Symantec FileStore Replication Guide

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Table of Contents

Technical Support ........................................................................................................4

Chapter 1  Introducing Symantec FileStore file-level replication ........................................11
- About FileStore file-level replication ......................................................... 11
- FileStore Replication license ................................................................ 12
- How FileStore Replication works ............................................................ 12
- About setting up FileStore Replication between two clusters ............... 13

Chapter 2  Using the CLI .................................................................................. 15
- About user roles and privileges .............................................................. 15
- About using the FileStore command-line interface ............................. 16

Chapter 3  Setting up basic Symantec FileStore Replication between two clusters ........... 17
- Accessing the FileStore Replication commands .................................. 18
- Starting FileStore Replication ............................................................... 19
- Setting up communication between the source and destination clusters .................................................................................. 23
- Setting up the file systems to replicate .................................................. 29
- Scheduling the replication ...................................................................... 31
- Defining what will be replicated .............................................................. 33
- Confirming replication compatibility ...................................................... 34
- About resynchronizing a replication job ............................................... 35
- Resynchronizing a replication job ........................................................... 36
- About Local Replication Initialization .................................................. 36
- Performing Local Replication Initialization .......................................... 37
- Accessing file systems configured as replication destinations ............... 38
- Using the destination file system for other purposes ............................ 39
Chapter 4 Using Symantec FileStore Replication commands ................................................................. 41
  About accessing the FileStore Replication commands .......................................................... 41
  About the service commands ................................................................................................. 42
  Using the service commands ................................................................................................. 43
  About the configuration commands ...................................................................................... 44
  Using the configuration commands ...................................................................................... 45
  About the replication unit commands .................................................................................. 52
  Using the replication unit commands .................................................................................. 54
  About the schedule commands ............................................................................................. 56
  Using the schedule commands ............................................................................................. 58
  About the job commands ....................................................................................................... 61
  Using the job commands ....................................................................................................... 65

Index ............................................................................................................................................. 73
Introducing Symantec FileStore file-level replication

This chapter includes the following topics:

■ About FileStore file-level replication
■ FileStore Replication license
■ How FileStore Replication works
■ About setting up FileStore Replication between two clusters

About FileStore file-level replication

The FileStore Replication solution provides high performance, scalable (one-to-many) data replication and is ideal for use as a content distribution solution, and for use to create hot standby copies of important data sets.

FileStore Replication allows you to asynchronously replicate a file system from one node in a source cluster to another node in a destination cluster at regularly timed intervals. This allows for content sharing, replication, and distribution.

The FileStore Replication functionality allows episodic replication with a minimum timed interval update of fifteen minutes and no set maximum. Unlike many replication solutions, FileStore Replication also allows the destination file system to be online for reads while replication is active.

Major features of FileStore Replication include:

■ Online access (read-only) to replicated data.
Immediate read/write access to destination replicated data in the unlikely event that the source file system goes offline for a sustained period of time.

- Load balancing across jobs.
- Transport failover of replication service from one node to another.
- Unlimited simultaneous replication operations.

---

**Note:** The FileStore Replication feature is designed to copy file systems only between FileStore clusters. Replication can be used with a single cluster when both the source and destination file systems are present on the same cluster. You can set up Local Replication Initialization to save bandwidth during the first replication session. See “Performing Local Replication Initialization” on page 37. You can also use as many replication sessions as desired with this configuration to perform a local backup to disk.

---

You can perform FileStore Replication operations from either the FileStore CLI or the FileStore GUI.

For more information about using FileStore Replication operations using the FileStore GUI, see the Symantec FileStore Graphical User Interface Administrator’s Guide.

### FileStore Replication license

FileStore Replication is included in the Enterprise edition of FileStore. If you have the Standard edition, FileStore Replication is available as a separate feature with a separate license. Licensing is available on a per cluster basis, with both the source and destination clusters requiring an FileStore Replication license. For more details, please contact your Symantec account team, or visit the Symantec Technical Support Web site at: [www.symantec.com/techsupp/](http://www.symantec.com/techsupp/).

