refer to the RMC by its hostname.

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2. (Optional) Obtain the IP address of an external server to which you can forward SGI UV 300 SNMP traps alerts.
3. Proceed to one of the following:

- If you installed the SGI UV 300 system in a generic rack at your site, proceed to the following:

  "(Conditional) Setting the Position of the RMC Within its Rack" on page 3

- If your SGI UV 300 system is installed in an SGI rack, proceed to the following:

  "Adding Your Site Network Information to the RMC" on page 7

(Conditional) Setting the Position of the RMC Within its Rack

Perform the procedure in this topic if you installed an SGI UV 300 into a generic rack at your site. You do not need to perform this procedure if you purchsed an SGI UV 300 system installed in an SGI rack.

The following procedure explains how to examine the RMC, and familiarize yourself with the RMC ports, and specify the location of the RMC in the SGI UV 300 rack.

Procedure 1-2 To connect to the RMC and specify the location of the SGI UV 300 RMC in the rack

1. Physically install the SGI UV 300 chassis and RMC into the rack, and note the following:
   - The rack number into which you installed the RMC.
   - The rack unit position of the RMC.
2. Obtain the following equipment:
   - A laptop computer with a terminal emulation program installed upon it. For example, if you have a Linux laptop, you could use cu or Minicom. If you have a Windows laptop, you could use PuTTY.
   - The cable that has a USB-A connector on one end and a micro USB-B connector on the other end.

     This is SGI part number 018–1667–001.
3. Open the front door to the SGI UV 300 computer system and locate the RMC.

   Figure 1-1 on page 4 shows where the RMC resides.

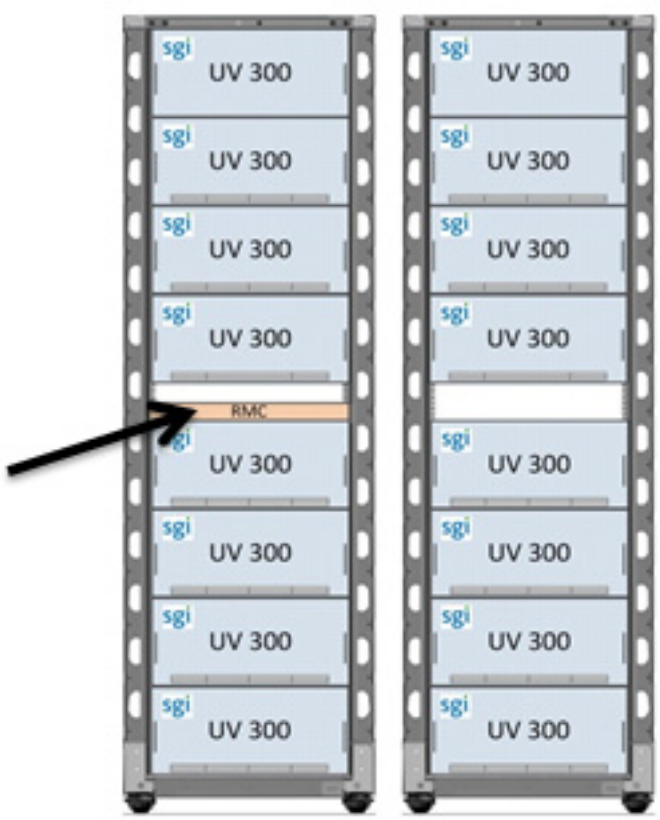

Figure 1-1 RMC Inside the SGI UV 300 Chassis

4. Examine the front panel and familiarize yourself with the items on the panel. Figure 1-2 on page 5 shows the RMC ports and light-emitting diodes (LEDs).

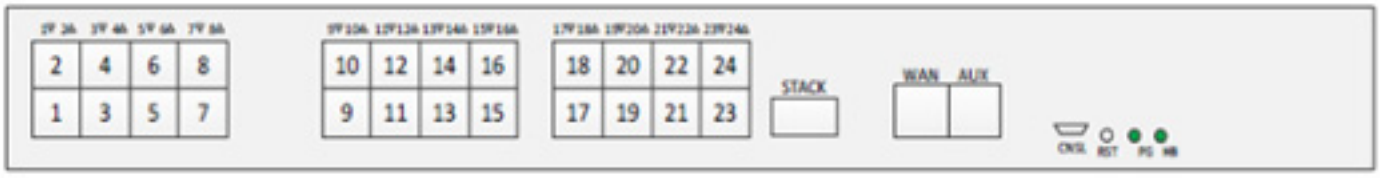

Figure 1-2 RMC Ports

The ports and light-emitting diodes (LEDs) in Figure 1-2 on page 5 are as follows:

Port or LED	Purpose
STACK	This 38–circuit ipass stack connecter is used to expand the system management network by connecting to a second SGI UV 300 chassis BMC.
WAN	The RJ45 port that connects to the customer's LAN.
AUX	An RRJ45 port that connects to the eth0 Ethernet card. You can configure it with a static IP address or a dynamic (dynamic host configuration protocol (DHCP)) IP address. This port is designed as a service port for SGI support staff.
CNSL	This micro USB B port is used to connect the RMC to a console.
RST	A recessed push button that you can use to reset the system.
PG LED	This green LED is lit when the RMC is receiving power at the correct level.
HB LED	This green LED is lit and is flashing when the RMC is functioning correctly.

5. Plug the cable end with the USB-A connector into the laptop.
6. Plug the cable end with the USB-B connector into the RMC's serial port, which is labeled CNSL.

   Figure 1-2 on page 5 shows all the ports on the RMC.
7. Use the terminal emulation program to set the following:

- Baud rate: 115200
- Data bits: 8
- Parity: No
- Stop bits: 1
- Hardware flow control (RTS/CTS): No

8. Open file `/etc/sysconfig/module_id` from within a text editor:
9. Search for `MODULE_RACK` within the file.

Note: The file mentioned in this procedure, `/etc/sysconfig/module_id`, refers to the CMC, but this file applies equally to both CMC units and RMC units.

---

10. Modify the `MODULE_RACK` line to specify the rack number of the rack into which you installed the RMC.
11. Search for `MODULE_UPOS` within the file.
12. Modify the `MODULE_UPOS` line to specify the rack unit position of the RMC within the rack.

    The following is an example of a completed `/etc/sysconfig/module_id` file:

```
#
# CMC Location/Position settings
#
#   This file contains the settings to configure the CMC's location
#   within the system.   These variables *MUST* be set in for correct
#   system operation.

# Rack number for this CMC [numbered from 1]
MODULE_RACK=1

# The IRU U-position within the rack [IRUs 1-40, top-of-rack enclosures 41+]
MODULE_UPOS=30
```

13. Proceed to the following:

    "Adding Your Site Network Information to the RMC" on page 7

Adding Your Site Network Information to the RMC

The procedure in this topic explains how to attach the RMC to your site network. SGI configures each RMC at the factory with DHCP addressing. Use the procedure in this topic to configure a static IP address if that is your site preference.

The following procedure explains how to configure networking information for the SGI UV 300 system's RMC.

Procedure 1-3 To configure a static IP address

1. Open file `/etc/sysconfig/ifcfg-eth1` from within a text editor.
2. Configure either static addressing or DHCP addressing.

   The SGI factory configures DHCP addressing on the RMC by default, but you need to specify a hostname. The procedure for configuring addressing differs, depending on whether you want static or addressing or the default DHCP addressing. The procedures are as follows:

To configure an RMC with static addressing	To configure an RMC with DHCP addressing
1. Search for the line that contains `BOOTPROTO=dhcp`.	1. Search for the line that contains `# HOSTNAME`.
2. Insert a pound character (#) in column 1 to make the `BOOTPROTO=dhcp` line look as follows: `# BOOTPROTO=dhcp`	2. Remove the pound character (#) from column 1 of the `HOSTNAME` line.
3. Remove the pound character (#) from the following line: `# BOOTPROTO=static`	3. Provide a hostname for the RMC on the `HOSTNAME` line.
4. Edit the `IPADDR`, `NETMASK`, and `HOSTNAME` lines as follows: • Remove the pound character (#) from column 1. • Provide site-specific information for the RMC.	

For example, the lines might appear as follows after they have been edited to enable static addressing:

```
BOOTPROTO-static
IPADDR=100.100.100.100
NETMASK=255.255.255.0
HOSTNAME=myuv300-rmc
```

3. (Optional) Edit the `GATEWAY` line to provide site-specific information for the RMC.

   This line is optional.

