



Sun Cluster Data Service for Sun Grid Engine Guide for Solaris OS

SPARC Platform Edition

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Preface

Sun Cluster Data Service for Sun Grid Engine Guide for Solaris OS explains how to install and configure Sun™ Cluster HA for Sun Grid Engine.

This document is intended for system administrators with extensive knowledge of Sun software and hardware. Do not use this document as a planning or presales guide. Before reading this document, you should have already determined your system requirements and purchased the appropriate equipment and software.

The instructions in this document assume knowledge of the Solaris™ Operating System and expertise with the volume manager software that is used with Sun Cluster.

UNIX Commands

This document contains information about commands that are specific to installing and configuring Sun Cluster data services. The document does *not* contain comprehensive information about basic UNIX® commands and procedures, such as shutting down the system, booting the system, and configuring devices. Information about basic UNIX commands and procedures is available from the following sources:

- Online documentation for the Solaris Operating System
- Solaris Operating System man pages
- Other software documentation that you received with your system

Typographic Conventions

The following table describes the typographic changes that are used in this book.

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories, and onscreen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name%</code> you have mail.
AaBbCc123	What you type, contrasted with onscreen computer output	<code>machine_name%</code> su Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	The command to remove a file is <code>rm filename</code> .
<i>AaBbCc123</i>	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. Do <i>not</i> save the file. (Emphasis sometimes appears in bold online.)

Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2 Shell Prompts

Shell	Prompt
C shell prompt	<code>machine_name%</code>
C shell superuser prompt	<code>machine_name#</code>
Bourne shell and Korn shell prompt	<code>\$</code>

TABLE P-2 Shell Prompts (Continued)

Shell	Prompt
Bourne shell and Korn shell superuser prompt	#

Related Documentation

Information about related Sun Cluster topics is available in the documentation that is listed in the following table. All Sun Cluster documentation is available at <http://docs.sun.com>.

Topic	Documentation
Data service administration	<i>Sun Cluster Data Services Planning and Administration Guide for Solaris OS</i> Individual data service guides
Concepts	<i>Sun Cluster Concepts Guide for Solaris OS</i>
Overview	<i>Sun Cluster Overview for Solaris OS</i>
Software installation	<i>Sun Cluster Software Installation Guide for Solaris OS</i>
System administration	<i>Sun Cluster System Administration Guide for Solaris OS</i>
Hardware administration	<i>Sun Cluster 3.x Hardware Administration Manual for Solaris OS</i> Individual hardware administration guides
Data service development	<i>Sun Cluster Data Services Developer's Guide for Solaris OS</i>
Error messages	<i>Sun Cluster Error Messages Guide for Solaris OS</i>
Command and function reference	<i>Sun Cluster Reference Manual for Solaris OS</i>

For a complete list of Sun Cluster documentation, see the release notes for your release of Sun Cluster at <http://docs.sun.com>.

Related Third-Party Web Site References

Third-party URLs that are referenced in this document provide additional related information.

Note – Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused or alleged to be caused by or in connection with use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

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Ordering Sun Documentation

Sun Microsystems offers select product documentation in print. For a list of documents and how to order them, see “Buy printed documentation” at <http://docs.sun.com>.

Help

If you have problems installing or using Sun Cluster, contact your service provider and provide the following information:

- Your name and email address (if available)

- Your company name, address, and phone number
- The model and serial numbers of your systems
- The release number of the Solaris Operating System (for example, Solaris 8)
- The release number of Sun Cluster (for example, Sun Cluster 3.0)

Use the following commands to gather information about each node on your system for your service provider.

Command	Function
<code>prtconf -v</code>	Displays the size of the system memory and reports information about peripheral devices
<code>psrinfo -v</code>	Displays information about processors
<code>showrev -p</code>	Reports which patches are installed
SPARC: <code>prtdiag -v</code>	Displays system diagnostic information
<code>scinstall -pv</code>	Displays Sun Cluster release and package version information

Also have available the contents of the `/var/adm/messages` file.

Installing and Configuring Sun Cluster HA for Sun Grid Engine

This chapter explains how to install and configure Sun Cluster HA for Sun Grid Engine.

Note – Sun Grid Engine was formerly known as Sun ONE Grid Engine. In this book, references to “Sun Grid Engine” also apply to Sun ONE Grid Engine unless this book explicitly states otherwise.

This chapter contains the following procedures.

- “How to Prepare the Nodes and Disks” on page 19
- “How to Install and Configure Sun Grid Engine” on page 21
- “How to Enable Sun Grid Engine to Run in a Cluster” on page 22
- “How to Verify the Installation and Configuration of Sun Grid Engine” on page 23
- “How to Install the Sun Cluster HA for Sun Grid Engine Packages by Using the Web Start Program” on page 25
- “How to Install the Sun Cluster HA for Sun Grid Engine Packages by Using the `scinstall` Utility” on page 26
- “How to Register and Configure an `HASStoragePlus` Resource” on page 27
- “How to Configure Sun Cluster HA for NFS for Use With Sun Cluster HA for Sun Grid Engine” on page 28
- “How to Create and Enable Sun Cluster HA for Sun Grid Engine Resources” on page 32
- “How to Verify the Sun Cluster HA for Sun Grid Engine Installation and Configuration” on page 34
- “How to Activate Debugging for Sun Cluster HA for Sun Grid Engine” on page 35

Sun Cluster HA for Sun Grid Engine Overview

Sun Grid Engine is a distributed resource management program, which runs jobs in parallel on multiple machines. To minimize the loss of work that a failure of a machine might cause, nodes in the management tier must be protected against failure. However, protection of individual execution nodes in the grid against failure is not required. Failure of an individual execution node in a grid causes only a minor loss of work.

To eliminate single points of failure in the management tier of a Sun Grid Engine system, Sun Cluster HA for Sun Grid Engine provides fault monitoring and automatic fault recovery for the following Sun Grid Engine daemons:

- Communications daemon
- Queue master daemon
- Scheduling daemon

You must configure Sun Cluster HA for Sun Grid Engine as a failover service.

For conceptual information about failover data services and scalable data services, see *Sun Cluster Concepts Guide for Solaris OS*.

Because the management tier relies on the Sun Grid Engine file system, the NFS server that exports this file system must also be protected against failure. To eliminate single points of failure in the NFS server, use the Sun Cluster HA for NFS data service. For more information about this data service, see *Sun Cluster Data Service for Network File System (NFS) Guide for Solaris OS*.