### How FileStore Replication works

FileStore Replication is an incremental file-level replication service that runs on top of the Cluster File System that is used by FileStore which is, in turn, based on the Veritas File System (VxFS). FileStore Replication uses two file system specific features: File Change Log (FCL) and Storage Checkpoint services, to retrieve file changes between replication periods.

For a given period, the FCL records every change made to the file system. By scanning the FCL, FileStore Replication quickly identifies the file(s) that have changed and generates the modified file list. This avoids the expensive file system
scanning that is normally associated with file-based replication, and which typically results in sub-optimal performance.

Next, FileStore Replication uses VxFS Storage Checkpoint's metadata comparison feature to retrieve the modified extent list of each changed file. It does not need to access the file data.

The FileStore Replication transport layer works in conjunction with, and interfaces to the well-known rsync remote file synchronization tool. Using this existing network transportation program makes the network configuration much easier in the enterprise domain: the Secure Socket Shell (SSH) port (22) required by rsync is opened by default on almost all enterprise firewalls. rsync is also a reliable solution for a low bandwidth or unreliable link environment.

**Note:** FileStore uses the rsync protocol to provide transportation of FileStore Replication encapsulated files. The use of rsync is not exposed in FileStore, and cannot be administered outside of the FileStore Replication feature set.

### About setting up FileStore Replication between two clusters

You run FileStore Replication between two FileStore clusters which will be referred as:

- **Source cluster** - where the data is being replicated from
- **Destination cluster** - where the data is being replicated to

FileStore Replication requires communication between both clusters. This communication occurs over TCP/IP Port 22 (SSH) so make sure that Port 22 is open across the network between the two clusters.

**Note:** Before you set up your clusters for replication, you must first identify which is the source cluster and which is the destination cluster. All of the operations are performed on the source cluster first.

To use FileStore Replication, you must first create an online file system on the FileStore source cluster and an online file system on the destination cluster.

**Note:** Assign a virtual IP (VIP) address to both the source and destination clusters. The FileStore Replication service requires VIP addresses not already in use for the two clusters to communicate.
The replication service can only be started after you bind a virtual IP address. To bind a virtual IP address, go to the Settings > Replication tab, and click the Bind button for the specified IP address, and enter the appropriate fields on the Bind VIP dialog.

This operation must be run on both the source and destination clusters.
Using the CLI

This chapter includes the following topics:

■ About user roles and privileges
■ About using the FileStore command-line interface

About user roles and privileges

The privileges within Symantec FileStore (FileStore) are based on what user role (Master, System Administrator, or Storage Administrator) has been assigned. Table 2-1 provides an overview of the user roles within FileStore.

Table 2-1 User roles within FileStore

<table>
<thead>
<tr>
<th>User role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master</td>
<td>Masters are responsible for adding or deleting users, displaying users, and managing passwords. Only the Masters can add or delete other administrators. A master can accomplish all commands and tasks that can be executed by the System and Storage Administrators.</td>
</tr>
<tr>
<td>System Administrator</td>
<td>System Administrators are responsible for configuring and maintaining the file system, NFS sharing, networking, clustering, setting the current date/time, and creating reports.</td>
</tr>
<tr>
<td>Storage Administrator</td>
<td>Storage Administrators are responsible for provisioning storage and exporting and reviewing reports.</td>
</tr>
</tbody>
</table>

The Support account is reserved for Technical Support use only, and it cannot be created by administrators. For more information, see the "Troubleshooting" chapter in the Symantec FileStore Command-Line Administrator’s Guide.
About using the FileStore command-line interface

You can enter FileStore commands on the system console or from any host that can access FileStore through a session using SSH.

