sgi

SGI® Foundation Software 2.6
Start Here

Record of Revision

Version	Description
001	April 2010 Original publication. Supports the SGI Foundation Software 2 release.
002	June 2010 Updated to support the SGI Foundation Software 2 Service Pack 1 release.
003	October 2010 Updated to support the SGI Foundation Software 2.2 release.
004	February 2011 Updated to support the SGI Foundation Software 2.3 release.
005	April 2011 Updated to support the SGI Foundation Software 2.4 release.
006	November 2011 Updated to support the SGI Foundation Software 2.5 release.
007	May 2012 Updated to support the SGI Foundation Software 2.6 release.

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About This Guide

This guide is a reference document for people who manage the operation of SGI®
computer systems. It describes how to use SGI Foundation Software 2.6 software on
SGI computer systems.

Helpful Online Resources

This section describes the electronic support services available for your SGI system
running SGI Foundation Software, as follows:

- Supportfolio

  Supportfolio, the SGI support web site, including the SGI Knowledgebase, links
  for software supports and updates.

  https://support.sgi.com/login

- Supportfolio SGI Knowledgebase

  The SGI Knowledgebase available from Supportfolio has answers to common
  questions, problem resolutions, how-to documents, and many other useful articles
  for system administrators.

  https://support.sgi.com/kb/publisher.asp

- SGI Update Server

  The SGI update server (https://update.sgi.com/) is available for your
  convenience. Get updates to the SGI Foundation software releases using update
  tools (for example, YaST, zypper and yum) available in your operating system
  environment. Refer to the product release notes for more information about
  specific product details on the SGI update server.

- Supportfolio Software Updates

  Check for new updates to your purchased SGI software, and download or order
  CDs all in one convenient place. Supportfolio Software Updates provides one-stop
  shopping to check for and get new updates for your SGI software.

  https://support.sgi.com/software?cmd=order

- SGI Customer Support Center

  You can open calls to the SGI Customer Support Center online, keep track of all your cases, and receive automatic update information when your case is updated via the Supportfolio Problem Resolution Tools at:

  https://support.sgi.com/caselist

- SGI Software Licensing

  If you need to get your license for SGI software, you can order your software licenses conveniently via e-mail or online.

  You can send a blank e-mail to license@sgi.com, and you will receive a simple template to fill out. You will quickly receive your new license back with complete instructions for installing it back via e-mail.

  Or, you can go online to the SGI Key-O-Matic at:

  http://www.sgi.com/support/licensing/

Related Publications

Documents listed in this section contain additional information that might be helpful, as follows:

- Novell documentation for SUSE Linux Enterprise Server 11 (SLES11)
- Red Hat Enterprise Server 6 (RHEL 6)
- Intel Compiler Documentation
- Intel documentation about Xeon architecture
- SGI Documentation

Novell Documentation

This section describes documentation for SUSE Linux Enterprise Server 11 available from Novell.

Documentation for SUSE Linux Enterprise Server 11 is located on your system in the `/docu/en` directory.

Note: Novell makes SUSE Linux Enterprise Server 11 documentation available online at: http://www.novell.com/documentation/

The following SLES11 documentation is available:

- *SUSE Linux Enterprise Server 11 Installation Quick Start*

  `art_sles_installquickstart.pdf`

- *SUSE Linux Enterprise Server 11 Deployment Guide*

  `book_sle_deployment.pdf`

- *SUSE Linux Enterprise Server 11 Administration Guide*

  `book_sle_admin.pdf`

- SUSE Linux Enterprise Server SLES11: Storage Administration Guide

  `stor_admin.pdf`

- SUSE Linux Enterprise Server 11 Package Descriptions available online at: http://www.novell.com/products/linuxenterpriseserver/packages.html

Red Hat Documentation

Documentation for Red Hat Enterprise Linux 6.1 (RHEL 6.1) or RHEL 6.2 is located in the `/usr/share/doc` directory. It contains package-specific documentation. If you install the `zisofs` module, additional documentation in the form of READMEs can be found in `/usr/share/doc/zisofs-tools-1.x.x`.

On the RHEL6 DVD, README-*{lang}* and RELEASE-NOTES-*{lang}* files are found in the root directory.

Note: Red Hat makes Red Hat Enterprise Linux 6 (RHEL 6) documentation available online at:
http://www.redhat.com/docs/manuals/enterprise/RHEL-6-manual/index.html

The following documentation is available:

- Release Notes for x86_64 architecture

- *Red Hat Enterprise Linux Deployment Guide*

- *Red Hat Enterprise Linux Installation Guide*

- *Red Hat Virtualization*

Intel Compiler Documentation

Documentation for the Intel compilers is located on your system in the /docs directory of the directory tree where your compilers are installed. If you have installed the Intel compilers, the following documentation is available:

- Intel C++ Compiler User's Guide (c_ug_lnx.pdf)

- Intel Fortran Compiler User's Guide (for_ug_lnx.pdf)

- Intel Fortran Programmer's Reference (for_prg.pdf)

- Intel Fortran Libraries Reference (for_lib.pdf)

Other Intel Documentation

Intel makes Intel server processor information available online at:

http://www.intel.com/support/processors/sb/CS-029807.htm

SGI Documentation

This section describes SGI documentation.

