Sun Cluster Quorum Server User's Guide

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Preface

Sun Cluster Quorum Server provides a quorum device that is not a shared storage device. The Sun Cluster Quorum Server User's Guide contains procedures for installing and configuring the Sun Cluster Quorum Server software.

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

Note – In this document, the term "x86" refers to the Intel 32-bit family of microprocessor chips and compatible microprocessor chips made by AMD. Sun Cluster Quorum Server software runs on two platforms, SPARC® and x86.

The information in this document pertains to both platforms unless otherwise specified in a special chapter, section, note, bulleted item, figure, table, or example.

Related Documentation

Information about related Sun Cluster Quorum Server topics is available in the documentation that is listed in the following table.

Topic	Documentation
Sun Cluster system administration	*Sun Cluster System Administration Guide for Solaris OS*
Sun Cluster hardware administration	*Sun Cluster 3.1 - 3.2 Hardware Administration Manual for Solaris OS*
Glossary	Sun Java Enterprise System Glossary

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

Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- Documentation (`http://www.sun.com/documentation/`)
- Support (`http://www.sun.com/support/`)
- Training (`http://www.sun.com/training/`)

Typographic Conventions

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

TABLE P–1 Typographic Conventions

Typeface	Meaning	Example
`AaBbCc123`	The names of commands, files, and directories, and onscreen computer output	Edit your `.login` file. Use `ls -a` to list all files. `machine_name% you have mail.`
`AaBbCc123`	What you type, contrasted with onscreen computer output	`machine_name%` **`su`** `Password:`
aabbcc123	Placeholder: replace with a real name or value	The command to remove a file is `rm` *filename*.
AaBbCc123	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the *User's Guide*. A *cache* is a copy that is stored locally. Do *not* save the file. **Note:** Some emphasized items appear bold online.

Shell Prompts in Command Examples

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

TABLE P–2 Shell Prompts

Shell	Prompt
C shell	`machine_name%`
C shell for superuser	`machine_name#`
Bourne shell and Korn shell	`$`
Bourne shell and Korn shell for superuser	`#`

◆ ◆ ◆ CHAPTER 1

Installing and Removing the Sun Cluster Quorum Server Software

This chapter describes how to install and remove the Sun Cluster Quorum Server software. It contains the following topics:

- "Installing the Quorum Server Software" on page 9
- "Removing the Quorum Server Software" on page 11

Installing the Quorum Server Software

You can install the quorum server software on any computer connected to your cluster through the public network. The quorum server should not run on a cluster node.

▼ How to Install Quorum Server Software

Before You Begin The Sun Cluster Quorum Server software requires at least 1 MB disk space for its installation. The installation is independent of other Sun Java Enterprise System components. The Sun Cluster Quorum Server software does not depend upon the installation of the Java Enterprise System shared components nor upon the installation of the Sun Cluster core software or its agent software.

When using a quorum server, disable the spanning tree algorithm on the Ethernet switches for the ports connected to the cluster public network where the quorum server will run.

1 Become superuser on the host server to install.

```
% su -
```

Root access is required for installation.

2 (Optional) To use the `installer` program with a GUI, ensure that the display environment of the host server to install is set to display the GUI.

```
# xhost +
# setenv DISPLAY nodename:0.0
```

3 **Load the installation media into the drive.**

If the volume management daemon (`vold`(1M)) is running and is configured to manage CD-ROM or DVD devices, the daemon automatically mounts the media on the `/cdrom/cdrom0/` directory.

4 **Change to the installation wizard directory of the media.**

- If you are installing the software packages on the SPARC platform, type the following command:

```
phys-schost# cd /cdrom/cdrom0/Solaris_sparc
```

- If you are installing the software packages on the x86 platform, type the following command:

```
phys-schost# cd /cdrom/cdrom0/Solaris_x86
```

5 **Start the installation wizard.**

```
phys-schost# ./installer
```

6 **Follow instructions on the screen to install the quorum server software on the host server.**

Choose the Configure Later option.

Note – If the installer does not allow you to choose the Configure Later option, choose Configure Now. You will still need to configure the quorum server by following the instructions in Chapter 2.

After installation is finished, you can view any available installation log. See the *Sun Java Enterprise System 2006Q4 Installation Guide for UNIX* for additional information about using the Java Enterprise System `installer` program.

7 **Unload the installation media from the drive.**

a. **To ensure that the installation media is not being used, change to a directory that does *not* reside on the media.**

b. **Eject the media.**

```
phys-schost# eject cdrom
```

8 **Apply any necessary patches to support the quorum server software.**

See "Patches and Required Firmware Levels" in *Sun Cluster 3.2 Release Notes for Solaris OS* for the location of patches and installation instructions.