FileStore provides the following features to help you when you enter commands on the command line:

- Command-line help by typing a command and then a question mark (?)
- Command-line manual (man) pages by typing `man` and the name of the command you are trying to find

Table 2-2  Conventions used in the FileStore online command-line man pages

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(pipe)</td>
</tr>
<tr>
<td>[ ] (brackets)</td>
<td>Indicates that the element inside the brackets is optional.</td>
</tr>
<tr>
<td>{ } (braces)</td>
<td>Indicates that the element inside the braces is part of a group.</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>Indicates a variable for which you need to supply a value. Variables are indicated in italics in the man pages.</td>
</tr>
</tbody>
</table>

To determine who can access the commands, refer to Table 2-3.

Table 2-3  Replication mode command access

<table>
<thead>
<tr>
<th>Replication mode commands</th>
<th>System Admin</th>
<th>Storage Admin</th>
<th>Master</th>
</tr>
</thead>
<tbody>
<tr>
<td>config</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>job</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>repunit</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>schedule</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>service</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Setting up basic Symantec FileStore Replication between two clusters

This chapter includes the following topics:

- Accessing the FileStore Replication commands
- Starting FileStore Replication
- Setting up communication between the source and destination clusters
- Setting up the file systems to replicate
- Scheduling the replication
- Defining what will be replicated
- Confirming replication compatibility
- About resynchronizing a replication job
- Resynchronizing a replication job
- About Local Replication Initialization
- Performing Local Replication Initialization
- Accessing file systems configured as replication destinations
- Using the destination file system for other purposes
Accessing the FileStore Replication commands

This chapter describes how to set up, configure, and enable basic FileStore Replication between two FileStore clusters.

You run FileStore Replication between two FileStore clusters which will be referred to as the source cluster and the destination cluster.

source                        The source is where the data is being replicated from.
destination                   The destination is where the data is being replicated to.

FileStore Replication requires communication between both clusters. This communication occurs over TCP/IP Port 22 (SSH) so ensure that port 22 is open across the network between the two clusters.

**Note:** The source and destination virtual IP addresses being used for replication between clusters must have port 22 access open between the source and destination.

The FileStore Replication top-level commands are listed in Table 3-1.

To access the FileStore Replication commands, log into your administrative console (master, system-admin, or storage-admin) and enter `Replication>` mode.

See “About using the FileStore command-line interface” on page 16.

**Table 3-1**   FileStore Replication commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>service</td>
<td>Starts, stops, and displays the status of the replication service.</td>
</tr>
<tr>
<td>config</td>
<td>Exports and imports the public keys and authenticates the destination cluster for replication service.</td>
</tr>
<tr>
<td>repunit</td>
<td>Creates, displays, and deletes the repunit definitions.</td>
</tr>
<tr>
<td>schedule</td>
<td>Creates, displays, modifies, and deletes replication schedules.</td>
</tr>
<tr>
<td>job</td>
<td>Creates, displays, modifies, disables, and destroys the job definitions.</td>
</tr>
</tbody>
</table>

Before using the FileStore Replication commands, make sure that the source and destination clusters are communicating with each other over the network. The
most common, and easiest way to verify communication, is to use the `ping` command included in the FileStore CLI.

**Starting FileStore Replication**

This section lists the specific commands needed to run FileStore Replication on your clusters.

See “About accessing the FileStore Replication commands” on page 41.

---

**Note:** Before you set up your clusters for replication, you must first identify which is the source cluster and which is the destination cluster. All of the commands below are performed on the source cluster first.

To use FileStore Replication, you must first create an online file system on the FileStore source cluster and an online file system on the FileStore destination cluster.

**Note:** Assign a virtual IP (VIP) address to both the source and destination clusters. The FileStore Replication service requires VIP addresses not already in use for the two clusters to communicate.
To start FileStore Replication on the source cluster

1. To bind a virtual IP address for the replication service on the source cluster, enter the following:

   Replication> config bind ip_addr [device]

   ip_addr Virtual IP address for the replication service on the source cluster.
   device Public network interface name that you want the replication IP address to use.

