



SGI UV System Software Installation and Configuration Guide

007-5948-003

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New Features

This revision adds information about how to configure Security-Enhanced Linux (SELinux).

Record of Revision

Version	Description
001	November 2013 Original publication.
002	May 2014 Revised to support the SGI Foundation Software 2.10 release.
003	June 2014 Revised to include information about how to configure Security-Enhanced Linux (SELinux).

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About This Guide

SGI installs operating system software and the SGI Foundation software on all SGI® UV™ 2000, SGI UV 1000, and SGI UV 100 systems before the systems leave the factory. The operating system software is either Red Hat Enterprise Linux (RHEL) or SUSE Linux Enterprise Server (SLES). In the event of a disaster or system failure, you can use the instructions in this manual to reinstall this software.

This guide does not support SGI UV 20 systems or SGI UV 10 systems.

Related Publications

The release notes for the SGI Foundation Suite and the SGI Performance Suite list SGI publications that pertain to the specific software packages in those products. The release notes reside in a text file in the `/docs` directory on the product media. For example, `SGI-MPI-1.x-readme.txt`. After installation, the release notes and other product documentation reside in the `/usr/share/doc/packages/product` directory.

The following additional documentation might be useful to you:

- *SGI UV System Management Node Administrator Guide*
Describes how to install, configure, and administer the system management node (SMN) on SGI UV 2000, SGI UV 1000, and SGI UV 100 series systems.
- *SGI UV CMC Software User Guide*
Describes how to use the chassis management controller (CMC) to monitor and manage SGI UV 2000, SGI UV 1000, and SGI UV 100 systems.

The SGI Knowledgebase includes additional technical information. For example, the Knowledgebase includes a document that explains how to boot an SGI UV 1000 system using the iSCSI protocol and how to boot from a Fibre Channel Disk. Contact your SGI representative for this information.

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 document:

Convention	Meaning
<code>command</code>	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
<i>variable</i>	Italic typeface denotes variable entries and words or concepts being defined.
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.)
[]	Brackets enclose optional portions of a command or directive line.
...	Ellipses indicate that a preceding element can be repeated.
manpage(x)	Man page section identifiers appear in parentheses after man page names.
GUI	This font denotes the names of graphical user interface (GUI) elements such as windows, screens, dialog boxes, menus, toolbars, icons, buttons, boxes, fields, and lists.

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>

S&I values your comments and will respond to them promptly.

Introduction

This chapter contains the following topics

- "About Installing the Operating System Software, SGI Foundation Suite, and Optional Features" on page 1
- "Installing the SGI Performance Suite" on page 2

About Installing the Operating System Software, SGI Foundation Suite, and Optional Features

This manual explains the following:

- How to reinstall the operating system software and SGI Foundation Suite software. You can reinstall this software to meet site requirements or to reinstall in the event of a disaster or a system failure.
- How to configure optional features, such as the hardware event tracker (HET), CPU frequency scaling, partitioning, or superpages.

The procedures in this guide were developed using the following hardware and software:

- An SGI UV 2000 with an SMN. This system was the primary test system. Differences for other systems are noted in the text, but noted differences are not comprehensive. Differences are noted for systems without an SMN.
- Red Hat Enterprise Linux 6.5 (RHEL 6.5) and SUSE Linux Enterprise Server 11 SP3 (SLES 11 SP3). These were the specific operating systems used during the documentation's development. Different operating system levels might behave somewhat differently on SGI hardware.
- The SGI Foundation Software 2.10 release. SGI requires that the SGI Foundation Software be installed on each SGI UV system. You can install the SGI Foundation Software on the SGI UV server and on the SMN after you install the operating system software.
- The System Management Node 1.9 release. If your SGI UV system includes a system management node (SMN), install the SMN software on this node.

Installing the SGI Performance Suite

The SGI Performance Suite is an optional package, but you need to install the SGI Performance Suite if you want to partition your SGI UV system or if you want to use superpages.

The SGI Performance Suite is also required if you want to use any of the following software tools:

- SGI Accelerate, which includes optimized software libraries and run-time performance tools.
- SGI MPI, which is SGI's high-performance message passing interface environment.
- SGI REACT, which is SGI's hard real-time performance solution.
- SGI UPC, which is SGI optimized Unified Parallel C compiler.

For information about how to install the SGI Performance Suite software, see the SGI Performance Suite release notes. The release notes reside in a text file in the `/docs` directory on the product media. After installation, the release notes and other product documentation reside in the `/usr/share/doc/packages/product` directory.

Preparing to Install the SGI UV System Software

This chapter includes the following topics:

- "About Installing SGI UV System Software" on page 3
- "Gathering Installation Materials and Information" on page 5
- "Preparing the Environment and Gathering BMC Information" on page 10
- "(Optional) Setting or Changing an Administrative Password on the Console" on page 14
- "Preparing to Install the Operating System Software and the SMN Software from the Local Console" on page 16
- "Creating the Installation Environment" on page 17

About Installing SGI UV System Software

SGI installs operating system software, the SGI Foundation Software, and any additional customer-purchased software on all SGI UV systems before the systems leave the SGI manufacturing facility. The operating system can be one of the following:

- Red Hat Enterprise Linux (RHEL)
- SUSE Linux Enterprise Server (SLES)

If your site practices require you to reinstall the software, or if a disaster occurs at your site, you can use the procedures in this manual to reinstall all the factory-installed software. The procedures in this manual assume the following:

- You, the installer, are familiar with Linux operating systems, and you are familiar with the operating system software update process. The installation instructions describe how to register the operating system installation with the operating system software provider to ensure automatic updates. This manual assumes that your site wants to use the automatic updates. As an alternative, you can use physical media to apply updates.
- You want to reinstall the factory-installed software on the SGI UV server and, optionally, on the SGI UV system management node (SMN).

If your system has an SMN, this documentation assumes that the SMN is a factory-installed SMN, which includes Java software. If your SMN hosts a custom installation, the procedures in this manual might fail. In addition, this documentation assumes that you can insert DVDs into the DVD drive on the SMN.

If your system does not have an SMN, plan to attach a keyboard, monitor, mouse, and a USB DVD drive directly to the Base I/O BMC on the SGI UV server. If you plan to install onto an SGI UV 2000 system, and you need this equipment, plan to procure an approved USB DVD drive from SGI. Contact your SGI representative and ask for the USB DVD drive with marketing code LSV-DVD-EXT.

- Your SGI UV system is cabled correctly and attached to the network in accordance with your site practices.

There is a specific order in which you need to install software on an SGI UV system.

To install the software on an SGI UV server, install the software in this order:

1. Operating system software, either RHEL or SLES
2. SGI Foundation Software
3. (Optional) SGI Performance Suite software. This optional SGI product is required if you want to partition your SGI UV system.

To install the software on an SGI UV SMN, install the software in this order:

1. Operating system software, either RHEL or SLES
2. SGI Foundation Software
3. SGI SMN Software

If you need to install software on both the SGI UV server and on the SGI UV SMN, install the software on the SMN first. Install the software on the SGI UV server after you install the operating system software, the SGI Foundation Software, and the SMN software on the SMN.

The operating system installation procedure is nearly identical for both the SGI UV server and the SMN. Use the operating system installation procedures in this manual as a guide when you perform the operating system installations on both the SGI UV server and the SMN. Small differences related to the platforms are noted within the procedures.

Gathering Installation Materials and Information

The following procedure explains how to gather the information you need for the SGI UV server operating system installation session. If you gather the information you need in advance, you can complete the installation more quickly.

Procedure 2-1 To gather installation materials and information

1. Locate the software DVDs or CDs that SGI sent to you, or download and create DVDs or CDs.

This manual assumes that you have DVDs of the operating system and CDs of the SGI software.

You can obtain the operating system software in one of the following ways:

- In a media kit from SGI. SGI distributes DVD copies of the RHEL and SLES operating system releases.
- As a software download. You can download the RHEL and SLES releases from the Red Hat or SUSE websites and write the software to a DVD.

You can obtain the SGI software from the SGI Supportfolio website. To download the SGI software, complete the following steps:

- In a browser window, navigate to the following URL:

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

SupportFolio prompts you for your username and password.

- Download the SGI software that you need. If you install the operating system software, also plan to install the SGI Foundation Software.
- Write the ISO file to a CD or DVD. The instructions in this manual assume that you have hard media. Some procedures explain how to access the release software if you want to install from a network-resident ISO image, but the instructions are not comprehensive. If you wrote downloaded ISO images to your house network and you do not want to write them to hard media, plan to use your network tools to access the software when the procedures instruct you to insert a DVD or CD.

2. Plan the order in which to install the software.

If you need to install both the SGI UV server software and the SGI SMN software, plan to install the SMN software first. You can install the SGI UV server software after the SMN software installation is complete.

3. Gather the information that the installer requires.

The installation requires you to provide information about passwords, your public (or house) network, and so on. You can complete the installation more quickly if you gather this information before you begin. Obtain the system configuration information that was used when the SGI UV System was originally configured. The following list shows the information you need to collect:

- SMN fully qualified domain name (FQDN)

- SMN hostname _____
- SMN IP address _____
- SMN subnet mask _____
- Password for the SMN's system administrator (root user) login

- SGI UV server fully qualified domain name (FQDN)

- SGI UV server hostname _____
- SGI UV server IP address _____
- SGI UV server subnet mask _____
- Site DNS server IP addresses _____
- Site search domain _____
- Password for the SGI UV server's system administrator (root user) login

- FQDN of your site's network time protocol (NTP) server

- IP address of your primary name server _____
- IP address of your secondary name server

- (Conditional) Fully qualified domain name (FQDN) of the chassis management controller (CMC) _____.

You need this information if your SGI UV system does not have an SMN.

- For RHEL installations, do the following:
 - Verify your site's Red Hat Networks (RHN) registration status and your Customer Center registration status.
 - Obtain your RHN login.
 - Obtain your RHN password.
 - For SLES installations, do the following:
 - Determine the email address you want to use when you register with Novell.
 - (Optional) Obtain the activation code for SLES components.
 - (Optional) Determine the system name or description.
4. Familiarize yourself with the hardware components in the rack, and identify the System Management Node (SMN), if present.

Figure 2-1 and Figure 2-2 show the location of the SMN in an SGI UV 2000 system rack and in an SGI UV 1000 system rack. The SMN is located either in the top 1U slot between the individual rack units (IRUs) or at the top of the rack.

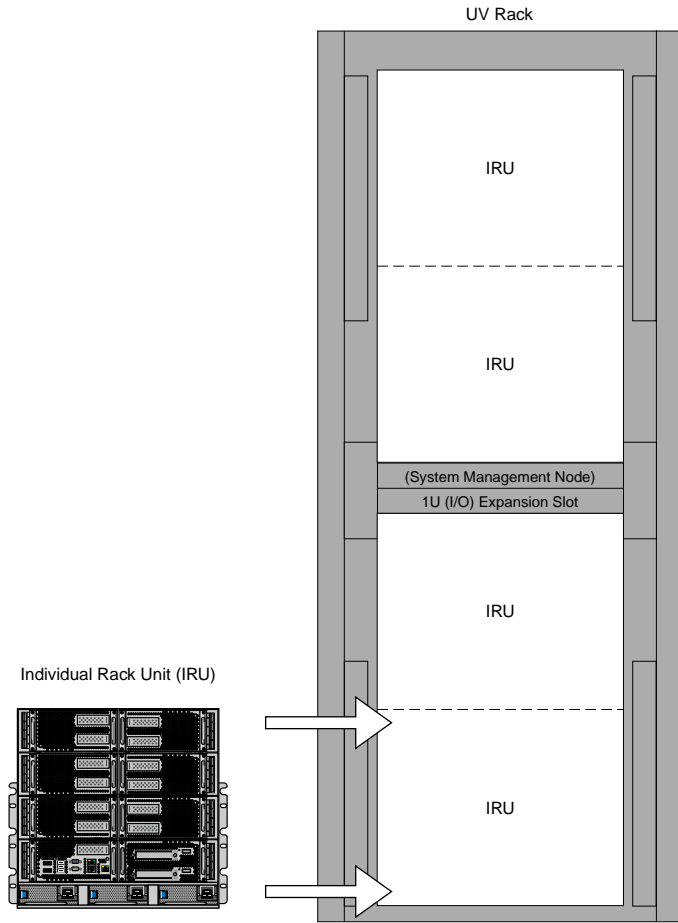


Figure 2-1 SGI UV 2000 System Rack

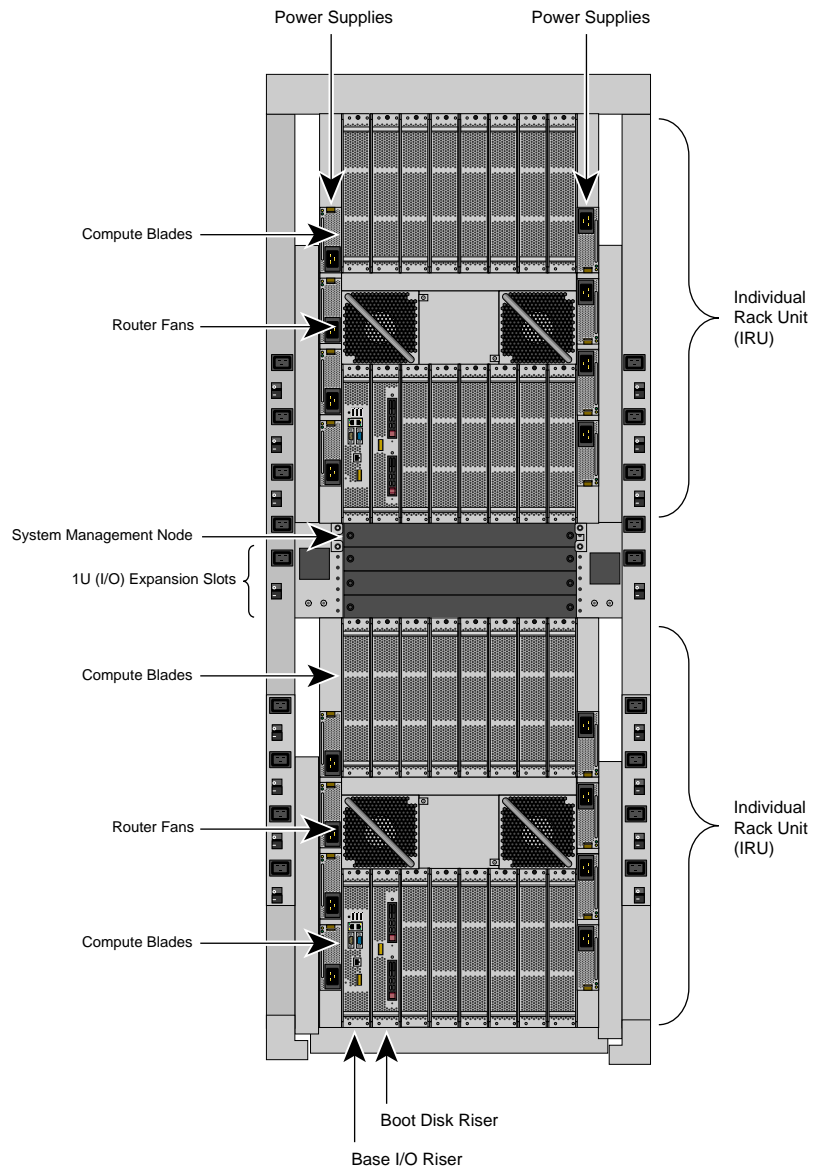


Figure 2-2 SGI UV 1000 System Rack

When you begin the installation, instructions direct you to insert the installation DVD into the SMN and press the power button. As Figure 2-3 on page 10 shows, the DVD drive is on the left of the SMN.

