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HPE Serviceguard Quorum Server for Linux Version A.12.30.10 Release Notes

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HPE Serviceguard Quorum Server for Linux version A.12.30.10 Release Notes

Supported Platforms

HPE Serviceguard Quorum Server for Linux is available on the following Linux distributions:

- Red Hat Enterprise Linux 6
- Red Hat Enterprise Linux 7
- SUSE Linux Enterprise Server 11
- SUSE Linux Enterprise Server 12

NOTE: For more information about supported Serviceguard quorum server version and operating system on which the quorum server can run, see the latest version of *HPE Serviceguard Quorum Server Compatibility Matrix* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

For information about system requirements and recommendations, see **Compatibility and installation requirements** on page 7.

Announcements

This edition of the release notes provides information about Quorum Server for Linux version A.12.30.10 and is supported for Serviceguard cluster on HP-UX.

Heartbeat based Smart Quorum

Serviceguard on HP-UX patch PHSS_44778 provides enhanced Smart Quorum feature to handle the quorum grant requests between the nodes of a cluster and the quorum server. This enhanced quorum protocol, which is also referred to as Heartbeat based Smart quorum, provides quorum grant to a node in a two node cluster which has superior heartbeat network health status over the other node.

For more information about how to use Heartbeat based Smart Quorum and its parameter, see *Managing HPE Serviceguard A.12.30.10 for Linux* available at <http://www.hpe.com/info/linux-serviceguard-docs> and **About the heartbeat-based Smart Quorum parameters** on page 11.

Features supported in earlier versions

Features supported in A.12.00.30

Serviceguard Quorum Server for Linux Version A.12.00.30 provides the following feature:

Support for Smart Quorum

Serviceguard for Linux 12.00.30 introduces Smart Quorum feature to handle the quorum grant requests between the nodes of a cluster and the quorum server. This new approach is introduced to increase the availability of critical workloads which can be deployed only in clusters configured with site-aware failover capability. For more information on how to use Smart Quorum and its parameter, see *Managing HPE Serviceguard A.12.00.30 for Linux* available at <http://www.hpe.com/info/linux-serviceguard-docs> and **About the Smart Quorum parameters** on page 11.

NOTE: This feature can be used only with HPE Serviceguard for Linux Enterprise bundle and when you configure site-aware Serviceguard cluster with sites.

Cluster name restrictions

The following characters must not be used in the cluster name if you are using the Quorum Server: at-sign (@), equal-sign (=), or-sign (!), semicolon (;).

These characters are deprecated, meaning that you must not use them even if you are not using the Quorum Server, because they will be illegal in a future Serviceguard release. Future releases will require the cluster name to:

- Begin and end with an alphanumeric character
- Otherwise use only alphanumeric characters, or dot (.), hyphen (-), or underscore (_).

△ CAUTION: Make sure that each cluster served by a given Quorum Server has a unique cluster name. Serviceguard normally enforces this, but under some circumstances (for example if the clusters are on different subnets) Serviceguard will not be able to detect a duplicate name. See also **Network recommendations** on page 8.

Using this version

For support information, see **Compatibility with Serviceguard versions** on page 8; for instructions, see **Configuring and running the Quorum Server** on page 14.

Getting the software

This version of the release is available only on the DVD for Red Hat Enterprise Linux 7 and SUSE Linux Enterprise Server 12. For Red Hat Enterprise Linux 6 and SUSE Linux Enterprise Server 11 SP3 and SP4, HPE Serviceguard Quorum Server for Linux version 12.10.00 is available as patch.

For more information about the patch and its installation, see the following documents available at **<http://www.hpe.com/info/linux-serviceguard-docs>**:

- HPE Serviceguard for Linux Base Version Release Notes
- HPE Serviceguard for Linux Advanced Version Release Notes
- HPE Serviceguard for Linux Enterprise Version Release Notes

Further information

The most recent versions of user's guides, release notes, and white papers about Serviceguard and related topics are available at **<http://www.hpe.com/info/linux-serviceguard-docs>**.

For a current list of patches, known problems, and workarounds, contact your Hewlett Packard Enterprise support representative or go to the Hewlett Packard Enterprise Support Center website: **<http://www.hpe.com/support/hpesc>**.

What is the Quorum Server?