   For example:

   Replication> config bind 10.10.10.10
   Please wait...
   Completed

2. To start the replication service, enter the following on the source node:

   Replication> service start [nodename]

   where nodename is the name of the node in the local cluster where you want to start the replication service.

   For example:

   Replication> service start
   Please wait. Starting replication service...
   SFS replication SUCCESS V-288-0 Replication service started successfully.
   Replication>
To check the status of the replication service, enter the following:

```
Replication> service status
```

For example:

```
Replication> service status
Status : RUNNING
Replication>
```

To confirm the IP address is up and running, enter the following:

```
Replication> config show ip
```

For example:

```
Local cluster details:
==========================
Replication VIP : 10.10.10.10
Replication Device : pubeth0
Online On Node : sfs_01
Replication protocol version : 2.0
```

The definitions of the headings are as follows:

- **Replication Device**: Device that the replication service is currently using.
- **Online on Node**: Cluster node on which the replication service is currently running.
- **Replication Protocol Version**: Replication protocol version the cluster is currently using.
To start FileStore Replication on the destination cluster

1. To bind a virtual IP address for the replication service on the destination cluster, enter the following:

   Replication> config bind ip_addr [device]

   `ip_addr` Virtual IP address for the replication service on the source cluster.
   `device` Public network interface name that you want the replication IP address to use.

   For example:

   Replication> config bind 10.10.20.20
   Please wait...
   Completed

2. To start the replication service, enter the following on the destination node:

   Replication> service start [nodename]

   where `nodename` is the name of the node in the local cluster where you want to start the replication service.

   For example:

   Replication> service start
   Please wait. Starting replication service...
   SFS replication SUCCESS V-288-0 Replication service started successfully.
   Replication>
3 To check the status of the replication service, enter the following:

Replication> service status

For example:

Replication> service status
Status : Replication service RUNNING on node src_01
Replication>

4 To confirm that the IP address is up and running, enter the following:

Replication> config show ip

For example:

Local cluster details:
==========================
Replication VIP : 10.10.20.20
Replication Device : pubeth0
Online On Node : sfs_01
Replication protocol version : 2.0

The definitions of the headings are as follows:

Replication Device Device that the replication service is currently using.
Online on Node Cluster node on which the replication service is currently running.
Replication Protocol Version Replication protocol version the cluster is currently using.

You next need to set up communication between the source and destination clusters.

See “Setting up communication between the source and destination clusters” on page 23.

---

Setting up communication between the source and destination clusters

You need to set up communication between your source and destination clusters.

Make sure that you already created an online file system on the FileStore source cluster and an online file system on the FileStore destination cluster.
See “Starting FileStore Replication” on page 19.

FileStore Replication makes use of encrypted keys in order to authenticate the source and destination cluster. This section provides a walk-through for the creation and export/import of these encrypted keys for both the source and destination cluster.

In this release of FileStore Replication, it is possible to provide a third-party destination to act as an intermediary between nodes for the transfer of the encrypted keys.

**Note:** Without the correct authentication of source/destination encryption keys, FileStore Replication will not function correctly.
To configure the export keys on the source cluster

1. To configure the export keys on the source cluster, enter the following:

   Replication> config export_keys [URL]

   where the URL is the location you want to copy the public keys to.

   If you do not want to enter a URL, you can copy the output from the

   Replication> config export_keys command into the

   Replication> config import_keys command. The output will by default
   be displayed to your computer screen.

   The SCP and FTP protocols are supported.