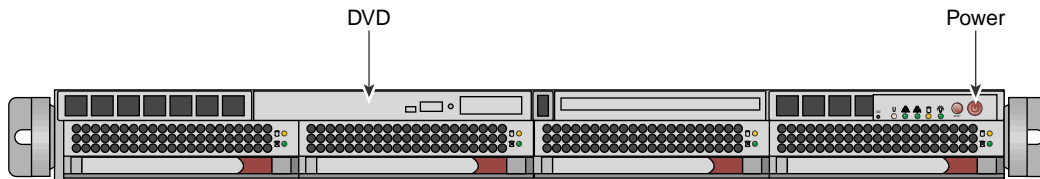


Figure 2-3 SMN Power Button and DVD Drive

5. Attach a keyboard, monitor, and mouse to the SMN.
The SMN includes USB ports for this purpose.
6. Proceed to the following:
"Preparing the Environment and Gathering BMC Information" on page 10

Preparing the Environment and Gathering BMC Information

The procedure in this topic explains how to prepare your local or remote console for an installation session. The connection procedures direct you to establish secure connections to various subsystems. For convenience, you can open each connection in its own window and leave that window open for the duration of the procedure. Some steps require you to go back to a previous subsystem and type additional commands.

Note: Some steps in the following procedure are labeled as conditional. Completion of these steps depends on whether you are local versus remote, using a specific SGI UV system model, or installing software on a single partition versus an entire system.

Procedure 2-2 To prepare a local or remote console

1. Notify users that they need to log off.

The software installation process includes a step to reboot the system. If any users are logged in at this time, their sessions end abruptly.

2. (Conditional) From the system management node (SMN), establish a secure network connection to the chassis management controller (CMC) of your SGI UV system.

Perform this step if you are logged into the SMN. You do not need to perform this step if you are at the local console.

For information about how to connect to the CMC, use one of the methods in the *SGI UV CMC Software User Guide*.

3. (Conditional) Type the `config -v` command to retrieve the blade name for the base I/O blade for each partition.

Perform this step if your goal is to install an operating system on a partition.

You need to create the partitions themselves before you can install an operating system on a partition. For information about how to create partitions, see the following:

"System Partitioning" on page 72

For example:

```
uv44-cmc CMC:r001i01c> config -v

SSN:UV2-00000048

CMCs:                1
                    r001i01c UV2000

BMCs:                8
                    r001i01b00 IP109-BASEIO P001
                    r001i01b01 IP109        P001
                    r001i01b02 IP109        P001
                    r001i01b03 IP109        P001
                    r001i01b04 IP109-BASEIO P002
                    r001i01b05 IP109        P002
                    r001i01b06 IP109        P002
                    r001i01b07 IP109        P002

Partitions:         2
                    partition001 BMCs:     4
                    partition002 BMCs:     4
```

```
Accessories:      0
```

The rightmost column in the preceding example output, which contains `Pxxx` entries, shows two partitions, `P001` and `P002`. The lines that contain `BASEIO` show the base I/O BMC for each partition. Note the blade names for the base I/O BMCs for each partition, which are `r001i01b00` for `P001` and `r001i01b04` for `P002`.

4. Open an `ssh` connection to the baseboard management controller (BMC).

This step differs depending on whether your goal is to install an operating system on an unpartitioned, single system image (SSI) SGI UV system or whether your goal is to install an operating system on a partition of an SGI UV system that is currently divided into partitions, as follows:

- To install onto an unpartitioned SSI, complete the following steps:

- On an SGI UV 2000 system, type the following command:

```
uv44-cmc CMC:r001i01c> ssh bmc0
```

- On an SGI UV 1000 system, type the following command:

```
uv44-cmc CMC:r001i01c> ssh bmc0i
```

- To install onto a partition, use the `ssh` command and specify the base I/O BMC name for the desired partition. For example, continuing the example from the previous step, to connect to `P001`, type the following command:

```
uv44-cmc CMC:r001i01c> ssh r001i01b00
```

5. Retrieve the IP address of the BMC.

This step differs, depending on your platform, as follows:

- For SGI UV 2000 systems, type the following command to retrieve the IP address of `eth2` on the BMC:

```
r001i01b00> ifconfig eth2
```

For example, the following output shows that `128.162.246.190` is the IP address of `eth2`:

```
BMC:r001i01b00> ifconfig eth2
eth2      Link encap:Ethernet  HWaddr 08:00:69:16:82:2B
          inet addr:128.162.246.190  Bcast:128.162.246.255  Mask:255.255.255.0
```

```
inet6 addr: fe80::a00:69ff:fe16:822b/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:21326174 errors:1250 dropped:2 overruns:0 frame:1248
TX packets:25887 errors:0 dropped:0 overruns:0 carrier:4
collisions:0 txqueuelen:1000
RX bytes:1733795498 (1.6 GiB) TX bytes:9314062 (8.8 MiB)
Interrupt:60 Base address:0x800 DMA chan:ff
```

- For SGI UV 1000 systems, type the following command to retrieve the IP address of eth1 on the BMC:

```
BMC:r001i01b00i> ifconfig eth1
```

For example, the following output shows that 172.20.255.254 is the IP address of eth1:

```
r001i01b00i> ifconfig eth1
eth1      Link encap:Ethernet HWaddr 08:00:69:15:C0:57
          inet addr:172.20.255.254 Bcast:172.20.255.255 Mask:255.255.0.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:1508779 errors:204 dropped:28 overruns:0 frame:204
          TX packets:2262923 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:924130317 (881.3 MiB) TX bytes:3017177156 (2.8 GiB)
          Interrupt:1
```

6. Note the IP address of eth2 on the BMC (for SGI UV 2000 systems) or eth1 on the BMC (for SGI UV 1000 systems).

Keep the IP address in a safe place. You need this IP address during the installation session and for future installation sessions.

7. Proceed to one of the following:

- To set an administrative password for the local console, proceed to the following:

"(Optional) Setting or Changing an Administrative Password on the Console" on page 14

SGI does not require that you set an administrative password, but you can do so if you are logged into a direct-attached, local console. After you set this password, you can proceed with the software installation.

- To install the operating system and SGI Foundation Software on an SMN, proceed to the following:
"Preparing to Install the Operating System Software and the SMN Software from the Local Console" on page 16
- To install the operating system and SGI Foundation Software on an SGI UV server, proceed to the following:
"Creating the Installation Environment" on page 17

(Optional) Setting or Changing an Administrative Password on the Console

The procedure in this topic explains how to set, or change, an administrative password on the console attached to an SGI UV system. A password is not required.

To delete a console password, type the following command, which clears the EFI variables:

```
system-cmc CMC:r001i01c> power -c reset
```

If you delete the password with the `power -c reset` command, you need to go back through the setup screens to set it again.

Procedure 2-3 To set or change an administrative password on the console

1. (Conditional) Shut down the system.

Complete this step if the system is running at this time.

Type the following command:

```
# shutdown now
```

2. From the CMC, type the following command to reset the power:

```
system-cmc CMC:r001i01c>power reset
```

3. Wait for the reset to complete and type the following command to start a console session on the base I/O BMC:

```
system-cmc CMC:r001i01c> uvcon
```

4. At the console's **Hit [Space] for Boot Menu** prompt, press the space bar.
5. On the boot manager screen, select **Device Manager**, and press Enter.

Figure 2-4 shows the boot manager screen.

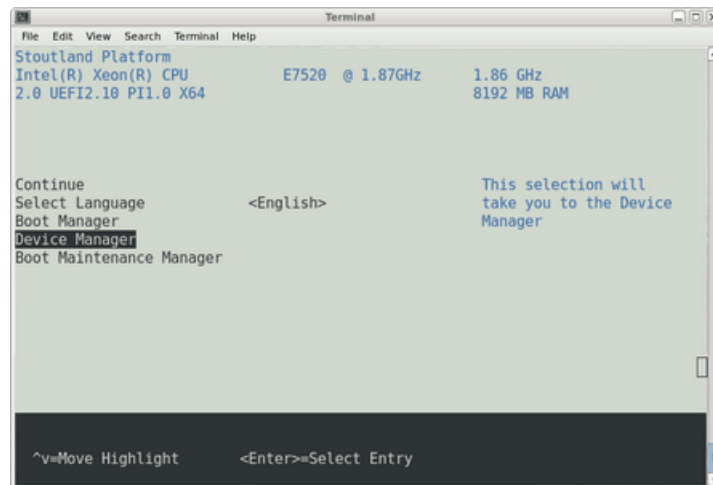


Figure 2-4 Boot Manager Screen

6. On the **Device Manager** screen, select **Security**, and press Enter.

The following list shows how to navigate the device manager:

- F1 scrolls the help.
- Shift-6(^), v, or arrow keys highlight a selection.
- F9 resets system defaults.
- Enter selects.
- F10 saves.
- Esc exits without saving.
- Plus (+) and minus (-) keys change setting values.
- To exit the console, press CTRL and the right bracket (]) together, and then press q. This sequence drops you to the CMC console.

7. On the **Security** screen, select the **Admin Password** option, and press Enter.

8. In the **Please type in your new password** field, type the new administrative password, and press Enter.

The minimum password length is 6 characters and the maximum password length is 30 characters. The password is case sensitive.

The next time you boot the system, the system will prompt you to type the new password at the end of the boot sequence. The system issues this prompt before the `Shell>` prompt appears.

9. Press `F10` to save the change.
10. Press `Esc` twice to return to the boot manager.
11. To return to the CMC console, press `CTRL` and the right bracket (`)` together, and then press `q`.
12. Proceed to one of the following:
 - To install the operating system and SGI Foundation Software on an SMN, proceed to the following:

"Preparing to Install the Operating System Software and the SMN Software from the Local Console" on page 16
 - To install the operating system and SGI Foundation Software on an SGI UV server, proceed to the following:

"Creating the Installation Environment" on page 17

Preparing to Install the Operating System Software and the SMN Software from the Local Console

Perform the procedure in this topic if you want to install software on the SMN.

Perform all SMN software installations from the local console that is attached directly to the SMN. You cannot install software on the SMN from a remote console.

The following procedure explains how to enable local console access.

Procedure 2-4 To enable access to the SMN from the local console

1. Make sure that the SGI UV system is configured properly.
2. Notify users that they need to log off.

The software installation process includes a step to reboot the system. If any users are logged in at this time, their sessions end.

3. Insert the operating system DVD into the DVD drive on the SMN.
4. Press CTRL-ALT-F2 to get to tty2.
5. Log in as `root`.
6. Type `reboot`.
7. Start the installer.

This step differs, depending on the operating system you want to install, as follows:

- To install a RHEL SMN, on the **Welcome to Red Hat Enterprise Linux 6.X** screen, position the cursor at **Install or upgrade an existing system**, and press Enter.
 - To install a SLES SMN, on the SLES boot menu, select **Installation**.
8. Proceed to one of the following:
 - To install a RHEL operating system, the SGI Foundation Software, and the SMN software on the SMN, proceed to the following:
Chapter 3, "Installing the Red Hat[®] Enterprise Linux[®] (RHEL) Operating System and the SGI Foundation Software" on page 25
 - To install a SLES operating system, the SGI Foundation Software, and the SMN software on the SMN, proceed to the following:
Chapter 4, "Installing the SUSE Linux Enterprise Edition (SLES) Operating System and the SGI Foundation Software" on page 45

Creating the Installation Environment

You can install the SGI UV server software by going through the SMN or by making a direct connection to the SGI UV server. Perform one of the following procedures to install software on the SGI UV server:

- "Using an SMN to Install the SGI UV Server Software" on page 18
- "Using Attached Peripherals to Install the SGI UV Server Software" on page 22

Using an SMN to Install the SGI UV Server Software

Perform the procedure in this topic if you have an SMN and you want to install the SGI UV server software through the SMN.

Procedure 2-5 To install the SGI UV server software through the SMN

1. Log into the SMN as the root user.
2. Click **Computer > Firefox**.
3. In the Firefox address bar, type the IP address of eth2 (on an SGI UV 2000 system) or eth1 (on an SGI UV 1000 system) on the BMC.

For example:

```
http://172.20.255.254
```

Use the URL you retrieved and saved in a safe place when you performed the following procedure:

"Preparing the Environment and Gathering BMC Information" on page 10

4. On the Megarac login screen, log into the system.

On an SGI UV 2000 system, type **admin** as the username, type **admin** as the password, and press Enter.

On an SGI UV 1000 system, type **root** as the username, type **superuser** as the password, and press Enter.

The system might issue a Java prompt at this point. Address any Java prompts that the system displays.

5. Launch the console.

This step differs depending on whether you want to install software on an SGI UV 2000 or an SGI UV 1000.

On an SGI UV 2000 system, on the **Dashboard** screen, click **Launch**.

On an SGI UV 1000 system, on the **Altix UV** screen, complete the following steps:

- Click **Remote Control**.
- Click **Console Redirection**.
- Click **Launch Console**.

6. (Conditional) Enable Firefox pop-ups.

Perform this step if Firefox displays a message about pop-ups.

Perform the following steps:

- Click **Preferences**.
- Click **Allow pop-ups for *ip_address***.
- Click **Launch** again.

7. On the **Opening jviewer.jnlp ...** screen, click **OK**.

8. On the **Warning — Security: The web site's certificate cannot be verified ...** screen, complete the following steps:

- Check **Always trust content from this publisher**.
- Click **Yes**.

9. On the **Warning — Security: The application's digital signature cannot be verified ...** screen, complete the following steps:

- Check **Always trust content from this publisher**.
- Click **Run**.

10. Launch the virtual media wizard.

This step differs on SGI UV 2000 and SGI UV 1000 systems.

On SGI UV 2000 systems, complete the following steps:

- In the top-most JViewer menu bar, click **Media > Virtual Media Wizard ...**
- Insert the operating system DVD into the DVD drive on the SMN, or if you are at a remote console, insert the DVD into your local desktop.
- On the **Virtual Media** pop-up, under **CD/DVD Media 1**, complete the following steps:

- Select the device that corresponds to your DVD drive.

Your choice is **/dev/device**, where *device* depends on your system. For example, select **/dev/sr0**.

- Click **Connect to CD/DVD**.

- On the **Information** pop-up, click **OK**.
- On the **Virtual Media** pop-up, click **Close**.

On SGI UV 1000 systems, complete the following steps:

- Insert the operating system DVD into the DVD drive on the SMN, or if you are at a remote console, insert the DVD into your local desktop.
- In the JViewer main menu, select **Device > Redirect CDROM**.
- On the **CD-ROM Selection** pop-up, select a drive.

For example, select **/dev/scd0**.

- Click **OK**.

11. In a terminal window, establish a secure connection to the SGI UV server.

For example:

```
ssh root@uv_server_name
```

12. Type the following command to shut down the system:

```
shutdown now
```

This command drops you into single-user mode. Wait for the root prompt (#) to appear.

13. In a terminal window, establish a secure connection to the CMC.

For example:

```
ssh root@cmc_name
```

14. (Conditional) Boot the system.

Perform this step if you want to install software onto an unpartitioned SGI UV system or if you want to install software on an SMN. Do not perform this step if you want to install an operating system on a single partition.

The CMC command you need to boot the system differs slightly, depending on whether you want to boot an SSI or whether you want to boot a partition. The formats are as follows:

- For an SSI, type the following command to boot the system as a single blade:

```
CMC:r001i01c> power -s reset
```

- For a specific partition, type the `power` command in the following format:

```
power -s reset number
```

For *number*, specify the partition number.