9 **Add the quorum server binary to your `PATH` environment variable.**

```
# PATH=$PATH:/usr/cluster/bin
```

10 **Add the quorum server man pages to your `MANPATH` environment variable.**

```
# MANPATH=$MANPATH:/usr/cluster/man
```

Troubleshooting The installer performs a simple `pkgadd` installation of the Sun Cluster Quorum Server packages and sets up the necessary directories. The software consists of the following packages:

- `SUNWscqsr`
- `SUNWscqsu`
- `SUNWscqsman`

The `pkgadd` of these packages adds software to the `/usr/cluster` and `/etc/scqsd` directories. You cannot modify the location of the Sun Cluster Quorum Server software.

If you receive an installation error message regarding the quorum server, verify that the packages were properly installed.

Next Steps If your system requires only the default quorum server, start the quorum server by following the instructions in "How to Start a Quorum Server" on page 15.

If your system requires a specially configured quorum server, or requires multiple quorum servers, configure quorum servers by following the instructions in "Configuring Multiple Quorum Servers on the Same Host" on page 14.

Removing the Quorum Server Software

▼ How to Remove Quorum Server Software

Before You Begin Before performing the uninstallation of the quorum server software, ensure that you have completed the following:

- On each cluster, unconfigure any quorum server quorum devices configured for the quorum server being removed, by performing the steps in "How to Remove a Quorum Device" in *Sun Cluster System Administration Guide for Solaris OS*.

  In normal operation, this step also removes the quorum server information on the quorum server host. If communications between the cluster and the quorum server host are down during this step, you must clean up the invalid quorum server information on the host. Perform the steps in "Cleaning Up Stale Quorum Server Cluster Information" on page 18 to accomplish this cleanup.
- On each quorum server host computer, stop the quorum server by following the steps in "How to Stop a Quorum Server" on page 16.

1 **(Optional) To use the interactive graphical interface to uninstall the Java Enterprise System components, ensure that the display environment of the host server to uninstall is set to display the GUI.**

```
% xhost +
% setenv DISPLAY nodename:0.0
```

2 Become superuser on the host server to uninstall.

Root access is required for software removal

3 Navigate to the directory where the uninstaller is located:

```
phys-schost# cd /var/sadm/prod/SUNWentsysver
```

ver The version of Java Enterprise System installed on your system.

4 Start the installation wizard.

```
phys-schost# ./uninstall
```

5 Follow instructions on the screen to uninstall the quorum server software on the host server.

After removal is finished, you can view any available log. See the *Sun Java Enterprise System 2006Q4 Installation Guide for UNIX* for additional information about using the Java Enterprise System `installer` program.

6 (Optional) On each quorum server host computer, clean up or remove the quorum server directories.

By default, this directory is `/var/scqsd`.

◆ ◆ ◆ CHAPTER 2

Configuring the Sun Cluster Quorum Server Software

This chapter describes how to configure the Sun Cluster Quorum Server software. It includes the following sections:

- "Overview of the Quorum Server Configuration File" on page 13
- "Configuring Multiple Quorum Servers on the Same Host" on page 14
- "Starting and Stopping the Sun Cluster Quorum Server Software" on page 15
- "Displaying Information About the Quorum Server" on page 16
- "Cleaning Up Stale Quorum Server Cluster Information" on page 18

Overview of the Quorum Server Configuration File

When you install the Sun Cluster Quorum Server software, a default configuration file, `/etc/scqsd/scqsd.conf`, is created that contains information about a single default quorum server. Each line in the `/etc/scqsd/scqsd.conf` file has the following format:

`/usr/cluster/lib/sc/scqsd [-d` *quorumdirectory*`] [-i` *instancename*`] -p` *port*

`/usr/cluster/lib/sc/scqsd`	The full path to where you installed the Sun Cluster Quorum Server software. This value must be `/usr/cluster/lib/sc/scqsd`.
`-d` *quorumdirectory*	The path to the directory where the quorum server can store quorum data. The quorum server process creates one file per cluster in this directory to store cluster-specific quorum information. By default, the value of this option is `/var/scqsd`. This directory must be unique for each quorum server that you configure.
`-i` *instancename*	A unique name that you choose for the quorum server instance.
`-p` *port*	The port number on which the quorum server listens for requests from the cluster. The default port is 9000.

Instance names are optional. If you specify a name for the quorum server, that name must be unique among all quorum servers in your system. If you choose to omit the instance name option, you must refer to the quorum server by the port on which it listens.