Note: Online and postscript versions of SGI documentation is available at SGI Technical Publications Library at http://docs.sgi.com

SGI Performance Suite Software Manuals

For information about manuals supporting the SGI Performance Suite products, such as SGI® MPI, SGI® REACT™, SGI® UPC, and SGI® Accelerate™, see the *SGI Performance Suite 1.x Start Here*.

Additional SGI Software Manuals

This section lists SGI software manuals supporting current SGI software products.

- *SGI UV System Management Node Administrator Guide*

  Describes the system management node (SMN) installation, configuration and operation for SGI® UV™ family of systems.

- *SGI Management Center for SGI ICE X*

  Describes how to perform general system installation, configuration, and operations on the SGI® ICE™ X systems.

- *SGI Management Center for SGI ICE*

  Describes how to perform general system installation, configuration, and operations on the SGI ICE 8200 and SGI ICE 8400 systems. For other SGI hardware platforms, see the *SGI Management Center System Administrator Guide* and *SGI Management Center Installation and Configuration.*

- *SGI Management Center Installation and Configuration*

  This guide is intended for system administrators. It describes how to install and configure the SGI Management Center. A companion manual, *SGI Management Center System Administrator Guide*, describes general cluster administration. For SGI ICE platforms, use the manual *SGI Management Center for SGI ICE* or *SGI Management Center for SGI ICE X.*

- *SGI Management Center System Administrator Guide*

  This guides describes how you can monitor and control a cluster using the SGI Management Center. A companion manual, *SGI Management Center Installation and Configuration Guide*, describes installing and configuring the SGI Management Center. For SGI ICE platforms, use the manual *SGI Management Center for ICE* or *SGI Management Center for SGI ICE X.*

- *SGI Management Center Quick Start Guide*

  The guide tells you how to get you SGI Management Center up and running.

- *Embedded Support Partner User Guide*

  Provides information about using the Embedded Support Partner (ESP) software suite to monitor events, set up proactive notification, and generate reports. This

revision of the document describes ESP version 3.0, which is the first version of ESP that supports the Linux operating system.

- *Event Manager User Guide*

  Provides information about the Event Manger application that collects event information from other applications. This document describes the Event Manager application, the application programming interface that you can use to access it, the procedures that you can use to communicate with it from another application, and the commands that you can use to control it.

- *XFS for Linux Administration*

  Describes XFS, an open-source, fast recovery, journaling filesystem that provides direct I/O support, space preallocation, access control lists, quotas, and other commercial file system features.

- *XVM Volume Manager Administrator Guide*

  Describes the configuration and administration of XVM logical volumes using the XVM Volume Manager.

- *CXFS 6 Administration Guide for SGI InfiniteStorage*

  Documents CXFS running on a storage area network (SAN). CXFS is clustered XFS, a parallel-access shared clustered filesystem for high-performance computing environments.

- *CXFS 6 Client-Only Guide for SGI InfiniteStorage*

  Provides an overview of the installation and configuration procedures for CXFS client-only nodes running SGI CXFS clustered filesystems.

- *Guaranteed-Rate I/O Version 2 for Linux Guide*

  Provides information about GRIO version 2, the second-generation guaranteed-rate I/O product from SGI.

- *High Availability Extension and SGI InfiniteStorage*

  Provides information about creating resources for the high-availability (HA) SGI resource agents that SGI provides for use with the SUSE Linux Enterprise High Availability Extension (HAE) product.

- *DMF 5 Administrator Guide for SGI InfiniteStorage*

Describes how to perform administration of the Data Migration Facility (DMF). DMF is a hierarchical storage management system for SGI environments. Its primary purpose is to preserve the economic value of storage media and stored data. This manual describes DMF components, features, and architecture; it focuses on the tasks of configuration and ongoing administrative duties.

- *SGI InfiniteStorage Appliance Manager User Guide*

  Describes the operation of SGI InfiniteStorage Appliance Manager, which is a web-based interface that lets you configure, manage, and monitor a storage server.

- *SGI UV CMC Controller Software User Guide*

  Documents the chassis manager controller (CMC) command line interface (CLI) software controller commands for the SGI UV 100 , SGI UV 1000, and SGI UV 2000 series systems.

- *Windows on SGI UV Software Install Guide*

  Describes how to install Windows Server 2008 R2 Datacenter software on an SGI UV 100, SGI UV 1000, or SGI UV 2000 system. This manual does not apply to the SGI UV 10 or SGI UV 20 systems.

SGI Hardware Manuals

This section lists SGI hardware manuals supporting current SGI hardware products.