   For example, the line might appear as follows after it has been edited:

   ```
   GATEWAY=150.150.150.150 # Optional
   ```

4. Save and close file `/etc/sysconfig/ifcfg-eth1`.

5. Type the following command to reboot the RMC:

   ```
   > reboot
   ```

6. (Optional) Complete one or more of the following optional procedures:

   - "(Optional) Changing the Factory Default `ipmitool` Command Password" on page 8
   - "(Optional) Changing the Factory Default `ssh` Command Password" on page 9
   - "(Optional) Enabling Simple Network Management Protocol (SNMP) Trap Forwarding" on page 10

(Optional) Changing the Factory Default `ipmitool` Command Password

The `ipmitool` command facilitates remote management of the SGI UV 300 system. The following procedure explains how to customize the password for the `ipmitool` command functions.

Procedure 1-4 To change the `ipmitool` command's authentication password

1. Use the following command to retrieve the current user IDs:

   ```
   ipmitool -I lanplus -H host -U ADMIN -P ADMIN user list
   ```

   For *host*, specify the hostname of the SGI UV 300 system's RMC.

For example:

```
% ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN user list
ID    Name        Callin  Link Auth   IPMI Msg       Channel Priv Limit
2     ADMIN       true    false       true           OEM
10    LOCAL       true    false       true           OEM
```

2. Examine the output from the `user list` command, and note the user ID of the `ADMIN` user.

   For example, in the preceding step, the user ID is `2`.

3. Use the following command to change the password for the `ADMIN` user's ID:

   `ipmitool -I lanplus -H` *host* `-U ADMIN -P ADMIN user set password` *user_ID new_password*

   For *host*, specify the hostname of the SGI UV 300 system's RMC.

   For *new_password*, specify the password you want to use for the `ipmitool` commands at your site.

   For example:

   ```
   % ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN user set password 2 newpwd
   ```

Note: Do not change the password for user `LOCAL`. That password is required for internal RMC operations and must not be modified.

(Optional) Changing the Factory Default `ssh` Command Password

The following procedure explains how to customize the password for the `ssh` command.

Procedure 1-5 To change the `ssh` command's authentication password

1. Use the `ssh` command to log into the RMC as the `root` user, and use the factory default password of `root`.

   For example:

   ```
   % ssh root@uv1-rmc
   root@uv1-rmc's password: #####
   ```

```
SGI UV300 RMC, Rev. 1.1.44 [Bootloader 1.1.4]

uv1-rmc RMC:r001i01c>
```

2. Use the Linux `passwd` command to change the password.

   For example:

```
% passwd
Changing password for root
New password: #####
Retype new password: #####
```

(Optional) Enabling Simple Network Management Protocol (SNMP) Trap Forwarding

You can enable SNMP forwarding for alerts sent from the SGI UV 300 system's BMCs and from the RMC. The procedures in this topic explain how to configure SNMP alert forwarding for the BMCs and for the RMC. The SNMP trap messages use SNMP Version 1. The SNMP trap community for the BMCs and for the RMC is `sgi`. If you want to enable operating system SNMP alerts, consult your operating system documentation.

The BMCs and the RMC run the IPMI stack and are designed to send alerts across the network to a trap listener server for environmental conditions such as the following: a sensor that is over its critical temperature, a fan that is running at a speed that is lower than its critical RPM, a voltage sensor that is outside of its expected range, and other conditions.

The BMC alerts follow the IPMI standard in that these alerts issue a single SNMP trap message that contains all the relevant detail. This message originates on the SGI UV 300's BMCs and is sent to the RMC. The RMC relays the trap to the external network IP address that you configure.

The RMC alerts use the IPMI protocol. Like the BMC alerts, the destination for the RMC alerts is also an external network IP address. Because the IPMI stack is not designed to send alerts to its own host, however, there is a separate procedure that explains how to configure the alert destination for the RMC. The following topics explain how to configure SNMP forwarding:

- "Configuring SNMP Forwarding From the BMCs" on page 11

• "Configuring SNMP Forwarding From the RMC" on page 12

Configuring SNMP Forwarding From the BMCs

The following procedure explains how to configure the BMCs to forward SNMP alerts to an external IP address.

Procedure 1-6 To configure SNMP forwarding from the BMCs

1. Use the `ssh`(1) command to connect to the RMC.

   For example:

   ```
   % ssh root@uv1-rmc
   ```

2. Use a text editor, such as `vi`(1), to open file `snmptrapd`.

3. Search within file `snmptrapd` for the line that inlcudes the following characters:

   ```
   FORWARD_DEST=
   ```

4. Edit the line as follows:

   - Remove the comment character. You need the line to be an active, recognized line.
   - Replace the IP address that appears on this line with the IP address of the server you want to configure as the trap listener.

5. Save and close the file.

6. Log into the SGI UV 300 as the root user.

7. Type the following command to restart the SGI UV 300 system:

   ```
   # reboot
   ```

   You can safely perform this step on a running SGI UV 300 system. You need to restart the system in order force the system to recognize the edits you made to file `snmptrapd`. The system restarts and logs out the `ssh`(1) session.

The following is an example of an edited SNMP trap configuration file on a BMC:

```
# snmptrapd configuration file
#
```

```
# snmptrapd command line options
# OPTIONS="-Lsd -p /var/run/snmptrapd.pid"

# use a custom snmptrapd.conf file (for special cases and testing only)
# CONF_FILE="/etc/sysconfig/snmptrapd.conf"

# snmptrapd forwarding destination list:
#    List of snmptrapd forward DESTINATIONs, separated by spaces.
#    Typically this will be one or more IP addresses, but each entry can
#    be a LISTENING ADDRESS as specified in snmpd(8).
FORWARD_DEST="192.100.1.1"
```

Configuring SNMP Forwarding From the RMC

The following procedure explains how to configure the RMC to forward SNMP alerts to an external IP address.

Procedure 1-7 To configure SNMP forwarding from the RMC

1. From a local server, type the `ipmitool` command in the following format:

   `ipmitool -I lanplus -H` *host* `-U ADMIN -P` *pwd* `lan alert set 1 1` *ip_addr*

   For *host*, specify the hostname of the SGI UV 300 system's RMC.

   For *pwd*, specify the password of the RMC. The default, factory-shipped password is `ADMIN`.

   For *ip_addr*, specify the IP address of the server that you want to configure as the trap listener. This is the external trap destination.

2. Type the `ipmitool` command in the following format to confirm the external trap destination:

   `ipmitool -I lanplus -H` *host* `-U ADMIN -P` *pwd* `lan alert print 1 1`

For example:

```
% ipmitool -I lanplus -H uv1-rmc -U ADMIN -P mypwd lan alert set 1 1 10.160.1.23
% ipmitool -I lanplus -H uv1-rmc -U ADMIN -P mypwd lan alert print 1 1
Alert Destination       : 1
Alert Acknowledge       : Unacknowledged
Destination Type        : PET Trap
Retry Interval          : 0
```

```
Number of Retries       : 0
Alert Gateway           : Default
Alert IP Address        : 10.160.1.23
Alert MAC Address       : 00:00:00:00:00:00
```

Rack Management Controller (RMC) Tasks

This chapter contains the following topics:

Connecting to the Rack Management Controller (RMC)

You can connect to the RMC one of the following ways:

- Through a laptop attached to the RMC through a serial connection.

  This type of direct connection is useful if you have lost the RMC password because the RMC does not prompt you for a password when you access the RMC through a serial connection. If you want to log in as the root user, and you do not know the root password, connect a laptop computer to the RMC as described in the following topic:

  "(Conditional) Setting the Position of the RMC Within its Rack" on page 3

- Through a network connection, via secure shell.

The following procedure explains how to connect to the RMC over a network connection.

Procedure 2-1 To connect to the RMC over a network connection

1. Use the secure shell (ssh(1)) command to log into the RMC.

   The SGI factory configures the default login for the RMC to be `root` and the default password to be `root`.

2. Respond to the prompts for the login name and password.

For example:

```
> ssh root@uv1-rmc
root@uv1-rmc's password: #####

SGI UV300 RMC, Rev. 1.1.44   [Bootloader 1.1.4]

uv1-rmc RMC:r001i01c>
```

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

1. Visually inspect the system and make sure that the power breakers are on.
2. Use the procedure in the following topic to establish a connection to the RMC and log in:

   "Connecting to the Rack Management Controller (RMC)" on page 15

3. Type the `power on` command to power up the SGI UV system.

   The power-on takes only a few minutes, but it can take 5 to 10 minutes for the `uvcon` command to return boot-to-shell progress information.

   For example:

   ```
   RMC:r001i01c> power on
   ```

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

   ```
   RMC:r001i01c> uvcon
   ```

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

For example:

```
Shell> fs0:
```

6. Boot the system.

   Use one of the following commands:

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

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

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

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

Creating Boot Options (SGI UV 300 Systems Only)

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 2-3 To create boot options for nondefault operating system boots

1. Use the procedure in the following topic to establish a connection to the RMC and log in:

   "Connecting to the Rack Management Controller (RMC)" on page 15

2. Type the `uvcon` command.

   The `uvcon` command opens a console, and you need the console open in order to see the shell prompt.