Each component of Sun Grid Engine has a data service that protects the component when the component is configured in Sun Cluster. See the following table.

TABLE 1 Protection of Sun Grid Engine Components by Sun Cluster Data Services

Sun Grid Engine Component	Data Service
Sun Grid Engine daemons: <ul style="list-style-type: none">■ Communication daemon (<i>sge_commd</i>)■ Queue master daemon (<i>sge_qmaster</i>)■ Scheduling daemon (<i>sge_schedd</i>)	Sun Cluster HA for Sun Grid Engine The resource type is <code>SUNW.gds</code> .
NFS server	Sun Cluster HA for NFS The resource type is <code>SUNW.nfs</code> .

Overview of Installing and Configuring Sun Cluster HA for Sun Grid Engine

The following table summarizes the tasks for installing and configuring Sun Cluster HA for Sun Grid Engine and provides cross-references to detailed instructions for performing these tasks. Perform the tasks in the order that they are listed in the table.

TABLE 2 Tasks for Installing and Configuring Sun Cluster HA for Sun Grid Engine

Task	Instructions
Plan the installation	“Sun Cluster HA for Sun Grid Engine Overview” on page 12 “Planning the Sun Cluster HA for Sun Grid Engine Installation and Configuration” on page 14
Prepare the nodes and disks	“Preparing the Nodes and Disks” on page 19
Install and configure Sun Grid Engine	“Installing and Configuring Sun Grid Engine” on page 21
Verify Sun Cluster HA for Sun Grid Engine installation and configuration	“Verifying the Installation and Configuration of Sun Grid Engine” on page 23
Install Sun Cluster HA for Sun Grid Engine Packages	“Installing the Sun Cluster HA for Sun Grid Engine Packages” on page 25
Configure the <code>HASStoragePlus</code> resource type to work with Sun Cluster HA for Sun Grid Engine	“Configuring the <code>HASStoragePlus</code> Resource Type to Work With Sun Cluster HA for Sun Grid Engine” on page 27
Configure Sun Cluster HA for NFS for use with Sun Cluster HA for Sun Grid Engine	“Configuring Sun Cluster HA for NFS for Use With Sun Cluster HA for Sun Grid Engine” on page 28
Register and Configure Sun Cluster HA for Sun Grid Engine	“Registering and Configuring Sun Cluster HA for Sun Grid Engine” on page 29
Verify Sun Cluster HA for Sun Grid Engine installation and configuration	“Verifying the Sun Cluster HA for Sun Grid Engine Installation and Configuration” on page 33
Tune Sun Cluster HA for Sun Grid Engine fault monitors	“Tuning the Sun Cluster HA for Sun Grid Engine Fault Monitors” on page 34
Debug Sun Cluster HA for Sun Grid Engine	“Debugging Sun Cluster HA for Sun Grid Engine” on page 35

Planning the Sun Cluster HA for Sun Grid Engine Installation and Configuration

This section contains the information that you need to plan your Sun Cluster HA for Sun Grid Engine installation and configuration.

Note – Before you begin, consult your Sun Grid Engine documentation for configuration restrictions and requirements that are not imposed by Sun Cluster software.

Configuration Restrictions

The configuration restrictions in the subsections that follow apply only to Sun Cluster HA for Sun Grid Engine.



Caution – Your data service configuration might not be supported if you do not observe these restrictions.

Sun Grid Engine Shadow Daemon

Do *not* use the Sun Grid Engine shadow daemon. The Sun Grid Engine shadow daemon provides an optional mechanism for recovery from failures. This mechanism interferes with the automatic fault recovery that Sun Cluster provides.

Start at Boot Option

Do *not* choose the start at boot option when installing Sun Grid Engine. To ensure that Sun Cluster HA for Sun Grid Engine can provide fault monitoring and automatic fault recovery, Sun Grid Engine must be started *only* by Sun Cluster.

Configuration Requirements

The configuration requirements in this section apply only to Sun Cluster HA for Sun Grid Engine.



Caution – If your data service configuration does not conform to these requirements, the data service configuration might not be supported.

Sun Grid Engine Software Version Requirements

Use Sun Grid Engine version 5.3.

Operating System for the Sun Grid Engine Management Tier

The Sun Grid Engine management tier must run on Sun Cluster nodes. Because Sun Cluster runs only on the Solaris Operating System, the Sun Grid Engine management tier must also run on the Solaris Operating System. However, Sun Grid Engine supports other operating systems. Therefore, this requirement applies only to the management tier, *not* to individual execution nodes in the grid.

Memory Requirements

Ensure that enough free memory is available on the cluster nodes where you plan to run the Sun Grid Engine master.

The amount of free memory that is required on each cluster node depends on the number of jobs that are running on the grid. For example:

- If 100 jobs are running, 10 Mbytes of free memory are required.
- If 10,000 jobs are running, 1 Gbyte of free memory is required.

Disk Space Requirements

Ensure that you have enough disk space in the Sun Grid Engine file system and on the local disk of each node.

The disk space requirements for each type of file or directory in the Sun Grid Engine file system are listed in the following table.

File Type or Directory Type	Required Disk Space
Binary files	15 Mbytes for each architecture

File Type or Directory Type	Required Disk Space
Spool directories	30–200 Mbytes
Installation tar file	40 Mbytes

On the local disk of each node, 10–20 Mbytes of disk space are required. If you are installing the Sun Grid Engine software on the local disk of a node, 15 Mbytes of disk space are additionally required for the binary files.

Sun Cluster HA for Sun Grid Engine Configuration Requirements

Configure Sun Cluster HA for Sun Grid Engine as a failover data service. You cannot configure Sun Cluster HA for Sun Grid Engine as a scalable data service. For more information, see:

- [“How to Enable Sun Grid Engine to Run in a Cluster” on page 22](#)
- [“Registering and Configuring Sun Cluster HA for Sun Grid Engine” on page 29](#)

NFS Configuration for the Sun Grid Engine File System

The Sun Grid Engine file system must reside on a multihost disk. This disk must be available to the other nodes in the cluster that will be used for the Sun Grid Engine administrative services,

You must use NFS to export the Sun Grid Engine file system to the noncluster nodes. The NFS server that exports this file system must also be protected against failure. To protect the NFS server against failure, use the Sun Cluster HA for NFS data service. For more information about this data service, see *Sun Cluster Data Service for Network File System (NFS) Guide for Solaris OS*.