- *SGI Altix UV 10 System User's Guide*

  This guide provides an overview of the architecture and descriptions of the major components that compose the SGI UV 10 system. It also provides the standard procedures for powering on and powering off the system, basic troubleshooting information, and important safety and regulatory specifications.

- *SGI Altix UV 100 System User's Guide*

  This guide provides an overview of the architecture and descriptions of the major components that compose the SGI UV 100 system. It also provides the standard procedures for powering on and powering off the system, basic troubleshooting information, and important safety and regulatory specifications.

- *SGI Altix UV 1000 System User's Guide*

  This guide provides an overview of the architecture and descriptions of the major components that compose the SGI UV 1000 system. It also provides the standard

procedures for powering on and powering off the system, basic troubleshooting information, and important safety and regulatory specifications.

- *SGI UV 2000 System User Guide*

  This guide provides an overview of the architecture and descriptions of the major components that compose the SGI UV 2000 system. It also provides the standard procedures for powering on and powering off the system, basic troubleshooting information, and important safety and regulatory specifications.

- *SGI ICE X System Hardware User Guide*

  Describes the features of the SGI ICE X systems and provides operating instructions and general troubleshooting information.

- *SGI Altix ICE 8200 Series System Hardware User's Guide*

  Describes the features of the SGI ICE 8200 systems and provides operating instructions and general troubleshooting information.

- *SGI Altix ICE 8400 Series System Hardware User's Guide*

  Describes the features of the SGI ICE 8400 systems and provides operating instructions and general troubleshooting information.

- *SGI Rackable C1104-2TY9 System User's Guide*

  Describes the features of the SGI Rackable C1104-2TY9 server system as well as troubleshooting, upgrading, and repairing.

- *SGI Rackable C2108-TY11 System User's Guide*

  Describes the features of the SGI Rackable C2108-TY11 server system as well as troubleshooting, upgrading, and repairing.

- *SGI Rackable C3108-TY11 System User's Guide*

  Describes the features of the SGI Rackable C3108-TY11 server system as well as troubleshooting, upgrading, and repairing.

- *SGI C1103-TY12 System User's Guide*

  This guide provides an overview of the architecture and descriptions of the major components that compose the SGI C1103-TY12 system. It also provides the standard procedures for powering on and powering off the system, basic troubleshooting information, and important safety and regulatory specifications.

- *SGI CloudRack X2 System User's Guide*

  This guide provides an overview of the SGI CloudRack X2 workgroup cluster server's architecture and descriptions of 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.

- *SGI Origin 400 System User's Guide*

  This manual is written for system technicians who are responsible for troubleshooting, upgrading, and repairing Origin 400 systems. This document provides reference information, feature information, and step-by-step instructions for adding and replacing components in the Origin 400 system.

Obtaining Publications

You can obtain SGI documentation in the following ways:

- See the SGI Technical Publications Library at: 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.

- Online versions of the *SGI Foundation Software 2.6 Start Here*, release notes, which contain the latest information about SGI Foundation software, can be found in the `/docs` directory on each SGI Foundation Software product media.

- You can view man pages by typing man *title* on a command line.

Conventions

The following conventions are used throughout this document:

Convention	Meaning
`command`	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
variable	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.

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 any 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.

• Send mail to the following address:

SGI
Technical Publications
46600 Landing Parkway
Fremont, CA 94538

SGI values your comments and will respond to them promptly.

SGI Foundation Software Overview

This guide documents the installation, configuration, and administration of the SGI Foundation Software 2.6 release. It contains the following sections:

- "Software Introduction" on page 1
- "SGI Foundation Software CD Contents" on page 2
- "Finding SGI Foundation Software Manuals" on page 2
- "Getting Updates" on page 4
- "Getting the Latest Firmware/Software for Your SGI Rackable or SGI ICE Series System" on page 5
- "Getting the Latest BIOS for Your SGI UV 2000, SGI UV 1000 or UV 100 Series System" on page 5
- "License Manager Updates" on page 6
- "Embedded Support Partner" on page 6
- "Topology API" on page 7
- "Check Feature Utility" on page 7

Software Introduction

SGI provides two primary software packages to enable your SGI systems to run with improved performance and enhanced technical support features:

- SGI Foundation Software
- SGI Performance Suite

The SGI Foundation Software suite provides the core set of tools and utilities, as described in "SGI Foundation Software CD Contents" on page 2. The SGI Performance Suite products provide additional performance enhancements, as described in the *SGI Performance Suite 1.4 Start Here.*

The SGI Foundation Software 2.6 release is fully supported on the SUSE Linux Enterprise Server 11 Service Pack 1 (SLES 11 SP2) base distribution or the Red Hat

Enterprise Linux 6.1 (RHEL 6.1) or Red Hat Enterprise Linux 6.2 (RHEL 6.2) base distribution. It also runs on the Community ENTerprise Operating System (CentOS 6) base distribution. While SGI support will answer questions relating to any of these products, it does not provide technical support for the CentOS operating system.