   For example, if you entered a URL in the command:

   Replication> config export_keys scp://username@hostname:~/
   Password: ******
   SFS Replication SUCCESS V-288-0
   Key file SFSKEY_source_10.10.10.10_2009-05-29
   copied successfully at location username@hostname:~/

   For example, if you did not enter a URL in the command:

   Replication> config export_keys
   Displaying replication key. Please use this key with config
   import_keys command.

   ssh-rsa
   AAAAB3NzaC1yc2EAAAABIwAAAQEApUukbe8znGccz9V1UPTwn8JpbtntfQ2eJGQw
   Br0IrI6dYyxPVe1b2MhdkjiIwDoHybyYkS6YXHR5AFT+m2gociKIVygD1fJppip
   6YC1BqTa5h7eI89eRS85PCywEXhoMJoUS4cFzxT3ggAMH80eu3aiZHn+
   PAU7Tu0xpY1vpTOQ1X661GfbtdLp9ZNF+9qbt/x73yh09HjVCgeTBCmMHJzhrbNZ2/
   mK7XX8509pM/7y2xSwzCswamuauum3VZBpyX+uwQp/KyyrO5znAW5WU093myqy
   ShwJKujRWF02sIm6bvn8pIOzukMWx16etnsLippqtR4ED8SXIIW1A3JysXiXw==
   sfs-replication@source::source_10.209.105.236

   Config export keys command completed successfully
To configure the import keys on the destination cluster, enter the following:

```
Replication> config import_keys [URL/keyfile]
```

where the **URL** is the location you want to copy the public keys from and
**keyfile** is the filename of the key generated by the export.

For example:

```
Replication> config import_keys
scp://username@hostname:/SFSKEY_source_10.209.05.236_2009-05-29
Password: ******
SFS Replication SUCCESS V-288-1089 Config import keys command completed successfully
Key file SFSKEY_source_10.10.10.10_2009-05-29 copied successfully at location username@hostname:~/
```

If you did not enter a URL during the `Replication> config export_keys` command, you can cut and paste the output and enter it into the `Replication> config import_keys` command.

For example:

```
Replication> config import_keys
Enter replication key of remote cluster:: ssh-rsa
AAAAB3NzaC1yc2EAAAABIwAAAQEApUukbe8znGccz9V1UPTwn8JpbtnfQ2eJGQwBrOi16dYyxPVeIb2MhdkjiwwDoHybYS6YXHR5AFT+m2gociKVYgDlfJpplp6YC1BqTa5h7eII89eRS85PCYwEXhoMJoUS4cFxzT3qgAMH80eu3aiZHn+
PAU7Tu0xpY1vpTOQ1X661GfbtdLp9ZNF+9qbt/x73yh09HjVCgeTBeCMHJZhrbNZ2/mK7XX8509pM/7y2xSWzCswauaum3V2BpyX+uwQP/KyvrO5ZnAW5WUO93myqyShwJKujRFw02sIm6bvn8pI0ZukwMx16etnsLippqttR4ED8SXI1W1A3JysXiXw==
sfs-replication@source::source_10.209.105.236
Enter console IP address of remote cluster::10.209.105.236
SFS Replication SUCCESS V-288-1089 Config import keys command completed successfully
```

To verify the key has been imported correctly, enter the following:

```
Replication> config show
```

2

To configure the import keys on the destination cluster, enter the following:

```
Replication> config import_keys [URL/keyfile]
```

where the **URL** is the location you want to copy the public keys from and
**keyfile** is the filename of the key generated by the export.

For example:

```
Replication> config import_keys
scp://username@hostname:/SFSKEY_source_10.209.05.236_2009-05-29
Password: ******
SFS Replication SUCCESS V-288-1089 Config import keys command completed successfully
Key file SFSKEY_source_10.10.10.10_2009-05-29 copied successfully at location username@hostname:~/
```

If you did not enter a URL during the `Replication> config export_keys` command, you can cut and paste the output and enter it into the `Replication> config import_keys` command.