Sun Cluster HA for NFS Configuration Requirements

Configure the resources for the Sun Grid Engine management tier in the same resource group as the resource for NFS. For more information, see [“Configuring Sun Cluster HA for NFS for Use With Sun Cluster HA for Sun Grid Engine” on page 28](#).

Dependencies Between Sun Grid Engine Components

The dependencies between Sun Grid Engine components are shown in the following table.

TABLE 3 Dependencies Between Sun Grid Engine Components

Sun Grid Engine Component	Dependency
Sun Grid Engine communication daemon (sge_commd)	SUNW.HAStoragePlus resource
Sun Grid Engine queue master daemon (sge_qmaster)	Sun Grid Engine communication daemon (sge_commd) resource
Sun Grid Engine scheduling daemon (sge_schedd)	Sun Grid Engine queue master daemon (sge_qmaster) resource

These dependencies are set when you register and configure Sun Cluster HA for Sun Grid Engine. For more information, see [“Registering and Configuring Sun Cluster HA for Sun Grid Engine” on page 29](#).

Configuration Considerations

The configuration considerations in the subsections that follow affect the installation and configuration of Sun Cluster HA for Sun Grid Engine.

Location of the Sun Grid Engine Binary Files

You can install Sun Grid Engine on one of the following locations:

- A highly available local file system
- The cluster file system

For the advantages and disadvantages of placing the Sun Grid Engine binary files on a highly available local file system and the cluster file system, see [“Configuration Guidelines for Sun Cluster Data Services”](#) in *Sun Cluster Data Services Planning and Administration Guide for Solaris OS*.

Tip – To enable the type of file system to be identified from the mount point, use a prefix that indicates the type of file system as follows:

- For mount points on a highly available local file system, use the `/local` prefix.
 - For mount points on the cluster file system, use the `/global` prefix.
-

File Systems for Spool Directories and Binary Files

The optimum distribution of spool directories and binary files among file systems depends on the grid configuration. See the following table.

Grid Configuration	File System Configuration
The execution tier contains fewer than 200 hosts.	Use a single shared NFS file system under the root of the Sun Grid Engine file system for the spool directories and binary files.
The execution tier contains about 200 hosts, or the applications are disk intensive.	Use a separate area on an NFS file system for the spool directories.
The execution tier contains more than 200 hosts, or NFS performance is likely to be a problem.	See the Sun Grid Engine documentation for alternate grid configurations.

Configuration Planning Questions

Use the questions in this section to plan the installation and configuration of Sun Cluster HA for Sun Grid Engine. Write the answers to these questions in the space that is provided on the data service worksheets in “Configuration Worksheets” in *Sun Cluster 3.1 Data Services Planning and Administration Guide*.

- Which resource group will you use for the following resources:
 - Logical host name resource
 - HASToragePlus resource
 - NFS resource
 - Sun Grid Engine application resources

Use the answer to this question when you perform the following procedures:

- “How to Enable Sun Grid Engine to Run in a Cluster” on page 22
 - “Configuring the HASToragePlus Resource Type to Work With Sun Cluster HA for Sun Grid Engine” on page 27
 - “Configuring Sun Cluster HA for NFS for Use With Sun Cluster HA for Sun Grid Engine” on page 28
 - “Specifying Configuration Parameters for Sun Cluster HA for Sun Grid Engine Resources” on page 30
- What is the logical host name for the Sun Grid Engine resource? Clients access the data service through this logical host name.

Use the answer to this question when you perform the procedure “How to Enable Sun Grid Engine to Run in a Cluster” on page 22.
 - Which resources will you use for the components of Sun Grid Engine?

You require one resource for each component in the following list:

- Communications daemon
- Queue master daemon
- Scheduling daemon

Use the answer to this question when you perform the procedure “[Specifying Configuration Parameters for Sun Cluster HA for Sun Grid Engine Resources](#)” on page 30.

- Where will the system configuration files reside?

See “[Configuration Guidelines for Sun Cluster Data Services](#)” in *Sun Cluster Data Services Planning and Administration Guide for Solaris OS* for the advantages and disadvantages of using the local file system instead of the cluster file system.

Preparing the Nodes and Disks

Preparing the nodes and disks modifies the configuration of the operating system to enable Sun Cluster HA for Sun Grid Engine to eliminate single points of failure in a Sun Grid Engine system.

Before you begin, ensure that the requirements in the following sections are met:

- “[Memory Requirements](#)” on page 15
- “[Disk Space Requirements](#)” on page 15

▼ How to Prepare the Nodes and Disks

1. **Become superuser of the cluster node where you are installing Sun Grid Engine.**
2. **Create an administrative user account for Sun Grid Engine.**

Either select an existing user account other than root for the grid administration, or create an account specifically for grid administration.

Tip – For consistency with the Sun Grid Engine documentation, name the account `sgeadmin`.

3. **Create a directory for the root of Sun Grid Engine file system.**

```
# mkdir sge-root-dir
```

4. **Change the owner of the root of the Sun Grid Engine file system to the administrative user whose account you created in [Step 2](#).**

```
# chown sge-admin sge-root-dir
```

5. Set the mode of the root of Sun Grid Engine file system to `drwxr-xr-x`.

```
# chmod 755 sge-root-dir
```

6. Specify the port number and protocol for the `sge_commd` service.

Choose an unused port number below 1024. The `sge_commd` service is to be provided through Transmission Control Protocol (TCP).

To specify the port number and protocol, add the following line to the `/etc/services` file.

```
sge_commd port-no/tcp
```

7. For each type of host in the grid, create a plain text file that contains the names of all hosts of that type in the grid.

The `install_qmaster` script uses these files when you install Sun Grid Engine. Create a separate file for each type of host in the grid:

- Execution hosts
- Administrative hosts
- Submit hosts

EXAMPLE 1 Preparing the Nodes and Disks for the Installation of Sun Grid Engine

This example shows how to prepare the nodes and disks for a Sun Grid Engine installation that is to be configured as follows:

- The root of Sun Grid Engine file system is the `/global/gridmaster` directory. This directory resides in the cluster file system.
- The account for grid administration is named `sgeadmin`.
- The `sge_commd` service is to be provided through port 536 and TCP.

