



# **Sun Cluster Quorum Server Reference Manual for Solaris OS**



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# Preface

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The *Sun Cluster Quorum Server Reference Manual* provides reference information for commands, file formats, and other public interface in Sun<sup>™</sup> Cluster Quorum Server software. This book is intended for experienced system administrators with extensive knowledge of Sun software and hardware. This book is not to be used as a planning or presales guide. The information in this book assumes knowledge of the Solaris<sup>™</sup> Operating System and expertise with the volume manager software that is used with Sun Cluster software.

Both novice users and those familiar with the Solaris Operating System can use online man pages to obtain information about their SPARC<sup>™</sup> based system or x86 based system and its features.

A man page is intended to answer concisely the question “What does this command do?” The man pages in general comprise a reference manual. They are not intended to be a tutorial.

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**Note** – Sun Cluster software runs on two platforms, SPARC and x86. The information in this book pertains to both platforms unless otherwise specified in a special chapter, section, note, bulleted item, figure, table, or example.

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## Overview

The following contains a brief description of each man page section and the information it references:

- Section 1CL describes, in alphabetical order, commands that are used for the maintenance and administration of Sun Cluster Quorum Server.
- Section 1M describes, in alphabetical order, commands that are used chiefly for system maintenance and administration purposes.
- Section 4 outlines the formats of various files. The C structure declarations for the file formats are given where applicable.

The following is a generic format for man pages. The man pages of each manual section generally follow this order, but include only needed headings. For example, if no bugs can be reported, no BUGS section is included. See the `intro` pages for more information and detail about each section, and `man(1)` for general information about man pages.

NAME	This section gives the names of the commands or functions that are documented, followed by a brief description of what they do.
------	---

**SYNOPSIS**

This section shows the syntax of commands or functions. If a command or file does not exist in the standard path, its full path name is shown. Options and arguments are alphabetized, with single-letter arguments first, and options with arguments next, unless a different argument order is required.

The following special characters are used in this section:

- [ ] Brackets. The option or argument that is enclosed in these brackets is optional. If the brackets are omitted, the argument must be specified.
- . . . Ellipses. Several values can be provided for the previous argument, or the previous argument can be specified multiple times, for example, “filename . . .”.
- | Separator. Only one of the arguments separated by this character can be specified at a time.
- { } Braces. The options and/or arguments enclosed within braces are interdependent. All characters within braces must be treated as a unit.

**PROTOCOL**

This section occurs only in subsection 3R and indicates the protocol description file.

**DESCRIPTION**

This section defines the functionality and behavior of the service. Thus it describes concisely what the command does. DESCRIPTION does not discuss OPTIONS or cite EXAMPLES. Interactive commands, subcommands, requests, macros, and functions are described under USAGE.

**IOCTL**

This section appears on pages in Section 7 only. Only the device class that supplies appropriate parameters to the `ioctl(2)` system call is called `ioctl` and generates its own heading. `ioctl` calls for a specific device are listed alphabetically (on the man page for that specific device). `ioctl` calls are used for a particular class of devices. All these calls have an `io` ending, such as `mtio(7I)`.

**OPTIONS**

This section lists the command options with a concise summary of what each option does. The options are listed literally and in the order they appear in the SYNOPSIS section. Possible arguments to options are discussed under the option, and where appropriate, default values are supplied.

**OPERANDS**

This section lists the command operands and describes how they affect the actions of the command.

OUTPUT	This section describes the output – standard output, standard error, or output files – generated by the command.
RETURN VALUES	If the man page documents functions that return values, this section lists these values and describes the conditions under which they are returned. If a function can return only constant values, such as 0 or -1, these values are listed in tagged paragraphs. Otherwise, a single paragraph describes the return values of each function. Functions that are declared void do not return values, so they are not discussed in RETURN VALUES.
ERRORS	On failure, most functions place an error code in the global variable <code>errno</code> that indicates why they failed. This section lists alphabetically all error codes a function can generate and describes the conditions that cause each error. When more than one condition can cause the same error, each condition is described in a separate paragraph under the error code.
USAGE	<p>This section lists special rules, features, and commands that require in-depth explanations. The subsections that are listed here are used to explain built-in functionality:</p> <ul style="list-style-type: none"><li>Commands</li><li>Modifiers</li><li>Variables</li><li>Expressions</li><li>Input Grammar</li></ul>
EXAMPLES	This section provides examples of usage or of how to use a command or function. Wherever possible, a complete example, which includes command-line entry and machine response, is shown. Whenever an example is given, the prompt is shown as <code>example%</code> , or if the user must be superuser, <code>example#</code> . Examples are followed by explanations, variable substitution rules, or returned values. Most examples illustrate concepts from the SYNOPSIS, DESCRIPTION, OPTIONS, and USAGE sections.
ENVIRONMENT VARIABLES	This section lists any environment variables that the command or function affects, followed by a brief description of the effect.
EXIT STATUS	This section lists the values the command returns to the calling program or shell and the conditions that cause these values to be returned. Usually, zero is returned for successful completion, and values other than zero are returned for various error conditions.