For example, to boot partitions 1 and 2, type the following commands:

```
CMC:r001i01c> power -s reset 1
CMC:r001i01c> power -s reset 2
```

15. Press the space bar after a message similar to the following appears in the JViewer window:

```
133,110,038,528 bytes of system memory tested OK
Hit [Space] for Boot Menu...
```

If you miss the opportunity to press the space bar, and you arrive at the EFI shell, type `exit` to return to the boot manager.

16. Use the arrow keys to select **Boot Manager**, and press Enter.
17. On the **Boot Manager** screen, use the down-arrow key to select or highlight **EFI USB Device**, and press Enter.

Several minutes might elapse before the system begins to boot. A series of question mark characters might appear on the screen during the system boot. This is a known problem, and you can ignore it safely.

18. (Conditional) Configure the accelerated boot process. (RHEL platform SGI UV servers only)

Perform this step only if you inserted a RHEL DVD into the DVD drive on an SGI UV server. Failure to accelerate the boot process can result in boots that last twenty minutes or more on RHEL platforms. You do not need to perform this step on an SMN.

Complete the following steps:

- On the **Press any key for the boot menu ...** screen, press Enter.

- On the GNU GRUB menu, verify that **Red Hat Enterprise Linux ...** is selected, and type `e` to edit the Red Hat Enterprise Linux commands before booting.
 - On the GNU GRUB menu, verify that **kernel / ...** is selected, and type `e` to edit the kernel.
 - At the end of the **grub edit >** line that contains the default boot options, type a space character and then type the following additional boot option:
`ipmi_si.trydefaults=0`
Press Enter when you finish typing the additional boot option.
 - On the GNU GRUB menu, type `b` to boot RHEL with the additional boot options.
19. Proceed to one of the following:
- To install a RHEL operating system and the SGI Foundation Software on an SGI UV server, proceed to the following:

Chapter 3, "Installing the Red Hat[®] Enterprise Linux[®] (RHEL) Operating System and the SGI Foundation Software" on page 25
 - To install a SLES operating system and the SGI Foundation Software on an SGI UV server, proceed to the following:

Chapter 4, "Installing the SUSE Linux Enterprise Edition (SLES) Operating System and the SGI Foundation Software" on page 45

Using Attached Peripherals to Install the SGI UV Server Software

Perform the procedure in this topic if you do not have an SMN.

Procedure 2-6 To install the SGI UV server software without an SMN

1. Attach a keyboard, a monitor, and a mouse directly to the SGI UV server.
2. Notify users that they need to log off.

The software installation process includes a step to reboot the system. If any users are logged in at this time, their sessions end.

3. Insert the operating system DVD into the USB DVD drive on the SGI UV server.
4. Press CTRL-ALT-F2 to get to tty2.

5. Log in as **root**.
6. Type **reboot**.
7. Press the space bar after a message similar to the following appears:

```
133,110,038,528 bytes of system memory tested OK  
Hit [Space] for Boot Menu...
```

8. Use the arrow keys to select **Boot Manager**, and press Enter.
9. On the **Boot Manager** screen, use the down-arrow key to select or highlight **EFI USB Device**, and press Enter.

Several minutes might elapse before the system begins to boot. A series of question mark characters might appear on the screen during the system boot. This is a known problem, and you can ignore it safely.

10. (Conditional) Configure the accelerated boot process. (RHEL platform SGI UV servers only)

Perform this step only if you inserted a RHEL DVD into the DVD drive on an SGI UV server. Failure to accelerate the boot process can result in boots that last twenty minutes or more on RHEL platforms. You do not need to perform this step on an SMN.

Complete the following steps:

- On the **Press any key for the boot menu ...** screen, press Enter.
- On the GNU GRUB menu, verify that **Red Hat Enterprise Linux ...** is selected, and type **e** to edit the Red Hat Enterprise Linux commands before booting.
- On the GNU GRUB menu, verify that **kernel / ...** is selected, and type **e** to edit the kernel.
- At the end of the **grub edit >** line that contains the default boot options, type a space character and then type the following additional boot option:
`ipmi_si.trydefaults=0`

Press Enter when you finish typing the additional boot option.

- On the GNU GRUB menu, type **b** to boot RHEL with the additional boot options.
11. Proceed to one of the following:

- To install a RHEL operating system and the SGI Foundation Software on an SGI UV server, proceed to the following:

Chapter 3, "Installing the Red Hat® Enterprise Linux® (RHEL) Operating System and the SGI Foundation Software" on page 25

- To install a SLES operating system and the SGI Foundation Software on an SGI UV server, proceed to the following:

Chapter 4, "Installing the SUSE Linux Enterprise Edition (SLES) Operating System and the SGI Foundation Software" on page 45

Installing the Red Hat® Enterprise Linux® (RHEL) Operating System and the SGI Foundation Software

This chapter includes the following topics:

- "About Installing the RHEL Operating System on an SGI UV System" on page 25
- "Installing the RHEL Operating System Software on an SGI UV Server or an SGI UV SMN" on page 26
- "Installing the SGI Foundation Software on a RHEL Platform SGI UV Server or a RHEL Platform SMN" on page 40
- "Installing the SMN Software on a RHEL Platform SMN" on page 43

Note: You can use the installation instructions in this chapter to install RHEL as a single-system image on an entire SGI UV system. Alternatively, if your SGI UV system is divided into partitions, you can use these instructions to install RHEL on an individual partition. The installation procedure, including the disk partitioning instructions, is identical for both purposes.

About Installing the RHEL Operating System on an SGI UV System

This chapter explains how to install the following software on an SGI® UV™ server and on an SGI UV system management node (SMN):

- The Red Hat® Enterprise Linux (RHEL) operating system. The operating system installation instructions are nearly identical for the SGI UV server and the SMN. The instructions note differences where necessary.
- The SGI Foundation Software. The SGI Foundation Software installation instructions are nearly identical for the SGI UV server and the SMN. The instructions note differences where necessary.
- The SMN software. This is an SMN-specific package.

The following additional documentation might be useful to you during this installation process:

- The *Red Hat Enterprise Linux 6 Installation Guide*. This guide is available at the following location:
http://docs.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/6/pdf/Installation_Guide/Red_Hat_Enterprise_Linux-6-Installation_Guide-en-US.pdf
- The SGI Foundation Software 2.X release notes file. After you log into Supportfolio, you can retrieve the release notes from the following location:
https://support.sgi.com/content_request/194480/index.html
- The SMN software release notes file. After you log into Supportfolio, you can retrieve the release notes from the following location:
https://support.sgi.com/content_request/738299/index.html

Installing the RHEL Operating System Software on an SGI UV Server or an SGI UV SMN

The following procedures explain how to install the RHEL operating system software:

- "Initiating the Installation" on page 26
- "Specifying the Network" on page 27
- "Specifying Disk Partitions for an SGI UV SMN" on page 29
- "Specifying Disk Partitions for an SGI UV Server" on page 34
- "Completing the RHEL Installation" on page 38

Initiating the Installation

The following procedure explains how to connect to the system management node (SMN) on an SGI UV system.

Procedure 3-1 To begin the software installation

1. Make sure you gathered the information that you need for this installation.

For more information, see the following:

"Gathering Installation Materials and Information" on page 5

2. On the **Disc Found** screen, tab to one of the following, and press Enter:
 - **Skip.** Select this option if you are using the standard DVD you received from SGI.
 - **OK.** Select this option if you downloaded the software and created your own DVD. This option checks the integrity of the disk.
3. On the **Red Hat Enterprise Linux 6** splash screen, click **Next**.
4. On the **What language would you like to use during the installation process?** screen, select your language, and click **Next**.
5. On the **Select the appropriate keyboard for the system** screen, select your keyboard, and click **Next**.
6. On the **What type of devices will your installation involve?** screen, select **Basic storage devices**, and click **Next**.
7. (Conditional) Select **Fresh Installation**, and select **Next**.

Perform this step if a screen with the following information appears: **At least one existing installation has been detected on your system. What would you like to do?**

8. On the **Please name this computer** screen, type the fully qualified domain name (FQDN) for the SMN, and click **Configure Network**.

If you are installing the operating system on a partition, make sure to use a different hostname for each partition you create. For example:
`system-pl.uv.com`. After you complete the installation, if you need to address the whole system, log into the CMC and use the hostname or FQDN for the system. If you need to address a partition, use the hostname or FQDN for the partition.

9. Proceed to the following:
"Specifying the Network" on page 27

Specifying the Network

The following procedure explains how to specify the networking information.

Procedure 3-2 To specify the network

1. On the **Network Connections** popup, select **System eth0**, and click **Edit**.
2. On the **Editing System eth0** popup, complete the following steps:
 - Select **Connect automatically** to start the network card.
 - Select the **IPv4 Settings** tab.
3. Complete the **IPv4 Settings** tab.

This step differs depending on whether you want to install the operating system on an SMN or on an SGI UV server.

Note: On an SGI UV SMN, complete this step as documented.

On an SGI UV server, use this step as a general guide. This step explains how to configure a static address on a network card. This is an example. If you want a different network configuration, for example to configure DHCP, your actions will be different. You can use this procedure as a guide and consult the RHEL documentation for more specific steps.

On an SMN, complete the following steps:

- Make sure that **Automatic (DHCP)** is selected.
- Click **Apply**
- On the **Network Connections** pop-up, click **Close**.

On an SGI UV server, complete the following steps:

- In the **Method:** field, pull down **Manual**.
- In the **Addresses** pane, click **Add**, and complete the following steps:
 - Type the IP address for the SMN.
 - Type the netmask for the SMN.
 - Type the IP address for the default gateway.
- In the **DNS servers:** field, type the IP address of one or more DNS servers. If you specify more than one, use a comma to separate each IP address.

- In the **Search domains:** field, type one or more search domains. If you specify more than one, use a comma to separate each domain.
 - Click **Apply**.
 - Click **Close**.
4. On the **Please name this computer screen**, click **Next**.
 5. On the **Please select the nearest city in your time zone screen**, select a city, and click **Next**.
 6. On the **The root account is used for administering the system screen**, complete the following steps:
 - In the **Root Password** field, type the password you want to use for the root account.
 - In the **Confirm** field, type the root password again.
 - Click **Next**.
 7. On the **Which type of installation would you like?** screen, select **Create Custom Layout**, and click **Next**.
 8. Proceed to one of the following:
 - To configure disk partitions on an SMN, complete the following procedure:
"Specifying Disk Partitions for an SGI UV SMN" on page 29
 - To configure disk partitions on an SGI UV server, complete the following procedure:
"Specifying Disk Partitions for an SGI UV Server" on page 34

Specifying Disk Partitions for an SGI UV SMN

Perform the procedure in this topic to configure the partitions for an SGI UV server.

This topic includes information about disk partitioning for SGI UV system SMNs. The procedure in this topic explains how to configure the disk partitions and monitor a reboot.

For the SMN, your goal is to configure the disks according to Table 3-1 on page 30. Note that the system automatically creates an **Extended** partition.

Table 3-1 Disk Partitions for an SGI UV SMN

Size	Mount Point	File System
200 MB	/boot	ext4
250 GB (256,000 MB)	/	ext4
8 GB (8,192 MB)	swap	swap
rest of disk	/data1	ext4

The following procedure explains how to specify the disk partitions.

Procedure 3-3 To specify disk partitions

1. On the main disk partitioning screen, complete the following steps to clean the disk:
 - Select a disk device.
 - Click **Delete**.
 - On the **Confirm Delete** pop-up, click **Delete**.
 - Proceed to the next step after you have deleted all existing partitions.
2. On the main disk partitioning screen, click **Create**.

Figure 3-1 on page 31 shows an example of the main screen before you create any disk partitions.

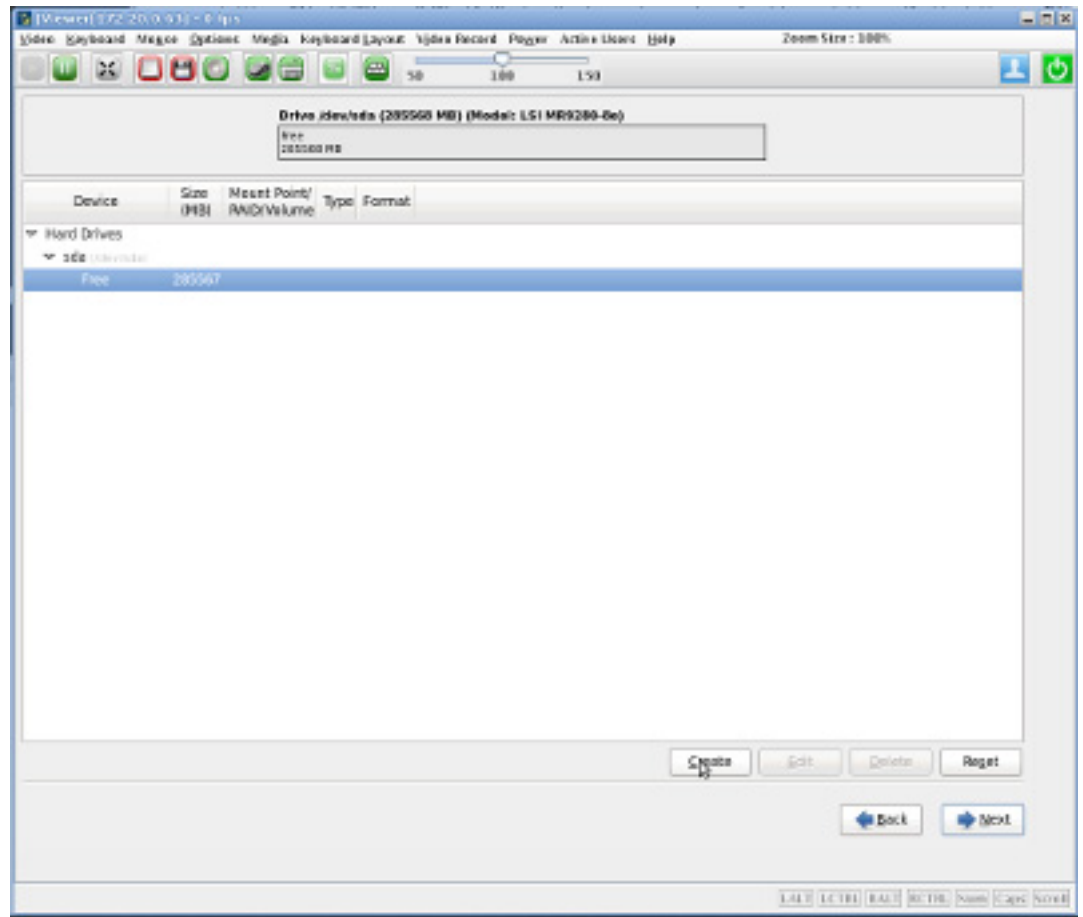


Figure 3-1 Initial RHEL Disk Partitioning Screen

3. On the **Create Storage** pop-up, complete the following steps:
 - Click **Standard Partition**.
 - Click **Create**.
4. On the **Add Partitions** pop-up, complete the following steps:
 - In the **Mount Point** field, select **/boot** from the pull-down menu.

- In the **File System Type** field, select **ext4** from the pull-down menu.
- Verify that the default size is **200 MB**.
- Verify that **Fixed size** is selected.
- Verify that **Encrypt** is clear.

Note: Do not check **Encrypt**.

- Click **OK**.
5. On the main disk partitioning screen, click **Create**.
 6. On the **Create Storage** pop-up, click **Create**.
 7. On the **Add Partition** pop-up, complete the following steps:
 - In the **Mount Point** field, select / from the pull-down menu.
 - In the **File System Type** field, verify that **ext4** appears.
 - In the **Size** field, type **256000**, which is 250 GB.
 - Verify that **Fixed size** is selected.
 - Verify that **Encrypt** is clear.