Configuring Multiple Quorum Servers on the Same Host

You can add multiple quorum servers to the configuration file on a single host machine. Edit the `/etc/scqsd/scqsd.conf` file and add one entry for each additional instance of the quorum server that you need.

Lines that begin with the number sign (#) are treated as comments and ignored. Every line is executed as specified in the file.

▼ How to Add a Quorum Server to the Configuration File

1 Become superuser on the host where the Sun Cluster Quorum Server software is installed.

2 Edit the `/etc/scqsd/scqsd.conf` file.

Identify the quorum server by using at least one of either an instance name or a port number.

**`/usr/cluster/lib/sc/scqsd [-d` *`/var/scqsd`*`] [-i` *`instancename`*`] -p` *`port`*

`-d` *`/var/scqsd`*	The path to the directory where the quorum server can store quorum data. The quorum server process creates one file per cluster in this directory to store cluster-specific quorum information. By default, the value of this option is `/var/scqsd`. This directory must be unique for each quorum server that you configure.
`-i` *`instancename`*	A unique name that you choose for the quorum server instance.
`-p` *`port`*	The port number on which the quorum server listens for requests from the cluster.

You must provide the port number, but the instance name is optional. If you provide an instance name, that name must be unique among your quorum servers. If you do not provide a name, always refer to this quorum server by the port on which it listens.

3 Save and close the `/etc/scqsd/scqsd.conf` file.

4 Start the newly configured quorum server.

`#` `/usr/cluster/bin/clquorumserver start` *`quorumserver`*

quorumserver Identifies the quorum server. You can use the port number on which the quorum server listens. If you provided an instance name in the configuration file, you can use that name instead.

To start a single quorum server, provide either the instance name or port number. To start all quorum servers, when you have multiple quorum servers configured, use the + operand.

Starting and Stopping the Sun Cluster Quorum Server Software

These procedures describe how to start and stop the Sun Cluster Quorum Server software.

By default, these procedures start and stop a single default quorum server unless you have customized the content of the quorum server configuration file, `/etc/scqsd/scqsd.conf`. The default quorum server is bound on port 9000 and uses the `/var/scqsd` directory for quorum information.

For information about customizing the quorum server startup file, see "Configuring Multiple Quorum Servers on the Same Host" on page 14.

▼ How to Start a Quorum Server

1 **Become superuser on the host where you want to start the Sun Cluster Quorum Server software.**

2 **Use the `clquorumserver start` command to start the software.**

```
# /usr/cluster/bin/clquorumserver start quorumserver
```

quorumserver Identifies the quorum server. You can use the port number on which the quorum server listens. If you provided an instance name in the configuration file, you can use the name instead.

To start a single quorum server, provide either the instance name or port number. To start all quorum servers, when you have multiple quorum servers configured, use the + operand.

Example 2–1 Starting All Configured Quorum Servers

The following example starts all the configured quorum servers.

```
# /usr/cluster/bin/clquorumserver start +
```

Example 2–2 Starting a Specific Quorum Server

The following example starts the quorum server that listens on port number 2000.

```
# /usr/cluster/bin/clquorumserver start 2000
```

▼ How to Stop a Quorum Server

1. **Become superuser on the host where you want to start the Sun Cluster Quorum Server software.**
2. **Use the** `clquorumserver stop` **command to stop the software.**

   `# /usr/cluster/bin/clquorumserver stop` *quorumserver*

   quorumserver — Identifies the quorum server. You can use the port number on which the quorum server listens. If you provided an instance name in the configuration file, you can use that name instead.

   To stop a single quorum server, provide either the instance name or port number. To stop all quorum servers, when you have multiple quorum servers configured, use the + operand.

Example 2–3 Stopping All Configured Quorum Servers

The following example stops all the configured quorum servers.

```
# /usr/cluster/bin/clquorumserver stop +
```

Example 2–4 Stopping a Specific Quorum Server

The following example stops the quorum server that listens on port number 2000.

```
# /usr/cluster/bin/clquorumserver stop 2000
```

Displaying Information About the Quorum Server

You can display configuration information about the quorum server. For every cluster that configured the quorum server as a quorum device, this command shows the corresponding cluster name, cluster ID, list of reservation keys, and list of registration keys.

▼ How to Display Information About the Quorum Server

1 Become the superuser on the host where you want to display the quorum server information.

Users other than the superuser require `solaris.cluster.read` role-based access control (RBAC) authorization. For more information about RBAC rights profiles, see the `rbac(5)` man page.