FILES	This section lists all file names that are referred to by the man page, files of interest, and files created or required by commands. Each file name is followed by a descriptive summary or explanation.
ATTRIBUTES	This section lists characteristics of commands, utilities, and device drivers by defining the attribute type and its corresponding value. See <code>attributes(5)</code> for more information.
SEE ALSO	This section lists references to other man pages, in-house documentation, and outside publications.
DIAGNOSTICS	This section lists diagnostic messages with a brief explanation of the condition that caused the error.
WARNINGS	This section lists warnings about special conditions that could seriously affect your working conditions. WARNINGS is not a list of diagnostics.
NOTES	This section lists additional information that does not belong anywhere else on the page. NOTES covers points of special interest to the user. Critical information is never covered here.
BUGS	This section describes known bugs and, wherever possible, suggests workarounds.



**R E F E R E N C E**

SC32QS 1cl

**Name** clquorumserver, clqs – manage quorum servers

**Synopsis** `/usr/cluster/bin/clquorumserver -V`  
`/usr/cluster/bin/clquorumserver subcommand -?`  
`/usr/cluster/bin/clquorumserver subcommand [ -v ] [quorumserver]`  
`/usr/cluster/bin/clquorumserver clear -c clustername -I clusterID [ -y ] quorumserver`  
`/usr/cluster/bin/clquorumserver show [ + | quorumserver... ]`  
`/usr/cluster/bin/clquorumserver start + | quorumserver...`  
`/usr/cluster/bin/clquorumserver stop + | quorumserver...`

**Description** Use the clquorumserver command for the following tasks:

- to clean up stale configuration information of one or more quorum servers
- to display the configuration of one or more quorum servers
- to start one or more quorum servers
- to stop one or more quorum servers

The clqs command is the short form of the clquorumserver command. You can use either form of the command.

The general form of this command is as follows:

clquorumserver [*subcommand*] [*options*]

You can omit *subcommand* only if *options* specifies the `-?`, `-v`, or `-V` options.

The quorum server must be configured as a quorum device for the cluster. For information about configuring the quorum server, see [scqsd.conf\(4\)](#) and [scqsd\(1M\)](#). For information about adding a quorum\_server type of quorum device to the cluster, see clquorum(1CL).

**Subcommands** The following subcommands are supported:

**clear**

Removes outdated cluster information from the quorum server. The quorum server keeps information about the cluster which it serves as a quorum device. This information can become invalid in the following circumstances:

- When a cluster is decommissioned without first removing the cluster quorum device 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 server is not yet removed from the cluster, using this subcommand to clean up a valid quorum server could compromise the cluster quorum.

You must specify the cluster name and cluster ID for a particular quorum server. See the `-c` and `-I` options for details.

Users other than superuser require `solaris.cluster.admin` RBAC authorization to use this subcommand. See `rbac(5)` for more information.

#### show

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

You can use the plus sign (+) to specify more than one quorum server.

If no operand is given, or if the plus sign (+) is specified with the operand, the command prints the configuration of all running quorum servers.

Users other than superuser require `solaris.cluster.read` RBAC authorization to use this subcommand. See `rbac(5)` for more information.

#### start

Starts the quorum server

#### stop

Stops the quorum server

**Options** The following options are supported:

- ?

--help

Prints help information.

This option can be used alone or with a subcommand.

- If you use this option alone, the list of available subcommands is printed.
- If you use this option with a subcommand, the usage options for that subcommand are printed.

When this option is used, no other processing is performed.

-c *clustername*

--clustername *clustername*

Specifies the name of the cluster that uses the quorum server as a quorum device. You can get the cluster name by running some Sun Cluster commands on the cluster nodes, such as `cluster show`.

This option is required with the `clear` subcommand.

-I *clusterID*

--clusterID *clusterID*

Specifies the cluster ID. The cluster ID is an 8-digit hexadecimal number. You can get the cluster ID by running some Sun Cluster commands on the cluster nodes, such as `cluster show`.

This option is required with the `clear` subcommand.

-V

--version

Prints the version of the command.

Do not specify this option with subcommands, operands, or other options. The subcommand, operands, or other options are ignored. The -V option only prints the version of the command. No other operations are performed.