Note: Do not check **Encrypt**.

- Click **OK**.
8. On the main disk partitioning screen, click **Create**.
 9. On the **Create Storage** pop-up, click **Create**.
 10. On the **Add Partition** pop-up, complete the following steps:
 - In the **File System Type** field, select **swap** from the pull-down menu.
 - In the **Size** field, type **8192**, which is 8 GB.
 - Verify that **Fixed size** is selected.
 - Verify that **Encrypt** is clear.

Note: Do not check **Encrypt**.

- Click **OK**.
11. On the main disk partitioning screen, click **Create**.
 12. On the **Create Storage** pop-up, click **Create**.
 13. On the **Add Partition** pop-up, complete the following steps:
 - In the **Mount Point** field, type **/data1**.
 - In the **File System Type** field, select **ext4** from the pull-down menu.
 - In the **Additional Size Options** box, select **Fill to maximum allowable size**.
 - Verify that **Encrypt** is clear.

Note: Do not check **Encrypt**.

- Click **OK**.
14. On the main disk partitioning screen, click **Next**.
 15. On the **Writing Storage Configuration to disk** pop-up, select **Write changes to disk**.
Wait for the disk formatting to complete.
 16. On the boot loader specifications page, complete the following steps:
 - Verify that the **Use boot loader password** box is clear.
 - In the **Boot loader operating system list** box, verify that **Red Hat Enterprise Linux ...** appears.
 - Click **Next**.
 17. Proceed to the following:
"Completing the RHEL Installation" on page 38

Specifying Disk Partitions for an SGI UV Server

Perform the procedure in this topic to configure the partitions for an SGI UV server.

This topic includes information about disk partitioning for SGI UV servers. The procedure in this topic explains how to configure the disk partitions and monitor a reboot.

For the SGI UV server, your goal is to configure the disks according to Table 3-2 on page 34

Table 3-2 Disk Partitions for an SGI UV Server

Size	Mount Point	File System
500 MB	/boot/efi	EFI System Partition
250 GB (256,000 MB)	/	ext4
8 GB (8,192 MB)	swap	swap
rest of disk	/data1	ext4

The following procedure explains how to specify the disk partitions.

Procedure 3-4 To specify disk partitions

1. On the main disk partitioning screen, complete the following steps to clean the disk:
 - Select a disk device.
 - Click **Delete**.
 - On the **Confirm Delete** pop-up, click **Delete**.
 - Proceed to the next step after you have deleted all existing partitions.
2. On the main disk partitioning screen, click **Create**.

Figure 3-2 on page 35 shows an example of the main screen before you create any disk partitions.

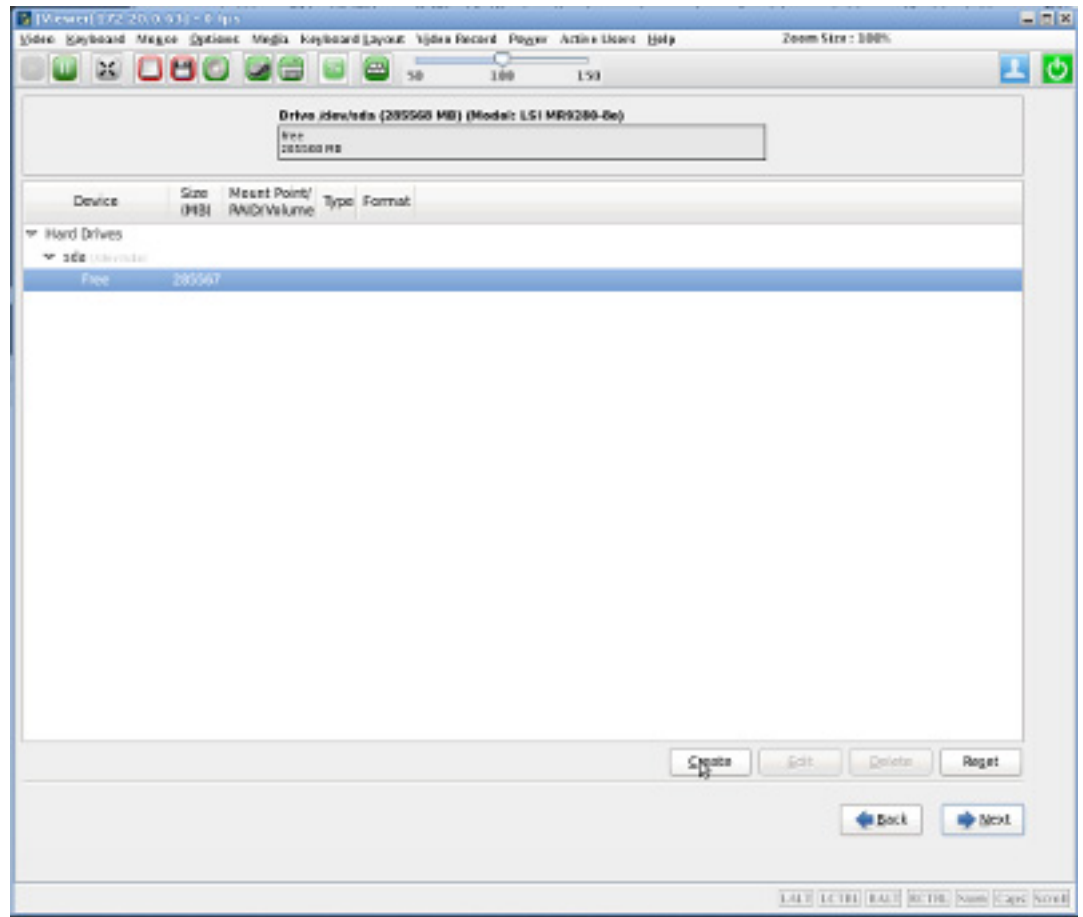


Figure 3-2 Initial RHEL Disk Partitioning Screen

3. On the **Create Storage** pop-up, complete the following steps:
 - Click **Standard Partition**.
 - Click **Create**.
4. On the **Add Partitions** pop-up, complete the following steps:
 - In the **Mount Point** field, select **/boot/efi** from the pull-down menu.

- Verify that **EFI System Partition** is selected.
- In the **Size** field, type **500**, which is 500 MB.
- Verify that **Fixed size** is selected.
- Verify that **Encrypt** is clear.

Note: Do not check **Encrypt**.

- Click **OK**.
5. On the main disk partitioning screen, click **Create**.
 6. On the **Create Storage** pop-up, click **Create**.
 7. On the **Add Partition** pop-up, complete the following steps:
 - In the **Mount Point** field, select / from the pull-down menu.
 - In the **File System Type** field, verify that **ext4** appears.
 - In the **Size** field, type **256000**, which is 250 GB.
 - Verify that **Fixed size** is selected.
 - Verify that **Encrypt** is clear.

Note: Do not check **Encrypt**.

- Click **OK**.
8. On the main disk partitioning screen, click **Create**.
 9. On the **Create Storage** pop-up, click **Create**.
 10. On the **Add Partition** pop-up, complete the following steps:
 - In the **File System Type** field, select **swap** from the pull-down menu.
 - In the **Size** field, type **8192**, which is 8 GB.
 - Verify that **Fixed size** is selected.
 - Verify that **Encrypt** is clear.

Note: Do not check **Encrypt**.

- Click **OK**.
11. On the main disk partitioning screen, click **Create**.
 12. On the **Create Storage** pop-up, click **Create**.
 13. On the **Add Partition** pop-up, complete the following steps:
 - In the **Mount Point** field, type **/data1**.
 - In the **File System Type** field, select **ext4** from the pull-down menu.
 - In the **Additional Size Options** box, select **Fill to maximum allowable size**.
 - Verify that **Encrypt** is clear.

Note: Do not check **Encrypt**.

- Click **OK**.
14. On the main disk partitioning screen, click **Next**.
 15. On the **Writing Storage Configuration to disk** pop-up, select **Write changes to disk**.
Wait for the disk formatting to complete.
 16. On the boot loader specifications page, complete the following steps:
 - Verify that the **Use boot loader password** box is clear.
 - In the **Boot loader operating system list** box, verify that **Red Hat Enterprise Linux /dev/sda2** appears.
 - Click **Next**.
 17. Proceed to the following:
"Completing the RHEL Installation" on page 38

Completing the RHEL Installation

The following procedure explains how to complete the installation.

Procedure 3-5 To complete the installation

1. On the **The default installation of Red Hat Enterprise Linux is a basic server install ...** page, complete the following steps:

- Select **Desktop**.
- Select **Next**.

Wait for the operating system installation to complete.

2. On the **Congratulations, your Red Hat Enterprise Linux installation is complete** page, click **Reboot**.
3. On the **Welcome** page, click **Forward**.
4. On the **License Information** page, complete the following steps:
 - Click **Yes, I agree to the License Agreement**.
 - Click **Forward**.
5. On the **Set Up Software Updates** page, decide whether to register now or whether to postpone registration.

If your SGI UV system is connected to the network correctly, you can register now. The following information explains how to proceed:

- If the screen contains a message that begins with **This assistant will guide you through the process of registering your system with Red Hat to receive software updates ...**, then the SGI UV system is connected correctly to the network. Complete the following steps:
 - Select **Yes, I'd like to register now**, and click **Forward**.
 - On the **Choose Service** page, select **Red Hat Subscription Management**, and click **Forward**.
 - On the **Subscription Management Registration** page, click **Forward**.
 - On the second **Subscription Management Registration** page, complete the fields appropriately for your site, and click **Forward**.
 - On the third **Subscription Management Registration** page, click **Forward**.

- If the screen includes a warning symbol and a message that begins with **The network connection on your system is not active ...**, then the SGI UV system is not connected correctly to the network. Complete the following steps:
 - Click **Forward**.
 - Continue on to the next step in this procedure.

You can restart the installer, correct your network network configuration, and connect to RHN later.
- 6. On the **Create User** page, complete the following steps to create an end-user account:
 - In the **Username** field, type the username.
 - In the **Full Name** field, type the user's full name.
 - In the **Password** field, type the user's password. Passwords must be at least eight characters long, contain at least one digit, and contain a mixture of uppercase and lowercase letters.
 - In the **Confirm Password** field, type the user's password again.
 - Click **Forward**.
- 7. On the **Date and Time** screen, configure system clock settings that your site requires and click **Forward**.
- 8. On the **Kdump** page, specify the following:
 - For the SGI UV server, specify 1280 MB, and click **Finish**.
 - For the SMN, specify 256 MB, and click **Finish**.
- 9. On the **Changing Kdump ...** pop-up, click **Yes**.
- 10. On the **The system must now reboot ...** pop-up, click **OK** to confirm the reboot.
- 11. Proceed to the following:

"Installing the SGI Foundation Software on a RHEL Platform SGI UV Server or a RHEL Platform SMN" on page 40

Installing the SGI Foundation Software on a RHEL Platform SGI UV Server or a RHEL Platform SMN

The following procedure explains how to install the SGI Foundation Software on a RHEL SGI UV server or SMN. You can use the same procedure on both the SGI UV server and an SGI UV SMN.

Procedure 3-6 To install the SGI Foundation Software

1. Log into the SGI UV server or the SGI UV SMN as the root user.

The SGI Foundation Software installation procedure is the same for both the SGI UV server and the SGI UV SMN.

2. On the login page, complete the following steps:
 - Select **Other**.
 - In the **Username** field, type `root`.
 - In the **Password** field, type the root user's password.
 - Click **Log In**.
3. On the **You are currently trying to run as the root super user ...** pop-up, click **Close**.
4. Access the installation software.

Complete this step in one of the following ways:

- If a DVD drive is available, insert the *SGI Foundation Software X.X* CD into the DVD drive.
- On an SGI UV 2000 without a DVD drive, complete the following steps:
 - In the top-most JViewer menu bar, click **Media > Virtual Media Wizard ...**
 - Insert the operating system DVD into the DVD drive on the SMN, or if you are at a remote console, insert the DVD into your local desktop.
 - On the **Virtual Media** pop-up, under **CD/DVD Media 1**, complete the following steps:
 - Select `/dev/sr0`.
 - Click **Connect to CD/DVD**.

- On the **Information** pop-up, click **OK**.
 - On the **Virtual Media** pop-up, click **Close**.
 - On an SGI UV 1000 without a DVD drive, complete the following steps:
 - Insert the operating system DVD into the DVD drive on the SMN, or if you are at a remote console, insert the DVD into your local desktop.
 - In the JViewer main menu, select **Device > Redirect CDROM**.
 - On the **CD-ROM Selection** pop-up, select a drive.
For example, select **/dev/scd0**.
 - Click **OK**.
5. Click **Applications > System Tools > Terminal** to open a terminal window.
 6. Type the following command to create an installation directory for the files from the CD:


```
# mkdir -p /opt/sgi/Factory-Install/sgi-foundation-2.10/
```
 7. Type the following command to create a temporary mount directory:


```
# mkdir /var/sfs2.10
```
 8. Type the following command to mount the CD in read-only mode (-r), using a loop device:


```
# mount -t iso9660 -ro loop /dev/cdrom /var/sfs2.10
```
 9. Type the following command to copy the files from the temporary mount directory to the installation directory:


```
# rsync -avHx /var/sfs2.10/ /opt/sgi/Factory-Install/sgi-foundation-2.10/
```
 10. Type the following command to unmount the CD from the temporary directory:


```
# umount /var/sfs2.10
```
 11. Type the following command to remove the temporary mount directory:


```
# rmdir /var/sfs2.10
```

12. Use a text editor to create file

`/etc/yum.repos.d/foundation2.10-local.repo` with the following contents:

```
#####  
[foundation2.10-repo]  
name=SGI Foundation Software 2.10 - $basearch  
baseurl=file:///opt/sgi/Factory-Install/sgi-foundation-2.10/RPMS  
enabled=1  
gpgcheck=1  
gpgkey=file:///opt/sgi/Factory-Install/sgi-foundation-2.10/RPM-GPG-KEY-sgi  
#####
```

13. Type the following command to retrieve the list of software that you can install:

```
# yum grouplist | grep SGI
```

14. (Conditional) Retype the preceding command.

Complete this step only if errors occur after you type the `yum grouplist | grep SGI` command the first time.

In some cases, the system issues a message similar to the following:

```
[root@pswsmn yum.repos.d]# yum grouplist | grep SGI  
Existing lock /var/run/yum.pid: another copy is running as pid 6748.  
Another app is currently holding the yum lock; waiting for it to exit...  
  The other application is: PackageKit  
    Memory : 104 M RSS (426 MB VSZ)  
    Started: Mon Aug 26 15:24:52 2013 - 01:56 ago  
    State   : Sleeping, pid: 6748
```

To remedy the situation, wait a few seconds, and type the command again.

15. Type the following command to install the SGI Foundation Software group:

```
# yum groupinstall "SGI Foundation Software"
```

16. Type `y` at the following prompt to confirm the download size:

```
Is this ok [y/N]
```

17. Type `y` at the following prompt to accept the GPG license key:

```
Is this ok [y/N]
```


18. Type the following command to reboot the system:

```
# reboot -f
```

19. Proceed as follows:

- If you wanted to install software only on the SGI UV server, you are finished at this time.
- If you want to install software on the SGI UV SMN, proceed to the following: "Installing the SMN Software on a RHEL Platform SMN" on page 43

Installing the SMN Software on a RHEL Platform SMN

The SMN requires its own specific software, and you need to install the SMN software on the SMN after you install the SGI Foundation Software.

The following procedure explains how to install the SMN software on a RHEL SMN.