The SGI Foundation Software 2.6 release supports X86-64 systems only.

SGI hardware platforms and operating system configuration settings supported by SGI are documented at the following URL: http://www.sgi.com/products/servers/

SGI Foundation Software CD Contents

This section describes the major contents of the SGI Foundation Software 2.6 CD, as follows:

- Device driver libraries

- LSI Logic LSIUtil (`lsiutil`) configuration utility

- Memory logging utility

- Open source Performance Co-Pilot

- Embedded Support Partner (ESP)

- SGI support tools

- SGI LK software licensing mechanism

- Environment modules

- SGI recommended system and boot-time configuration changes

- Check feature utility

- SGC - DVI graphics input capture

Finding SGI Foundation Software Manuals

The SGI Foundation Software manuals are installed in the following location on your SGI system:

`/usr/share/doc/packages/sgi-foundation-2`

Change directory (cd) to this location to see a list manual directories. Each manual directory contains a pdf and HTML copy of the manual.

```
ESP_UG       figures     LX_UVConfigOps_AG  Start_Here_Fond_2  UV_Install_AG
EventMgr_UG  index.html  LX_XFS_AG          UVcontroller_UG
```

For example, cd to the Start_Here_Fond_2 directory and list (ls) its contents, as follows:

```
/usr/share/doc/packages/sgi-foundation-2 # ls
pdf sgi_html
```

You can also access the following local URL on your SGI system using the Mozilla Firefox browser, as follows:

```
# firefox -no-remote file:///usr/share/doc/packages/sgi-foundation-2/index.html
```

The SGI Foundation Software Documentation page appears, as shown in Figure 1-1 on page 4.
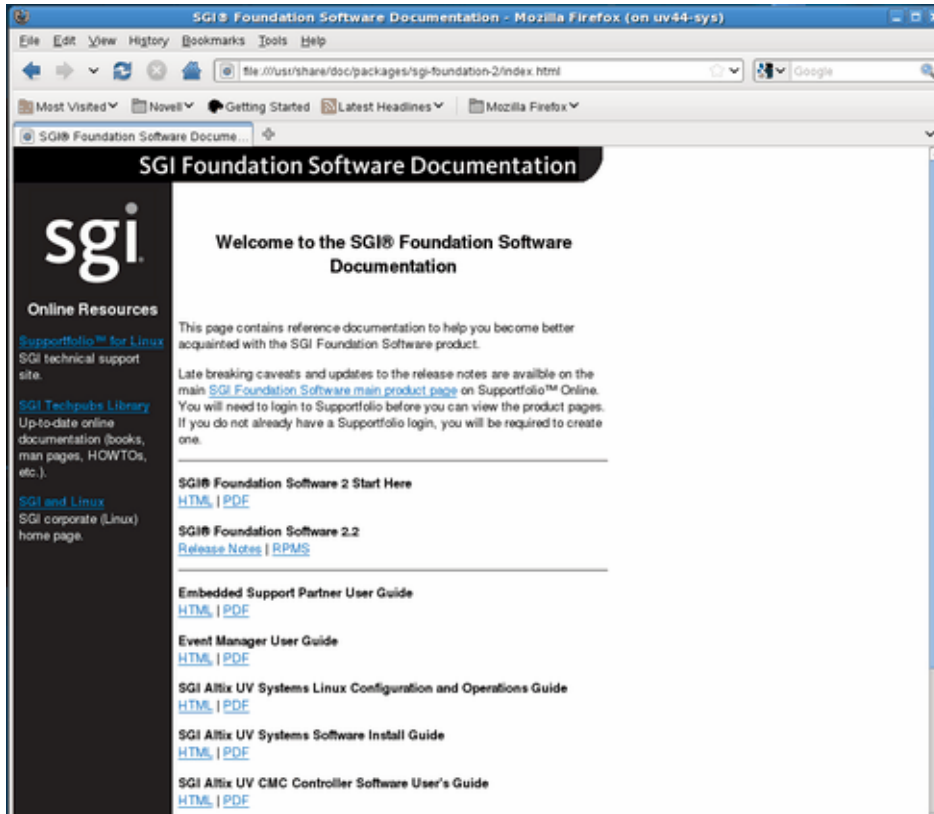
Figure 1-1 SGI Foundation Software Documentation Page

Getting Updates

This section describes how to get software updates for SGI Foundation Software 2.6 release.

Detailed instructions for downloading and installing SGI Foundation Software 2.6 updates are available from the SGI Foundation Software product pages on Supportfolio: https://support.sgi.com/content_request/194480/index.html.

Note: You must have a Supportfolio account to access this page and the SGI update server.

Customers that received SGI Foundation Software 2.6 pre-installed on their new SGI system may run the following command to add the proper update source for SGI Foundation Software 2.6:

```
$ /usr/sbin/sgi-foundation-update-source
```

This script will prompt you for your Supportfolio login and then add the proper SGI update source for the given architecture and base operating system.