The sequence of operations for preparing the nodes and disks for the installation of Sun Grid Engine is as follows:

1. To create the `/global/gridmaster` directory for the root of Sun Grid Engine file system, the following command is run:

```
# mkdir /global/gridmaster
```

2. To change the owner of the `/global/gridmaster` directory to the `sgeadmin` user, the following command is run:

```
# chown sgeadmin /global/gridmaster
```

3. To set the mode of the `/global/gridmaster` directory to `drwxr-xr-x`, the following command is run:

```
# chmod 755 /global/gridmaster
```

4. To specify that the `sge_commd` service is to be provided through port 536 and TCP, the following line is added to the `/etc/services` file:

```
sge_commd 536/tcp
```

Installing and Configuring Sun Grid Engine

The procedure that follows explains only the special requirements for installing Sun Grid Engine for use with Sun Cluster HA for Sun Grid Engine. For complete information about installing and configuring Sun Grid Engine, see your Sun Grid Engine documentation.

To enable Sun Grid Engine to run in a cluster, you must modify Sun Grid Engine to use a logical host name.

▼ How to Install and Configure Sun Grid Engine

Before you begin, ensure that you have the host names of all hosts in the grid. Create a separate list of host names for each type of host in the grid:

- Execution hosts
- Administrative hosts
- Submit hosts

1. Become superuser of the cluster node where you are installing Sun Grid Engine.

2. Install the `SDRMcomm` and `SDRMsp64` packages with `pkgadd`.

When you install each package, you are asked for the directory for the root of the Sun Grid Engine file system.

```
Where should Sun Grid Engine 5.3 be installed [default /gridware/sge]
```

3. Specify the directory for the root of Sun Grid Engine file system that you created in “Preparing the Nodes and Disks” on page 19.

4. When you are prompted, specify the following information:

- The name of the Sun Grid Engine administrative user whose account you created in “Preparing the Nodes and Disks” on page 19. The default is `sgeadmin`.
- The name of the user group of the Sun Grid Engine administrative user. The default is `adm`.

5. Set the `SGE_ROOT` environment variable to the directory for the root of Sun Grid Engine file system that you created in “Preparing the Nodes and Disks” on page 19.

```
# SGE_ROOT=sge-root-dir
# export SGE_ROOT
```

6. Go to the directory for the root of Sun Grid Engine file system.

```
# cd sge-root-dir
```

7. Start the script that installs the Sun Grid Engine master host.

```
# ./install_qmaster
```

8. Follow the prompts on screen to provide or confirm the following information:

- The value of the SGE_ROOT environment variable
- The TCP port number
- The name of the Sun Grid Engine administrative user
- The method that you used to install the SDRMCOMM and SDRMSP64 packages
- Details of your domain name service (DNS) domains

9. When you are prompted, specify the range of group IDs for Sun Grid Engine to use.

To ensure that you allocate enough group IDs, specify a range of approximately 100 group IDs, for example, 20000-20100.

You are asked if you want to install the script that starts Sun Grid Engine at boot time.

```
We can install the startup script that
Grid Engine is started at machine boot (y/n) [y] >>
```

10. When you are asked if you want to install the script that starts Sun Grid Engine at boot time, reply no.

To ensure that Sun Cluster HA for Sun Grid Engine can provide fault monitoring and automatic fault recovery, Sun Grid Engine must be started *only* by Sun Cluster.

11. When you are prompted, specify the list of execution hosts.

▼ How to Enable Sun Grid Engine to Run in a Cluster

1. Become superuser of a node in the cluster that will host Sun Grid Engine.

2. Create a failover resource group to contain the Sun Cluster HA for Sun Grid Engine resources.

Use the resource group that you identified when you answered the questions in “Configuration Planning Questions” on page 18.

```
# scrgadm -a -g sge-rg \  
-y Pathprefix=sge-root-dir
```

```
-g sge-rg
```

Specifies that the resource group that you are creating is named *sge-rg*.

-y Pathprefix= *sge-root-dir*

Specifies a directory on a cluster file system that Sun Cluster HA for NFS uses to maintain administrative and status information. This directory must be the directory that you created for the root of the Sun Grid Engine file system in “Preparing the Nodes and Disks” on page 19.

3. Add a resource for the Sun Grid Engine logical host name to the failover resource group that you created in Step 2.

```
# scrgadm -a -L -j sge-lh-rs \  
-g sge-rg \  
-l hostlist
```

-j *sge-lh-rs*

Specifies that the resource that you are creating is named *sge-lh-rs*

-g *sge-rg*

Specifies that the logical host name resource is to be added to the failover resource group that you created in Step 2

-l *hostlist*

Specifies a comma-separated list of host names that are to be made available by this logical host name resource

Verifying the Installation and Configuration of Sun Grid Engine

Before you install the Sun Cluster HA for Sun Grid Engine packages, verify that the Sun Grid Engine software is correctly installed and configured to run in a cluster. This verification does *not* verify that the Sun Grid Engine application is highly available because the Sun Cluster HA for Sun Grid Engine data service is not yet installed.

Note – If any step in this procedure fails, see your Sun Grid Engine documentation for more information about how to verify the Sun Grid Engine installation.

▼ How to Verify the Installation and Configuration of Sun Grid Engine

You verify the installation and configuration of Sun Grid Engine by submitting a dummy job and checking that the required processes are running.

1. **Log in to the master host as the administrative user whose account you created in “Preparing the Nodes and Disks” on page 19.**

2. Set the `SGE_ROOT` environment variable to the directory for the root of Sun Grid Engine file system that you created in [“Preparing the Nodes and Disks”](#) on page 19.

```
$ SGE_ROOT=sge-root-dir
$ export SGE_ROOT
```

3. Start the script that modifies your environment to enable Sun Grid Engine to run.

```
$ . $SGE_ROOT/default/common/settings.sh
```

4. Submit a dummy job to Sun Grid Engine.

```
$ qsub $SGE_ROOT/examples/jobs/sleeper.sh
your job 1 (*Sleeper*) has been submitted
```

5. On the master host, confirm that these processes are running:

- `sge_commd`
- `sge_qmaster`
- `sge_schedd`

```
# ps -ef | grep sge_
root 429 1 0 Jul 27 3:37 /global/gridmaster/bin/solaris64/sge_commd
root 429 1 0 Jul 27 3:37 /global/gridmaster/bin/solaris64/sge_qmaster
root 429 1 0 Jul 27 3:37 /global/gridmaster/bin/solaris64/sge_schedd
```

6. View the global configuration of the grid.

- If you are using the command line, type the following command:

```
$ qconf -sconf
```
- If you are using the QMON graphical user interface (GUI), select Cluster Configuration.