Procedure 3-7 To install the SMN software on a RHEL SMN

1. Insert the CD labeled *SGI System Management Node Software X.X* into the DVD drive on the SMN.
2. Type the following command to create an installation directory for the files from the CD:

```
# mkdir -p /opt/sgi/Factory-Install/sgi-smn-1.9/
```

3. Type the following command to create a temporary mount directory:

```
# mkdir /var/smn1.9
```

4. Type the following command to mount the CD in read-only mode (-r), using a loop device:

```
# mount -ro loop /dev/cdrom /var/smn1.9
```

5. Type the following command to copy the files from the temporary mount directory to the installation directory:

```
# rsync -avHx /var/smn1.9/ /opt/sgi/Factory-Install/sgi-smn-1.9/
```

6. Type the following command to unmount the CD from the temporary directory:

```
# umount /var/smn1.9
```

7. Type the following command to remove the temporary mount directory:

```
# rmdir /var/smn1.9
```

8. Use a text editor to create file `/etc/yum.repos.d/smn1.9-local.repo` with the following contents:

```
#####  
[smn1.9-repo]  
name=SGI SMN Software 1.9 - $basearch  
baseurl=file:///opt/sgi/Factory-Install/sgi-smn-1.9/RPMS  
enabled=1  
gpgcheck=1  
gpgkey=file:///opt/sgi/Factory-Install/sgi-smn-1.9/RPM-GPG-KEY-sgi  
#####
```

9. Type the following command to retrieve the list of software that you can install:

```
# yum grouplist | grep SGI
```

10. Type the following command to install the SGI SMN software group:

```
# yum --enablerepo=rhel-6-server-optional-rpms groupinstall "SGI Management Node Software"
```

11. Type the following command to reboot the system:

```
# reboot -f
```

12. Log into the system as the root user.

13. Type the following command to configure the SMN software:

```
# smnconfig -Aa -3
```

14. Type the following command to reboot:

```
# reboot -f
```

Installing the SUSE Linux Enterprise Edition (SLES) Operating System and the SGI Foundation Software

This chapter includes the following topics:

- "About Installing the SLES Operating System on an SGI UV System" on page 45
- "Installing the SLES Operating System Software on an SGI UV Server or an SGI UV SMN" on page 46
- "Installing the SGI Foundation Software on a SLES Platform SGI UV Server or a SLES Platform SMN" on page 60
- "Installing the SMN Software on a SLES Platform SMN" on page 61

Note: You can use the installation instructions in this chapter to install SLES as a single-system image on an entire SGI UV system. Alternatively, if your SGI UV system is divided into partitions, you can use these instructions to install SLES on an individual partition. The installation procedure, including the disk partitioning instructions, is identical for both purposes.

About Installing the SLES Operating System on an SGI UV System

This chapter explains how to install the following software on an SGI UV server and on an SGI UV system management node (SMN):

- The SLES operating system. The operating system installation instructions are nearly identical for the SGI UV server and the SMN. The instructions note differences where necessary.
- The SGI Foundation Software. The SGI Foundation Software installation instructions are nearly identical for the SGI UV server and the SMN. The instructions note differences where necessary.
- The SMN software. This is an SMN-specific package.

The following additional documentation might be useful to you during this installation process:

- The *SLES 11 Installation Quick Start* and the *SLES 11 Deployment Guide*. These guides are available at the following location:
<https://www.suse.com/documentation/sles11/>
- The SGI Foundation Software 2.X release notes file. After you log into Supportfolio, you can retrieve the release notes from the following location:
https://support.sgi.com/content_request/194480/index.html
- The SMN software release notes file. After you log into Supportfolio, you can retrieve the release notes from the following location:
https://support.sgi.com/content_request/738299/index.html

Installing the SLES Operating System Software on an SGI UV Server or an SGI UV SMN

The following procedures explain how to install the SLES operating system software:

- "Initiating the Installation" on page 46
- "Specifying Disk Partitions for an SGI UV SMN" on page 48
- "Specifying Disk Partitions for an SGI UV Server" on page 52
- "Specifying the Network and Miscellaneous Settings" on page 56
- "Completing the SLES Installation" on page 59

Note: The mouse unit's behavior can be unpredictable during the following procedures:

- "Initiating the Installation" on page 46
- "Specifying Disk Partitions for an SGI UV Server" on page 52
- "Specifying Disk Partitions for an SGI UV SMN" on page 48

After the first boot, the mouse unit behaves as expected.

Initiating the Installation

The following procedure explains how to begin the installation.

Procedure 4-1 To begin the installation

1. Make sure you prepared for the installation.

For more information, see the following:

"Gathering Installation Materials and Information" on page 5

2. On the boot loader screen, select **Installation**.

3. On the **Welcome** page, complete the following steps:

- Select your language.
- Select your keyboard layout.
- Click **I agree to the license terms**.
- Click **Next**.

4. On the **Media Check** page, complete the following steps:

- (Conditional) Select **Start Check**.

Select this option if you want to troubleshoot a failed installation. If a previous installation failed, you can check this option, install the operating system software again, and observe the messages that the installer issues. It is possible that media problems prevented your previous installation from completing correctly.

- Click **Next**.

If this is your first installation session, you can click **Next** safely.

5. On the **System Probing ...** screen, monitor the progress.

6. On the **Installation Mode** screen, accept the default of **New Installation**, and click **Next**.

7. On the **Clock and Time Zone** screen, complete the following steps:

- Select your region.
- Select your time zone.
- Check the box next to **Hardware Clock Set To UTC**.
- Click **Next**.

8. On the **Server Base Scenario** screen, accept the default of **Physical Machine**, and click **Next**.
9. Proceed to one of the following:
 - To configure disk partitions on an SMN, complete the following procedure:
"Specifying Disk Partitions for an SGI UV SMN" on page 48
 - To configure disk partitions on an SGI UV server, complete the following procedure:
"Specifying Disk Partitions for an SGI UV Server" on page 52

Specifying Disk Partitions for an SGI UV SMN

Perform the procedure in this topic to configure the partitions for an SMN.

This topic includes information about disk partitioning for SGI UV system SMNs. The procedure in this topic explains how to configure the disk partitions and monitor a reboot.

For the SMN, your goal is to configure the disks according to Table 4-1 on page 48.

Table 4-1 Disk Partitions for an SGI UV SMN

Size	Mount Point	File System
200 MB	/boot	Ext3
250 GB (256,000 MB)	/	XFS
8192 MB	swap	swap
rest of disk	/data1	XFS

The following procedure explains how to specify the disk partitions.

Procedure 4-2 To configure the disk partitions

1. On the **Installation Settings** screen, click the **Partitioning** link.
2. On the **Preparing Hard Disk** screen, click **Custom Partitioning (for experts)**, and click **Next**.

3. On the **Expert Partitioner** screen, complete the following steps to clean the disk:
 - Expand **Hard Disks**.
 - Expand the hard disk you want to use.
For example, expand **sda**.
 - Select the first disk partition.
For example, select **sda1**.
 - Click **Delete ...**.
 - On the **YaST2** pop-up, select **Yes**.
 - Select the other partitions, click **Delete ...**, and confirm.
 - Proceed to the next step after you have deleted all existing partitions.
4. On the **Expert Partitioner** screen, complete the following steps:
 - Expand **Hard Disks**.
 - Select the hard disks you want to use.
 - Click **Add**.
5. Complete the following steps on the **Add Partition on /dev/disk** screen to configure the boot partition:
 - Under **New Partition Type**, select **Primary Partition**, and click **Next**.
 - Under **New Partition Size**, click **Custom Size**.
 - Specify 200 MB in the **Size** field.
 - Click **Next**.
 - Under **Formatting Options**, select **Format partition**.
 - Under **File system**, use the pull-down menu to select **Ext3**.
 - Under **Mounting Options**, select **Mount Partition**.
 - Under **Mount point**, use the pull-down menu to select **/boot**.
 - Select **Finish**.

6. On the **Expert Partitioner** screen, click **Add**.
7. On the **Add Partition on /dev/disk** screen, select **Primary Partition**, and click **Next**.
8. Complete the following steps on the **Add Partition on /dev/disk** screen to configure the root partition:
 - Under **New Partition Size**, click **Custom Size**.
 - Specify 250 GB in the **Size** field.
 - Click **Next**.
 - Under **Formatting Options**, select **Format partition**.
 - Under **File system**, use the pull-down menu to select XFS.
 - Under **Mounting Options**, select **Mount Partition**.
 - Under **Mount point**, use the pull-down menu to select /.
 - Select **Finish**.
9. On the **Expert Partitioner** screen, click **Add**.
10. On the **Add Partition on /dev/disk** screen, select **Primary Partition**, and click **Next**.
11. Complete the following steps on the **Add Partition on /dev/disk** screen to configure the swap partition:
 - Under **New Partition Size**, click **Custom Size**.
 - Specify 8 GB in the **Size** field.
 - Click **Next**.
 - Under **Formatting Options**, select **Format partition**.
 - Under **File system**, use the pull-down menu to select Swap.
 - Under **Mounting Options**, select **Mount Partition**.
 - Under **Mount point**, use the pull-down menu to select swap.
 - Select **Finish**.
12. On the **Expert Partitioner** screen, click **Add**.
13. On the **Add Partition on /dev/disk** screen, select **Primary Partition**, and click **Next**.

14. Complete the following steps on the **Add Partition on /dev/disk** screen to configure the data partition:
 - Under **New Partition Size**, click **Maximum Size**.
 - Click **Next**.
 - Under **Formatting Options**, select **Format partition**.
 - Under **File system**, use the pull-down menu to select **XFS**.
 - Under **Mounting Options**, select **Mount Partition**.
 - Under **Mount point**, type `/data1`.
 - Select **Finish**.
15. On the **Expert Partitioner** screen, examine the disk partitions in the **Partitions** tab.
If the partitions match those in Table 4-2 on page 52, click **Accept**.
If the partitions are incorrect, correct the partition specifications.
16. On the **Installation Settings** screen, complete the following steps:
 - Click the **Expert** tab near the top of the page.
 - Scroll down to **Kdump**, and click the **Kdump** link.
 - In the **Kdump Memory** box, type one of the following values:
 - For the SGI UV server, type 512.
 - For the SMN, type 256.
 - Click **OK**.
17. On the **Installation Settings** screen, click **Install**.
18. On the **Confirm Package License: agfa-fonts** pop-up, click **I Agree**.
19. On the **Confirm Installation** pop-up, click **Install**.
20. Monitor the installation and be prepared to remove the installation software media before the boot.

The installation itself can take several minutes. At the end of the installation, the system boots. The installation software notifies you of this boot. If you can, remove the installation DVD before the system boots, as follows:

- If you are performing the installation at the console, remove the DVD.
- If you are performing the installation remotely, complete the following steps:
 - Click **Media > Virtual Media Wizard**.
 - Under **CD/DVD Media1**, select **Disconnect CD/DVD**.
 - Click **Close**.

If you fail to remove the installation DVD before the final boot, the machine boots from the DVD. In this case, remove the DVD after the boot; press **CTRL—ALT—DEL** to boot the machine again; and allow the machine to boot from the hard disk to finish the installation.

21. Proceed to the following:

"Specifying the Network and Miscellaneous Settings" on page 56

Specifying Disk Partitions for an SGI UV Server

Perform the procedure in this topic to configure the partitions for an SGI UV server.

This topic includes information about disk partitioning for SGI UV system servers. The procedure in this topic explains how to configure the disk partitions and monitor a reboot.

For the SGI UV server, your goal is to configure the disks according to Table 4-2.

Table 4-2 Disk Partitions for an SGI UV Server

Size	Mount Point	File System
500 MB	/boot/efi	FAT
250 GB	/	Ext3
8 GB	swap	Swap
rest of disk	/data1	Ext3

The following procedure explains how to specify the disk partitions.

Procedure 4-3 To configure the disk partitions

1. On the **Installation Settings** screen, click the **Partitioning** link.
2. On the **Preparing Hard Disk** screen, click **Custom Partitioning (for experts)**, and click **Next**.
3. On the **Expert Partitioner** screen, complete the following steps to clean the disk:
 - Expand **Hard Disks**.
 - Expand the hard disk you want to use.
For example, expand **sda**.
 - Select the first disk partition.
For example, select **sda1**.
 - Click **Delete ...**.
 - On the **YaST2** pop-up, select **Yes**.
 - Select the other partitions, click **Delete ...**, and confirm.
 - Proceed to the next step after you have deleted all existing partitions.
4. On the **Expert Partitioner** screen, complete the following steps:
 - Expand **Hard Disks**.
 - Select the hard disks you want to use.
 - Click **Add**.
5. Complete the following steps on the **Add Partition on /dev/disk** screen to configure the boot partition:
 - Under **New Partition Size**, click **Custom Size**.
 - Type 500 MB in the **Size** field.
 - Click **Next**.
 - Under **Formatting Options**, select **Format partition**.
 - Under **File system**, use the pull-down menu to select **FAT**.

- Under **Mounting Options**, select **Mount Partition**.
 - Under **Mount point**, use the pull-down menu to select `/boot/efi`.
 - Select **Finish**.
6. On the **Expert Partitioner** screen, click **Add**.
 7. Complete the following steps on the **Add Partition on /dev/disk** screen to configure the root partition:
 - Under **New Partition Size**, click **Custom Size**.
 - Type 250 GB in the **Size** field.
 - Click **Next**.
 - Under **Formatting Options**, select **Format partition**.
 - Under **File system**, use the pull-down menu to select `ext3`.
 - Under **Mounting Options**, select **Mount Partition**.
 - Under **Mount point**, use the pull-down menu to select `/`.
 - Select **Finish**.
 8. On the **Expert Partitioner** screen, click **Add**.
 9. Complete the following steps on **Add Partition on /dev/disk** screen to configure the swap partition:
 - Under **New Partition Size**, click **Custom Size**.
 - Specify 8 GB in the **Size** field.
 - Click **Next**.
 - Under **Formatting Options**, select **Format partition**.
 - Under **File system**, use the pull-down menu to select `swap`.
 - Under **Mounting Options**, select **Mount Partition**.
 - Under **Mount point**, use the pull-down menu to select `swap`.
 - Select **Finish**.
 10. On the **Expert Partitioner** screen, click **Add**.

11. Complete the following steps on the **Add Partition on /dev/disk** screen to configure the data partition:
 - Under **New Partition Size**, click **Maximum Size**.
 - Click **Next**.
 - Under **Formatting Options**, select **Format partition**.
 - Under **File system**, use the pull-down menu to select `Ext3`.
 - Under **Mounting Options**, select **Mount Partition**.
 - Under **Mount point**, type `/data1`.
 - Select **Finish**.
12. On the **Expert Partitioner** screen, in the **Partitions** tab, examine the disk partitions.
If the partitions match those in Table 4-2 on page 52, click **Accept**.
If the partitions are incorrect, correct the partition specifications.
13. On the **Installation Settings** screen, click **Install**.
14. On the **Confirm Package License: agfa-fonts** pop-up, click **I Agree**.
15. On the **Confirm Installation** pop-up, click **Install**.
16. Monitor the installation and be prepared to remove the installation software media before the boot.

The installation itself can take several minutes. At the end of the installation, the system boots. The installation software notifies you of this boot. If you can, remove the installation DVD before the system boots, as follows:

- If you are performing the installation at the console, remove the DVD.
- If you are performing the installation remotely, complete the following steps:
 - Click **Media > Virtual Media Wizard**.
 - Under **CD/DVD Media1**, select **Disconnect CD/DVD**.
 - Click **Close**.

If you fail to remove the installation DVD before the final boot, the machine boots from the DVD. In this case, remove the DVD after the boot; press

CTRL—ALT—DEL to boot the machine again; and allow the machine to boot from the hard disk to finish the installation.

