



# SGI® UV™ RMC Software User Guide

007-6361-002

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## New Features in this Guide

The following new features were added in this revision:

- Added additional information to the `power` command.
- Added a pointer to the Supportfolio website that contains information about additional software that you might need if you want to connect to the RMC from a Windows<sup>®</sup> laptop.



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## Record of Revision

<b>Version</b>	<b>Description</b>
001	December 2014 Initial release.
002	May 2015 Supports the SGI Foundation Software 2.12 release.



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## About This Guide

Each SGI® UV™ 300 system and each SGI® UV™ for SAP HANA® appliance includes a rack management controller (RMC). This guide explains RMC operations, such as the following:

- Connecting to the RMC.
- Using RMC commands.
- Using the open source `ipmitool(1)` command for remote management.

You can use the RMC commands and the open source `ipmitool(1)` commands to monitor and manage SGI UV 300 computer systems and SGI UV for SAP HANA appliances. 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](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](https://support.sgi.com/content_request/786853/index.html)

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

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- 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.
<code>command</code>	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.
<code>manpage(x)</code>	Man page section identifiers appear in parentheses after man page names.
<b>user input</b>	This bold, fixed-space font denotes literal items that the user enters in interactive sessions. Output is shown in nonbold, fixed-space font.
<i>variable</i>	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.)

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[techpubs@sgi.com](mailto: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" on page 1
- "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
- "(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

### 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 facilitates the following:

- 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. The RMC provides time synchronization through a synchronous Ethernet connection to each SGI UV 300 chassis baseboard management controller (BMC).
- 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.

### 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 to 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 examples, and SGI recommends that you refer to the RMC by its hostname.

---

2. (Optional) Obtain the IP address of an external server to which you can forward SGI UV 300 SNMP trap 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 purchased an SGI UV 300 system installed in an SGI rack.

The following procedure explains how to examine the RMC, 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 cable is SGI part number 018-1667-001.

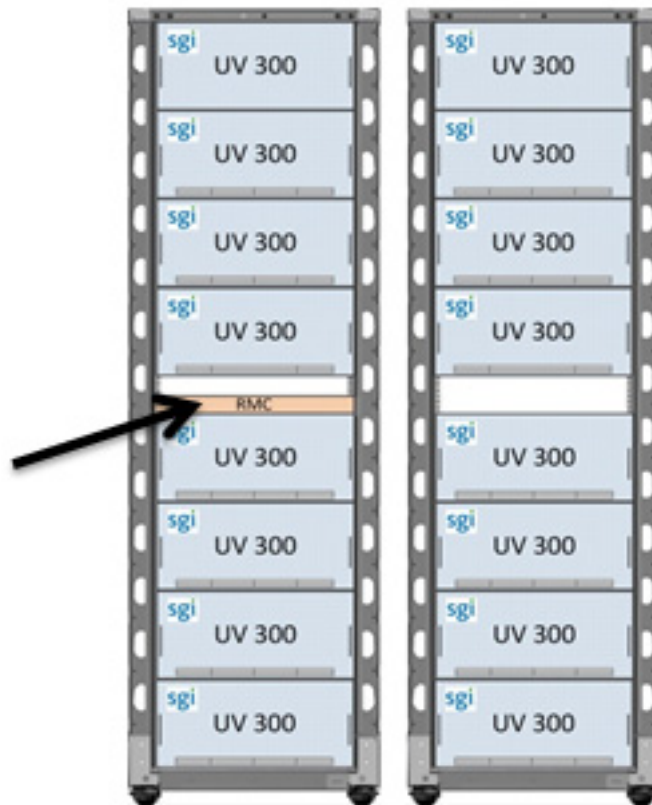
---

**Note:** If you have difficulty completing this procedure from a Windows® laptop using `PuTTY`, you might need to install additional software on your laptop. The following Supportfolio website includes a Windows driver shim and instructions that explain how to install the shim on a Windows laptop:

[https://support.sgi.com/content\\_request/607030/index.html](https://support.sgi.com/content_request/607030/index.html)