Getting the Latest Firmware/Software for Your SGI Rackable or SGI ICE Series System

For information on the basic input/output system (BIOS), Baseboard Management Controller (BMC) firmware, Intelligent Platform Management Interface (IPMI) control utility, Field Replaceable Unit/Sensor Data Record (FRUSDR) software, Hierarchical Storage Controller (HSC) software, LSI RAID firmware, Platform Manager cluster management software, InfiniBand drivers, INTEL MPI Runtime Environment Kit for Linux, and Java Runtime Environment (JRE), see the SGI XE Firmware/Software page on SGI Supportfolio at:https://support.sgi.com/browse_request/firmware_diagnostic_software

For information on SGI ICE system firmware, see the "Firmware Management" section in Chapter 3, "System Operation" and the "System Firmware" section in Chapter 5, "System Maintenance, Monitoring, and Debugging" in the *SGI Management Center for SGI ICE* or *SGI Management Center for SGI ICE X* available on http://docs.sgi.com.

Getting the Latest BIOS for Your SGI UV 2000, SGI UV 1000 or UV 100 Series System

Get the latest BIOS for your SGI UV 2000, SGI UV 1000, or SGI UV 100 series system at SGI Supportfolio at https://support.sgi.com. For instructions for flashing compute blade BIOS, see "Upgrading System BIOS" in the *SGI UV CMC Controller Software User Guide.*

License Manager Updates

Warning: Please backup your license key files prior to installing SLES11 SP2, RHEL 6.1 or RHEL 6.2 and/or SGI Performance Suite 1.4 products. A license key file is not included in these RPMs.

Your original license key files will need to be restored after you complete your installation.

In terms of software licensing support, the Red Hat and SUSE distributors do not ship any code. ISVs are responsible for obtaining and including software licensing components into their products.

SGI Foundation Software contains a licensing mechanism called LK. LK was developed by SGI for SGI products only. For more information, see the "SGI LK License Facility" chapter in the *Linux Configuration and Operations Guide* or *SGI UV Systems Linux Configuration and Operations Guide* on the SGI Technical Publications Library at http://docs.sgi.com.

For more information, see the specific product release notes or the FAQ, as follows:

http://www.sgi.com/support/licensing/faq.html

If you encounter any license related problems, please contact your local support center at this location:

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

Embedded Support Partner

Embedded Support Partner (ESP) is a support infrastructure which is integrated into the operating system. ESP components capture and store system level events, system configuration information, system availability information, provide an electronic logbook of activities performed on the system, log calls to the ESP database at SGI and other support related activities. For more information, see *Embedded Support Partner User Guide* available on http://docs.sgi.com.

Topology API

The SGI topology application programming interface (API) allows a workload management system (WMS) to obtain topology information from SGI systems. For more information on the SGI topology API, see the sgitopo(8) and topology(1) man pages.

Check Feature Utility

The check feature utility, chkfeature(8), checks the contents of /etc/opt/sgi/features directory and provides status. Without arguments, it prints a list of all the files. To use the chkfeature command, you must first load the chkfeature module, as follows:

```
sys:~ # module load chkfeature

sys:~ # chkfeature
sgi-accelerate       status            on
sgi-array            status            on
sgi-cpuset           status            on
sgi-foundation       status            on
sgi-libbitmask       status            on
sgi-libcpuset        status            on
sgi-libnuma          status            on
sgi-lk               status            on
sgi-memacct          status            on
sgi-mpi              status            on
sgi-mpiplace         status            on
sgi-mpt              status            on
sgi-scotch           status            on
sgi-upc              status            on
```

To determine if a feature is active, perform the following:

```
sys:~ # chkfeature -a
sgi-accelerate         active                on
sgi-array              active                on
sgi-cpuset             active                on
sgi-foundation         active                on
sgi-libbitmask         active                on
sgi-libcpuset          active                on
sgi-libnuma            active                on
sgi-lk                 active                off    Not applicable
sgi-memacct            active                on
sgi-mpi                active                on
sgi-mpiplace           active                off
sgi-mpt                active                off
sgi-scotch             active                off
sgi-upc                active                on
```

To determine the version level of a software module, perform the following:

```
sys:~ # chkfeature -v
sgi-accelerate      version            on   1.1.4 Build 706a95.sles11sp2
sgi-array           version            on   sgi-arraysvcs 3.7
sgi-cpuset          version            on   2.0
sgi-foundation      version            on   2.2.6 Build 706a95.sles11sp2
sgi-kproc           version            on   1.0 sgi706a4.sles11sp2
sgi-libbitmask      version            on   2.0sgi sgi706a7.sles11sp2
sgi-libcpuset       version            on   1.0sgi sgi706a7.sles11sp2
sgi-libnuma         version            on   2.0sgi sgi706a8.sles11sp2
sgi-lk              version            on   2.2
sgi-memacct         version            on   1.3
sgi-mpi             version            on   1.1.4 Build 706a95.sles11sp2
sgi-mpiplace        version            on   1.02
sgi-mpt             version            on   2.06
sgi-propack         version            on   706.ga Build 706a95.sles11sp2
sgi-scotch          version            on   5.1.11
sgi-upc             version            on   1.1.4 Build 706a95.sles11sp2
```

For more information, see the chkfeature(8) man page.