17. Proceed to the following:

"Specifying the Network and Miscellaneous Settings" on page 56

Specifying the Network and Miscellaneous Settings

The following procedure explains how to specify the hostname, networking information, and other miscellaneous settings.

Procedure 4-4 To specify the hostname, networking, and miscellaneous settings

1. On the **Password for the System Administrator "root"** screen, complete the following steps:
 - In the **Password for root User** field, type the root user's password.
 - In the **Confirm password** field, retype the root user's password.
 - Type a few characters in the **Test Keyboard Layout** field. For example, if you specified a language that includes non-English characters and you include these characters in passwords, type these characters into this field. This is a plain text field, and you can assure yourself that the operating system recognizes these characters when you type them.
 - Click **Next**.
2. On the **Hostname and Domain Name** screen, complete the following steps:
 - Type the hostname.
 - Type the domain name.
 - Verify that **Change Hostname via DHCP** is set correctly.

To assign a static IP address, clear the checkbox to the left of the **Change Hostname via DHCP** label. A later step saves the hostname to the `/etc/hosts` file. Consult your network administrator if you have questions regarding the use of DHCP.

Note: This procedure explains how to configure a static address on a network card. This is an example. If you want a different network configuration, for example if you want to configure DHCP, ensure that the checkbox in this step is checked before you click **Next**. You can use this procedure as a guide and consult the SLES documentation for more specific steps.

- Select **Next**.
3. On the **Network Configuration** screen, proceed as follows:
 - For an SGI UV server configuration, complete the following steps:
 - Click the **Network Interfaces** link.
 - Proceed to the next step in this procedure, which is as follows:
Procedure 4-4, step 4 on page 57
 - For an SGI UV SMN, complete the following steps:
 - Click **Next**.
 - Jump to the following step in this procedure:
Procedure 4-4, step 8 on page 58
 4. On the **Network Settings** screen, highlight one of the network cards, and click **Edit**.
 5. On the **Network Card Setup** screen, take one of the following actions:
 - Select the type of dynamic addressing that you want, and click **Next** to accept the default of DHCP.
 - Verify that **eth0** appears in the **Configuration Name** field, and click **Statically assigned IP Address**.

This rest of this step shows an example session that enables static addressing.

Configure the first NIC (`eth0`) for your house (public) network. Complete the tabs as follows:

- On the **Address** tab, specify the following:
 - The **IP Address**

- The **Subnet Mask**
 - The **Hostname**
 - Click **Next**.
 - Click the **Hostname/DNS** tab.
 - On the **Hostname/DNS** tab, specify the following:
 - The IP address for **Name Server 1**.
 - (Optional) The IP address for **Name Server 2**.
 - (Optional) The IP address for **Name Server 2**.
 - (Optional) In the **Domain Search** field, add additional domains.
 - Click the **Routing** tab.
 - On the **Routing** tab, type the **Default Gateway**, and click **OK**.
6. (Optional) Examine the **Network Configuration** screen, and supply additional network information as required by your site.

For example, you might want to change the following settings:

- Firewall settings. If you enable a firewall, make sure to enable the firewall only for the public NIC (`eth0`). The firewall is enabled by default.
 - VNC Remote Administration. This setting enables remote administration and is disabled by default.
 - By default, the SSH port is closed, and the menu displays **SSH port is blocked (open)**. Click **open** to open this port.
7. Click **Next** to advance from the **Network Configuration** screen.
- Wait for the installer to save the network configuration.
8. On the **Test Internet Connection** screen, click **Next**.
- Wait for the internet connection test to complete.
9. On the **Novell Customer Center Configuration** screen, complete the following steps:
- Select **Configure Now (Recommended)**.

- Verify that each of the following defaults under **Include for Convenience** are selected:
 - **Hardware Profile**
 - **Optional Information**
 - **Regularly Synchronize With the Customer Center**
- Click **Next**.

For more information about how to register with Novell, see the following website:

www.novell.com

10. On the **YaST2 Manual Interaction Required** pop-up, click **Continue**.
11. On the **Novell Customer Center System Registration** screen, complete the fields, and click **Submit**.
12. On the **Novell Customer Center Configuration** screen, click **Next**.
13. On the **Network Services Configuration** screen, click **Next**.
14. Proceed to the following:
 - "Completing the SLES Installation" on page 59

Completing the SLES Installation

The following procedure explains how to complete the SLES installation.

Procedure 4-5 To complete the SLES installation

1. On the **User Authentication Method** screen, select one of the authentication methods, and click **Next**.
2. On the **New Local User** screen, create at least one non-root user.

Complete the following steps:

- Complete the following fields:
 - **User's Full Name**
 - **Username**

- **Password**
 - **Confirm Password**
 - (Optional) Click **User Management** to specify another non-root user.
 - Click **Next**.
3. On the **Release Notes** screen, click **Next**.
 4. (Conditional) Let the Yast2 popup time out.
Complete this step if this installation is for the SMN and if the system issues a popup here.
 5. On the **Hardware Configuration** screen, click **Next**.
 6. On the **Installation Completed** screen, click **Finish**.
 7. Proceed to the following:
"Installing the SGI Foundation Software on a SLES Platform SGI UV Server or a SLES Platform SMN" on page 60

Installing the SGI Foundation Software on a SLES Platform SGI UV Server or a SLES Platform SMN

The following procedure explains how to install the SGI Foundation Software on an SMN or on an SGI UV server that hosts the SUSE operating system.

Procedure 4-6 To install the SGI Foundation Software on a SUSE platform from the direct-attached console

1. Insert the CD labeled *SGI Foundation Software X.X* into the DVD drive on the SMN.
2. Log into the SMN as the root user.
3. Click **Computer > YaST** to start the YaST interface.
4. Click **Software > Software Repositories** to start the SLES repository manager.
5. On the **Configured Software Repositories** screen, click **Add**.
6. On the **Media Type** screen, select **DVD**, and click **Next**.
7. On the **YaST** pop-up, click **Continue**.

8. (Conditional) On the **Import Untrusted GnuPG Key**, click **Import**.

Perform this step if this is the first time through this process and you need to confirm the security of the SGI digital key.

9. On the **Configured Software Repositories** screen, click **OK**.
10. On the **YaST Control Center** screen, click **Software Management**.
11. Select **View > Patterns**.
12. Scroll down to **SGI Foundation**.
13. Check the box to the left of **SGI Foundation Libraries, Software, and Drivers**, and click **Accept**.
14. On the **Changed Packages** pop-up, click **Continue**.
15. Insert CDs into the DVD drive as directed by the prompts on the **Perform Installation** screen.

If necessary, click **Eject** on the YaST2 pop-up to open the DVD drive. In the **YaST** pop-up, you might need to click **Retry** more than once to read a new disc. You can ignore the graphic representation of the file system that appears in a new window during this step.

16. Close the YaST session.
17. Type the following command to reboot the system:

```
# reboot -f
```

18. (Conditional) Install the SMN-specific software on the SMN.

Perform the following procedure to complete the SMN software installation:

"Installing the SMN Software on a SLES Platform SMN" on page 61

The SGI UV server installation is finished at this time.

Installing the SMN Software on a SLES Platform SMN

The SMN requires its own specific software, and you need to install the SMN software on the SMN after you install the SGI Foundation Software.

The following procedure explains how to install the SMN software on a SLES platform SMN.

Procedure 4-7 To install the SMN software on a SLES platform SMN

1. Insert the CD labeled *SGI System Management Node Software X.X* into the DVD drive on the SMN.
2. Complete the following steps from "Installing the SGI Foundation Software on a SLES Platform SGI UV Server or a SLES Platform SMN" on page 60:
 - Procedure 4-6, step 2 on page 60
through
 - Procedure 4-6, step 11 on page 61
3. Scroll down to **SGI SMN**.
4. Check the box to the left of **SGI System Management Node Libraries, Software, and Drivers** and click **Accept**.
5. Return to "Installing the SGI Foundation Software on a SLES Platform SGI UV Server or a SLES Platform SMN" on page 60 and complete the following steps:
 - Procedure 4-6, step 14 on page 61
through
 - Procedure 4-6, step 17 on page 61
6. Log into the system as the root user.
7. Type the following command to configure the SMN software:

```
# smnconfig -Aa -3
```
8. Type the following command to reboot the system:

```
# reboot -f
```

Configuring Your System

This chapter provides information about configuring your system and covers the following topics:

- "Enabling Hardware Event Tracker (HET) Notifications" on page 63
- "CPU Frequency Scaling" on page 67
- "System Partitioning" on page 72
- "Superpages" on page 86
- "Configuring Security-Enhanced Linux (SELinux) (RHEL Platforms Only)" on page 89

Enabling Hardware Event Tracker (HET) Notifications

The following topics contain information about HET:

- "About HET" on page 63
- "Customizing HET Notifications" on page 65
- "HET Examples" on page 66

Note: This documentation includes information about all SGI systems for the sake of completeness.

About HET

All of your SGI system's IPMI controllers send SNMP traps to the management node, which is the system admin controller (SAC) on an SGI ICE X system or the system management node (SMN) on an SGI UV system. The SGI Foundation Software's HET tools process these system alerts and send an email notification after critical hardware events occur.

On SGI ICE X and SGI UV platforms, the HET tools are configured by default. You do not need to perform any additional system configuration, but SGI recommends

that you customize the email address to which the HET tools send critical event notifications. On SGI Rackable systems, you need to configure the system manually as noted in the `het(8)` man page. The `het(8)` man page also contains information about HET defaults and internal processes.

HET accumulates information about system events in the following log file on the system management node (SMN):

```
/var/log/het/het_trap_processor.log
```

As an event-driven system monitoring tool, HET listens for system events. When HET receives information about an event, it converts the message from coded numbers into a readable form, as follows:

- When a noncritical event occurs, HET simply logs the event. As an option, you can configure an email address to receive noncritical event notifications.
- When a critical event occurs, HET logs the event and send an email message. SGI recommends that you edit file `/etc/sysconfig/het` and specify an email address specific to your site. By default, HET sends event information to `root@localhost`. For more information about how to customize HET notifications, see "Customizing HET Notifications" on page 65.

The firmware for each baseboard management controller (BMC) and the firmware for each cooling node on an SGI ICE X system includes threshold values for each component. If a system condition becomes too low or too high for its threshold, the BMC sends a critical event alert. The following are examples of critical system events that cause an alert:

- Ambient air temperature outside of recommended range
- Voltage sensor unable to attain a critical low voltage
- Power supply failure
- Loss of redundant power supply
- Fan speed unable to attain a critical threshold or a loss of fan redundancy
- Board processor modules that exceed a critical temperature threshold
- Memory uncorrectable errors

Customizing HET Notifications

You can customize the email addresses to which event information about `NON-RECOVERABLE` events is sent. As an option, you can specify a site-specific email address for less-severe events, or all HET events, too.

The HET log file, `/var/log/het/het_trap_processor.log`, contains information about all HET events. You can consult this file periodically to monitor noncritical events.

The following procedure explains how to configure an email address or email alias to receive HET notifications.

Procedure 5-1 To customize HET notifications

1. Log in as root and open the following file with a text editor:

```
/etc/sysconfig/het
```

On an SGI ICE X system, log into the system admin controller (SAC) node.

On an SGI UV system, log into the system management node (SMN). HET requires an SMN. If your system does not include an SMN, you cannot enable HET.

2. Search the file for the following string:

```
HET_MAIL_TROUBLE_TO
```

3. Change the default recipient, `root`, to be the email address of a person or the email alias of a group who can attend to the system when `NON-RECOVERABLE` events occur.
4. (Optional) Configure an email recipient for notifications about `CRITICAL` events.

Search the file for the following string:

```
HET_MAIL_NEWS_TO
```

Specify an email address or alias to receive `CRITICAL` event notifications.

5. Save and close file `/etc/sysconfig/het`.
6. (Optional) Configure an email recipient for all HET events.

Complete the following steps:

- Open file `/etc/het.action.d/het_mail` with a text editor.

- Search for the following lines in `/etc/het.action.d/het_mail`:

```
# NOTE: Adjust if needed
# Default is an empty mailing list audience for
# non (NON-RECOVERABLE or CRITICAL) events.
to=""
```
- Edit the `to=""` line to specify an email address or an email alias between the quotation marks.
- Save and close the file.

HET Examples

The following is an example of a HET log file that contains critical information:

```
dump      2013-10-23.07.13.21 [het_process_thread:2] # begin -----
dump      2013-10-23.07.13.21 [het_process_thread:2] agentAddr      172.24.0.2
dump      2013-10-23.07.13.21 [het_process_thread:2] het_type        ipmi
dump      2013-10-23.07.13.21 [het_process_thread:2] guid            rllead
dump      2013-10-23.07.13.21 [het_process_thread:2] sn              X1-----
dump      2013-10-23.07.13.21 [het_process_thread:2] alertSeverity   NONE
dump      2013-10-23.07.13.21 [het_process_thread:2] event           uncorrectableECC
dump      2013-10-23.07.13.21 [het_process_thread:2] sensorName      None-memory
dump      2013-10-23.07.13.21 [het_process_thread:2] sensorNumber    0x00
dump      2013-10-23.07.13.21 [het_process_thread:2] sensorTypeName  memory
dump      2013-10-23.07.13.21 [het_process_thread:2] eventClassName  discrete
dump      2013-10-23.07.13.21 [het_process_thread:2] event1          0x51
dump      2013-10-23.07.13.21 [het_process_thread:2] event2          0xff
dump      2013-10-23.07.13.21 [het_process_thread:2] event3          0x51
dump      2013-10-23.07.13.21 [het_process_thread:2] flap_count      1
dump      2013-10-23.07.13.21 [het_process_thread:2] # end -----
```

The corresponding email message that HET sends is as follows:

```
X-Original-To: root
Delivered-To: root@saturn9-1.americas.sgi.com
Date: Wed, 18 Dec 2013 14:36:52 -0600
From: HET.ALERT.donotreply@saturn9-1.americas.sgi.com
To: root@saturn9-1.americas.sgi.com
Subject: HET ALERT from cb9 - NON-RECOVERABLE
```


User-Agent: Heirloom mailx 12.2 01/07/07

The following HET(Hardware Environment Tracking) event has been recorded:
HET ALERT from cb9 - NON-RECOVERABLE

Event Details:

EVENT	uncorrectableECC
HET	r1i0n4
LOCATION	r1i0n4
SENSOR	None-memory
SENSORNUMBER	0x00
SENSORTHRESHOLD	81
SENSORTYPE	memory
SENSORVALUE	255
SEVERITY	NON-RECOVERABLE
SN	X1-----
TYPE	ipmi

CPU Frequency Scaling

CPU frequency scaling allows the operating system to automatically and dynamically scale the processor frequency. CPU frequency scaling needs to be enabled if you want to take advantage of the Intel Turbo Boost technology that is built into each processor.

The Intel Turbo Boost Technology allows processor cores to run faster than the base operating frequency as long as they are operating below the limits set for power, current, and temperature. The CPU frequency scaling setting also affects power consumption and enables you to manage power consumption. For example, you can theoretically cut power consumption in half if you clock the computer's processors from 2 GHz down to 1 GHz.

The following procedures pertain to CPU frequency:

- "Enabling CPU Frequency Scaling" on page 68
- "(Conditional) Changing the Governor Setting and Configuring Turbo Mode" on page 69

Note: For the sake of completeness, this documentation includes information about both SGI UV systems and SGI Rackable systems.

Enabling CPU Frequency Scaling

The procedure in this topic explains how to enable or disable CPU frequency scaling on SGI UV systems and SGI Rackable systems. SGI recommends that you complete this procedure, particularly if you use an SGI UV system.