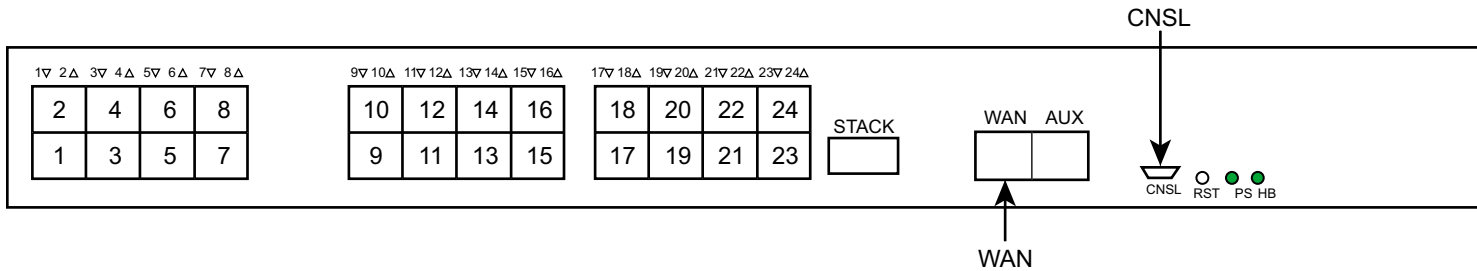
---

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 connector 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.
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:

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

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

# The RMC U-position within the rack [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
<ol style="list-style-type: none"><li>1. Search for the line that contains <code>BOOTPROTO=dhcp</code>.</li><li>2. Insert a pound character (#) in column 1 to make the <code>BOOTPROTO=dhcp</code> line look as follows:  <code># BOOTPROTO=dhcp</code></li><li>3. Remove the pound character (#) from the following line:  <code># BOOTPROTO=static</code></li><li>4. Edit the <code>IPADDR</code>, <code>NETMASK</code>, and <code>HOSTNAME</code> lines as follows:<ul style="list-style-type: none"><li>• Remove the pound character (#) from column 1.</li><li>• Provide site-specific information for the RMC.</li></ul></li></ol>	<ol style="list-style-type: none"><li>1. Search for the line that contains <code># HOSTNAME</code>.</li><li>2. Remove the pound character (#) from column 1 of the <code>HOSTNAME</code> line.</li><li>3. Provide a hostname for the RMC on the <code>HOSTNAME</code> line.</li></ol>

---

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 `/etc/sysconfig/snmptrapd`.
3. Search within file `snmptrapd` for the line that includes 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 to 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)" on page 15
- "Powering On and Booting an SGI UV System From a Complete Power Off" on page 16
- "Creating Boot Options (SGI UV 300 Systems Only)" on page 17
- "Powering Off an SGI UV System" on page 22
- "Creating a Crash Dump File on the SGI UV Server (RHEL 7, SLES 12, and SLES 11 Platforms Only)" on page 23
- "Enabling the Auto-power Capability" on page 25
- "Retrieving System Configuration Information" on page 25
- "Setting Hardware Configuration Overrides (SGI UV 300 Systems Only)" on page 26

### 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 (RHEL) 7 RMCs, type the following command:

```
fs0:\> EFI\redhat\grubx64.efi
```

- On RHEL 6 RMCs, type the following command:

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

- On SLES 12 RMCs, type the following command:

```
fs0:\> EFI\sles12\grubx64.efi
```

- On SLES 11 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.