-v

---verbose

Prints verbose information to standard output, stdout.

You can specify this option with any form of this command.

-y

--yes

This option is only used with the `clear` subcommand. It pre-answers the confirmation question that is prompted by `clear` subcommand. Without this option, the `clear` subcommand asks a question to confirm whether you want to clean up the cluster information, and you need to answer yes or no. The subcommand only continues processing if you answer yes. When use this option, the `clear` subcommand will not ask any confirmation question, and instead directly removes the cluster information for the specified quorum server.

**Operands** The following operand is supported:

*quorumserver*

Specifies an identifier for the quorum server or servers. A quorum server can be identified by either 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 can be specified in the quorum server configuration file, `/etc/scqsd/scqsd.conf`. See [scqsd.conf\(4\)](#).

**Exit Status** If the command is successful for all specified operands, it returns zero (`CL_NOERR`). If an error occurs for an operand, the command processes the next operand in the operand list. The returned exit code always reflects the error that occurred first.

The following exit values are returned:

0 `CL_NOERR`

No error

The command that you issued completed successfully.

1 `CL_ENOMEM`

Not enough swap space

A cluster node ran out of swap memory or ran out of other operating system resources.

3 `CL_EINVAL`

Invalid argument

You typed the command incorrectly, or the syntax of the cluster configuration information that you supplied with the `-i` option was incorrect.

**6 CL\_EACCESS**

Permission denied

The object that you specified is inaccessible. You might need superuser or RBAC access to issue the command. See the `su(1M)` and `rbac(5)` man pages for more information.

**18 CL\_EINTERNAL**

Internal error was encountered

An internal error indicates a software defect or other defect.

**35 CL\_EIO**

I/O error

A physical input/output error has occurred.

**36 CL\_ENOENT**

No such object

The object that you specified cannot be found for one of the following reasons:

- The object does not exist.
- A directory in the path to the configuration file that you attempted to create with the `-o` option does not exist.
- The configuration file that you attempted to access with the `-i` option contains errors.

**Examples** **EXAMPLE 1** Displaying the Configuration of One Quorum Server

The following command displays the configuration information for the quorum server that uses port 9000.

```
# clquorumserver show 9000
```

**EXAMPLE 2** Displaying the Configuration of Several Quorum Servers

The following command displays the configuration information for the quorum servers listed by their instance names.

```
# clquorumserver show qs1 qs2 qs3
```

**EXAMPLE 3** Displaying the Configuration of All Running Quorum Servers

The following command displays the configuration information of all running quorum servers.

```
# clquorumserver show +
```

**EXAMPLE 4** Starting Quorum Servers

The following command starts all the configured quorum servers.

```
# clquorumserver start +
```

The following command starts a quorum server that is listening on port 9000.

```
# clquorumserver start 9000
```

The following command starts the quorum server instance qs1.

```
# clquorumserver start qs1
```

**EXAMPLE 5** Stopping a Quorum Server By Port Number

The following command stops a quorum server that is listening on port 9000.

```
# clquorumserver stop 9000
```

**EXAMPLE 6** Cleaning Up Outdated Cluster Information From the Quorum Server

This example removes information about the cluster named `sc-cluster` from the quorum server.