Serviceguard cluster products are specialized facilities for protecting mission-critical applications from a wide variety of hardware and software failures. The Serviceguard Quorum Server provides arbitration services for Serviceguard clusters when a cluster partition is discovered: must equal-sized groups of nodes become separated from each other, the Quorum Server allows one group to achieve quorum and form the cluster, while the other group is denied quorum and cannot start a cluster.

NOTE:

In Serviceguard for Linux 12.00.30, a new feature called “Smart Quorum” is introduced to handle the split-brain failure scenario. By default, Smart Quorum feature is disabled. For information about Smart Quorum feature, see [Features supported in A.12.00.30](#) on page 5.

How the Quorum Server works?

The Quorum Server runs on an Linux system **outside of the cluster for which it is providing quorum services**.

Within the restrictions specified under [Compatibility and installation requirements](#) on page 7, a Quorum Server running on Linux can serve a Serviceguard for Linux cluster, HP-UX Serviceguard cluster, or a combination of clusters of both types.

The Quorum Server uses TCP/IP, and listens to connection requests from the Serviceguard nodes on port # 1238. The server maintains a special area in memory for each cluster; when a node obtains the cluster lock, this area is marked so that other nodes will recognize the lock as “taken.”

In recent versions of Serviceguard, you can configure more than one connection between the Quorum Server and each cluster node; see [Compatibility with Serviceguard versions](#) on page 8 and [Using alternate subnets](#) on page 12.

NOTE:

The difference between Serviceguard A.11.19 and the earlier versions that support an alternate-subnet connection is that in the earlier versions, the alternate connections are serialized; if the first connection fails, the node will attempt to connect to the Quorum Server on the alternate subnet. In A.11.19 the connections are created in parallel, improving availability; if one connection fails, the other is still active.

You can make the Quorum Server highly available by configuring it as a Serviceguard package, so long as the package runs outside the cluster the Quorum Server serves; see [Creating a package for the Quorum Server](#) on page 15.

You can also configure any two Serviceguard clusters to provide quorum services for each other; for more information, see the white paper, *Cross-cluster Quorum Server Configurations* at www.hpe.com/info/hpux-serviceguard-docs -> HPE Serviceguard Quorum Server Software.

If the Quorum Server is not available or reachable, it will not adversely affect any clusters using it, unless a cluster needs to reform and requires the Quorum Server’s arbitration to do so.

You can change from one quorum server to another, or to or from another quorum method, while the cluster is running.

! **IMPORTANT:**

For more information, see “What Happens when You Change the Quorum Configuration Online” in Chapter 3 of *Managing HPE Serviceguard A.12.00.30 for Linux* manual.

Compatibility and installation requirements

Compatibility with Serviceguard versions

This version of the Quorum Server supports:

Serviceguard clusters running Serviceguard A.11.20 or later on supported Red Hat, Oracle Linux, or SUSE Linux distributions.

For complete compatibility information, see the latest version of *HPE Serviceguard Quorum Server Compatibility Matrix* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Hardware requirements

For more information about hardware requirements, see the latest version of **HPE Serviceguard for Linux Certification Matrix** at <http://www.hpe.com/info/sglx>.

Memory and disk requirements

Memory: 7.0 MB

Disk space: 1 MB

Network recommendations

- Ideally the Quorum Server and the cluster or clusters it serves must communicate over a subnet that does not handle other traffic. (If you are using a version of Serviceguard that supports more than one subnet for communication with the Quorum Server, this must be true for all subnets.) This helps to ensure that the Quorum Server is available when it is needed.

If this is not practical, or if the communication must cover a long distance (for example, if the Quorum Server is serving an Extended Distance cluster) heavy network traffic or network delays could cause Quorum Server timeouts. You can reduce the likelihood of timeouts by increasing the Quorum Server timeout interval; use the `QS_TIMEOUT_EXTENSION` parameter in the cluster configuration file. See [Configuring Serviceguard to use the Quorum Server](#) on page 10 and [Setting Quorum Server parameters in the cluster configuration file](#) on page 12.

- If a subnet that connects the Quorum Server to a cluster is also used for the cluster heartbeat, configure the heartbeat on at least one other network, so that both Quorum Server and heartbeat communication are not likely to fail at the same time.