Procedure 5-2 To enable CPU frequency scaling

1. Log in as `root` to the system you want to configure.
2. Use a text editor to open file `/etc/sysconfig/x86config`, and change the system setting from within this file.

This file contains the settings that enable or disable CPU frequency scaling. Complete this step to verify or change the current setting. Table 5-1 on page 68 explains the CPU frequency scaling settings.

Table 5-1 CPU Frequency Scaling Settings

Setting	To Enable on SGI UV Systems	To Disable on SGI UV Systems	To Enable on SGI Rackable Systems	To Disable on SGI Rackable Systems
<code>NON_UV_DISABLE_CPU_FREQUENCY_SCALING</code>	N/A	N/A	no (Default)	yes (Default)
<code>UV_DISABLE_CPU_FREQUENCY_SCALING</code>	no	yes (Default)	N/A	N/A

For example, to enable CPU frequency scaling on an SGI UV system, set `UV_DISABLE_CPU_FREQUENCY_SCALING=no`.

In the preceding table, *N/A* represents a setting that is not applicable to a particular SGI system. For example the operating system ignores the

`NON_UV_DISABLE_CPU_FREQUENCY_SCALING` setting on an SGI UV system, so this setting can be either `yes` or `no`.

3. Type the following command to propagate the new system setting:

```
# /usr/sbin/x86config
```

4. Type one of the following commands to restart services:

- On RHEL platforms, type the following:

```
# service cpuspeed restart
```

- On SLES platforms, type the following:

```
# service haldaemon restart
```

5. Change the CPU frequency governor setting and configure turbo mode.

Proceed to the following:

"(Conditional) Changing the Governor Setting and Configuring Turbo Mode" on page 69

(Conditional) Changing the Governor Setting and Configuring Turbo Mode

Perform the procedure in this topic if you have an SGI UV system. On SGI UV systems, the default CPU frequency governor setting can inhibit the system's performance. Use the procedure in this topic to change the governor setting and, optionally, to configure turbo mode. When you enable turbo mode, you enable the CPU frequency to exceed its nominal level for short periods of time, depending on the processor, temperature, current, power, and other factors. For general information about turbo mode, see the following website:

<https://www-ssl.intel.com/content/www/us/en/architecture-and-technology/turbo-boost/turbo-boost-technology.html>

The following procedure explains how to set the CPU frequency governor appropriately and how to configure turbo mode.

Procedure 5-3 To change the governor setting and configure turbo mode

1. Make sure that CPU frequency is enabled.

For information, see "Enabling CPU Frequency Scaling" on page 68.

2. Change the governor from `ondemand` (the default) to a site-specific setting.

For SGI UV systems, SGI recommends that you configure the governor to `performance`.

Examine the following list and choose a power governor setting:

<i>governor</i> Setting	Effect
<code>ondemand</code>	Dynamically switches between the available CPUs if at 95% of CPU load. Default.
<code>performance</code>	SGI does not recommend this setting for SGI UV systems. Consider using the <code>performance</code> setting. Runs the CPUs at the maximum frequency. SGI recommends this setting for all SGI UV systems.
<code>conservative</code>	Dynamically switches between the available CPUs if at 75% of CPU load.
<code>powersave</code>	Runs the CPUs at the minimum frequency.
<code>userspace</code>	Runs the CPUs at user-specified frequencies.

3. Use one of the following platform-specific methods to change the setting:
 - On RHEL platforms, complete the following steps:
 1. Open file `/etc/sysconfig/cpuspeed`.
 2. Search for the `GOVERNOR=` string.
 3. Edit the setting, adding the *governor* setting you chose in the previous step.
 4. Save and close the file.
 5. Type the following command:

```
# service cpuspeed restart
```
 - On SLES platforms, complete the following steps:
 1. Type the following command:

```
# cpupower frequency-set -g governor
```

For *governor*, specify the setting you chose in the previous step.

2. Type the following command:

```
# cpupower frequency-info
```

3. Verify that the *governor* setting you specified appears in the command in the output in the `current policy` field.
4. Use a text editor to edit the `/etc/init.d/after.local` file and add the following line:

```
cpupower frequency-set -g governor
```

The preceding line ensures that after each boot, the system sets the *governor* setting you specified.

Complete the rest of this procedure if you want to configure turbo mode. If your goal was to configure a nondefault governor setting, you do not need to perform the remaining steps in this procedure.

4. Use the `cat(1)` command to retrieve the list of available frequencies. For example:

```
# cat /sys/devices/system/cpu/cpu0/cpufreq/scaling_available_frequencies
3301000 3300000 3200000 3100000 3000000 2900000 2800000 2700000 2600000
2500000 2400000 2300000 2200000 2100000 2000000 1900000 1800000 1700000
1600000 1500000 1400000 1300000 1200000
```

The preceding output shows the available frequencies, listed in order from the highest, 3301000 KHz, to the lowest, 1200000 KHz.

On SGI systems, the second frequency listed is always the processor's nominal frequency. This is a 3.3 GHz processor, so 3300000 KHz is the nominal frequency.

You can also obtain the nominal frequency by typing the following command and examining the information in the `model name` field:

```
# cat /proc/cpuinfo
```

5. Use the `cpupower` command to set the frequency to the nominal frequency of 3.3 GHz plus 1 MHz.

That is, specify a frequency of 3301 MHz. For example:

```
# cpupower frequency-set -u 3301MHz
```

Later, if you want to disable turbo mode, type the following command to set the maximum frequency back to the nominal frequency:

```
# cpupower frequency-set -u 3300MHz
```

System Partitioning

The following topics include more information about partitioning an SGI UV 2000, SGI UV 1000, or SGI UV 100 server:

- "About Partitioning" on page 72
- "Partitioning Advantages" on page 73
- "Partitioning Limitations" on page 73
- "Message Passing Toolkit (MPT) on a Partitioned System" on page 74
- "Partitioning Requirements" on page 74
- "Creating Partitions" on page 75

About Partitioning

You can divide a single SGI UV server into multiple, distinct systems, each with its own console, root filesystem, and IP network address. Each of these software-defined groups of processor cores constitute a *partition*. You can reboot, install software, power down, and upgrade each partition independently. The partitions can communicate with each other over an SGI NUMAlink connection, and this is called *cross-partition communication*. Collectively, all of these partitions compose a single, shared-memory cluster.

Partition discovery software allows all of the partitions to know about each other, and partition firewalls provide memory protection for each partition. The system software uses firewall code to open up a portion of memory so that it can be accessed by CPU cores in other partitions.

You can configure differently sized partitions. For example, you can configure a 128-processor system into four partitions of 32 CPU cores each, or you can configure the same 128-processor system into two partitions of 64 CPU cores each. The partition sizes and the number of partitions affect fault containment and scalability. For example, you might want to dedicate all 64 CPU cores of a system to a single

large application during the night. During the day, you can partition the system into two 32-processor systems for separate and isolated use.

Note: The terms *single system image* (SSI) and *partition* can be used interchangeably, so you might see both used in SGI documentation.

Partitioning Advantages

Partitioning provides the following capabilities:

- The ability to create a large, shared-memory cluster.

You can use SGI's NUMALink technology to create a very low latency, very large, shared-memory cluster for optimized use of Message Passing Interface (MPI) software and logically shared, distributed memory access (SHMEM) routines. MPI and SHMEM exploit the globally addressable, cache coherent, shared memory to deliver high performance.

- Fault containment.

In most cases, you can bring down a single partition, for any reason, without affecting the rest of the system. Hardware memory protections prevent any unintentional accesses to physical memory on a different partition from reaching and corrupting that physical memory. For current fault containment caveats, see "Partitioning Limitations" on page 73.

Partitioning Limitations

Partitioning can increase the reliability of a system because power failures and other hardware errors can be contained within a particular partition. However, there still can be cases in which the whole shared memory cluster is affected. For example, this can occur during hardware upgrades that multiple partitions share.

If a partition is sharing its memory with other partitions, the loss of that partition may take down all other partitions that were accessing its memory. This is currently possible when an MPI or SHMEM job is running across partitions using the XPC kernel module.

Failures are usually contained within a partition even when memory is being shared with other partitions. XPC is invoked using normal shutdown commands such as `reboot(8)` and `halt(8)` to ensure that all memory shared between partitions is

revoked before the partition resets. This is also done if you use the `rmmmod(8)` command to remove the XPC kernel modules. Unexpected failures such as kernel panics or hardware failures almost always force the affected partition into the KDB kernel debugger or the LKCD crash dump utility. These tools also invoke XPC to revoke all memory shared between partitions before the partition resets. XPC cannot be invoked for unexpected failures such as power failures and spontaneous resets (not generated by the operating system), and thus all partitions sharing memory with the partition may also reset.

Message Passing Toolkit (MPT) on a Partitioned System

If you enable the XPC kernel module, you enable direct memory access between partitions, which is referred to as *global shared memory*. When XPC is enabled, processes in one partition can access physical memory located on another partition.

If the system issues the following message when your application runs, you need to enable the kernel modules:

```
MPT ERROR from do_cross_gets/xpmem_get, rc = -1, errno = 22
```

For more information about the benefits of global shared memory and how to enable the XPC kernel module, see the *Message Passing Toolkit (MPT) User Guide*.

Partitioning Requirements

The following topics describe the system requirements for partitioning on SGI UV 2000 and SGI UV 1000 systems:

- "SGI UV 2000 System Partitioning Requirements" on page 74
- "SGI UV 1000 System Partitioning Requirements" on page 75

SGI UV 2000 System Partitioning Requirements

An SGI UV 2000 system includes one or more individual rack units (IRUs). Each IRU is a 10U high enclosure that includes eight compute blades and one chassis management controller (CMC). For each partition, you can include the following:

- As few as two and as many as 128 compute blades.
- A maximum of 2048 physical processor cores. When you enable Hyper-Threading, the maximum number of processor threads is 4096.

For information about how to enable Hyper-Threading, see the *SGI UV CMC Software User Guide*.

The following list describes additional requirements for a single partition:

- Each partition must have the infrastructure to run as a standalone system. This infrastructure includes a system disk and console connection.
- An I/O blade belongs to the partition to which the attached IRU belongs. I/O blades cannot be shared by two partitions.
- Peripherals, such as dual-ported disks, can be shared the same way two nodes in a cluster can share peripherals.
- Partitions must be contiguous in the topology. For example, the route between any two nodes in the same partition must be contained within that partition and not route through any other partition. This allows intrapartition communication to be independent of other partitions.
- Partitions must be fully interconnected. That is, for any two partitions, there must be a direct route between those partitions without passing through a third. This is required to fulfill true isolation of a hardware or software fault to the partition in which it occurs.

SGI UV 1000 System Partitioning Requirements

An SGI UV 1000 system includes at least two and up to 128 compute blades (16 to 2048 cores). The following list describes additional requirements for a single partition:

- One base I/O blade per partition.
- As few as two and up to 128 compute blades.
- 16 to 2048 physical processor cores, for a maximum of 4096 threads with Hyper-Threading enabled.

Creating Partitions

The following procedure explains how to partition a system, and it includes a running example that divides a system into two partitions.

Procedure 5-4 To partition an SGI UV system

1. Log in as the root user to the SGI UV system.

2. Verify that SGI Performance Suite is installed on your SGI UV system.

Partitioning requires the following products from the SGI Performance Suite: SGI Accelerate and SGI MPI. To verify that these products are installed, type one of the following commands:

- On RHEL platforms, type the following command:

```
# yum grouplist | grep SGI
SGI Accelerate
SGI Foundation Software
SGI MPI
SGI REACT
```

- On SLES platforms, type the following command:

```
# zypper search -C -i SGI
```

```
Loading repository data...
Reading installed packages...
```

S	Name	Summary	Type
i	SGI-Accelerate	SGI Accelerate	pattern
i	SGI-Accelerate-trace-modules	SGI Accelerate Trace Kernel Modules	pattern
i	SGI-MPI	SGI MPI	pattern
i	SGI-MPI-trace-modules	SGI MPI Trace Kernel Modules	pattern
i	SGI-Management-Center-Server	SGI Management Center Server	pattern
i	SGI-Management-Center-Supplemental	SGI Management Center Supplemental	pattern

The preceding example output shows that both the RHEL and SLES systems include the appropriate software packages.

3. Log into the chassis management controller (CMC) as the root user.

For example:

```
# ssh root@uv-cmc
```

4. Type the following command to retrieve information about the SGI UV system:

```
> config -v
```

```
SSN: UV2-00000048
```

```

CMCs:          1
              r001i01c UV2000

BMCs:          8
r001i01b00 IP109-BASEIO
r001i01b01 IP109
r001i01b02 IP109
r001i01b03 IP109
r001i01b04 IP109-BASEIO IORISER-DISABLED
r001i01b05 IP109
r001i01b06 IP109
r001i01b07 IP109

Partitions:    1
              partition000 BMCs:    8

Accessories:   0
    
```

Your goal is to determine the following:

- If the system is partitioned currently.
- The number of blades, base I/O risers, base I/O BMCs that are available. You need at least two compute blades per partition and one base I/O riser per partition.

The preceding output shows the following:

- This system has two blades that are base I/O BMCs: one is r001i01b00, and the other is r001i01b04. Only base I/O BMC r001i01b00 is enabled at this time.
- This system has eight compute blades.
- Only one base I/O riser can be enabled per partiton. This machine has only one partition at this time, so only one base I/O riser is enabled. This procedure shows how to enable the other base I/O riser and how to create two partitions.

5. Type the following command to retrieve information about the SGI UV system:

```

> hwcfg --all -v
BIOS_FILE=/common/bios.fd
      all targeted BMC(s)
BLADE_DISABLE=no
      all targeted BMC(s)
    
```

```
DEBUG_SW=0x0
    all targeted BMC(s)
IORISER_DISABLE=no ..... 7/8 BMC(s)
    r001i01b00
    r001i01b01
    r001i01b02
    r001i01b03
    r001i01b05
    r001i01b06
    r001i01b07
IORISER_DISABLE=yes ..... 1/8 BMC(s)
    r001i01b04
NL6_ENABLE=yes
    all targeted BMC(s)
PARTITION=0
    all targeted BMC(s)
ROUTER_TYPE=ordinary
    all targeted BMC(s)
SOCKET_DISABLE=no
    all targeted BMC(s)
```

Your goal is to verify the `IORISER_DISABLE` and `PARTITION` variables.

6. Enable additional base I/O risers, as needed.

In this procedure's example, there are two base I/O risers on the SGI UV system, but currently, one base I/O riser is disabled because the system is configured as a single, large partition. Type the following command to enable the additional base I/O riser:

```
> hwcfg IORISER_DISABLE=no r001i01b04
IORISER_DISABLE=default [no] <PENDING RESET>
IORISER_DISABLE=no (this is the BMC default, override cleared)
```

7. Type the following command to verify the base I/O riser(s) that you enabled:

```
> hwcfg --all -v
BIOS_FILE=/common/bios.fd
    all targeted BMC(s)
BLADE_DISABLE=no
    all targeted BMC(s)
DEBUG_SW=0x0
    all targeted BMC(s)
```

```

IORISER_DISABLE=default [no] <PENDING RESET> ..... 1/8 BMC(s)
  r001i01b04
IORISER_DISABLE=no ..... 7/8 BMC(s)
  r001i01b00
  r001i01b01
  r001i01b02
  r001i01b03
  r001i01b05
  r001i01b06
  r001i01b07
NL6_ENABLE=yes
  all targeted BMC(s)
PARTITION=0
  all targeted BMC(s)
ROUTER_TYPE=ordinary
  all targeted BMC(s)
SOCKET_DISABLE=no
  all targeted BMC(s)

```

In the previous output, the <PENDING RESET> line shows that base I/O riser r001i01b04 is set to be enabled. The enablement occur later in the procedure, after the power cycle.