2 Display the configuration information of the quorum server by using the `clquorumserver` command.

```
# /usr/cluster/bin/clquorumserver show quorumserver
```

quorumserver Identifies one or more quorum servers. You can specify the quorum server by instance name, or by port number. To display configuration information for all quorum servers, use the + operand.

Example 2–5 Displaying the Configuration of One Quorum Server

The following example displays the configuration information for the quorum server that uses port 9000. The command displays information for every cluster that has the quorum server configured as a quorum device. This information includes the cluster name and ID, and the list of reservation and registration keys on the device.

In the following example, nodes with IDs 1, 2, 3, and 4 of cluster `bastille` have registered their keys on the quorum server. Also, because Node 4 owns the quorum device reservation, its key is displayed in the reservation list.

```
# /usr/cluster/bin/clquorumserver show 9000

=== Quorum Server on port 9000 ===

   ---  Cluster bastille (id 0x439A2EFB) Reservation ---

   Node ID:                      4
     Reservation key:            0x439a2efb00000004

   ---  Cluster bastille (id 0x439A2EFB) Registrations ---

   Node ID:                      1
     Registration key:           0x439a2efb00000001

   Node ID:                      2
     Registration key:           0x439a2efb00000002

   Node ID:                      3
     Registration key:           0x439a2efb00000003
```

```
Node ID:                        4
  Registration key:             0x439a2efb00000004
```

Example 2–6 Displaying the Configuration of Several Quorum Servers

The following example displays the configuration information for three quorum servers, `qs1`, `qs2`, and `qs3`.

```
# /usr/cluster/bin/clquorumserver show qs1 qs2 qs3
```

Example 2–7 Displaying the Configuration of All Running Quorum Servers

The following example displays the configuration information for all running quorum servers:

```
# /usr/cluster/bin/clquorumserver show +
```

Cleaning Up Stale Quorum Server Cluster Information

To remove a quorum device of type `quorumserver`, use the `clquorum remove` command as described in "How to Remove a Quorum Device" in *Sun Cluster System Administration Guide for Solaris OS*. Under normal operation, this command also removes the quorum server information on the quorum server host. However, if the cluster loses communications with the quorum server host, removing the quorum device does not clean up this information.

The quorum server cluster information becomes invalid in the following circumstances:

- When a cluster is decommissioned without first removing the cluster quorum device by using the `clquorum remove` command
- When a `quorum_server` type quorum device is removed from a cluster while the quorum server host is down

Caution – If a quorum device of type `quorumserver` is not yet removed from the cluster, using this procedure to clean up a valid quorum server could compromise the cluster quorum.

▼ How to Clean Up the Quorum Server Configuration Information

Before You Begin Remove the quorum server quorum device from the cluster, as described in "How to Remove a Quorum Device" in *Sun Cluster System Administration Guide for Solaris OS*.

Caution – Use this procedure only if the circumstances described in "Cleaning Up Stale Quorum Server Cluster Information" on page 18 pertain. If a cluster is still using this quorum server, performing this procedure will compromise cluster quorum.

1 **Become the superuser on the quorum server host.**

2 **Use the `clquorumserver clear` command to clean up the configuration file.**

```
# clquorumserver clear -c clustername -I clusterID quorumserver [-y]
```

`-c` *clustername*	The name of the cluster that formerly used the quorum server as a quorum device. You can obtain the cluster name by running `cluster show` on a cluster node.
`-I` *clusterID*	The cluster ID. The cluster ID is an 8-digit hexadecimal number. You can obtain the cluster ID by running `cluster show` on a cluster node.
quorumserver	An identifier for one or more quorum servers. The quorum server can be identified by a port number or an instance name. The port number is used by the cluster nodes to communicate with the quorum server. The instance name is specified in the quorum server configuration file, `/etc/scqsd/scqsd.conf`.
`-y`	Force the `clquorumserver clear` command to clean up cluster information from the configuration file without first prompting for confirmation. Use this option only if you are confident that you want outdated cluster information to be removed from the quorum server.

3 **(Optional) If no other quorum devices are configured on this server instance, stop the quorum server.**

For specific instructions, see "How to Stop a Quorum Server" on page 16.

Example 2–8 Cleaning Up Outdated Cluster Information From the Quorum Server Configuration

This example removes information about the cluster named `sc-cluster` from the quorum server that uses port 9000.

```
# clquorumserver clear -c sc-cluster -I 0x4308D2CF 9000
The quorum server to be unconfigured must have been removed from the cluster.
Unconfiguring a valid quorum server could compromise the cluster quorum.  Do you
want to continue? (yes or no) y
```

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