7. On at minimum one execution host, confirm that these processes are running:

- `sge_commd`
- `sge_execd`

```
# ps -ef | grep sge_
root 439 1 0 Jul 27 3:37 /global/gridmaster/bin/solaris64/sge_commd
root 451 1 0 Jul 27 3:37 /global/gridmaster/bin/solaris64/sge_execd
```

Installing the Sun Cluster HA for Sun Grid Engine Packages

If you did not install the Sun Cluster HA for Sun Grid Engine packages during your initial Sun Cluster installation, perform this procedure to install the packages. Perform this procedure on each cluster node where you are installing the Sun Cluster HA for Sun Grid Engine packages. To complete this procedure, you need the Sun Java Enterprise System Accessory CD Volume 3.

If you are installing more than one data service simultaneously, perform the procedure in “Installing the Software” in *Sun Cluster Software Installation Guide for Solaris OS*.

Install the Sun Cluster HA for Sun Grid Engine packages by using one of the following installation tools:

- The Web Start program
- The `scinstall` utility

Note – The Web Start program is *not* available in releases earlier than Sun Cluster 3.1 Data Services 10/03.

▼ How to Install the Sun Cluster HA for Sun Grid Engine Packages by Using the Web Start Program

You can run the Web Start program with a command-line interface (CLI) or with a graphical user interface (GUI). The content and sequence of instructions in the CLI and the GUI are similar. For more information about the Web Start program, see the `installer(1M)` man page.

1. **On the cluster node where you are installing the Sun Cluster HA for Sun Grid Engine packages, become superuser.**
2. **(Optional) If you intend to run the Web Start program with a GUI, ensure that your `DISPLAY` environment variable is set.**
3. **Load the Sun Java Enterprise System Accessory CD Volume 3 into the CD-ROM drive.**

If the Volume Management daemon `vold(1M)` is running and configured to manage CD-ROM devices, it automatically mounts the CD-ROM on the `/cdrom/cdrom0` directory.

4. **Change to the Sun Cluster HA for Sun Grid Engine component directory of the CD-ROM.**

The Web Start program for the Sun Cluster HA for Sun Grid Engine data service resides in this directory.

```
# cd /cdrom/cdrom0/\
components/SunCluster_HA_SUN_GRID_ENG_3.1
```

5. **Start the Web Start program.**

```
# ./installer
```

6. **When you are prompted, select the type of installation.**

- To install only the C locale, select Typical.
- To install other locales, select Custom.

7. **Follow instructions on the screen to install the Sun Cluster HA for Sun Grid Engine packages on the node.**

After the installation is finished, the Web Start program provides an installation summary. This summary enables you to view logs that the Web Start program created during the installation. These logs are located in the `/var/sadm/install/logs` directory.

8. **Exit the Web Start program.**

9. **Unload the Sun Java Enterprise System Accessory CD Volume 3 from the CD-ROM drive.**

- a. To ensure that the CD-ROM is not being used, change to a directory that does *not* reside on the CD-ROM.
- b. Eject the CD-ROM.

```
# eject cdrom
```

▼ How to Install the Sun Cluster HA for Sun Grid Engine Packages by Using the `scinstall` Utility

1. **Load the Sun Java Enterprise System Accessory CD Volume 3 into the CD-ROM drive.**

2. **Run the `scinstall` utility with no options.**

This step starts the `scinstall` utility in interactive mode.

3. **Select the menu option, Add Support for New Data Service to This Cluster Node.**

The `scinstall` utility prompts you for additional information.

4. **Provide the path to the Sun Java Enterprise System Accessory CD Volume 3.**

The utility refers to the CD as the “data services cd.”

5. **Specify the data service to install.**

The `scinstall` utility lists the data service that you selected and asks you to confirm your choice.

6. **Exit the `scinstall` utility.**

7. **Unload the CD from the drive.**

Configuring the `HASStoragePlus` Resource Type to Work With Sun Cluster HA for Sun Grid Engine

For maximum availability of the Sun Grid Engine application, resources that Sun Cluster HA for Sun Grid Engine requires must be available before the Sun Grid Engine management tier is started. An example of such a resource is the Sun Grid Engine file system. To ensure that these resources are available, configure the `HASStoragePlus` resource type to work with Sun Cluster HA for Sun Grid Engine.

For information about the relationship between resource groups and disk device groups, see “Relationship Between Resource Groups and Disk Device Groups” in *Sun Cluster Data Services Planning and Administration Guide for Solaris OS*.

Configuring the `HASStoragePlus` resource type to work with Sun Cluster HA for Sun Grid Engine involves the following operations:

- Synchronizing the startups between resource groups and disk device groups as explained in “Synchronizing the Startups Between Resource Groups and Disk Device Groups” in *Sun Cluster Data Services Planning and Administration Guide for Solaris OS*
- Registering and configuring an `HASStoragePlus` resource

▼ How to Register and Configure an `HASStoragePlus` Resource

1. **Become superuser on a node in the cluster that will host Sun Grid Engine.**

2. **Register the `SUNW.HASStoragePlus` resource type.**

```
# scrgadm -a -t SUNW.HASStoragePlus
```

3. Add an `HASStoragePlus` resource for the Sun Grid Engine file system to the resource group that you created in “How to Enable Sun Grid Engine to Run in a Cluster” on page 22.

```
# scrgadm -a -j sge-hasp-rs \  
-g sge-rg \  
-t SUNW.HASStoragePlus \  
-x FilesystemMountPoints=sge-root  
  
-j sge-hasp-rs  
    Specifies that the resource that you are creating is named sge-hasp-rs  
  
-g sge-rg  
    Specifies that the resource is to be added to the resource group that you created  
    in “How to Enable Sun Grid Engine to Run in a Cluster” on page 22  
  
-x FilesystemMountPoints=sge-root  
    Specifies that the mount point for this file system is the root of the Sun Grid  
    Engine file system
```

Configuring Sun Cluster HA for NFS for Use With Sun Cluster HA for Sun Grid Engine

You must use NFS to export the Sun Grid Engine file system to the noncluster nodes. The NFS server that exports this file system must also be protected against failure. To protect the NFS server against failure, use the Sun Cluster HA for NFS data service.