SGI Foundation Software Installation

This manual describes the contents of the SGI Foundation Software 2.6 (SFS 2.6) release and how to install and configure it.

Table of Disk Partitions

SGI ships systems with X86-64 processors from the factory running SGI Foundation 2.6 with SLES11 SP2 with the partition layout shown in Table 2-1 on page 9.

Table 2-1 Disk Partitions for X86-64 Systems with SFS 2.6 and SLES 11 SP2

Partition	Type	Mount Point	Size
part1	ext3	/boot/efi	200 MB
part2	XFS	/	250 GB
part3	SWAP	/swap	10 GB
part4			Remainder of the disk with filesytem mounted as /data1

SGI ships systems with X86-64 processors from the factory running SGI Foundation 2.6 with RHEL 6.1 or RHEL 6.2 with the partition layout shown in Table 2-2 on page 10.

Table 2-2 Disk Partitions for X86-64 Systems with SFS 2.6 and RHEL 6.1 or 6.2 or CentOS 6

Partition	Type	Mount Point	Size
part1	ext4	/boot/efi	200 MB
part2	ext4	/	250 GB
part3	SWAP	/swap	10 GB
part4	ext4	/data1	Remainder of the disk with filesytem mounted as /data1

SGI ships SGI UV systems from the factory running SGI Foundation 2.6 with SLES11 SP2 with the partition layout shown in Table 2-3 on page 10.

Table 2-3 Disk Partitions for SGI UV Systems with SFS 2.6 and SLES 11 SP2

Partition	Type	Mount Point	Size
part1	vfat	/boot/efi	500 MB
part2	ext3	/	250 GB
part3	swap	swap	10 GB
part4	ext3	/data1	Remainder of the disk with filesystem mounted as /data1

SGI ships SGI UV systems from the factory running SGI Foundation 2.6 with RHEL 6.1 or RHEL 6.2 or CentOS 6 with the partition layout shown in Table 2-4 on page 11.

Table 2-4 Disk Partitions for UV Systems with SFS 2.6 and RHEL 6.1 or 6.2 or CentOS 6

Partition	Type	Mount Point	Size
part1	vfat	/boot/efi	500 MB
part2	ext4	/	250 GB
part3	swap	swap	10 GB
part4	ext4	/data1	Remainder of the disk with filesytem mounted as /data1

Linux Kernel Crash Dump

In the event of a system crash running SLES11 SP2 or RHEL 6 .1 or RHEL 6.2, the system uses the kexec/kdump crash dump utility. The kexec/kdump utility creates a Linux kernel crash dump at /var/crash/timestamp/vmcore if kexec/kdump is installed, enabled, and configured. In order to analyze a crash dump, you need the debuginfo packages installed. For more information, see the appropriate operating system documentation.

Installing SGI Foundation Software

The following set of instructions is based on an install using the physical product media. For other installation methods, see the product release notes.

Installing on SUSE Linux Enterprise Server 11 SP2

For an overview of SLES11 SP2 installation, see the *SUSE Linux Enterprise Server 11 Installation Quick Start* (installquick.pdf). This document provides a quick overview of how to run through the default installation of SLES walking you through a number of installation screens. For detailed installation instructions, see the *SUSE Linux Enterprise Server 11 Deployment Guide* (deployment.pdf)

Note: Documentation for SUSE Linux Enterprise Server 11 SP2 is located on your install media in the `/docu/en` directory.

There are a number of ways to install SGI Foundation Software 2.6 on top of the SUSE Linux Enterprise Server 11 Service Pack 1 (SLES 11 SP2) operating system. One method is to install it at the same time as you install SLES11 SP2. Another method is to install SGI Foundation Software 2.6 after SLES 11 SP2 has been completely installed. The two procedures are quite similar and are described in this section, as follows:

- "Install SLES 11 SP2 and SGI Foundation Software 2.6 Together" on page 12

- "Install SGI Foundation Software 2.6 on a Previously Installed SLES 11 SP2 System" on page 15

Install SLES 11 SP2 and SGI Foundation Software 2.6 Together

To install SUSE Linux Enterprise Server 11 Service Pack 1 (SLES 11 SP2) from the DVD media and SGI Foundation Software 2.6 as an add-on product, perform the following steps:

1. Insert the SLES 11 SP2 Installation DVD in the DVD drive and reboot your system.

2. Follow the steps in the *SUSE Linux Enterprise Server 11 Installation Quick Start*. When you get to the **Installation Mode** screen, as shown in Figure 2-1 on page 13, click the button next to **Include Add-On Products from Separate Media** and then click **Next** to continue.
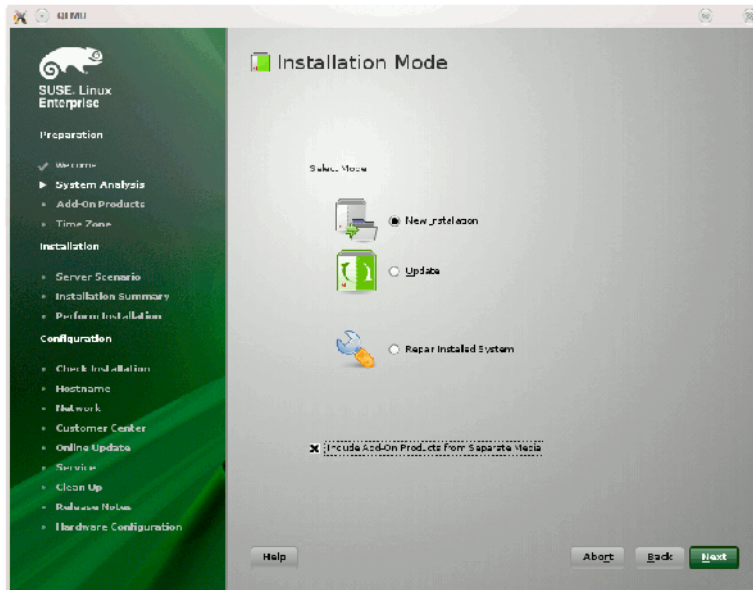
Figure 2-1 SLES11 **Installation Mode** Screen

3. From the **Media Type** screen, shown in Figure 2-2 on page 14, click the button to the left of **CD**.
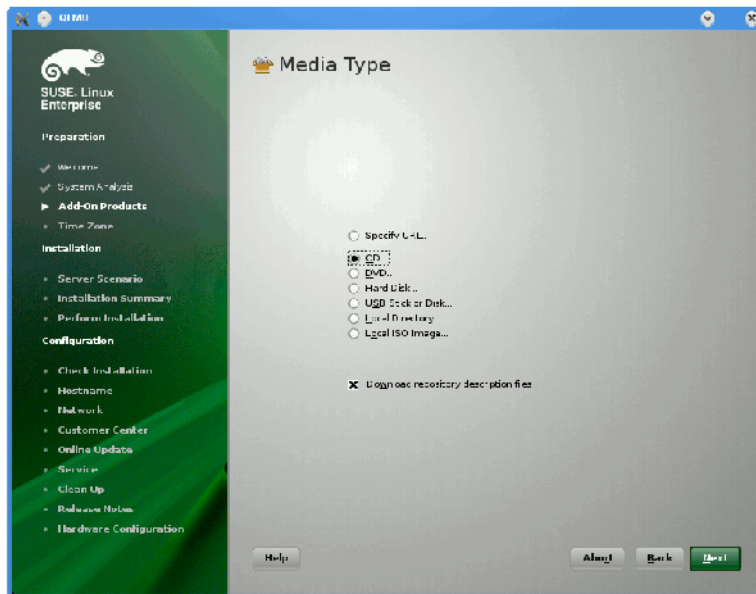
Figure 2-2 SLES11 **Media Type** Screen

4. The **Insert the add-on product CD** dialog box appears. Insert the SGI -Foundation-x86_64 CD into the drive and click the **Continue** button and then **Next** to proceed.

5. From the **Add-On Product Installation** screen, as shown in Figure 2-3 on page 15, click on **SGI-Foundation-x86_64 1-6 cd:///.Directory** and click the **Add** button and then **Next** to proceed

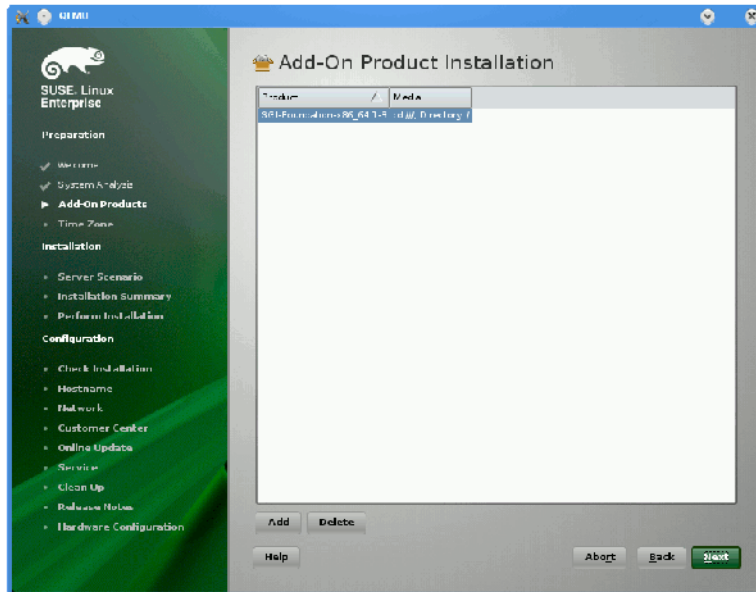6. Follow the SLES11 SP2 instructions to complete the installation.