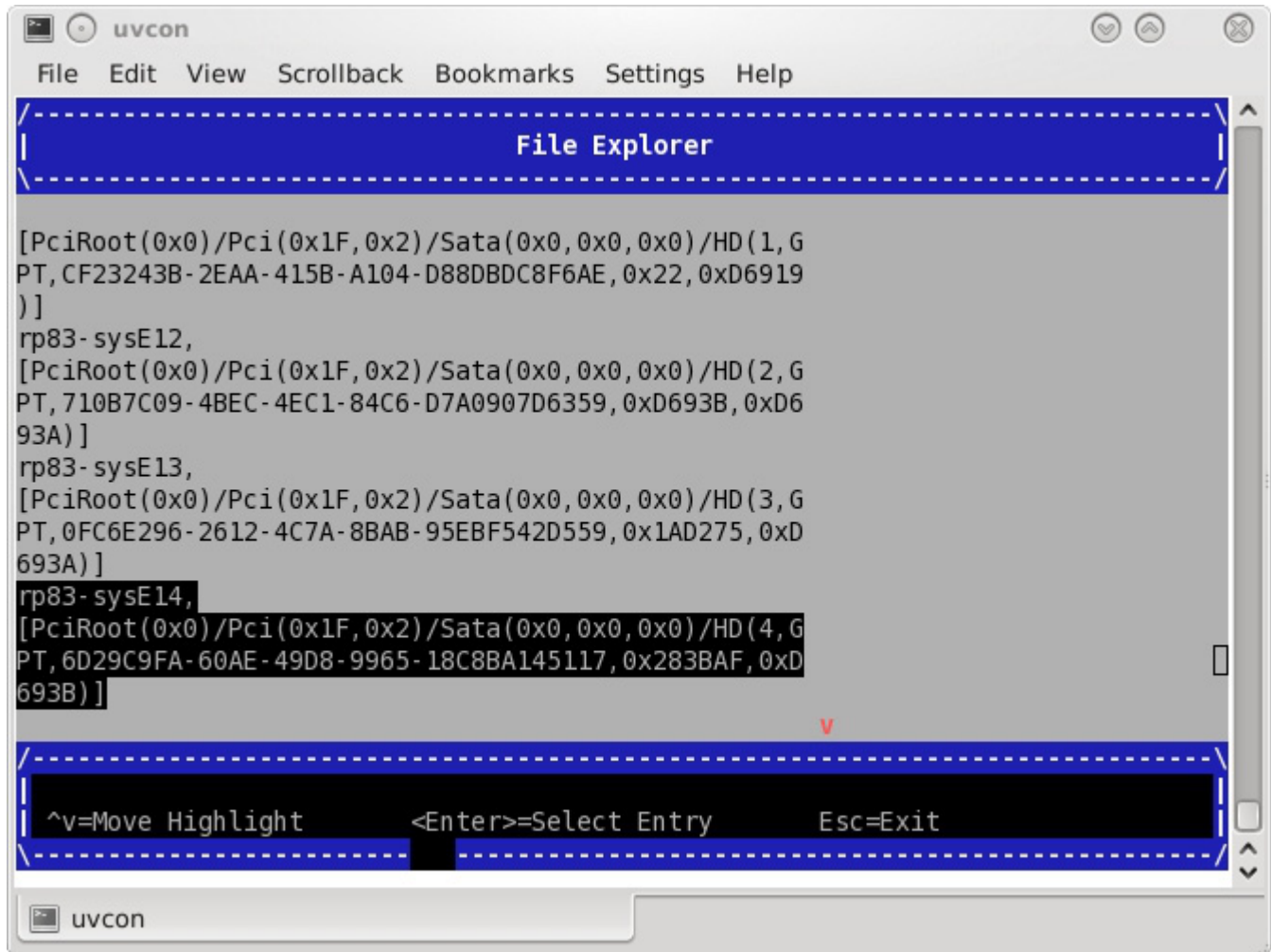
---

**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 7), `elio.efi` (SLES 11), or `grubx64.efi` (RHEL 7 or SLES 12).

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:

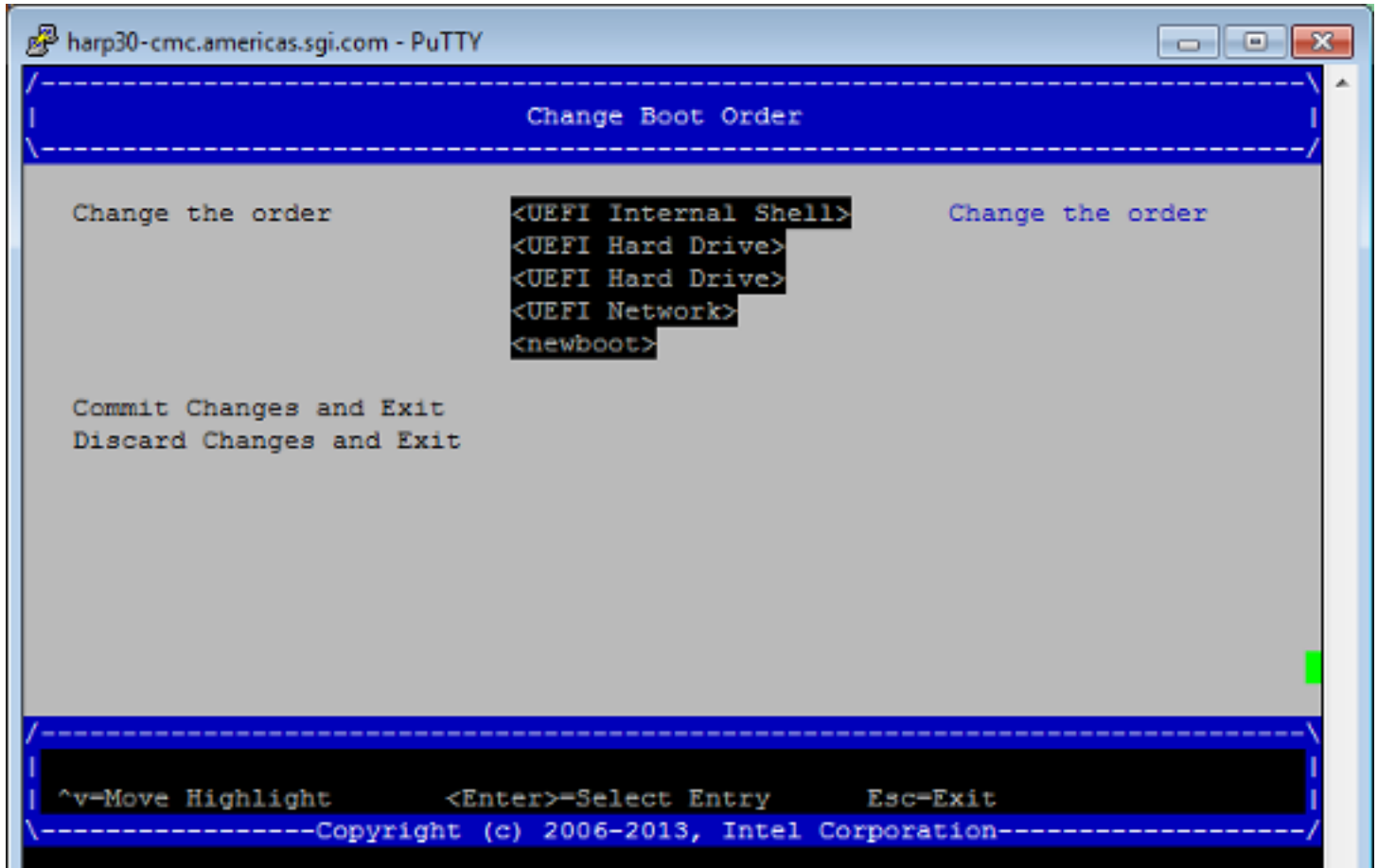


Figure 2-2 Change Boot Order Screen

- 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
```

## Creating a Crash Dump File on the SGI UV Server (RHEL 7, SLES 12, and SLES 11 Platforms Only)

You can request that the operating system write a crash dump file. The file's name includes a timestamp, and the file's location depends on your operating system, as follows:

- For the RHEL 7 operating systems, the file is as follows:

```
/var/crash/127.0.0.1-year.month.day-hour:minutes:seconds
```

- For SLES 11 and SLES 12 operating systems, the file is as follows:

```
/var/crash/year-month-day-hour:minutes
```

---

**Note:** This topic does not apply to RHEL 6 platforms. The `power nmi` and `power diag` commands send backtraces of CPU tasks to the console but do not create a crash dump file.

---

The following procedure explains how to create a crash dump file.

**Procedure 2-5** To create a crash dump file

1. Log in to the SGI UV server as the root user, and type the following commands to enable the kernel crash dump service, `kdump`:

On RHEL 7 and SLES 12, type the following:

```
# systemctl enable kdump
# systemctl start kdump
```

On SLES 11, type the following:

```
# chkconfig boot.kdump on
# service boot.kdump start
```

The SGI Foundation Software package installation process enables `kdump` by default. If you are unsure of whether `kdump` is enabled on your SGI UV server, type the preceding commands. You can enable `kdump` on your server at any time. `kdump` must be enabled in order to create a crash dump file.

2. (Conditional) Ensure that the `uv_nmi` default action is `kdump`.

Complete this step on RHEL 7 and SLES 12 platforms.

Type the following command:

```
# echo kdump > /sys/module/uv_nmi/parameters/action
```

As an alternative to this command, you could also boot the kernel with the following parameter:

```
uv_nmi.action=kdump
```

3. Send a nonmaskable interrupt (NMI) signal to start the dump.

You have the option to send an NMI from a remote connection or when logged in directly to the RMC, as follows:

- To send the NMI signal from a remote connection, type the following `ipmitool` command:

```
# ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN chassis power diag
```

For more information about the `ipmitool` commands, see the following:

Chapter 3, "Remote Management" on page 31

- To send the NMI signal while logged in directly to the RMC, complete the following command sequence:

1. Type the `ssh(1)` command to connect securely. For example:

```
# ssh root@uv1-rmc
```

Provide the root user's password when prompted. For more information about connecting to the RMC, see the following:

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

2. Type the following command to send the NMI signal:

```
RMC> power nmi
```

4. (Conditional) Open a console to the RMC and to initiate a crash dump capture.

Complete this step on SLES 11 platforms.



Type the following commands:

```
> uvcon  
kdb> kdump
```

On SLES 11 platforms, you can type additional `kdb` commands at the `kdb>` prompt. For information about `kdb` commands, see your SLES documentation.

## Enabling the Auto-power Capability

The auto-power capability allows the SGI UV server 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 management controllers (BMCs).

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 31

- 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

This chapter includes the following topics:

- "About the `ipmitool` Remote Management Command" on page 31
- "`ipmitool` Commands Supported on the RMC" on page 35

### About the `ipmitool` Remote Management Command

The Intelligent Platform Management Interface (IPMI) protocol enables you to manage a system from a remote console over a network connection. You can access the IPMI v1.5/v2.0 interface through the `ipmitool(1)` command, which is an open-source command line tool that SGI includes on SGI UV systems and on the SGI<sup>®</sup> UV<sup>™</sup> for SAP HANA<sup>®</sup> appliances. IPMI management software is included in most Linux distributions and in IPMI-compliant management applications. For more information about the `ipmitool` command, see the following:

<http://ipmitool.sourceforge.net/>

SGI supports a subset of the `ipmitool` commands. You can use the `ipmitool` commands to manage the SGI UV system from a remote console, such as a laptop computer or a server that supports `ipmitool` commands.

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)" on page 31
- "`ipmitool` Command Format" on page 33
- "Command Format Examples" on page 34

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

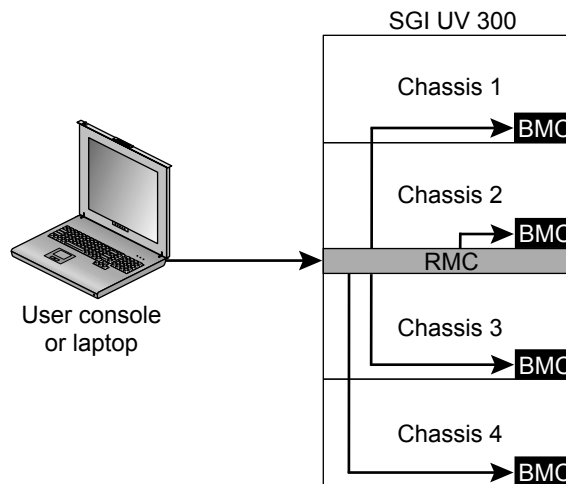
From a remote console, you can issue `ipmitool` commands over the network to the RMC. The remote console needs to be on the same local network as the RMC. The

`ipmitool` commands operate on either the RMC itself or on an individual SGI UV chassis BMC.

The SGI UV 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 32 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. The RMC's hostname is `uv1--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 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:

<b>Parameter</b>	<b>Meaning</b>
<code>ssh root@<i>host</i></code>	<p>(Conditional) The <code>ssh</code> command prefix to the <code>ipmitool</code> command.</p> <p>If you want to run <i>command</i> on one of the SGI UV chassis BMCs, precede the <code>ipmitool</code> command name with <code>ssh root@<i>host</i></code> and specify the RMC's hostname for <i>host</i>. This prefix is required in order to run <i>command</i> on one of the SGI UV chassis BMCs.</p> <p>If you want to run <i>command</i> on the RMC, do not specify <code>ssh root@<i>host</i></code> as a prefix to the <code>ipmitool</code> command name. In this case, use the <code>-H</code> parameter to specify the hostname of the RMC.</p>
<code>ipmitool</code>	The command name.
<code>-I lanplus</code>	The encryption specification.
<code>-H <i>target</i></code>	<p>The computer system upon which the command needs to operate.</p> <p>For <i>target</i>, specify either a hostname (preferred) or an IP address. The <i>target</i> can be one of the following:</p> <ul style="list-style-type: none"> <li>• The RMC's hostname, which is <code>uv1-rmc</code>.</li> <li>• The system ID of a specific SGI UV chassis BMC. When you specify an SGI UV chassis BMC's ID, the RMC relays information back and forth from the remote console to the SGI UV chassis BMC.</li> </ul>

To obtain the list of SGI UV 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 25.

`-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.

---

**Note:** The SGI documentation shows `ipmitool` command output. 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.

---

## 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 system's RMC is `uv1-rmc`.

- The SGI UV 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 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:

- chassis power
- fru list
- lan print 1
- sdr list
- sel list
- sol activate

For more information about these commands, see the `ipmitool(1)` man page on your SGI UV server or see the following topics:

- "Creating Crash Dumps and Issuing Power Cycling Commands" on page 36
- "Listing Information for Field Replaceable Units (FRUs)" on page 37
- "Listing the Local Area Network (LAN) Configuration" on page 38

- "Retrieving a List of the Environmental Sensors and Values" on page 40
- "Retrieving the System Event Log (SEL)" on page 41
- "Opening a Serial Console" on page 43

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 57

## Creating Crash Dumps and Issuing Power Cycling Commands

The RMC itself has no power on or power off capability. The RMC is always on if the SGI UV server is connected to a power source. Likewise, the BMCs for each chassis are always on when the SGI UV server is connected to a power source. To power on and power off the SGI UV server, you need to issue power on and power off commands through the RMC.

The following topics explain the `ipmitool power` commands:

- "Issuing Power Cycling Commands" on page 36
- "Sending a Non Maskable Interrupt (NMI) Signal to Write a Crash Dump" on page 37

### Issuing Power Cycling Commands

The following command sends power control requests to the SGI UV system:

```
ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN chassis power action
```

For *action*, specify `on`, `off`, `cycle`, or `reset`.

If you want to watch the server boot process, use the `ipmitool sol activate` command to open up a serial console. For information about the `sol activate` command, see the following:

"Opening a Serial Console" on page 43

---

**Note:** The `ipmitool power` command in this topic addresses the entire SGI UV server, not any of the individual chassis. SGI recommends that you do not attempt to issue power commands to any of the individual SGI UV chassis.

The RMC `power` command is an alternative to the `ipmitool power` command. For more information about the RMC `power` command, see the following:

"power" on page 51

---

### **Sending a Non Maskable Interrupt (NMI) Signal to Write a Crash Dump**

The following command sends a non-maskable interrupt (NMI) signal to the SGI UV system, which responds by writing a system crash dump:

```
ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN chassis power diag
```

For information about how to use this command, see the following:

"Creating a Crash Dump File on the SGI UV Server (RHEL 7, SLES 12, and SLES 11 Platforms Only)" on page 23

### **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
```

### 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
Gratuitous 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
Gratuitous 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
```

### Retrieving a List of the Environmental Sensors and Values

The following command retrieves a list of the SGI UV 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 IOU            | 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 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 -I lanplus -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
```

## Opening a Serial Console

The `ipmitool sol activate` command opens a serial console to the SGI UV server. You might want to issue this command, for example, if you want to observe system messages during a boot. This command is as follows:

```
ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN sol activate
```



## Rack Management Controller (RMC) Command Reference

This chapter includes the following topics:

- "About the RMC Commands" on page 45
- "Rack Management Controller (RMC) and Baseboard Management Controller (BMC) Command Targets" on page 46
- "autopower" on page 48
- "bios" on page 49
- "bmc" on page 49
- "config" on page 49
- "console" on page 50
- "hel" on page 50
- "hwcfg" on page 51
- "log" on page 51
- "power" on page 51
- "sensor" on page 53
- "uv3dmp" on page 54
- "version" on page 54

### 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: `rrackiuposb[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 50

Table 4-1 on page 47 shows how to specify groups of targets. The table uses the following notation:

Notation	Meaning
Any	In the table, <i>Any</i> refers to all racks, all SGI UV 300 chassis BMCs, or all slots.
<i>upos</i>	The rack unit position, or U-position, 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 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