8. Use the `hwcfg` command to create two or more partitions.

The format for the command is as follows:

```
hwcfg PARTITION=partition_num BMC_num BMC_num [BMC_num ...]
```

The variables in the preceding command are as follows:

- For *partition_num*, specify the number for one of the partitions. SGI recommends that you start partition numbers at 1. For example, you can have partitions 1 and 2, or you can have partitions 1 and 2 and 3.

You can use 0 for a partition number only if you want to configure the system as a single, large partition. A single partition should have all blades in partition 0.

- For *BMC_num*, specify the BMC identifier for one or more blades.

For example, to create two partitions, type the following commands:

```
> hwcfg PARTITION=1 r001i01b00 r001i01b01 r001i01b02 r001i01b03
PARTITION=1 <PENDING RESET>
> hwcfg PARTITION=2 r001i01b04 r001i01b05 r001i01b06 r001i01b07
PARTITION=2 <PENDING RESET>
```

It is customary to list the base I/O BMC first, as the preceding lines show, but it is not necessary.

9. Verify that the system registered the information from the preceding step's hwcfg commands.

For example, type the following command and verify its output:

```
> hwcfg --all -v
BIOS_FILE=/common/bios.fd
    all targeted BMC(s)
BLADE_DISABLE=no
    all targeted BMC(s)
DEBUG_SW=0x0
    all targeted BMC(s)
IORISER_DISABLE=default [no] <PENDING RESET> ..... 1/8 BMC(s)
    r001i01b04
IORISER_DISABLE=no ..... 7/8 BMC(s)
    r001i01b00
    r001i01b01
    r001i01b02
    r001i01b03
    r001i01b05
    r001i01b06
    r001i01b07
NL6_ENABLE=yes
    all targeted BMC(s)
PARTITION=1 <PENDING RESET> ..... 4/8 BMC(s)
    r001i01b00
    r001i01b01
    r001i01b02
    r001i01b03
PARTITION=2 <PENDING RESET> ..... 4/8 BMC(s)
    r001i01b04
    r001i01b05
    r001i01b06
```

```
      r001i01b07
ROUTER_TYPE=ordinary
      all targeted BMC(s)
SOCKET_DISABLE=no
      all targeted BMC(s)
```

The preceding output shows the second base I/O Riser is ready to be enabled. The output also shows the eight blades associated with the two partitions you created.

10. Type the following command to power cycle the blades:

```
> power -o cycle
```

11. Wait for the power cycling to complete.

On a large system, this could take several minutes.

12. Periodically, type the following command to affirm that all the blades are powered up:

```
> power status
```

The following example output shows that all blades are powered up:

```
==== r001i01c (PRI) ====
blades - on: 8, off: 0, unknown: 0, disabled: 0
chassis - on: 1, off: 0
accio - on: 0, off: 0
```

After all the blades power up, proceed to the next step.

13. Use the `uvcon` command to return to the shell.

For example, to get to the shell for partition 1 or partition 2, type one of the following commands:

```
> uvcon p1
```

OR

```
> uvcon p2
```

Installing the Operating System on a Partition

The procedure you use to install an operating system on an individual partition is the same procedure that you use to install an operating system as a single-system image on an entire SGI UV system. The procedures in this manual contain some conditional statements that pertain to either a single-system image or to a partition image, so make sure to note these conditional statements when you perform the installation.

The installation procedure assumes that you have a system management node (SMN) attached to your SGI UV system. If you do not have an SMN, you need the software media and an extra DVD drive. You need to plug the DVD drive into each base I/O blade in the partition and install the operating system manually.

The following procedure explains how to install a copy of the operating system and the SGI Foundation Software on a partition.

Procedure 5-5 To install an operating system on a partition

1. Log into the system management node (SMN) as the root user.
2. Complete the following procedures to connect to the base I/O blade of the partition:
 - "Preparing the Environment and Gathering BMC Information" on page 10
Specifically, complete the following steps:
 - Procedure 2-2, step 1 on page 10
through
 - Procedure 2-2, step 6 on page 13
 - "Using an SMN to Install the SGI UV Server Software" on page 18
Specifically, complete the following steps:
 - Procedure 2-5, step 1 on page 18
through
 - Procedure 2-5, step 18 on page 21
3. Proceed to one of the following:
 - To install a RHEL operating system and the SGI Foundation Software on an SGI UV partition, proceed to the following:

Chapter 3, "Installing the Red Hat® Enterprise Linux® (RHEL) Operating System and the SGI Foundation Software" on page 25

- To install a SLES operating system and the SGI Foundation Software on an SGI UV partition, proceed to the following:

Chapter 4, "Installing the SUSE Linux Enterprise Edition (SLES) Operating System and the SGI Foundation Software" on page 45

Disabling Partitions

The following procedure explains how to remove the partitions from a partitioned system, and it includes a running example that changes a system from a two-partition system to a one-partition system.

Procedure 5-6 To remove partitions

1. Log in as the root user to the SGI UV system.
2. Log into the chassis management controller (CMC) as the root user.

For example:

```
# ssh root@uv-cmc
```

3. Type the following command to retrieve the system's current partitioning information:

```
> hwcfg -av
BIOS_FILE=/common/bios.fd
    all targeted BMC(s)
BLADE_DISABLE=no
    all targeted BMC(s)
DEBUG_SW=0x0
    all targeted BMC(s)
IORSER_DISABLE=no
    all targeted BMC(s)
NL6_ENABLE=yes
    all targeted BMC(s)
PARTITION=1 ..... 4/8 BMC(s)
    r001i01b00
    r001i01b01
    r001i01b02
    r001i01b03
```

```

PARTITION=2 ..... 4/8 BMC(s)
    r001i01b04
    r001i01b05
    r001i01b06
    r001i01b07
ROUTER_TYPE=ordinary
    all targeted BMC(s)
SOCKET_DISABLE=no
    all targeted BMC(s)

```

The preceding output shows two partitions.

4. Remove all the partitions you configured.

It is possible to remove only one partition, but subsequent system operations can be confusing. To make operations more straightforward, remove all partitions if you want to remove one.

To remove a partition, type the `hwcfg` command in the following format:

```
hwcfg -c partition_id
```

For *partition_id*, type the partition identifier as shown in the previous step's `hwcfg -av` output.

For example, to remove the two partitions :

```

> hwcfg -c PARTITION=1
PARTITION=default [0] <PENDING RESET>
> hwcfg -c PARTITION=2
PARTITION=default [0] <PENDING RESET>

```

5. Type the following command to verify that the partition(s) that you want to remove are set to be removed:

```

> hwcfg -av
BIOS_FILE=/common/bios.fd
    all targeted BMC(s)
BLADE_DISABLE=no
    all targeted BMC(s)
DEBUG_SW=0x0
    all targeted BMC(s)
IORSER_DISABLE=no

```

```

        all targeted BMC(s)
NL6_ENABLE=yes
        all targeted BMC(s)
PARTITION=default [0] <PENDING RESET>
        all targeted BMC(s)
ROUTER_TYPE=ordinary
        all targeted BMC(s)
SOCKET_DISABLE=no
        all targeted BMC(s)

```

The preceding output shows `PARTITION=default [0] <PENDING RESET>`, which means that the BMCs are set for the change when the next power cycle occurs.

6. Disable the base I/O risers that are associated with the partitions you want to remove.

This step is important because the SGI UV system cannot be reset if it is configured to have only one partition but it is configured to have multiple base I/O riser blades with each blade's base I/O riser enabled.

Use the `hwcfg` command in the following format to disable the base I/O risers:

```
hwcfg IORISER_DISABLE=yes blade_id
```

For example:

```
> hwcfg IORISER_DISABLE=yes r001i01b04
IORISER_DISABLE=yes <PENDING RESET>
```

7. Type the `hwcfg -av` command again to retrieve the system status.

For example:

```
> hwcfg -av
BIOS_FILE=/common/bios.fd
        all targeted BMC(s)
BLADE_DISABLE=no
        all targeted BMC(s)
DEBUG_SW=0x0
        all targeted BMC(s)
IORISER_DISABLE=no ..... 7/8 BMC(s)
        r001i01b00
        r001i01b01
```

```

        r001i01b02
        r001i01b03
        r001i01b05
        r001i01b06
        r001i01b07
IORISER_DISABLE=yes <PENDING RESET> ..... 1/8 BMC(s)
        r001i01b04
NL6_ENABLE=yes
        all targeted BMC(s)
PARTITION=default [0] <PENDING RESET>
        all targeted BMC(s)
ROUTER_TYPE=ordinary
        all targeted BMC(s)
SOCKET_DISABLE=no
        all targeted BMC(s)
```

8. Type the following command to power cycle the blades:

```
> power -o cycle
```

9. Wait for the power cycling to complete.

On a large system, this could take several minutes.

10. Periodically, type the following command to affirm that all the blades are powered up:

```
> power status
```

The following example output shows that all blades are powered up:

```
==== r001i01c (PRI) ====
blades - on: 8, off: 0, unknown: 0, disabled: 0
chassis - on: 1, off: 0
accio - on: 0, off: 0
```

Superpages

The following topics describe superpages:

- "About Superpages" on page 87
- "Examples" on page 87

- "Saving Your Superpage Configuration" on page 88

About Superpages

Superpages allow you to map large areas of reserved memory into your application. `libsuperpages` is a library for allocating and mapping SGI UV superpages. For more information, see the `libsuperpages(3)` man page. Superpages requires SGI Performance Suite. If your SGI UV system is partitioned, you can define superpages within a partition.

Superpages are defined in an EFI firmware variable as a kernel boot option. When you enable superpages, you need to boot the system and then the SGI UV reserves the amount of specified memory to be used via superpages. The reserved memory is not available to the operating system for its regular activities. The SGI UV BIOS passes superpage addresses to the superpages driver as an Advanced Configuration and Power Interface (ACPI) device.

The `superpages` command allows you to test the functionality of an SGI UV system's superpages. The `superpages_define -w` command creates `superpages0`, which is an EFI variable that resides on the chassis management controller (CMC) and defines superpages. You must be a superuser (root) to run this command. After execution, to enable superpages, you need to reboot the system. The system BIOS then reserves the system memory for superpages rather than providing it to the operating system. For a usage statement, enter `superpages -h`.

Examples

The following examples show the `superpages_define` command:

- **Example 1.** The `superpages_define` command's `-L` option displays valid superpage sizes, as follows:

```
uv-sys:~ # superpages_define -L
Valid superpage sizes:
0x100000000 4G (4294967296)
0x400000000 16G (17179869184)
0x1000000000 64G (68719476736)
0x4000000000 256G (274877906944)
0x10000000000 1T (1099511627776)
```

- **Example 2.** The `superpages_define -c` command displays the available memory ranges for superpage allocation, as follows:

```
uv-sys:~ # superpages_define -c
available memory ranges for superpage allocation:
0x100000000-0x87fffffff 0x780000000 30G
0x100000000-0x17feffffff      0x7ff000000 31G
available memory: 61G (63472M)
```

- **Example 3.** The following command shows the 4G areas of memory that can be used as superpages:

```
uv-sys:~ # superpages_define -p 4G

in /etc/superpages.conf format:
# for pagesize: 0x100000000 4G
size_4G 4G #node0 0x100000000:3 #node1 0x400000000:4 #node2 0x100000000:4 #node 3 0x140000000:3
# 14 4G superpages
```

- **Example 4.** The following command shows the 4G areas of memory that can be used as superpages, but it limits such areas to two per node:

```
uv-sys:~ # superpages_define -p 4G -n 2

in /etc/superpages.conf format:
# for pagesize: 0x100000000 4G
size_4G 4G #node0 0x100000000:2 #node1 0x400000000:2 #node2 0x100000000:2 #node3 0x140000000:2
# 8 4G superpages
```

- **Example 5.** After you are satisfied with your memory selection, type commands similar to the following to define superpages:

```
uv-sys:~ # superpages_define -p 4G -n 2 > /etc/superpages.conf
uv-sys:~ # superpages_define -w
```

When you reboot your SGI UV system, the specified areas are superpages.

Saving Your Superpage Configuration

If you reconfigure your system's superpages, the new configuration goes into effect after you reboot the system. To use the same configuration and avoid a reboot, you can save superpage configuration information to an EFI variable. The SGI UV system

stores the EFI variable on the CMC, and you can use the `efiv` command to restore the configuration. The `superpages0` variable contains the addresses and lengths of all the superpages.

You can use the `efiv` command as follows:

- To display the superpage configuration, type the following command:

```
CMC> efiv -p part_num -l | grep superpage
```

For *part_num*, specify the partition number. For example, specify 0 on an unpartitioned system.

- To save the superpage configuration, type the following command:

```
CMC> efiv -p -s superpage0 2> /dev/null > superpage0
```

- To restore a superpage configuration, type the following command:

```
CMC> efiv -c superpage0
```

- To delete a superpage configuration, type the following command:

```
CMC> efiv -p part_num -d superpage0
```

For *part_num*, specify the partition number. For example, specify 0 on an unpartitioned system.

Configuring Security-Enhanced Linux (SELinux) (RHEL Platforms Only)

You can configure SELinux on an SGI UV computer that runs the Red Hat Enterprise Linux (RHEL) operating system. SELinux supports Multi-Level Security (MLS) and Multi-Category Security (MCS) modes. When you configure SELinux, you create an MLS-compliant or MCS-compliant environment on an SGI UV computer system, and you enable SGI MPI programs to take full advantage of all the features that SGI Accelerate provides on SGI UV hardware. For more information about SELinux, see your RHEL documentation.

Note: If you are not interested in MLS or MCS, you do not need to configure SELinux. In this case, do not perform the procedure in this topic.

The SUSE Linux Enterprise Server (SLES) operating system does not support SELinux.

To obtain help output for the `sgi-selinux-configuration` command, type the command name, with no options. For example:

```
# sgi-selinux-configuration
sgi-selinux-configuration
Actions
-h|--help      Print usage
-s|--status    Return module(s) status
-i|--insert    Insert policy module
-r|--remove    Remove policy module
-l|--label     Label policy files
-R|--restart   Restart services affected by SGI policies

Select target policy modules (default is all)
-S|--services Perform operation on services
-D|--devices  Perform operation on devices
--bigpage
--gru
--mmtimer
--xpmem
--procset
--arraysvcs
```

The following procedure explains how to configure SELinux on an SGI UV computer system.

Procedure 5-7 To configure SELinux

1. Log in as root.
2. Type the following commands to load the SELinux software modules from the RHEL distribution:

```
# yum install policycoreutils-python
# yum install selinux-policy-mls
sgi_bigpage      1.0.0
sgi_gru 1.0.0
sgi_mmtimer      1.0.0
sgi_xpmem        1.0.0
sgi_procset      1.0.0
sgi_arraysvcs    1.0.0
```


3. Type the following command to ensure that the modules are loaded correctly:

```
# sgi-selinux-configuration -s
```

If the SELinux software modules are loaded correctly, the command returns a list of the loaded modules.

If the `sgi-selinux-configuration -s` command returns nothing, then the policy modules did not load correctly. Type the following command to load all SGI policies:

```
# sgi-selinux-configuration -i
```

4. Type the following command to apply security labels to the file system for all kernel modules and services:

```
# sgi-selinux-configuration -l
```

Note that the option to the preceding command is a lowercase L character.

5. Type the following command to restart services:

```
# sgi-selinux-configuration -R
```

6. (Conditional) Repeat the preceding steps on other partitions.

Perform the steps in this procedure again on all other partitions if your SGI UV computer is divided into partitions.

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