3. Monitor the power-on process.

   The power-on takes only a few minutes, but it can take 5 to 10 minutes for the `uvcon` command to return boot-to-shell progress information.

4. After the power-on process completes, type `CTRL-] q` to exit the console.

Note: The `CTRL-] q` key sequence closes the `uvcon` console session.

---

5. When the `Shell>` prompt appears, type `exit` to access the BIOS manager.
6. Use the arrow keys to select **Boot Maintenance Manager**, and press Enter.
7. On the **Boot Maintenance Manager** screen, use the arrow keys to select **Boot Options** and press Enter.
8. On the **Boot Options** screen, use the arrow keys to select **Add Boot Option** and press Enter.
9. On the **File Explorer** screen, complete the following steps:
   - Use the arrow keys to select the disk from which you want to boot and press Enter.

     For example:

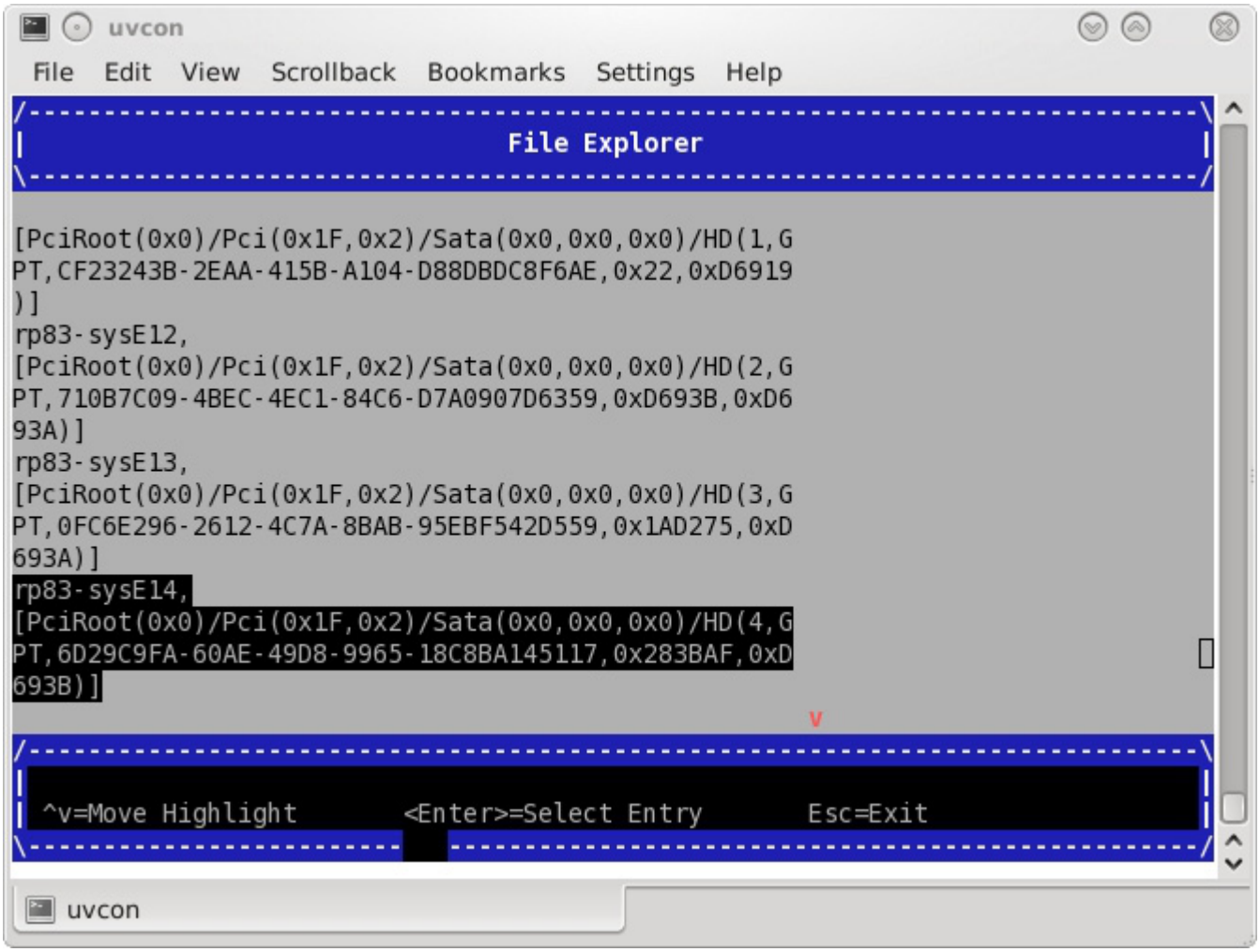

Figure 2-1 File Explorer Screen

- Peruse the directory system, from the disk you selected, through `<efi>` or `<sgi>`, through `<redhat>` or `SUSE`, until you find `grub.efi` (RHEL) or `elio.efi` (SLES).
- Select `grub.efi` (RHEL) or `elio.efi` (SLES).

10. On the **Modify Boot Option Description** screen, note that the cursor is at the end of the `Input the description` field.

    Complete the following steps:

    - Press Enter.
    - In the **Please type in your data** popup, type a name for this boot option and press Enter. For example, `RHEL 6.6` or `SLES11 SP3`.
    - Use the arrow keys to select **Commit Changes and Exit**.
    - Press Enter.

11. On the **Boot Maintenance Manager** screen, select **Boot Options** and press Enter.
12. On the **Boot Options** screen, use the arrow keys to select **Change Boot Order** and press Enter.
13. On the **Change Boot Order** screen, complete the following steps:

    - If they are not already selected, select the boot order entries.

      For example:

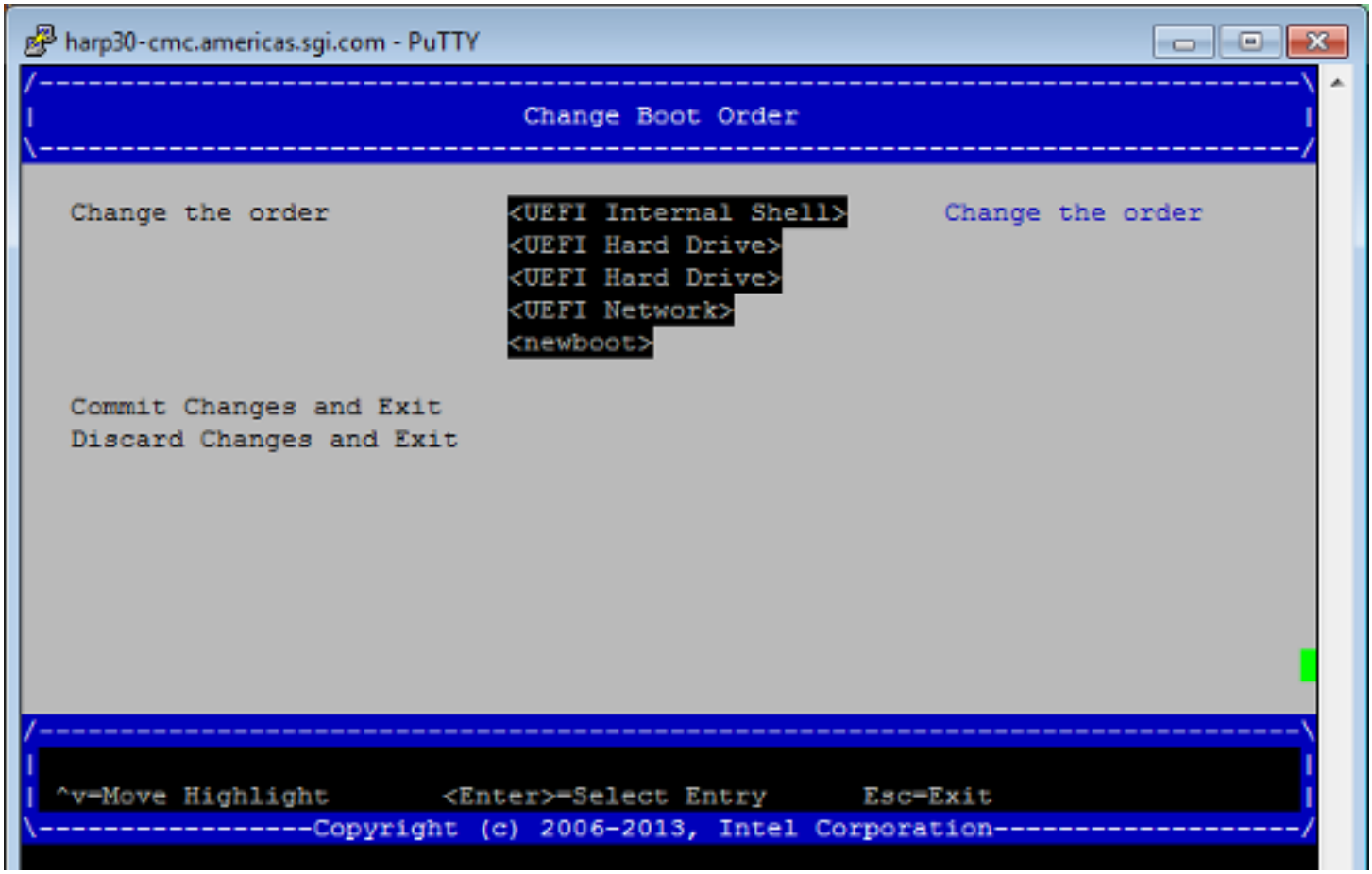

Figure 2-2 Change Boot Order Screen

- Press Enter.
- 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**.