<i>target</i> Syntax	BMC <i>rack, upos, slot</i>	RMC <i>rack, upos</i>
<i>*, all</i>	Any, Any, Any	Any, Any
<i>r*</i>	<i>rack</i> , Any, Any	<i>rack</i> , Any
<i>r*i*</i>	<i>rack, upos</i> , Any	<i>rack, upos</i>
<i>r*i*b*</i>	<i>rack, upos, slot</i>	N/A
<i>*c</i>	N/A	Any, Any
<i>r*i*c</i>	N/A	<i>rack, upos</i>
<i>alli</i>	Any, Any, Any	N/A
<i>p*</i>	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 48 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 an SGI UV server 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 25

## 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 2014-07-24 at 19:13:20 UTC
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 25

## 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 26

## 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 *targets*.

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

## power

The `power` command enables you to manipulate and to retrieve information about the power status of an SGI UV server. Specifically, you can use the `power` command to power on, power off, reset, power cycle, get status, or invoke the kernel debugger (KDB) of an SGI UV server.

Unlike the server itself, the RMC and each chassis BMC are always powered on if the SGI UV server is connected to an AC power source. You cannot power on or power off the RMC or any of the BMCs.

Within an SGI UV server, the individual chassis are connected via NUMALink, and the `power` command typically operates upon these chassis as if they were one system. In exceptional cases, you can use the `power` command to target an individual chassis.

The `power` command accepts the following two command line options:

- `-c`, which clears any saved BIOS settings in conjunction with `on`, `off`, or `reset` actions. For example, you can specify the `-c` option on of the following ways:  
`power -c on`, `power -c off`, or `power -c reset`.
- `-v`, which lists the individual chassis and the power status of each chassis.

**Example 1.** You can use the `power` command or `power status` command to retrieve information about the power state of the SGI UV 300 chassis in the server, as follows:

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

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

**Example 2.** The `-v` option lists the power status of each chassis, as follows:

```
RMC:r001i01c> power status -v
==== r001i01c ====
    r001i01b
    r001i06b
    r001i11b
    r001i16b
chassis off: 0
chassis unknown: 0
chassis disabled: 0
RMC:r001i01c>
```

**Example 3.** The `power reset` command resets the system without cycling power. The following command resets a system that is powered up:

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

**Example 4.** The `-c` option clears the BIOS settings and returns the SGI UV server BIOS to the original, factory-defined settings. You can use the `-c` option with the `on`, `off`, and `reset` arguments. The following command resets a system that is powered up, clears any saved BIOS configuration settings, and returns the BIOS to its original, default configuration:

```
RMC:r001i01c> power -c reset
```

---

**Note:** The BIOS configuration settings menus enable you to change BIOS settings. The `-c` option clears all EFI environment variables and all BIOS settings that have been changed.

---

**Example 5.** The following command powers the SGI UV server up and down:

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

**Example 6.** The following command invokes the kernel debugger:

```
RMC:r001i01c> power nmi
```

## 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 | 55.000
RMC Exhst     | 24.000 | degrees C | ok | na | na | na | 43.000 | 53.000 | 55.000
RMC PSOC 3.3v | 3.330 | Volts     | ok | 2.625 | 2.787 | 2.950 | 3.620 | 3.783 | 3.946
RMC 12v       | 12.012 | Volts     | ok | 9.570 | 10.164 | 10.758 | 13.200 | 13.794 | 14.388
RMC 3.3v Aux  | 3.294 | Volts     | ok | 2.625 | 2.787 | 2.950 | 3.620 | 3.783 | 3.946
RMC 2.5v      | 2.425 | Volts     | ok | 1.987 | 2.110 | 2.233 | 2.740 | 2.863 | 2.987
RMC 1.5v      | 1.484 | Volts     | ok | 1.189 | 1.263 | 1.337 | 1.640 | 1.714 | 1.788
RMC 1.2v      | 1.188 | Volts     | ok | 0.957 | 1.016 | 1.076 | 1.320 | 1.379 | 1.439
RMC 1.0v      | 0.996 | Volts     | ok | 0.797 | 0.847 | 0.897 | 1.100 | 1.149 | 1.199
RMC 0.75v     | 0.754 | Volts     | ok | 0.595 | 0.631 | 0.668 | 0.820 | 0.857 | 0.894
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" on page 57
- "`pef info` Command Examples" on page 58
- "`pef status` Command Examples" on page 58
- "`pef list` Command Examples" on page 58

### 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

```

## A: Retrieving Platform Event Filtering (PEF) Information

---

```
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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