Installing the Quorum Server

Read the release notes before installing the Quorum Server. The Quorum Server software, which must be running during cluster configuration, must be installed on a system other than the nodes on which your cluster will be running. This could be a single Linux system, or it could be a separate cluster. If you are updating from an older version of Quorum Server, see the instructions below.

IMPORTANT:

Order is important if you are updating Quorum Server and also updating Serviceguard. You must update Quorum Server before updating Serviceguard. See the instructions below.

Installing on Linux

See *HPE Serviceguard Quorum Server Compatibility Matrix* for the Supported Linux versions. Before installing, you can see the complete version name in the file name; after installing, you can get it by using the command `rpm -q qs`.

Procedure

1. Download the appropriate quorum server version from the DVD.
2. Install the rpm using the following command:
3. `#rpm -ivh <serviceguard-qs rpm>`

For example:

- On Red Hat 7:
`rpm -ihv serviceguard-qs-A.12.00.30-0.rhel7.x86_64.rpm`
- On Oracle Linux 7:
`rpm -ihv serviceguard-qs-A.12.40.00-0.ol7.x86_64.rpm`
- On SUSE 12:
`rpm -ihv serviceguard-qs-A.12.00.30-0.sles12.x86_64.rpm`
- On Red Hat 5:
`rpm -ihv serviceguard-qs-A.12.00.00-0.rhel5.x86_64.rpm`
- On Red Hat 6:
`rpm -ihv serviceguard-qs-A.12.00.00-0.rhel6.x86_64.rpm`
- On SUSE 11:
`rpm -ihv serviceguard-qs-A.12.00.00-0.sles11.x86_64.rpm`

The Quorum Server executable file, `qs`, is installed on Red Hat or Oracle Linux in the `/usr/local/qs/bin` directory, and on SUSE in the `/opt/qs/bin` directory.

When the installation is complete, you need to create an authorization file on the server where the Quorum Server will be running, to allow specific host systems to obtain quorum services. See [Creating and updating the authorization file](#) on page 17.

Now create a directory for the Quorum Server log file. The recommended pathnames are in Table 2 page 13. (You may need to create the directory.)

Updating the Quorum Server

You can upgrade Quorum Server even if the cluster is running, but the Quorum Server's tie-breaking services will not be available while the update is in progress (For more information, see [Replacing a failed Quorum Server system](#) on page 18).

CAUTION:

If you are updating Serviceguard as well, the Quorum Server update must be done **before** you update Serviceguard.

Updating the Quorum Server for RHEL 6

Procedure

1. Comment the Quorum Server entry in `/etc/inittab` and run the following command: `/sbin/init q`
2. If you install the version of Quorum Server A.12.00.00 or later appropriate to your distribution and hardware. For example:

```
rpm -Uvh serviceguard-qs-A.12.00.30-0.rhel6.x86_64.rpm
```
3. Uncomment the entry you commented out in `/etc/inittab`.
4. Re-start the Quorum Server:
`upstart` on RHEL 6

Updating the Quorum Server for SUSE 11

An update can be done while the cluster is running.

If you are updating Serviceguard as well, the Quorum Server update must be done **before** you update Serviceguard.

Procedure

1. Comment the Quorum Server entry in `/etc/inittab` and run the following command:
`/sbin/init q`
2. If you install the version of Quorum Server A.12.00.00 or later appropriate to your distribution and hardware. For example:

```
rpm -Uvh serviceguard-qs-A.12.30.00-0.sles11.x86_64.rpm
```
3. Uncomment the entry you commented out in `/etc/inittab`.
4. Restart the Quorum Server:
`/sbin/init q`

Updating the Quorum Server (for RHEL7 and SUSE12)

Run the following commands to update the Quorum Server for RHEL7 and SUSE12 operating systems:

Procedure

1. Stop the quorum service.
`systemctl stop qs.service`
2. Update the Quorum Server.
`rpm -Uvh <serviceguard-qs rpm>`
3. Start the quorum service
`systemctl start qs.service`

Configuring Serviceguard to use the Quorum Server

About the QS polling interval and timeout extension

Serviceguard probes the Quorum Server at intervals determined by the `QS_POLLING_INTERVAL` parameter in the cluster configuration file. The default value for `QS_POLLING_INTERVAL` is 5 minutes and the minimum value is 10 seconds.