Use caution when unconfiguring a quorum server in this way. Generally, you should use `clquorum remove` to remove the quorum server device from cluster configuration and clean up the configuration information on the quorum server in a single set. You should only need to use this command if communications were lost between the cluster and the quorum server host during the `clquorum remove` operation.

```
# 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)

**Attributes** See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Availability	SUNWscu
Interface Stability	Evolving

**See Also** `Intro(1CL)`, `clquorum(1CL)`, `cluster(1CL)`, [scqsd\(1M\)](#), [scqsd.conf\(4\)](#).

**Notes** The superuser can run all forms of this command.

Any user can run this command with the following options:

- `-?` (help) option

- -V (version) option

To run this command with other subcommands, users other than superuser require RBAC authorizations. See the following table.

Subcommand	RBAC Authorization
clear	solaris.cluster.admin
show	solaris.cluster.read
start	solaris.cluster.admin
stop	solaris.cluster.admin

**Name** clquorumserver, clqs – manage quorum servers

**Synopsis** `/usr/cluster/bin/clquorumserver -V`  
`/usr/cluster/bin/clquorumserver subcommand -?`  
`/usr/cluster/bin/clquorumserver subcommand [ -v ] [quorumserver]`  
`/usr/cluster/bin/clquorumserver clear -c clustername -I clusterID [ -y ] quorumserver`  
`/usr/cluster/bin/clquorumserver show [ + | quorumserver... ]`  
`/usr/cluster/bin/clquorumserver start + | quorumserver...`  
`/usr/cluster/bin/clquorumserver stop + | quorumserver...`

**Description** Use the clquorumserver command for the following tasks:

- to clean up stale configuration information of one or more quorum servers
- to display the configuration of one or more quorum servers
- to start one or more quorum servers
- to stop one or more quorum servers

The clqs command is the short form of the clquorumserver command. You can use either form of the command.

The general form of this command is as follows:

`clquorumserver [subcommand] [options]`

You can omit *subcommand* only if *options* specifies the `-?`, `-v`, or `-V` options.

The quorum server must be configured as a quorum device for the cluster. For information about configuring the quorum server, see [scqsd.conf\(4\)](#) and [scqsd\(1M\)](#). For information about adding a quorum\_server type of quorum device to the cluster, see [clquorum\(1CL\)](#).

**Subcommands** The following subcommands are supported:

#### **clear**

Removes outdated cluster information from the quorum server. The quorum server keeps information about the cluster which it serves as a quorum device. This information can become invalid in the following circumstances:

- When a cluster is decommissioned without first removing the cluster quorum device 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 server is not yet removed from the cluster, using this subcommand to clean up a valid quorum server could compromise the cluster quorum.

You must specify the cluster name and cluster ID for a particular quorum server. See the `-c` and `-I` options for details.



Users other than superuser require `solaris.cluster.admin` RBAC authorization to use this subcommand. See `rbac(5)` for more information.

#### show

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

You can use the plus sign (+) to specify more than one quorum server.

If no operand is given, or if the plus sign (+) is specified with the operand, the command prints the configuration of all running quorum servers.

Users other than superuser require `solaris.cluster.read` RBAC authorization to use this subcommand. See `rbac(5)` for more information.

#### start

Starts the quorum server

#### stop

Stops the quorum server

**Options** The following options are supported:

- ?

--help

Prints help information.

This option can be used alone or with a subcommand.

- If you use this option alone, the list of available subcommands is printed.
- If you use this option with a subcommand, the usage options for that subcommand are printed.

When this option is used, no other processing is performed.

-c *clustername*

--clustername *clustername*

Specifies the name of the cluster that uses the quorum server as a quorum device. You can get the cluster name by running some Sun Cluster commands on the cluster nodes, such as `cluster show`.

This option is required with the `clear` subcommand.

-I *clusterID*

--clusterID *clusterID*

Specifies the cluster ID. The cluster ID is an 8-digit hexadecimal number. You can get the cluster ID by running some Sun Cluster commands on the cluster nodes, such as `cluster show`.

This option is required with the `clear` subcommand.

-V

--version

Prints the version of the command.

Do not specify this option with subcommands, operands, or other options. The subcommand, operands, or other options are ignored. The -V option only prints the version of the command. No other operations are performed.

-v

---verbose

Prints verbose information to standard output, stdout.

You can specify this option with any form of this command.

-y

--yes

This option is only used with the `clear` subcommand. It pre-answers the confirmation question that is prompted by `clear` subcommand. Without this option, the `clear` subcommand asks a question to confirm whether you want to clean up the cluster information, and you need to answer yes or no. The subcommand only continues processing if you answer yes. When use this option, the `clear` subcommand will not ask any confirmation question, and instead directly removes the cluster information for the specified quorum server.

**Operands** The following operand is supported:

*quorumserver*

Specifies an identifier for the quorum server or servers. A quorum server can be identified by either 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 can be specified in the quorum server configuration file, `/etc/scqsd/scqsd.conf`. See [scqsd.conf\(4\)](#).

**Exit Status** If the command is successful for all specified operands, it returns zero (CL\_NOERR). If an error occurs for an operand, the command processes the next operand in the operand list. The returned exit code always reflects the error that occurred first.

The following exit values are returned:

0 CL\_NOERR

No error

The command that you issued completed successfully.

1 CL\_ENOMEM

Not enough swap space

A cluster node ran out of swap memory or ran out of other operating system resources.

3 CL\_EINVAL

Invalid argument

You typed the command incorrectly, or the syntax of the cluster configuration information that you supplied with the `-i` option was incorrect.

**6 CL\_EACCESS**

Permission denied

The object that you specified is inaccessible. You might need superuser or RBAC access to issue the command. See the `su(1M)` and `rbac(5)` man pages for more information.

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```

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The following command displays the configuration information of all running quorum servers.

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```

**EXAMPLE 4** Starting Quorum Servers

The following command starts all the configured quorum servers.

```
# clquorumserver start +
```

The following command starts a quorum server that is listening on port 9000.