14. Press the space bar to return to the BIOS manager.
15. 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 Off an SGI UV System

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

Procedure 2-4 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 RMC, type the `power off` command to power off the SGI UV system.

   For example:

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

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

   For example:

   ```
   RMC:r1i1c> power status
   ==== r001i01c (PRI) ====
   chassis on: 0, off: 1, 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 2-5 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 RMC, type the following command to enter kdump:

   ```
   RMC: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 2-6 To send an NMI signal and invoke kdb

1. On the RMC, type the following command:

```
RMC:r1i1c> power nmi
RMC:r1i1c> uvcon
8 out of 80 cpus in kdb, waiting for the rest, timeout in 10 second(s)
.. Sending NMI to non-responding cpus: 0 1 2 4 5 7 8 9 10 11 12 13 14 15 16 18 20 21 22 23 24 25 26 27 28 29 30 31 32
41 42 44 45 47 48 49 50 51 52 53 54 56 57 58 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79.
.72 cpus are not in kdb, their state is unknown
Entering kdb (current=0xffff8820726b82c0, pid 0) on processor 46 due to NonMaskable Interrupt @ 0xffffffff812bd251
  r15 = 0x0000000000000001     r14 = 0xffff88207fc197e0
  r13 = 0x0000000000000001     r12 = 0x0000000000000002
   bp = 0x0000000000000000      bx = 0x139085e2becbae10
  r11 = 0x0000000000000000     r10 = 0x0000000000000000
   r9 = 0x0000000000000002      r8 = 0x0000000000000f47
   ax = 0x0000000000000000      cx = 0x0000000000000001
   dx = 0x0000000000000000      si = 0xffff8820726ba010
   di = 0xffff8820726bbfd8 orig_ax = 0xffffffffffffffff
   ip = 0xffffffff812bd251      cs = 0x0000000000000010
flags = 0x0000000000000046      sp = 0xffff88207fc07f90
   ss = 0x0000000000000018   &regs = 0xffff88207fc07ef8
[46]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:

```
RMC:r001i01c> autopower
==== r001i01c (PRI) ====
auto-power on is disabled
```

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

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

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

```
RMC:r001i01c> autopower -d
==== r001i01c (PRI) ====
auto-power on disabled
```

Retrieving System Configuration Information

You can use the `config -v` command to view your system configuration. Use this command, for example, if you need to retrieve the IDs of the SGI UV 300 chassis baseboard anagement controllers (BMCs) in your SGI UV system.

The following shows output from this command:

```
RMC:r001i01c> config -v

SSN: UV300-00001111

RMCs:            1
        r001i01c UV300


BMCs:            3
        r001i01b IP127-BASEIO
```

```
        r001i06b IP127
        r001i11b IP127-BASEIO     BASEIO-DISABLED


Partitions:      1
        partition000 BMCs:    3
```

The output shows the following:

- This SGI UV computer has one RMC, and its node name is `r001i01c`.
- There are three SGI UV 300 chassis BMCs, and their IDs are `r001i01b`, `r001i06b`, and `r001i11b`.

  Many SGI UV commands and `ipmitool` commands require you to specify one of these IDs when you want the command to operate on a specific SGI UV chassis BMC. The commands' syntax permits you to shorten the IDs by omitting the leading `0` characters. In these commands, if you decide to omit any leading `0` characters, omit all of them. For example, you can specify `r1i01b` rather than `r001i01b`, but you cannot specify `r1i01b`.

Setting Hardware Configuration Overrides (SGI UV 300 Systems Only)

The `hwcfg` command lets you view and set hardware configuration overrides.

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

- To see a list of the override settings, use the `hwcfg` command without options. This shows all overrides set on any SGI UV 300 chassis BMCs in the system. If any overrides are set on some chassis BMCs and not on others, the output shows a count of chassis BMCs for which the override is set. For example:

  ```
  RMC:r001i01c> hwcfg
  DEBUG_SW=0x4
  MEMRISER_DISABLE=0x2
  ```

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

  ```
  RMC:r001i01c> hwcfg -v
  DEBUG_SW=0x4
    all targeted BMC(s)
  ```

```
MEMRISER_DISABLE=0x2
  all targeted BMC(s)
```

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

  ```
  RMC:r001i01c> hwcfg -vv
  ==== r001i01b ====
  MEMRISER_DISABLE=0x2
  DEBUG_SW=0x4
  harp26-cmc CMC:r001i01c>
  ```

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

  `hwcfg` *node_name=value* [*node_name=value* `...`]

  For example:

  ```
  uv3ess-rmc RMC:r001i01c> hwcfg DEBUG_SW=0x4
  DEBUG_SW=0x4 <PENDING RESET>
  ```

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

  ```
  uv3ess-rmc RMC:r001i01c> hwcfg -c
  ```

- To clear all overrides use both the `-a` and `-c` options. For example:

  ```
  uv3ess-rmc RMC:r001i01c> hwcfg -ac
  DEBUG_SW=default [0x0] <PENDING RESET>
  MEMRISER_DISABLE=DEFAULT [0X0] <PENDING RESET>
  ```

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

  `hwcfg -c` *node_name* [`...` *node_name*]

- To show a list of `hwcfg` variables available, use the `--list` option. For example:

```
RMC:r001i01c> hwcfg -list
==== 4/4 BMC(s) ====
SOCKET_DISABLE=yes|no|<socket bitmask>
    Socket disable

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

```
CHASSIS_DISABLE=yes|no
    Disable this chassis

BASEIO_DISABLE=yes|no
    Disable the BaseIO on this blade (if present)

IIO_DISABLE=yes|no|<socket bitmask>
    Disable I/O on specified socket(s)

MEMRISER_DISABLE=yes|no|<mem riser bitmask: bit0=MEM1....bit7=MEM8>
    Memory riser disable

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

BIOS_FILE=<filename>
    Alternate BIOS image file

NL_ENABLE=yes|no|<NL port bitmask>
    Enable NL links
```

- To show all variables, regardless of state, use the `--all` option. For example:

```
RMC:r1i1c> hwcfg --all
BASEIO_DISABLE=no
BIOS_FILE=/common/bios.fd
CHASSIS_DISABLE=no
DEBUG_SW=0x0
IIO_DISABLE=no
MEMRISER=DISABLE=no
NL_ENABLE=yes
PARTITION=0
SOCKET_DISABLE=no
```

Monitoring Log Files

The SGI UV 300 system generates the following log files:

- Log files for the RMC's system event log (SEL). You can also obtain log information for each SGI UV 300 chassis BMC's SEL. Use the `ipmitool sel list` command to access these log files.

  For more information on these commands, see the following:

  Chapter 3, "Remote Management" on page 29

- The SGI UV 300 chassis BMC log file. To retrieve this log file, use the `ssh` command to log into the RMC, and type the following command:

  ```
  > log
  ```

  The `log` command accepts specific targets, so you can retrieve log information for a specific target if you specify an individual SGI UV chassis BMC. For more information, log into an RMC and type `log --help`.

- Standard Linux operating system log files. The RMC hosts a standard Linux operating system, so you can view the operating system log file entries in `/var/log/messages`.

- System start-up message log file. To retrieve this log file, use the `ssh` command to log into the RMC, and type the following command:

  ```
  > dmesg
  ```

Remote Management

The following topics explain how to use the `ipmitool` command to manage an SGI UV system from a remote console:

About the `ipmitool` Remote Management Command

SGI supports a subset of the open source `ipmitool` commands on SGI UV 300 systems. The `ipmitool` commands facilitate remote management of the SGI UV 300 system through their implementation of the industry-standard IPMI protocol. You can use the `ipmitool` commands to manage the SGI UV system from a remote console, such as a laptop computer or a server upon which the `ipmitool` commands are supported.