If the quorum server process goes down while its node is still up, the Serviceguard cluster nodes can detect the halt in the quorum server process. Serviceguard will try to reconnect to the quorum server every 10 seconds until the quorum server is back up and the connection is successful. If the quorum server is needed as a tie-breaker during this downtime, the cluster will halt.

However, Serviceguard cannot immediately detect the loss of connection to the process if the quorum server's node goes down. Serviceguard will continue to poll at the configured interval, and will not discover that the quorum server connection is down until the next polling is done. If a cluster reformation starts before the next polling has occurred, Serviceguard assumes the Quorum Server is down. Because it requires the Quorum Server as a tie-breaker, it will halt the cluster. (Even if the Quorum Server comes back up before or during reformation, Serviceguard will not know that it has until the next polling.)

Reducing the `QS_POLLING_INTERVAL` means Serviceguard will detect Quorum Server failures sooner, but it will also increase the load on the Quorum Server. If you set a short interval, you may have to reduce the number of clusters or nodes using the Quorum Server to reduce the load. Test very low settings carefully to fine-tune all timing parameters, and do the tests in an environment that imitates the actual production environment as closely as possible.

You can use the optional `QS_TIMEOUT_EXTENSION` to increase the time interval (in microseconds) after which the current connection (or attempt to connect) to the quorum server is deemed to have failed; see [Network recommendations](#) on page 8 and [Setting Quorum Server parameters in the cluster configuration file](#) on page 12.

About the Smart Quorum parameters

With Serviceguard for Linux A.12.00.30, a new parameter `QS_SMART_QUORUM` is introduced that is part of the cluster configuration file.

For more information about Smart Quorum, see *Managing HPE Serviceguard for Linux* at <http://www.hpe.com/info/linux-serviceguard-docs>.

QS_SMART_QUORUM

This `QS_SMART_QUORUM` parameter can be set to either ON or OFF. By default, `QS_SMART_QUORUM` parameter is commented. This can be enabled only in a site-aware cluster (that is, where sites are configured). If `QS_SMART_QUORUM` parameter is enabled (ON), then quorum server decides which site will survive in an event of a split between the sites based on the workload status information. In case of network partition between the sites, Smart Quorum grants quorum to the site that is running the critical workload. Thus, it avoids unnecessary failover of application. Also, this feature supports the deployment of asymmetric configurations where the two sites can have unequal number of nodes.

NOTE: Serviceguard Quorum Server for Linux Version A.12.00.30 can support clusters that have Smart Quorum feature `QS_SMART_QUORUM` either enabled or disabled.

About the heartbeat-based Smart Quorum parameters

With Serviceguard on HP-UX patch PHSS_44778, a new parameter `QS_HB_HEALTH` is introduced that is part of the cluster configuration file.

QS_HB_HEALTH

Heartbeat-based quorum mechanism allows the quorum server to consider the heartbeat health status of cluster nodes while resolving split-brain situation. When enabled, the node with healthy heartbeat network

will survive over the other node, and heartbeat health status gets the highest preference during arbitration. By default, the `QS_HB_HEALTH` feature is disabled.

QS_ARBITRATION_WAIT

You can use `QS_ARBITRATION_WAIT` parameter when either `QS_SMART_QUORUM` or `QS_HB_HEALTH` parameters are enabled. This parameter sets the time (in microseconds) for which quorum server will wait for both the nodes or sites to send their quorum grant request along with workload or heartbeat health status. By default, `QS_ARBITRATION_WAIT` parameter is disabled. The default value for `QS_ARBITRATION_WAIT` is 3 seconds. The maximum supported value is 5 minutes.

Using alternate subnets

Some versions of Serviceguard (see [Compatibility with Serviceguard versions](#) on page 8) support new functionality in the Quorum Server that allows you to configure more than one subnet on which communication between the Quorum Server and the cluster nodes can take place.

In this case, you configure a primary subnet (indicated by the `QS_HOST` parameter in the cluster configuration file) and a second subnet (indicated by `QS_ADDR` in the cluster configuration file).