Figure 2-3 SLES11 SP2 **Add-On Product Installation** Screen Showing SGI Foundation

Install SGI Foundation Software 2.6 on a Previously Installed SLES 11 SP2 System

To install SGI Foundation Software 2.6 on a previously installed SLES 11 SP2 system, perform the following steps:

1. Start the graphical (yast2) version of the YaST install tool.

2. Under the **Software** section, choose **Add-On Products**.

3. From the **Add-On Product Installation** screen, press the **Add** button on the bottom left side.

4. The **Media Type** screen appears, as shown in Figure 2-2 on page 14. Insert the SGI -Foundation-x86_64 CD into the drive and press the **Continue** button and then the **Next** button to proceed.

5. Enter you SGI SupportFolio login and password. This will enable you to set up an install source for software updates from SGI Foundation Software 2.6.

6. If you wish to simply install suggested defaults, simply press **Accept** in the screen that lists available patterns. The software will then be installed.

Installing on Red Hat Enterprise Linux 6.1 or RHEL 6 .2

These instructions assume that you have a VGA display or that you are able to remotely display X11 graphics. If you do not have a VGA display, you should connect from your workstation to the target server with the following command:

```
% ssh -X root@target-server
```

To install SGI Foundation Software 2.6 on Red Hat Enterprise Linux (RHEL 6.1) or RHEL 6.2, perform the following steps:

1. Make sure you have registered with the Red Hat Network (RHN). If you have not yet registered, run the following command:

```
% /usr/bin/rhn_register
```

2. Insert the product media and enter the following command to mount it:

```
% mount /dev/cdrom/mnt
```

3. Run the following command and follow the examples provided:

```
% /mnt/create-yum-config-file
```

Additional installation instructions are provided in the release notes file.

Upgrade from Earlier Releases

For information on upgrading from SLES10 SPx to SLES 11 SP2, see the appropriate Novell, Inc. documentation.

For information on upgrading from a previous RHEL release to RHEL 6 .1 or RHEL 6 .2, see the appropriate Red Hat, Inc. documentation.

Upgrade instructions for the SGI Foundation Software 2.6 release are contained in the product release notes for the product in a file with the product name and -readme.txt suffix that is available in /docs directory on the CD media.

OFED Configuration for SHMEM and UPC

This section describes how to configure the OpenFabrics Enterprise Distribution (OFED) maximum queue pair (QP) max_qp variable to be able to run SHMEM and UPC on large node count clusters over the OFED fabric running SUSE Linux Enterprise Server 11 Service Pack 1 (SLES 11 SP1), SLES 11 SP2, or Red Hat Enterprise Server 6.2 (RHEL 6.2).

Running Large RC Jobs

SHMEM and UPC codes need to use the InfiniBand Reliable Connection (RC) protocol for communication between all pairs of processes in the parallel job. This requires a large number of queue pairs (QPs) The log(2) of the number of QPs is defined by the log_num_qp and can be configured, as follows:

SLES11 SP1

The mlx4_core module provided by the kernel-default package does **not** have the log_num_qp parameter.

The maximum number of queue pairs (QPs) will default to 2^{17} (131072).

The mlx4_core provided by the ofed-kmp-default (from the PTF.693243 update only, not from the standard SLES11 SP1 release), **does** have the log_num_qp parameter.

It can be adjusted by making an addition to the /etc/modprobe.conf.local file, as follows:

```
options mlx4_core log_num_qp=21
```

SLES11 SP2

The mlx4_core module provided by the kernel-default package **does** support the log_num_qp parameter.

The maximum number of QPs will default to 2^{17} (131072).

It can be adjusted by making an addition to the /etc/modprobe.conf.local file, as follows:

```
options mlx4_core log_num_qp=21
```

RHEL 6.2

The `mlx4_core` module provided by the kernel package **does** support the `log_num_qp` parameter.

The maximum number of QPs will default to $2\char94 17$ (131072).

You can adjust this with an entry in the `/etc/modprobe.conf` file, as follows:

```
options mlx4_core log_num_qp=21
```

Using XRC Protocol

Using XRC protocol will reduce the required number of queue pairs (QPs) by sharing at the host channel adapter (HCA) level. This requires XRC capable hardware (Mellanox ConnectX-2 or later). To enable use of XRC, use the following environment variable setting:

```
MPI_IB_XRC=1
```

Reinstalling Your Software

To reinstall all of the software on your system, follow the entire set of installation instructions listed previously, using the latest SGI Foundation Software 2.6 CD.

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