The SGI documentation shows output from the `ipmitool` command. However, depending on the revision level of the `ipmitool` command you use on your remote console, the command output you see at your site can differ from the output shown in the documentation.

The following topics explain how to connect to the SGI UV system components and explain how to use the open source `ipmitool` utility for remote management:

About Connecting to the RMC and to the Individual SGI UV Chassis Baseboard Management Controller (BMC)

From a remote console, you can issue `ipmitool` commands over the network to the RMC. The remote console needs to be on the same local network as the RMC. The `ipmitool` commands operate on either the RMC itself or on an individual SGI UV 300 chassis BMC.

The SGI UV 300 chassis BMCs are not exposed directly to the network, so to issue `ipmitool` commands to the chassis BMCs requires an `ssh` preface to the `ipmitool` command. The `ssh` preface performs the following functions:

- It relays the command from the remote console to the chassis BMC.
- It relays the chassis BMC's response back to the remote console.

Figure 3-1 on page 30 shows the network topology for the RMC management network. The figure shows the relationships between the major components.

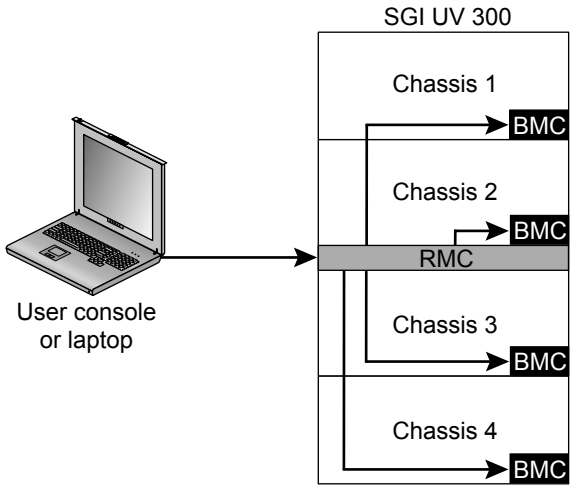

Figure 3-1 Connecting to the RMC and SGI UV Chassis BMC

The following guidelines summarize how to use the `ipmitool` command:

- To run an `ipmitool` command on the RMC, use the `ipmitool` command's `-H` parameter to specify the hostname (preferred) or the IP address of the RMC.
- To run an `ipmitool` command on a specific SGI UV chassis BMC, use the `ssh` command to connect to the RMC, and use the `ipmitool` command's `-H` parameter to specify the ID of the chassis BMC you want to examine.

`ipmitool` Command Format

The `ipmitool` command has the following two formats:

- To run a command on the RMC, use the following format:

  `ipmitool -I lanplus -H` *target* `-U ADMIN -P` *pwd command*

- To run a command on one of the SGI UV 300 chassis BMCs, use the following format:

  `ssh root@`*host* `ipmitool -I lanplus -H` *target* `-U ADMIN -P` *pwd command*

The preceding command formats include the following parameters and arguments:

Parameter	Meaning
`ssh root@`*host*	(Conditional) The `ssh` command prefix to the `ipmitool` command. If you want to run *command* on one of the SGI UV 300 chassis BMCs, precede the `ipmitool` command name with `ssh root@`*host* and specify the RMC's hostname for *host*. This prefix is required in order to run *command* on one of the SGI UV 300 chassis BMCs. If you want to run *command* on the RMC, do not specify `ssh root@`*host* as a prefix to the `ipmitool` command name. In this case, use the `-H` parameter to specify the hostname of the RMC.
`ipmitool`	The command name.
`-I lanplus`	The encryption specification.
`-H` *target*	The computer system upon which the command needs to operate. For *target*, specify either a hostname (preferred) or an IP address. The *target* can be either the RMC's hostname or the system ID of a specific SGI UV 300 chassis BMC. When you specify an SGI UV 300 chassis BMC's ID, the RMC relays information back and forth from the remote console to the SGI UV 300 chassis BMC.

	To obtain the list of SGI UV 300 chassis IDs, log into the RMC as the root user, and type the `config -v` command. For more information about the `config` command, see the following: "Retrieving System Configuration Information" on page 24.
`-U ADMIN -P` *pwd*	The authentication parameters. These parameters specify the username and password. The default username and password are `ADMIN` and `ADMIN`. If you changed the `ipmitool` command's password, specify your site-defined new password. For information about how to change the `ipmitool` command's password, see the following: "(Optional) Changing the Factory Default `ipmitool` Command Password" on page 8
command	One of the `ipmitool` commands. There many IPMI commands. The topics in this chapter explain the IPMI commands that SGI supports. For more information, see the `ipmitool`(1) man page on the SGI UV server.

Command Format Examples

Assume the following:

- You are logged into a Linux computer as a regular user, not the root user.
- The hostname of the SGI UV 300 system's RMC is `uv1-rmc`.
- The SGI UV 300 chassis BMC IDs are `r001i01b`, `r001i06b`, `r001i11b`, and `r001i02b`.

Example 1. Type the following command to obtain information about the power status on the RMC:

```
% ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN power status
Chassis Power is on
```

Example 2. Type the following command to obtain information about the power status on SGI UV 300 chassis BMC `r001i01b`:

```
% ssh root@uv1-rmc ipmitool -I lanplus -H r001i01b -U ADMIN -P ADMIN power status
root@uv1-rmc's password:######
Chassis Power is on
```

In this example, the user supplied the root user's password for the RMC when prompted.

`ipmitool` Commands Supported on the RMC

The following list shows the `ipmitool` commands that SGI supports for use on the RMC:

- `sdr list`
- `sel list`
- `lan print 1`
- `fru list`

For more information about these commands, see the following topics:

- "Power Commands" on page 34
- "Retrieving a List of the Environmental Sensors and Values" on page 34
- "Retrieving the System Event Log (SEL)" on page 35
- "Listing the Local Area Network (LAN) Configuration" on page 36
- "Listing Information for Field Replaceable Units (FRUs)" on page 38

SGI also supports the following commands for platform event filtering (PEF): `pef info`, `pef status`, and `pef list`. For information about these commands, see the following:

Appendix A, "Retrieving Platform Event Filtering (PEF) Information" on page 51

Power Commands

The RMC itself has no power on or power off capability. The RMC is always on. However, remote power on and remote power off commands issued to the RMC perform the power on or power off of the SGI UV 300 system.

SGI recommends that you do not attempt to issue power commands to any of the individual SGI UV 300 chassis BMCs.

Retrieving a List of the Environmental Sensors and Values

The following command retrieves a list of the SGI UV 300 system's environmental sensors and shows their values:

```
ipmitool -I lanplus -H target -U ADMIN -P ADMIN sdr list
```

Example 1. The following command targets the RMC:

```
% ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN sdr list
RMC Inlet         | 23 degrees C      | ok
RMC Exhst         | 24 degrees C      | ok
RMC PSOC Temp     | 23 degrees C      | ok
RMC PSOC 3.3v     | 3.33 Volts        | ok
RMC 12v           | 12.08 Volts       | ok
RMC 3.3v Aux      | 3.33 Volts        | ok
RMC 2.5v          | 2.47 Volts        | ok
RMC 1.5v          | 1.49 Volts        | ok
RMC 1.2v          | 1.19 Volts        | ok
RMC 1.0v          | 1.00 Volts        | ok
RMC 0.75v         | 0.76 Volts        | ok
Pwr Good          | 0x00              | ok
Pwr Sply Fault    | 0x00              | ok
Pwr Redund OK     | 0x00              | ok
Stacking Pres     | 0x00              | ok
PS0 VOUT          | 11.92 Volts       | ok
PS0 IOUT          | 0.41 Amps         | ok
PS0 Temp1         | 20 degrees C      | ok
PS0 Temp2         | 23 degrees C      | ok
PS0 Fan1          | 10858 RPM         | ok
PS1 VOUT          | 12.05 Volts       | ok
PS1 IOUT          | 0.69 Amps         | ok
PS1 Temp1         | 19 degrees C      | ok
```

```
PS1 Temp2        | 23 degrees C      | ok
PS1 Fan1         | 10797 RPM         | ok
Memory Warning   | 0x00              | ok
Memory Critical  | 0x00              | ok
Disk Warning     | 0x00              | ok
Disk Critical    | 0x00              | ok
12V ENA          | 0x00              | ok
```