Requirements for using alternate subnets

All of the following must be true in order for you to configure more than one subnet for communication between the Quorum Server and the cluster nodes:

- You must be running a version of Serviceguard, and of Quorum Server, that support this capability. See [Compatibility with Serviceguard versions](#) on page 8 , and [Compatibility and installation requirements](#) on page 7.
- All of the cluster nodes must be able to communicate with both of the Quorum Server subnets when you configure or reconfigure the cluster.If this is not true when you run `cmquerycl`,`cmcheckconf`, or `cmapplyconf` , the command will fail.
- Both of the IP addresses specified for the Quorum Server must map to the same Quorum Server.
- The authorization file must specify all the addresses from which the cluster nodes will communicate with the Quorum Server. See [Creating and updating the authorization file](#) on page 17 .

Setting Quorum Server parameters in the cluster configuration file

❗ **IMPORTANT:** If you will be using an IPv6 subnet or subnets for communication between the Quorum Server and a Serviceguard A.11.19 cluster, and you have not applied the July 2009 patch to Serviceguard A.11.19, follow the instructions under [Configuring IPv6 addresses without the July 2009 patch](#) on page 14 to generate the cluster configuration file. Read the remainder of this section first.

You need to set values for Quorum Server parameters in the cluster configuration file. Use a command such as the following (all on one line) to obtain a cluster configuration file that includes Quorum Server parameters:

```
cmquerycl -q <QS_Host> -n <Node1> -n <Node2> -C <ClusterName>.conf
```

NOTE: If you are using a version of Serviceguard that supports alternate subnets (see **Compatibility with Serviceguard versions** on page 8), you can specify a second hostname or IP address in the `-q` option (all one line):

```
cmquerycl -q <QS_Host> <QS_Addr> -n <Node1> -n <Node2> -C  
<ClusterName>.config
```

`QS_Host` and `QS_Addr` can each be either a fully qualified hostname or an IP address.

The setting of the `HOSTNAME_ADDRESS_FAMILY` parameter in the cluster configuration file constrains the type of address(es) you can use for the Quorum Server connection:

- If `HOSTNAME_ADDRESS_FAMILY` is set to `IPV4`, the connection (or both connections if `QS_ADDR` is used) must be IPv4.
- If `HOSTNAME_ADDRESS_FAMILY` is set to `IPV6`, the connection (or both connections if `QS_ADDR` is used) must be IPv6.
- If `HOSTNAME_ADDRESS_FAMILY` is set to `ANY`, each connection can be either IPv4 or IPv6.

The resulting file contains the `QS_HOST`, `QS_POLLING_INTERVAL`, and `QS_TIMEOUT_EXTENSION` parameters, and the `QS_ADDR` parameter if your version of Serviceguard supports it. In that case, the Quorum Server section of the file looks like this:

```
# for the quorum server timeout, enter  
# QS_HOST qs_host  
# QS_ADDR qs_addr  
# QS_POLLING_INTERVAL 120000000  
# QS_TIMEOUT_EXTENSION 2000000  
# QS_SMART_QUORUM OFF  
# QS_ARBITRATION_TIME 3000000  
QS_HOST          gf2_qs1  
QS_ADDR          15.106.73.114  
QS_POLLING_INTERVAL 300000000
```

If your version of Serviceguard supports alternate subnets, but you are working with an existing cluster configuration file that does not contain the `QS_ADDR` parameter, you can add this parameter, and its value, yourself.

You can use the optional `QS_TIMEOUT_EXTENSION` to increase the time interval (in microseconds) after which the current connection (or attempt to connect) to the quorum server is deemed to have failed; see **Network recommendations** on page 8.

NOTE: Increasing this value will increase the failover time accordingly; that is, if failover time is currently 30 seconds and you set `QS_TIMEOUT_EXTENSION` to one second, the failover time will increase to 31 seconds.

Setting Quorum Server parameters for IPv6 subnets

Serviceguard A.11.19 clusters support IPv6 addresses for both `QS_HOST` and `QS_ADDR`, but you must apply the July 2009 patch to Serviceguard A.11.19 if you want to supply IPv6 addresses, or hostnames that resolve only to IPv6 addresses, to `cmquerycl`. See the latest Serviceguard release notes for information about the patch.

Requirements for using IPv6 subnets

If you are using an IPv6 subnet, or subnets, to connect the Quorum Server to the cluster, make sure the following requirements are met:

- If the Quorum Server is on a different subnet from the cluster, you must use an IPv6–capable router.
- All the IPv6 addresses used by the cluster nodes to connect to the Quorum Server must be listed in the Quorum Server's authorization file. See **Creating and updating the authorization file** on page 17

These IPv6 addresses must also be resolvable on the Quorum Server.