The procedure that follows explains only the special requirements for using Sun Cluster HA for NFS with Sun Cluster HA for Sun Grid Engine. For complete information about installing and configuring Sun Cluster HA for NFS, see *Sun Cluster Data Service for Network File System (NFS) Guide for Solaris OS*.

▼ How to Configure Sun Cluster HA for NFS for Use With Sun Cluster HA for Sun Grid Engine

Note – Commands in this procedure assume that you have set the `$SGE_ROOT` environment variable to specify the root of the Sun Grid Engine file system.

1. Register the `SUNW.nfs` resource type.

```
# scrgadm -a -t SUNW.nfs
```

2. From any cluster node, create a directory for NFS configuration files.

Create the directory under root of the Sun Grid Engine file system. Name the directory `SUNW.nfs`.

```
# mkdir -p $SGE_ROOT/SUNW.nfs
```

3. In the directory that you created in [Step 2](#), create a file that contains the `share` command for the root of the Sun Grid Engine file system.

Name the file the `dfstab.sge-nfs-rs`, where `sge-nfs-rs` is the name of the NFS resource that you will create in [Step 4](#).

```
# echo "share -F nfs -o rw sge-root" \  
> $SGE_ROOT/SUNW.nfs/dfstab.sge-nfs-rs
```

4. Add a `SUNW.nfs` resource to the failover resource group that you created in [“How to Enable Sun Grid Engine to Run in a Cluster”](#) on page 22.

```
# scrgadm -a -j sge-nfs-rs \  
-g sge-rg \  
-t SUNW.nfs \  
-y Resource_dependencies=sge-hasp-rs
```

EXAMPLE 2 Creating a `dfstab` File for the Root of the Sun Grid Engine File System

This example shows the command for creating a `dfstab` file for the root of the Sun Grid Engine file system.

- The root of the Sun Grid Engine file system is `/global/gridmaster`.
- The name of the NFS resource for which this file is created is `sge-nfs-rs`.

```
# echo "share -F nfs -o rw /global/gridmaster" \  
> /global/gridmaster/SUNW.nfs/dfstab.sge-nfs-rs
```

Registering and Configuring Sun Cluster HA for Sun Grid Engine

Before you perform this procedure, ensure that the Sun Cluster HA for Sun Grid Engine data service packages are installed.

Use the configuration and registration files in the `/opt/SUNWscsge/util` directory to register the Sun Cluster HA for Sun Grid Engine resources. The files define the dependencies that are required between Sun Grid Engine components. For information about these dependencies, see [“Dependencies Between Sun Grid Engine Components”](#) on page 16. For a listing of these files, see [Appendix A](#).

Registering and configuring Sun Cluster HA for Sun Grid Engine involves the tasks that are explained in the following sections:

1. [“Specifying Configuration Parameters for Sun Cluster HA for Sun Grid Engine Resources”](#) on page 30
2. [“How to Create and Enable Sun Cluster HA for Sun Grid Engine Resources”](#) on page 32

Specifying Configuration Parameters for Sun Cluster HA for Sun Grid Engine Resources

Sun Cluster HA for Sun Grid Engine provides scripts that automate the process of configuring and removing Sun Cluster HA for Sun Grid Engine resources. These scripts obtain configuration parameters from the `sge_config` file in the `/opt/SUNWscsge/util/` directory. To specify configuration parameters for Sun Cluster HA for Sun Grid Engine resources, edit the `sge_config` file.

Each configuration parameter in the `sge_config` file is defined as a keyword-value pair. The `sge_config` file already contains the required keywords and equals signs. For more information, see [“Listing of `sge_config`”](#) on page 37. When you edit the `sge_config` file, add the required value to each keyword. Use the values that you identified in [“Configuration Planning Questions”](#) on page 18.

The keyword-value pairs in the `sge_config` file are as follows:

```
COMMDRS=sge-commd-rs
QMASTERS=sge-qmaster-rs
SCHEDDRS=sge-schedd-rs
RG=sge-rg
LH=sge-lh-rs
SGE_ROOT=sge-root-dir
SGE_CELL=cell-name
PORT=portno
USE_INTERNAL_DEP=FALSE|TRUE
```

The meaning and permitted values of the keywords in the `sge_config` file are as follows:

```
COMMDRSS=sge-commd-rs
    Specifies the name that you are assigning to the resource for the Sun Grid Engine
    communications daemon sge_commd.
```

```
QMASTERS=sge-qmaster-rs
    Specifies the name that you are assigning to the resource for the Sun Grid Engine
    queue master daemon sge_qmaster.
```

```
SCHEDDRS=sge-schedd-rs
    Specifies the name that you are assigning to the resource for the Sun Grid Engine
    scheduling daemon sge_schedd.
```

`RG=sge-rg`

Specifies the name of the resource group that contains the Sun Cluster HA for Sun Grid Engine resources. This name must be the name that you assigned when you created the resource group as explained in [“How to Enable Sun Grid Engine to Run in a Cluster” on page 22](#).

`LH=sge-lh-rs`

Specifies the name of the logical host name resource for Sun Grid Engine. This name must be the name that you assigned when you created the resource in [“How to Enable Sun Grid Engine to Run in a Cluster” on page 22](#).

`SGE_ROOT=sge-root-dir`

Specifies the root directory of the Sun Grid Engine file system. This directory must be the directory that you created for root of the Sun Grid Engine file system in [“Preparing the Nodes and Disks” on page 19](#).

`SGE_CELL=cell-name`

Specifies the cell that Sun Grid Engine references.

`PORT=portno`

The port number is ignored. You can specify any integer for `PORT`. In the `sge_config` file, `PORT` is preset to 1234.

`USE_INTERNAL_DEP=FALSE|TRUE`

Specifies whether dependencies are to be set between resource groups. The possible values for this keyword are as follows:

- `FALSE` Specifies that dependencies are *not* to be set between resource groups.
- `TRUE` Specifies that dependencies are to be set between resource groups.

In the `sge_config` file, `USE_INTERNAL_DEP` is preset to `FALSE`.