Example 2. The following command targets a specific SGI UV 300 chassis BMC:

```
% ssh root@uv1-rmc ipmitool -H  r001i01b -I lanplus -U ADMIN -P ADMIN sdr list
root@uv1-rmc's password: #####
CPU0_TEMP        | -58 degrees C     | ok
CPU1_TEMP        | -57 degrees C     | ok
CPU2_TEMP        | -59 degrees C     | ok
CPU3_TEMP        | -58 degrees C     | ok
CPU0_DIMM_MAX    | 29 degrees C      | ok
CPU1_DIMM_MAX    | 27 degrees C      | ok
CPU2_DIMM_MAX    | 26 degrees C      | ok
CPU3_DIMM_MAX    | 26 degrees C      | ok
CPU0_DIMM_MAX_ID | 0x00              | ok
CPU1_DIMM_MAX_ID | 0x00              | ok
CPU2_DIMM_MAX_ID | 0x00              | ok
CPU3_DIMM_MAX_ID | 0x00              | ok
HARP_INLET_TEMP  | 23 degrees C      | ok
HARP_OUTLET_TEMP | 31 degrees C      | ok
.
.
.
```

Retrieving the System Event Log (SEL)

The following command retrieves the system event log (SEL):

```
ipmitool -I lanplus -H target -U ADMIN -P ADMIN sel list
```

Example 1. The following command targets the RMC:

```
% ipmitool -H uv1-rmc -U ADMIN -P ADMIN sel list
   1 | 07/10/2014 | 12:11:20 | Temperature #0x01 | Upper Non-critical going low  | Asserted
   2 | 07/10/2014 | 12:11:20 | Temperature #0x01 | Upper Critical going low  | Asserted
   3 | 07/10/2014 | 12:11:20 | Temperature #0x01 | Upper Non-recoverable going low  | Asserted
```

```
   4 | 07/10/2014 | 12:11:20 | Temperature #0x02 | Upper Non-critical going low  | Asserted
   5 | 07/10/2014 | 12:11:20 | Temperature #0x02 | Upper Critical going low  | Asserted
   6 | 07/10/2014 | 12:11:20 | Temperature #0x02 | Upper Non-recoverable going low  | Asserted
   7 | 07/10/2014 | 12:16:53 | Voltage #0x0a | Upper Non-critical going high | Asserted
   8 | 07/10/2014 | 12:16:53 | Voltage #0x0a | Upper Critical going high | Asserted
   9 | 07/10/2014 | 12:16:53 | Voltage #0x0a | Upper Non-recoverable going high | Asserted
   a | 07/10/2014 | 12:16:56 | Voltage #0x0a | Upper Non-critical going high | Deasserted
   b | 07/10/2014 | 12:16:56 | Voltage #0x0a | Upper Critical going high | Deasserted
   c | 07/10/2014 | 12:16:56 | Voltage #0x0a | Upper Non-recoverable going high | Deasserted
   d | 07/10/2014 | 12:23:50 | Voltage #0x0a | Lower Non-critical going low  | Asserted
   e | 07/10/2014 | 12:23:50 | Voltage #0x0a | Lower Critical going low  | Asserted
   f | 07/10/2014 | 12:23:50 | Voltage #0x0a | Lower Non-recoverable going low  | Asserted
  10 | 07/10/2014 | 12:23:53 | Voltage #0x0a | Lower Non-critical going low  | Deasserted
  11 | 07/10/2014 | 12:23:53 | Voltage #0x0a | Lower Critical going low  | Deasserted
  12 | 07/10/2014 | 12:23:53 | Voltage #0x0a | Lower Non-recoverable going low  | Deasserted
  13 | 07/10/2014 | 12:34:50 | Voltage #0x0a | Upper Non-critical going high | Asserted
.
.
.
```

Example 2. The following command targets the RMC on a different day and shows no SEL entries:

```
% ipmitool -H uv1-rmc -U ADMIN -P ADMIN sel list
SEL has no entries
```

Example 3. The following command targets a specific SGI UV chassis BMC:

```
% ssh root@uv1-rmc ipmitool -H  r001i01b -I lanplus -U ADMIN -P ADMIN sel list
root@uv1-rmc's password: #####
SEL has no entries
```

Listing the Local Area Network (LAN) Configuration

The following command lists the LAN configuration:

```
ipmitool -I lanplus -H target -U ADMIN -P ADMIN lan print 1
```

Example 1. The following command lists the LAN configuration for the RMC:

```
# ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN lan print 1
Set in Progress         : Set Complete
Auth Type Support       : NONE MD2 MD5 PASSWORD
```

```
Auth Type Enable        : Callback :
                        : User     : MD5
                        : Operator : MD5
                        : Admin    : MD5
                        : OEM      : MD5
IP Address Source       : Static Address
IP Address              : 192.168.1.22
Subnet Mask             : 255.255.255.0
MAC Address             : 00:00:00:00:00:00
SNMP Community String   : sgi
IP Header               : TTL=0x40 Flags=0x40 Precedence=0x00 TOS=0x10
BMC ARP Control         : ARP Responses Enabled, Gratuitous ARP Disabled
Gratituous ARP Intrvl   : 2.0 seconds
Default Gateway IP      : 0.0.0.0
Default Gateway MAC     : 00:00:00:00:00:00
Backup Gateway IP       : 0.0.0.0
Backup Gateway MAC      : 00:00:00:00:00:00
RMCP+ Cipher Suites     : 0,1,2,3,6,7,8,11,12
Cipher Suite Priv Max   : XuuOXXuuOXXuOXX
                        :     X=Cipher Suite Unused
                        :     c=CALLBACK
                        :     u=USER
                        :     o=OPERATOR
                        :     a=ADMIN
                        :     O=OEM
```

Example 2. The following command lists the current configuration for a specific SGI UV chassis BMC:

```
% ssh root@uv1-rmc ipmitool -I lanplus -H r001i01b -U ADMIN -P ADMIN lan print 1
root@uv1-rmc's password: #####
Set in Progress         : Set Complete
Auth Type Support       : NONE MD2 MD5 PASSWORD OEM
Auth Type Enable        : Callback : NONE MD2 MD5 PASSWORD OEM
                        : User     : NONE MD2 MD5 PASSWORD OEM
                        : Operator : NONE MD2 MD5 PASSWORD OEM
                        : Admin    : NONE MD2 MD5 PASSWORD OEM
                        : OEM      :
IP Address Source       : Static Address
IP Address              : 172.30.50.100
Subnet Mask             : 255.255.255.0
MAC Address             : 08:00:69:17:00:b4
```

```
SNMP Community String   : sgi
IP Header               : TTL=0x40 Flags=0x40 Precedence=0x00 TOS=0x10
BMC ARP Control         : ARP Responses Enabled, Gratuitous ARP Disabled
Gratituous ARP Intrvl   : 0.0 seconds
Default Gateway IP      : 0.0.0.0
Default Gateway MAC     : 00:00:00:00:00:00
Backup Gateway IP       : 0.0.0.0
Backup Gateway MAC      : 00:00:00:00:00:00
802.1q VLAN ID          : Disabled
802.1q VLAN Priority    : 0
RMCP+ Cipher Suites     : 0,1,2,3,6,7,8,11,12
Cipher Suite Priv Max   : XaaaXXaaaXXaaXX
                        :     X=Cipher Suite Unused
                        :     c=CALLBACK
                        :     u=USER
                        :     o=OPERATOR
                        :     a=ADMIN
                        :     O=OEM
```

Listing Information for Field Replaceable Units (FRUs)

The following command lists information about each FRU:

`ipmitool -I lanplus -H` *target* `-U ADMIN -P ADMIN fru list`

Example 1. The following command lists FRUs for the RMC:

```
# ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN fru list
FRU Device Description : Builtin FRU Device (ID 0)
 Board Mfg Date        : Mon Oct  6 08:29:00 2014
 Board Mfg             : BENCHMARK
 Board Product         : UV3_RMC
 Board Serial          : RXE968
 Board Part Number     : 030_2940_002
 Board Extra           : _A01
 Board Extra           : 00004a87
 Board Extra           : 00000002
 Board Extra           : 00000e46
```

Example 2. The following command lists FRUs for a specific SGI UV chassis BMC:

```
# ssh root@uv1-rmc ipmitool -I lanplus -H r001i01b -U ADMIN -P ADMIN fru list
root@uv1-rmc's password: #####
FRU Device Description : Builtin FRU Device (ID 0)
 Board Mfg Date        : Tue May 27 05:21:00 2014
 Board Mfg             : BENCHMARK
 Board Product         : IP127_EX_4_SKT
 Board Serial          : RWN463
 Board Part Number     : 030_2926_001
 Board Extra           : _A05
 Board Extra           : 00001369
 Board Extra           : 00000002
 Board Extra           : 00000448

FRU Device Description : SH775
 Board Mfg Date        : Tue May 27 05:21:00 2014
 Board Mfg             : BENCHMARK
 Board Product         : IP127_EX_4_SKT
 Board Serial          : RWN463
 Board Part Number     : 030_2926_001
 Board Extra           : _A05
 Board Extra           : 00001369
 Board Extra           : 00000002
 Board Extra           : 00000448
```

Rack Management Controller (RMC) Command Reference

This chapter includes the following topics:

About the RMC Commands

The rack management controller (RMC) commands perform the following functions:

- Control or monitor a specific SGI UV 300 chassis baseboard management controller (BMC)
- 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

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

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

For a information about each command, type the command's name and `--help` at the RMC prompt. For example:

`RMC:r001i01c>` *command* **`--help`**

Rack Management Controller (RMC) and Baseboard Management Controller (BMC) Command Targets

You run the RMC commands from the RMC command line. The commands typically use the following format:

command [*command_parameters*] [*target* [*target* ...]]