! **IMPORTANT:** In the case of an IPv6–only Quorum Server, this means that the addresses **must** be listed in `/etc/hosts`, as you cannot use DNS or NIS for name resolution in an IPv6–only Serviceguard cluster. Similarly, in an IPv6–only cluster, the Quorum Server's IPv6 addresses must be listed in the cluster nodes' `/etc/hosts`.

See “About Hostname Address Families: IPv4-Only, IPv6-Only, and Mixed Mode” in Chapter 4 of *Managing Serviceguard* for more information.

Configuring IPv6 addresses without the July 2009 patch

If you have not applied the patch, you can still use IPv6 addresses, but you must generate the cluster configuration file using an IPv4 address, then edit it to supply the IPv6 address(es) you will actually use.

Proceed as follows to create two IPv6 connections to the Quorum Server if you **have not** applied the July 2009 Serviceguard patch:

Procedure

1. Make sure that there is at least one IPv4 address on the Quorum Server that can be reached by all the cluster nodes.
2. Generate the cluster configuration file; for example:
3. `cmquerycl -q <QS_Host> -n <Node1> -n <Node2> -C <ClusterName>.conf`
4. Edit the resulting file:
 - a. Change the value of the `QS_HOST` parameter to an IPv6 address, or a hostname that resolves to an IPv6 address.
 - b. Add the `QS_ADDR` parameter, and a second IPv6 address or hostname that resolves to an IPv6 address.
 - c. Change the value of `HOSTNAME_ADDRESS_FAMILY` to `ANY`.
5. Apply the new configuration.

Configuring and running the Quorum Server

- You can configure the Quorum Server as a monitored package in one Serviceguard cluster to provide quorum service to another Serviceguard cluster or clusters; see **Creating a package for the Quorum Server** on page 15 below.
- You can also configure the Quorum Server to run on a single system; see **Running the Quorum Server on a single system** on page 16 .

NOTE: The Quorum Server must be running during the following cluster operations:

- when the `cmquerycl` command is issued when there is a cluster re-formation
 - when the `cmapplyconf` command is issued
-

Creating a package for the Quorum Server

You can run the Quorum Server as a package in another cluster.

NOTE: The instructions and examples in this section are for creating a legacy package. Such packages are supported with all currently-supported versions of Serviceguard. For information on creating a modular package, supported as of Serviceguard A.11.18, see Chapter 6 of the latest version of *Managing Serviceguard* at <http://www.hpe.com/info/hpux-serviceguard-docs-> HPE Serviceguard>.

To configure the Quorum Server into a package with `Quorum Server` as the monitored service, do the following.

NOTE: If you have just installed the quorum server, or if you are adding new cluster nodes, or implementing the alternate-subnet functionality, you must update the authorization file before you run the package; see **Creating and updating the authorization file** on page 17.

1. Install the Quorum Server software on all nodes; see **Installing the Quorum Server** on page 8.
2. In the configuration directory (`$SGCONF`), create a subdirectory for the Quorum Server package, then change your working directory to it:

```
mkdir qs-pkg
```

```
cd qs-pkg
```

3. Create a package configuration file:

```
cmmakepkg -P qs-pkg.config
```

4. Edit the parameter values in the file as follows.

Table 1: Package configuration file parameters for `qs-pkg`

Parameter	Value
<code>PACKAGE_NAME</code>	<code>qs-pkg</code>
<code>PACKAGE_TYPE</code>	<code>FAILOVER</code>
<code>FAILOVER_POLICY</code>	<code>CONFIGURED_NODE</code>
<code>FAILBACK_POLICY</code>	<code>MANUAL</code>
<code>NODE_NAME</code>	<code>*</code>
<code>AUTO_RUN</code>	<code>YES</code>
<code>LOCAL_LAN_FAILOVER_ALLOWED</code>	<code>YES</code>
<code>NODE_FAIL_FAST_ENABLED</code>	<code>NO</code>
<code>RUN_SCRIPT</code>	<code>\$SGCONF/qs-pkg/qs-pkg.ct1</code>

Table Continued

Parameter	Value
<i>RUN_SCRIPT_TIMEOUT</i>	NO_TIMEOUT
<i>HALT_SCRIPT</i>	\$SGCONF/qs-pkg/qs-pkg.ctl
<i>HALT_SCRIPT_TIMEOUT</i>	NO_TIMEOUT
<i>SERVICE_NAME</i>	qs
<i>SERVICE_FAIL_FAST_ENABLED</i>	NO
<i>SERVICE_HALT_TIMEOUT</i>	10
<i>SUBNET</i>	If the Quorum Server connection is on a single subnet, specify the subnet here.