EXAMPLE 3 Sample `sge_config` File

This example shows an `sge_config` file in which configuration parameters are set as follows:

- The name of the resource for the Sun Grid Engine communications daemon `sge_commd` is `sge_commd-rs`.
- The name of the resource for the Sun Grid Engine scheduling daemon `sge_schedd` is `sge_qmaster-rs`.
- The name of the resource for the Sun Grid Engine scheduling daemon `sge_schedd` is `sge_schedd-rs`.
- The name of the resource group that contains the Sun Cluster HA for Sun Grid Engine resources is `sge-rg`.
- The name of the logical host name resource for Sun Grid Engine is `sge-lh-rs`.
- The root directory of the Sun Grid Engine file system is `/global/gridmaster`.
- Sun Grid Engine references the default cell.
- The port number is set to 1234. This number is ignored.

EXAMPLE 3 Sample `sge_config` File (Continued)

- Dependencies are not to be set between resource groups.

```
COMMDRS=sge_commd-rs
QMASTERS=sge_qmaster-rs
SCHEDDRS=sge_schedd-rs
RG=sge-rg
LH=sge-lh-rs
SGE_ROOT=/global/gridmaster
SGE_CELL=default
PORT=1234
USE_INTERNAL_DEP=FALSE
```

▼ How to Create and Enable Sun Cluster HA for Sun Grid Engine Resources

Before you begin, ensure that you have edited the `sge_config` file to specify configuration parameters for Sun Cluster HA for Sun Grid Engine resources. For more information, see [“Specifying Configuration Parameters for Sun Cluster HA for Sun Grid Engine Resources”](#) on page 30.

1. Register the `SUNW.gds` resource type.

```
# scrgadm -a -t SUNW.gds
```

2. Go to the directory that contains the script for creating the Sun Grid Engine resources.

```
# cd /opt/SUNWscsge/util/
```

3. Run the script that creates the Sun Grid Engine resources.

```
# ./sge_register
```

4. Bring online the failover resource group that you created in [“How to Enable Sun Grid Engine to Run in a Cluster”](#) on page 22.

This resource group contains the following resources:

- Logical host name resource
- HAStoragePlus resource
- NFS resource
- Sun Grid Engine application resources

```
# scswitch -z -g sge-rg
```

`-g sge-rg` Specifies the resource group that you created in [“How to Enable Sun Grid Engine to Run in a Cluster”](#) on page 22 is to be brought online

Setting Sun Cluster HA for Sun Grid Engine Extension Properties

Extension properties for Sun Cluster HA for Sun Grid Engine resources are set when you run the script that creates these resources. You need to set these properties only if you require values other than the values that are set by the script. For information about Sun Cluster HA for Sun Grid Engine extension properties, see the `SUNW.gds(5)` man page. You can update some extension properties dynamically. You can update other properties, however, only when you create or disable a resource. The Tunable entry indicates when you can update a property.

To update an extension property of a resource, run the `scrgadm(1M)` command with the following option to modify the resource:

`-x property=value`

`-x property` Identifies the extension property that you are setting

`value` Specifies the value to which you are setting the extension property

You can also use the procedures in “Administering Data Service Resources” in *Sun Cluster Data Services Planning and Administration Guide for Solaris OS* to configure resources after the resources are created.

Verifying the Sun Cluster HA for Sun Grid Engine Installation and Configuration

After you install, register, and configure Sun Cluster HA for Sun Grid Engine, verify the Sun Cluster HA for Sun Grid Engine installation and configuration. Verifying the Sun Cluster HA for Sun Grid Engine installation and configuration determines if the Sun Cluster HA for Sun Grid Engine data service makes the Sun Grid Engine application highly available.

▼ How to Verify the Sun Cluster HA for Sun Grid Engine Installation and Configuration

1. Become superuser a node that will host Sun Grid Engine.

2. Verify that all Sun Grid Engine resources are online.

```
# scstat
```

3. If a Sun Grid Engine resource is not online, enable the resource.

```
# scswitch -e -j sge-rs
```

4. Switch the Sun Grid Engine resource group to another cluster node.

```
# scswitch -z -g sge-rg -h node
```

Tuning the Sun Cluster HA for Sun Grid Engine Fault Monitors

The Sun Cluster HA for Sun Grid Engine fault monitors verify that the following daemons are running correctly:

- Communications daemon `sge_commd`
- Queue master daemon `sge_qmaster`
- Scheduling daemon `sge_schedd`

Each Sun Cluster HA for Sun Grid Engine fault monitor is contained in the resource that represents Sun Grid Engine component. You create these resources when you register and configure Sun Cluster HA for Sun Grid Engine. For more information, see [“Registering and Configuring Sun Cluster HA for Sun Grid Engine”](#) on page 29.

System properties and extension properties of these resources control the behavior of the fault monitor. The default values of these properties determine the preset behavior of the fault monitor. The preset behavior should be suitable for most Sun Cluster installations. Therefore, you should tune the Sun Cluster HA for Sun Grid Engine fault monitor *only* if you need to modify this preset behavior.

Tuning the Sun Cluster HA for Sun Grid Engine fault monitors involves the following tasks:

- Setting the interval between fault monitor probes
- Setting the timeout for fault monitor probes
- Defining the criteria for persistent faults
- Specifying the failover behavior of a resource

For more information, see “Tuning Fault Monitors for Sun Cluster Data Services” in *Sun Cluster Data Services Planning and Administration Guide for Solaris OS*.

Debugging Sun Cluster HA for Sun Grid Engine

The `config` file in the `/opt/SUNWscsge/etc` directory enables you to activate debugging for Sun Grid Engine resources. This file enables you to activate debugging for all Sun Grid Engine resources or for a specific Sun Grid Engine resource on a particular node. If you require debugging for Sun Cluster HA for Sun Grid Engine to be enabled throughout the cluster, repeat this procedure on all nodes.

▼ How to Activate Debugging for Sun Cluster HA for Sun Grid Engine

1. **Determine whether debugging for Sun Cluster HA for Sun Grid Engine is active.**

If debugging is inactive, `daemon.notice` is set in the file `/etc/syslog.conf`.

```
# grep daemon /etc/syslog.conf
*.err;kern.debug;daemon.notice;mail.crit      /var/adm/messages
*.alert;kern.err;daemon.err                   operator
#
```

2. **If debugging is inactive, edit the `/etc/syslog.conf` file to change `daemon.notice` to `daemon.debug`.**

3. **Confirm that debugging for Sun Cluster HA for Sun Grid Engine is active.**

If debugging is active, `daemon.debug` is set in the file `/etc/syslog.conf`.

```
# grep daemon /etc/syslog.conf
*.err;kern.debug;daemon.debug;mail.crit      /var/adm/messages
*.alert;kern.err;daemon.err                   operator
#
```

4. **Restart the `syslogd` daemon.**

```
# pkill -1 syslogd
```

5. Edit the `/opt/SUNWscsge/etc/config` file to change `DEBUG=` to `DEBUG=ALL` or `DEBUG=sge-rs`.

```
# cat /opt/SUNWscsge/etc/config
#
# Copyright 2003 Sun Microsystems, Inc. All rights reserved.
# Use is subject to license terms.
#
# Usage:
#     DEBUG=<RESOURCE_NAME> or ALL
#
DEBUG=ALL
#
```

Note – To deactivate debugging, reverse the preceding steps.