```
# clquorumserver start 9000
```

The following command starts the quorum server instance qs1.

```
# clquorumserver start qs1
```

**EXAMPLE 5** Stopping a Quorum Server By Port Number

The following command stops a quorum server that is listening on port 9000.

```
# clquorumserver stop 9000
```

**EXAMPLE 6** Cleaning Up Outdated Cluster Information From the Quorum Server

This example removes information about the cluster named `sc-cluster` from the quorum server.

Use caution when unconfiguring a quorum server in this way. Generally, you should use `clquorum remove` to remove the quorum server device from cluster configuration and clean up the configuration information on the quorum server in a single set. You should only need to use this command if communications were lost between the cluster and the quorum server host during the `clquorum remove` operation.

```
# 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)

**Attributes** See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Availability	SUNWscu
Interface Stability	Evolving

**See Also** `Intro(1CL)`, `clquorum(1CL)`, `cluster(1CL)`, [scqsd\(1M\)](#), [scqsd.conf\(4\)](#).

**Notes** The superuser can run all forms of this command.

Any user can run this command with the following options:

- `-?` (help) option

- -V (version) option

To run this command with other subcommands, users other than superuser require RBAC authorizations. See the following table.

Subcommand	RBAC Authorization
clear	solaris.cluster.admin
show	solaris.cluster.read
start	solaris.cluster.admin
stop	solaris.cluster.admin



( REFERENCE  
SC32QS 1m

**Name**    `scqsd` – quorum server daemon

**Synopsis**    `/usr/cluster/lib/sc/scqsd [-i instance] [-p port-number] [-d quorum-directory]`

**Description**    The `scqsd` daemon starts automatically when the node is booted. Installing the `SUNWscqs` package sets up a startup file, `/etc/scqsd/scqsd.conf`, which contains information for starting a single quorum server using default values. See the `scqsd.conf(4)` man page for the format of this configuration file. Installing the package also adds an entry to the `/etc/services` file. This entry specifies the default port number to be used by the quorum server. If you need multiple quorum servers on the same machine, then create one entry per instance in the `/etc/scqsd/scqsd.conf` file.

You specify options such as port number and quorum directory in the configuration file. To start multiple quorum servers, you must provide at least a unique port number and a unique quorum directory for each instance of the quorum server.

The use of a startup file enables administrators to start and stop different instances of the quorum server through a single script. For details about starting and stopping the daemon on the command line, see the `clquorumserver(1CL)` man page.

**Examples**    **EXAMPLE 1** Starting a Quorum Server

The following command starts a quorum server listening on port 2000.

```
# clquorumserver start 2000
```

**EXAMPLE 2** Stopping All Quorum Servers

The following command stops all configured quorum servers.

```
# clquorumserver stop
```

**Exit Status**    The following exit values are returned:

- 0                      The command completed successfully.
- nonzero                An error occurred.

**Attributes**    See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Availability	SUNWscqs
Stability	Deprecated

**See Also**    `Intro(1CL)`, `clquorumserver(1CL)`, `scconf_quorum_dev_quorum_server(1M)`, `scqsd.conf(4)`



( R E F E R E N C E  
SC32QS 4

**Name** scqsd.conf – startup file for the quorum server

**Synopsis** /etc/scqsd/scqsd.conf

**Description** The /etc/scqsd/scqsd.conf file contains information that allows the clquorumserver command to manage quorum server instances on a machine. Each line in this file has the following format:

```
full-path-to-quorum-server-binary [-i instancename] [-p portname] [-d quorumdirectory]
```

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

See [scqsd\(1M\)](#) for information about specific options.

**Examples** EXAMPLE 1 Initial scqsd.conf File

The following screen shows the default contents of the configuration file.

```
#Copyright 2005 Sun Microsystems, Inc. All rights reserved.
#Use is subject to license terms.
#
#ident "@(#)scqsd.conf 1.4 05/10/10
#
#This is the startup for for Quorum Server daemons.
#Each line in the file starts up an instance of the quorum server
#daemon. The command must have the following format:
#
#full-parth-to-quorum-server-binary 9-i instancename] [-p [port] \
# [-d quorumdirectory]
#
#The minimum requirement to start multiple quorum servers is to
#speciry a unique port and a unique quorum directory for
#each quorum server instance.
#
#To configure more instances, add commands to this file.
#Lines beginning with a # are treated as comments and ignored.
#
/usr/cluster/lib/sc/scqsd -d /var/scqsd -p 9000
```

**See Also** [scqsd\(1M\)](#), [clquorumserver\(1CL\)](#)

**Attributes** See [attributes\(5\)](#) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Availability	SUNWscqs
Stability	evolving

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