5. Create a control script in the same directory:

```
cmmakepkg -s qs-pkg.ctl
```

6. Edit the file using the parameters in the following table.

Table 2: Package control script parameters for qs-pkg

Parameter	Value
<i>IP[]</i>	IP address(es) to be used when accessing the Quorum Server. If you are using more than one subnet for communicate between the Quorum Server and the cluster nodes, make sure each address is on a different subnet.
<i>SUBNET[]</i>	Specify your subnet(s) here
<i>SERVICE_NAME[0]</i>	qs
<i>SERVICE_CMD[0]</i>	(>> Redirect file in this example shows recommended log pathnames) Red Hat, Oracle Linux: <code>/usr/local/qs/bin/qs >> /var/log/qs/qs.log 2>&1</code> SUSE: <code>/opt/qs/bin/qs >> /var/log/qs/qs.log 2>&1</code>
<i>SERVICE_RESTART</i>	"-R"

7. Update the authorization file if necessary.

See **Creating and updating the authorization file** on page 17.

8. Run the cluster and start the quorum server package.

Running the Quorum Server on a single system

Specifying a Log File

By default, Quorum Server logs are placed in the `/var/log/qs/qs.log` directory.

Running the Quorum Server

You must have root capability to run the Quorum Server. On a single system, configure the Quorum Server to start up when the system on where it is installed restarts or reboots. Create an entry such as the following in the `/etc/inittab` file:

- For RHEL 5 Linux:

```
qs:345:respawn:/usr/local/qs/bin/qs >> /var/log/qs/qs.log 2>&1
```

NOTE: Nothing has to be done on RHEL 6 systems for Quorum Server to start up when the system on which it is installed. As part of installation this is added to the “upstart.”

In RHEL 6, `init` from the `sysvinit` package has been replaced with “upstart”, an event-based `init` system. This system handles the starting of tasks and services during boot, stopping them during shutdown and supervising them while the system is running.”

With this `/etc/inittab` is deprecated.

- For SUSE Linux 11:

```
qs:345:respawn:/opt/qs/bin/qs >> /var/log/qs/qs.log 2>&1
```

- For RHEL 7 and SUSE Linux 12:

If quorum service must be started automatically as part of reboot of Quorum Server, enable the `qs` service by using the following command:

```
#systemctl enable qs.service
```

To run the service:

```
#systemctl start qs.service
```

On RHEL 5 and SUSE Linux 11, do the following:

1. Start the Quorum Server:

```
init q
```

2. Verify the Quorum Server is running by checking the `qs.log` file.

```
cat /var/log/qs/qs.log
```

The log must contain entries such as the following, indicating that the Quorum Server has started:

```
Oct 04 12:25:06:0:main:Starting Quorum Server
```

```
Oct 04 12:25:09:0:main:Server is up and waiting for connections at port 1238
```

Creating and updating the authorization file

The Quorum Server reads the authorization file when it starts up. You need to create the file, on the system(s) where the Quorum Server software resides, when you first install the Quorum Server, and update it when you add nodes to a cluster the Quorum Server serves, or add or change the IP addresses or hostnames by which the nodes communicate with the Quorum Server.

On a Red Hat Linux system or Oracle Linux system, it must be `/usr/local/qs/conf/qs_authfile`.

On a SUSE Linux system, it must be `/opt/qs/conf/qs_authfile`.

Enter into the file the fully-qualified hostnames, or IP addresses, of all the cluster nodes that will obtain quorum services from this Quorum Server. Use one line per node, for example:

```
ftsys9.localdomain.com  
ftsys10.localdomain.com
```

NOTE: If you are specifying an alternate subnet (for clusters running a version of Serviceguard that supports it, you must specify **both** IP addresses by which each node can be reached, for example:

```
ftsys9.localdomain.com
10.10.10.20 #alternate IP address on ftsys9
ftsys10.localdomain.com
10.10.10.21 #alternate IP address on ftsys10
```

To allow access by any system, enter a plus sign (+).