Many RMC commands accept a *target* argument that you can use to direct the command to operate on a group of SGI UV 300 chassis BMCs. The syntax lets you specify one target or multiple targets.

If no *target* parameter appears on a command line, the command operates on all SGI UV 300 chassis BMCs.

A *target* is defined by the following syntax: r*rack*i*upos*b[*slot*]. The variables in the *target* are as follows:

- The *rack* can be the rack number of the SGI UV 300 chassis BMC or a * for all racks.
- The *upos* can be the rack unit position, or U-position, of the SGI UV 300 chassis BMC or * for all U-positions.
- (Conditional) The *slot* can often be omitted. Specify a *slot* when the SGI UV 300 system is connected to a node console. In that configuration, specify slot 0 (b0) along with a hub specification.

For more information, see the following:

"`console`" on page 46

Table 4-1 on page 43 shows how to specify groups of targets. The table uses the following notation:

Notation	Meaning
Any	In the table, *Any* refers to all racks, all SGI UV 300 chassis BMCs, or all slots.
upos	The rack unit position, or U-position, in the rack. Some command output uses *u*, rather than *upos*; these terms are equivalent.
rack	The rack in which the component is housed.
*	All values in that position. For example, `r*` references all racks, and `i*` references all SGI UV 300 chassis BMCs. 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.

Table 4-1 RMC Command *target* Specifications

target Syntax	BMC *rack*, *upos*, *slot*	RMC *rack*, *upos*
`*, all`	Any, Any, Any	Any, Any
`r*`	*rack*, Any, Any	*rack*, Any
`r*i*`	*rack*, *upos*, Any	*rack*, *upos*
`r*i*b*`	*rack*, *upos*, *slot*	N/A
`*c`	N/A	Any, Any
`r*i*c`	N/A	*rack*, *upos*
`alli`	Any, Any, Any	N/A
`p*`	All SGI UV 300 chassis BMCs with matching partitions. This is a partition target.	N/A

RMC and SGI UV 300 Chassis BMC Commands

The following topics describe the RMC and SGI UV chassis BMC commands. Some commands accept both the RMC and the SGI UV 300 chassis BMC as targets, and other commands work on only one target or the other. Table 4-2 on page 44 shows the command targets for each command.

Table 4-2 RMC and SGI UV 300 Chassis BMC Command Targets

Command	Appropriate target(s)
`autopower`	RMC
`bios`	RMC
`bmc`	BMC
`config`	RMC
`console`	RMC or SGI UV 300 chassis BMC
`hel`	RMC
`hwcfg`	RMC
`leds`	RMC
`log`	RMC or SGI UV 300 chassis BMC
`power`	RMC or SGI UV 300 chassis BMC
`sensor`	RMC
`uv3dmp`	RMC
`version`	RMC or SGI UV 300 chassis BMC

`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.

For examples, see the following:

"Enabling the Auto-Power Capability" on page 24

bios

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

```
RMC:r001i01c> bios
Last booted: SGI BIOS 2.1.0 built in rel-5.0.4-2014-07-24_14.12.35 by ajm on 2014-
uv3ess-rmc RMC:r001i01c> bios -s
[S:0x03,DF:0x009000] Booted      - CoreExitBootServices
```

bmc

The `bmc` command sends a command to one or more SGI UV 300 chassis BMCs. It is a shell command similar in behavior to the `ssh` command.

config

The `config` command shows your system configuration.

For example, the following `config` command displays a hardware configuration summary:

```
RMC:r001i01c> config

SSN: UV300-00000006

RMCs:            1
BMCs:            1
Partitions:      1
```

For another `config` command example, see the following:

"Retrieving System Configuration Information" on page 24

console

The `console` command opens a console window on a target. The targets can be one of the following:

- The system console. To open this console, log into the RMC and type `console` on an unpartitioned system.
- The SGI UV chassis BMC console. To open this console, log into the RMC and type the `console` command with a chassis BMC target and hub specification. For example:

  ```
  console r1i0b0h0
  ```

Use `CTRL -] q` to exit the console.

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

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-] b    sens break
console:    ctrl-] c    connection status
console:    ctrl-] q    quit (if active console
console:    ctrl-] ?|h  this help
```

---

hel

The `hel` command displays the hardware error logs.

hwcfg

The `hwcfg` command displays and sets hardware override variables. You also use the `hwcfg` command when you partition an SGI UV system, as described in the *SGI UV System Software Installation and Configuration Guide*.

For a `hwcfg` command example, see the following:

"Setting Hardware Configuration Overrides (SGI UV 300 Systems Only)" on page 25

leds

The `leds` command displays system LED values.

log

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

If you do not specify a *target*, the command returns all log information for all possible *target*s.

If you specify a *target*, the command returns log information for only that *target*.

power

The `power` command lets you obtain information, power on, power off, reset, cycle, get status, or invoke the kernel debugger (KDB) for an individual SGI UV 300 chassis BMC. When you use the `power` command, you do not have to power up the chassis BMC. When the `power` command runs, it checks to see if the chassis BMC is powered on. If the chassis BMC is not powered on, it powers up the chassis BMC, and it then powers up the compute blades.

Example 1. You can type `power` or `power status all` to retrieve information about how many SGI UV 300 chassis BMCs are powered on, as follows:

```
RMC:r001i01c> power
==== r001i01c ====
chassis - on: 1, off: 0, unknown: 0, disabled: 0
```

```
RMC:r001i01c> power status all
==== r001i01c ====
chassis - on: 1, off: 0, unknown: 0, disabled: 0
```

Example 2. The following command displays information about a specific IRU:

```
RMC:r001i01c> power status r1
==== r001i01c ====
chassis - on: 1, off: 0, unknown: 0, disabled: 0
uv3ess-rmc RMC:r001i01c> power status r1i*
==== r001i01c ====
chassis - on: 1, off: 0, unknown: 0, disabled: 0
uv3ess-rmc RMC:r001i01c> power status r1i*b*
==== r001i01b ==== power is on
```

Example 3. The following command resets a system that is powered up:

```
RMC:r001i01c> power reset
```

Example 4. The following command powers the RMC up and down:

```
RMC:r001i01c> power cycle
```

sensor

You can use the `sensor` command to get system temperatures, fan speed, and voltage information.

Example 1:

```
RMC:r001i01c> sensor
RMC Inlet        | 23.000     | degrees C  | ok    | na        | na        | na        | 43.000    | 53.000    | 55.0
RMC Exhst        | 24.000     | degrees C  | ok    | na        | na        | na        | 43.000    | 53.000    | 55.0
RMC PSOC 3.3v    | 3.330      | Volts      | ok    | 2.625     | 2.787     | 2.950     | 3.620     | 3.783     | 3.94
RMC 12v          | 12.012     | Volts      | ok    | 9.570     | 10.164    | 10.758    | 13.200    | 13.794    | 14.3
RMC 3.3v Aux     | 3.294      | Volts      | ok    | 2.625     | 2.787     | 2.950     | 3.620     | 3.783     | 3.94
RMC 2.5v         | 2.425      | Volts      | ok    | 1.987     | 2.110     | 2.233     | 2.740     | 2.863     | 2.98
RMC 1.5v         | 1.484      | Volts      | ok    | 1.189     | 1.263     | 1.337     | 1.640     | 1.714     | 1.78
RMC 1.2v         | 1.188      | Volts      | ok    | 0.957     | 1.016     | 1.076     | 1.320     | 1.379     | 1.43
RMC 1.0v         | 0.996      | Volts      | ok    | 0.797     | 0.847     | 0.897     | 1.100     | 1.149     | 1.19
RMC 0.75v        | 0.754      | Volts      | ok    | 0.595     | 0.631     | 0.668     | 0.820     | 0.857     | 0.89
Pwr Good         | 0x0        | discrete   | 0x0200| na        | na        | na        | na        | na        | na
```

```
Pwr Sply Fault   | 0x0       | discrete   | 0x0100| na        | na        | na        | na        | na        | na
Pwr Redund OK    | 0x0       | discrete   | 0x0200| na        | na        | na        | na        | na        | na
Stacking Pres    | 0x0       | discrete   | 0x0100| na        | na        | na        | na        | na        | na
```

Example 2:

```
RMC:r001i01c> bmc sensor
==== r001i01b ====
/bin/sh: sensor: not found
==== r001i06b ====
/bin/sh: sensor: not found
==== r001i11b ====
/bin/sh: sensor: not found
==== r001i16b ====
/bin/sh: sensor: not found
```

uv3dmp

The `uv3dmp` command retrieves information that can be useful for diagnostics. It is possible that an SGI technical support staff member might ask you to run this command.

version

The `version` command displays the firmware version of the SGI UV 300 RMC or of an SGI UV 300 chassis BMC.

Example 1. The following command returns RMC firmware version information:

```
RMC:r001i01c> version
SGI UV300 RMC, Rev. 1.1.38   [Bootloader 1.1.4]
```

Example 2. The following command returns SGI UV 300 chassis BMC firmware version information:

```
RMC:r001i01c> bmc version
==== r001i01b ====
SGI UV300 BMC, Firmware Rev. 1.0.4pre2   [Bootloader 0.5.0]
==== r001i06b ====
SGI UV300 BMC, Firmware Rev. 1.0.4pre2   [Bootloader 0.5.0]
```

```
==== r001i11b ====
SGI UV300 BMC, Firmware Rev. 1.0.4pre2   [Bootloader 0.5.0]
==== r001i16b ====
SGI UV300 BMC, Firmware Rev. 1.0.4pre2   [Bootloader 0.5.0]
```

Example 3. The following example shows how to use the `ssh` command to log into an SGI UV 300 chassis BMC from the RMC and how to use the `version` command to retrieve firmware information from that specific SGI UV 300 chassis BMC:

```
RMC:r001i01c> ssh bmc0
Executing [-/bin/sh]


BusyBox v1.13.2 (2014-10-29 12:19:08 CDT) built-in shell (ash)
Enter 'help' for a list of built-in commands.
BMC:r001i01b> version
SGI UV300 BMC, Firmware Rev. 1.0.4pre2   [Bootloader 0.5.0]
BMC:r001i01b>
```

Example 4. The following example shows how to use the `ssh` command to log into an SGI UV 300 chassis BMC from the RMC and how to use the `version` command, as follows:

```
uv3-rmc RMC:r001i01c> ssh r1i1b

SGI UV BMC, Firmware Rev. 1.3.9
r001i01b00i> version
SGI Chassis Manager Controller, Firmware Rev. 1.3.9   [Bootloader 0.3.0]
```

Retrieving Platform Event Filtering (PEF) Information

This appendix includes the following topics:

About the `ipmitool` PEF Commands

The entries in the PEF table describe sensor events and actions to be taken after sensor events occur. When PEF is active, the BMC scans the PEF table after each platform event. The BMC is searching for entries that match the event in order to find possible actions to be taken. If there is more than one possible action, the BMC performs critical actions first.

Note: The information returned by the PEF commands can be used for system administration. SGI does not support your ability to alter the system to change the way in which the sensors work.

The PEF commands are as follows:

- `pef info`
- `pef status`
- `pef list`

Note: Some of the command output in the following examples has been wrapped at the right for inclusion in this documentation.

`pef info` Command Examples

Example 1. The following `pef info` command targets the RMC:

```
% ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN pef info
 0x51 | 32 | 20 | 68617270-3237-2d63-6d63-000000000000 | Alert,Power-off,Reset,P
```

Example 2: The following `pef info` command targets a specific SGI UV chassis BMC:

```
% ssh root@uv1-rmc ipmitool -H r001i01b -I lanplus -U ADMIN -P ADMIN pef info
root@uv1-rmc's password: #####
 0x51 | 40 | 60 | 08006917-00a2-ce05-0010-debf0a026e80 | Alert,Power-off,Reset,Power-cycle,OEM-defined,
Diagnostic-interrupt
```

`pef status` Command Examples

Example 3: The following `pef status` command targets the RMC:

```
% ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN pef status
 12/12/2014 18:30:35 | 0x0200 | 0xffff | 0x1e7f | PEF,PEF event messages | Alert,Power-off
```

Example 4: The following `pef status` command targets a specific SGI UV chassis BMC:

```
% ssh root@uv1-rmc ipmitool -H r001i01b -I lanplus -U ADMIN -P ADMIN pef status
root@uv1-rmc's password: #####
 12/12/2014 13:39:32 | 0x001a | 0xffff | 0x001a | PEF,PEF event messages,PEF startup delay,Alert startup delay |
Alert,Power-off,Reset,Power-cycle,OEM-defined
```

`pef list` Command Examples

Example 5: The following `pef list` command targets the RMC:

```
% ipmitool -I lanplus -H harp27-rmc -U ADMIN -P ADMIN pef list
 1 | active, pre-configured | 0x11 | Temperature | 1 | Non-recoverable | Threshold | (0x01/0x0200),<UC |
Alert,Power-off | 1
 2 | active, pre-configured | 0x11 | Temperature | 1 | Non-recoverable | Threshold | (0x01/0x0200),<UC |
Alert,Power-off | 1
 3 | active, pre-configured | 0x11 | Voltage | Any | Warning | Threshold | (0x01/0x0a14),<LC,<LNR,<UC,<UNR |
Alert | 1
```

```
 4 | active, pre-configured | 0x11 | Temperature | Any | Critical | Threshold | (0x01/0x0a00),<UC,<UNR | Alert | 1
 5 | active, pre-configured | 0x11 | Processor | Any | Non-recoverable | Discrete | Sensor-specific | Alert | 1
 6 | active, pre-configured | 0x11 | Fan | Any | Critical | Threshold | (0x01/0x0014),<LC,<LNR | Alert | 1
 7 | active, pre-configured | 0x11 | Power supply | Any | Critical | Discrete | Sensor-specific | Alert | 1
 8 | active, pre-configured | 0x11 | Cooling device | Any | Critical | Discrete |
(0x0b/0x002c),redundancy degraded,<non-redundant/sufficient,non-redundant/insufficient | Alert 1
 9 | inactive
 10 | inactive
 11 | inactive
 12 | inactive
 13 | inactive
 14 | inactive
 15 | inactive
 16 | inactive
 17 | inactive
 18 | inactive
 19 | inactive
 20 | inactive
 21 | inactive
 22 | inactive
 23 | inactive
 24 | inactive
 25 | inactive
 26 | inactive
 27 | inactive
 28 | inactive
 29 | inactive
 30 | inactive
 31 | inactive
 32 | inactive
```

Example 6. The following `pef list` command targets a specific SGI UV chassis BMC:

```
% ssh root@uv1-rmc ipmitool -H r001i01b -I lanplus -U ADMIN -P ADMIN pef list
root@uv1-rmc's password: #####
 1 | active, pre-configured | 0x11 | Temperature | 0 | Non-recoverable | Threshold | (0x01/0x0200),<UC |
Alert,Power-off | 1
 2 | active, pre-configured | 0x11 | Temperature | 14 | Non-recoverable | Threshold | (0x01/0x0200),<UC |
Alert,Power-off | 1
 3 | active, pre-configured | 0x11 | Voltage | Any | Warning | Threshold | (0x01/0x0a14),<LC,<LNR,<UC,<UNR |
Alert | 1
```

```
 4 | active, pre-configured | 0x11 | Temperature | Any | Critical | Threshold | (0x01/0x0a00),<UC,<UNR | Alert | 1
 5 | active, pre-configured | 0x11 | Processor | Any | Non-recoverable | Discrete | Sensor-specific | Alert | 1
 6 | active, pre-configured | 0x11 | Fan | Any | Critical | Threshold | (0x01/0x0014),<LC,<LNR | Alert | 1
 7 | active, pre-configured | 0x11 | Power supply | Any | Critical | Discrete | Sensor-specific | Alert | 1
 8 | active, pre-configured | 0x11 | Cooling device | Any | Critical | Discrete |
(0x0b/0x002c),redundancy degraded,<non-redundant/sufficient,non-redundant/insufficient | Alert 1
 9 | inactive
 10 | inactive
 11 | inactive
 12 | inactive
 13 | inactive
 14 | inactive
 15 | inactive
 16 | inactive
 17 | inactive
 18 | inactive
 19 | inactive
 20 | inactive
 21 | inactive
 22 | inactive
 23 | inactive
 24 | inactive
 25 | inactive
 26 | inactive
 27 | inactive
 28 | inactive
 29 | inactive
 30 | inactive
 31 | inactive
 32 | inactive
 33 | inactive
 34 | inactive
 35 | inactive
 36 | inactive
 37 | inactive
 38 | inactive
 39 | inactive
 40 | inactive
```

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