Files for Configuring and Removing Sun Cluster HA for Sun Grid Engine Resources

The `/opt/SUNWscsge/util` directory contains files that automate the process of configuring and removing Sun Cluster HA for Sun Grid Engine resources. Listings of these files are provided in the following sections:

- “Listing of `sge_config`” on page 37
- “Listing of `sge_register`” on page 38
- “Listing of `sge_remove`” on page 39

Listing of `sge_config`

```
#
# Copyright 2003 Sun Microsystems, Inc. All rights reserved.
# Use is subject to license terms.
#
# This file will be sourced in by sge_register and the parameters
# listed below will be used.
#
# These parameters can be customized in (key=value) form
#
#     COMMDRS - name of the resource for the application
#     QMASTERRS - name of the resource for the application
#     SCHEDDRS - name of the resource for the application
#     RG - name of the resource group containing the resources
#     PORT - name of any port number, as it's ignored
#     LH - name of the LogicalHostname SC resource
#     SGE_ROOT - SGE_ROOT of this Sun GridEngine Installation
#     SGE_CELL - SGE_CELL of this Sun GridEngine Installation
#     USE_INTERNAL_DEP - if internal Inter RG-dependency is being
#                       used set this to TRUE else to FALSE.
#
COMMDRS=
```

```
QMASTERS=
SCHEDDRS=
RG=
LH=
SGE_ROOT=
SGE_CELL=
PORT=1234
USE_INTERNAL_DEP=FALSE
```

Listing of sge_register

```
#
# Copyright 2003 Sun Microsystems, Inc. All rights reserved.
# Use is subject to license terms.
#

. `dirname $0`/sge_config

if [ "${USE_INTERNAL_DEP}" = "FALSE" ]; then
    DEPFLAG="-Z"
else
    DEPFLAG=""
fi

# Disable SGE launch at boot if same exists.
# A marker is left to restore boot launch
# iif SGE cluster agents are removed with:
# sge_remove.

if [ -L /etc/rc2.d/S95rcsge ]; then
    touch $SGE_ROOT/sge_boot_launch_disabled
    rm /etc/rc2.d/S95rcsge
fi

scregadm -a -j $COMMDRS -g $RG -t SUNW.gds \
-x Start_command="/opt/SUNWscsge/bin/sge_commd/start_sge_commd \
-R $COMMDRS -G $RG -S $SGE_ROOT -C $SGE_CELL " \
-x Stop_command="/opt/SUNWscsge/bin/sge_commd/stop_sge_commd \
-R $COMMDRS -G $RG -S $SGE_ROOT -C $SGE_CELL " \
-x Probe_command="/opt/SUNWscsge/bin/sge_commd/probe_sge_commd \
-R $COMMDRS -G $RG -S $SGE_ROOT -C $SGE_CELL " \
-y Port_list=$PORT/tcp -y Network_resources_used=$LH \
-x Stop_signal=9 \
-y retry_count=5 -y retry_interval=300

scregadm -a -j $QMASTERS -g $RG -t SUNW.gds \
-x Start_command="/opt/SUNWscsge/bin/sge_qmaster/start_sge_qmaster \
```

```

-R $QMASTERRS -G $RG -S $$SGE_ROOT -C $$SGE_CELL " \
-x Stop_command="/opt/SUNWscsge/bin/sge_qmaster/stop_sge_qmaster \
-R $QMASTERRS -G $RG -S $$SGE_ROOT -C $$SGE_CELL " \
-x Probe_command="/opt/SUNWscsge/bin/sge_qmaster/probe_sge_qmaster \
-R $QMASTERRS -G $RG -S $$SGE_ROOT -C $$SGE_CELL " \
-y Port_list=$PORT/tcp -y Network_resources_used=$LH \
-x Stop_signal=9 \
-x probe_timeout=90 -y Thorough_probe_interval=120 \
-y retry_count=2 -y retry_interval=900 \
-y Resource_dependencies=$COMMDRS

scrgadm -a -j $SCHEDDRS -g $RG -t SUNW.gds \
-x Start_command="/opt/SUNWscsge/bin/sge_schedd/start_sge_schedd \
-R $SCHEDDRS -G $RG -S $$SGE_ROOT -C $$SGE_CELL " \
-x Stop_command="/opt/SUNWscsge/bin/sge_schedd/stop_sge_schedd \
-R $SCHEDDRS -G $RG -S $$SGE_ROOT -C $$SGE_CELL " \
-x Probe_command="/opt/SUNWscsge/bin/sge_schedd/probe_sge_schedd \
-R $SCHEDDRS -G $RG -S $$SGE_ROOT -C $$SGE_CELL " \
-y Port_list=$PORT/tcp -y Network_resources_used=$LH \
-x Stop_signal=9 \
-x probe_timeout=90 -y Thorough_probe_interval=120 \
-y retry_count=2 -y retry_interval=900 \
-y Resource_dependencies=$QMASTERRS

```

Listing of sge_remove

```

#
# Copyright 2003 Sun Microsystems, Inc. All rights reserved.
# Use is subject to license terms.
#

. `dirname $0`/sge_config

scswitch -n -j $SCHEDDRS
scswitch -n -j $QMASTERRS
scswitch -n -j $COMMDRS
scrgadm -r -j $SCHEDDRS
scrgadm -r -j $QMASTERRS
scrgadm -r -j $COMMDRS

# SGE launch at boot re-enabled, and
# run-level script link re-established.

if [ -e $$SGE_ROOT/sge_boot_launch_disabled && -e /etc/init.d/rcsge ]; then
    rm $$SGE_ROOT/sge_boot_launch_disabled
    ln -s /etc/init.d/rcsge /etc/rc2.d/S95rcsge
    chmod 111 /etc/rc2.d/S95rcsge
fi

```


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