After modifying this file, you must force the Quorum Server to re-read it:

- Red Hat, Oracle Linux:
`/usr/local/qs/bin/qs -update`
- SUSE:
`/opt/qs/bin/qs -update`

! **IMPORTANT:**

If the Quorum Server serves a mixed-mode or IPv6-only cluster, make sure that all the IPv6 addresses from which cluster nodes can reach the Quorum Server are listed in the authorization file (or use the plus sign to allow access from any system). See also **Setting Quorum Server parameters for IPv6 subnets** on page 13 .

For more information about the authorization file, see the `qs (1)` man page.

Replacing a failed Quorum Server system

Use the following procedure to replace a defective Quorum Server system without changing the configuration of any cluster nodes.

1. Remove the old Quorum Server system from the network.
2. Set up the new system and configure it with the old Quorum Server's IP address(es) and hostname(s).

NOTE: If you have configured the cluster to communicate with the Quorum Server on more than one subnet, the new Quorum Server must be able to communicate with all cluster nodes on both subnets, using the same IP addresses as the old.

3. Install and configure the Quorum Server software on the new system.

Be sure to include in the new Quorum Server authorization file on all of the nodes that were configured for the old Quorum Server; see **Creating and updating the authorization file** on page 17.

4. Start the Quorum Server. For information on how to start the quorum server, see **Running the Quorum Server** on page 17. Refer to the `qs (1)` man page for more details.
5. All nodes in all clusters that were using the old Quorum Server will connect to the new Quorum Server. Use the `cmviewcl -v` command from any cluster that is using the Quorum Server to verify that the nodes in that cluster have connected to the Quorum Server.

6. The Quorum Server log file on the new Quorum Server will show a log message such as the following for each cluster that uses the Quorum Server:

```
Request for lock /sg/<ClusterName> succeeded. New lock owners: N1, N2
```

7. To check that the Quorum Server has been correctly configured and to verify the connectivity of a node to the Quorum Server, you can execute the following command from your cluster nodes as follows:

```
cmquerycl -q <QS_Host> -n <Node1> -n <Node2> ...
```

or (if you are using more than one subnet; see [Using alternate subnets](#) on page 12):

```
cmquerycl -q <QS_Host> <QS_Addr> -n <Node1> -n <Node2> ...
```

The command will output an error message if the specified nodes cannot communicate with the Quorum Server.

While the old Quorum Server is down and the new one is being set up, these things may happen:

- Commands:

```
cmapplyconf -C, cmquerycl -q and cmcheckconf -C not working.
```

- If there is a node or network failure that creates a 50-50 membership split, the Quorum Server will not be available as a tie-breaker, and the cluster will fail.

⚠ CAUTION: Make sure that the old system does not re-join the network with its old IP address(es).

Uninstalling the Quorum Server

To uninstall the Quorum Server on Linux, use the `rpm` command:

```
rpm -e serviceguard-qs-A.12.00.30-0
```

Patches, fixes, and known problems in this Version

This section describes patches that are required and known problems.

Patches

Apart from the patches mentioned in the *HPE Serviceguard Quorum Server Compatibility Matrix* available at <http://www.hpe.com/info/linux-serviceguard-docs> no other patches are needed for version A12.10.00 at the time of publication. Contact your Hewlett Packard Enterprise support representative for up-to-the-moment information. Patches can be created, superseded, or withdrawn at any time without notice. An updated list of patches is available at Hewlett Packard Enterprise Support Center website: <http://www.hpe.com/support/hpesc>

Known problems and limitations

Quorum Server sometimes fails to start on RHEL 7

Symptom

Quorum Server sometimes fails to start on RHEL 7 with the following error:

```
Could not set realtime priority to 94: rtn=-1 Operation not permitted
```

Cause

In certain scenarios, RHEL 7 is unable to run programs such as Quorum Server which requires to set Real-Time Scheduling.

Action

Complete the steps provided in the Red Hat knowledgebase article to resolve this issue.

<https://access.redhat.com/articles/3696121>

Documentation feedback

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