For example:

```
Replication> config import_keys
Enter replication key of remote cluster:: ssh-rsa
AAAAB3NzaC1yc2EAAAABIwAAAQEApUukbe8znGccz9V1UPTwn8JpbtnfQ2eJGQwBrOi16dYyxPVeIb2MhdkjiwwDoHybYS6YXHR5AFT+m2gociKVYgDlfJpplp6YC1BqTa5h7eII89eRS85PCYwEXhoMJoUS4cFxzT3qgAMH80eu3aiZHn+
PAU7Tu0xpY1vpTOQ1X661GfbtdLp9ZNF+9qbt/x73yh09HjVCgeTBeCMHJZhrbNZ2/mK7XX8509pM/7y2xSWzCswauaum3V2BpyX+uwQP/KyvrO5ZnAW5WUO93myqyShwJKujRFw02sIm6bvn8pI0ZukwMx16etnsLippqttR4ED8SXI1W1A3JysXiXw==
sfs-replication@source::source_10.209.105.236
Enter console IP address of remote cluster::10.209.105.236
SFS Replication SUCCESS V-288-1089 Config import keys command completed successfully
```

3

To verify the key has been imported correctly, enter the following:

```
Replication> config show
```
To configure the export keys on the destination cluster

1. To configure the export keys on the destination cluster, enter the following:

```
Replication> config export_keys [URL]
```

where the **URL** is the location you want to copy the public keys to.

The SCP and FTP protocols are supported.

If you do not want to enter a URL, you can cut and paste the output from the

```
Replication> config export_keys command to the
Replication> config import_keys command. The output will by default be displayed to your computer screen.
```

For example, if you entered a URL with the command:

```
Replication> config export_keys scp://username@hostname:~/
Password: ******
```

SFS Replication SUCCESS V-288-0

Key file SFSKEY_destination_10.182.107.133_2009-05-29
copied successfully at location username@hostname:~/

For example, if you did not enter a URL with the command:

```
Replication> config export_keys
Displaying replication key. Please use this key with config import_keys command.
```

```
ssh-rsa
AAAAB3NzaC1yc2EAAAABIBwAAAAEApUukbe8znGccz9V1UPTwn8JpbtnfQ2eJGQwBrOIr16dYyxPVe1b2MhdkjIwDoHytB6Yk6YXHR5AFT+m2gociKVYgD1fJpplp6YClBqTa5h7eI89eRS85PCywEXhoMjmoUS4cFxzT3gAMH80eu3ai2Hn+PAU7Tu0xpY1vpTOQ1X661GfbtdLp9ZNF+9qbt/x73yh09HjVCgeTBoMHJ2hrbNZ2/mK7XX8509pM/7yZxSwzMswamaum3VZBpyX+uwQp/Kyvr05ZnAW5WU093myqyShwJKujRWF02sIm6bvn8p10ZuwNxX16etnsLippqttR4ED8SX1W1A3JysXiXw==sfs-replication@source::source_10.182.107.133
```

Config export keys command completed successfully
2 To configure the import keys on the source cluster, enter the following:

```
Replication> config import_keys [URL/keyfile]
```

where the URL is the location you want to copy the public keys from and keyfile is the filename of the key generated by the export.

For example:

```
Replication> config import_keys
scp://username@hostname:~/SFSKEY_source_10.182.107.133_2009-05-29
Password: ******
SFS Replication SUCCESS V-288-1089 Config import keys command completed successfully
Key file SFSKEY_source_10.10.20.20_2009-05-29 copied successfully at location username@hostname:~/
```

If you did not enter a URL during the `Replication> config export_keys` command, you can cut and paste the output and enter it into the `Replication> config import_keys` command.

For example:

```
Replication> config import_keys
Enter replication key of remote cluster:: ssh-rsa
AAAAB3NzaC1yc2EAAAABIsAQEAPluukbe8znGccz9V1UPTwn8JpbntfQ2eJGQwBr0Ir16dYyxPVeIb2Mhdkj1iwDoHybYkS6YXHR5AFT+m2gociKgDifJppl
6YCIbxTa5h7eII89eRS85PCywEXhoMJoUS4cFxxT3gqAMH80eu3aiZH+n+
PAU7Tu0xpY1vpTOQ1X661GfbtdLp9ZNF+9qbt/x73yh09HjVgeTbcMHJZhrbNZ2/
mK7XX8509pM/7y2xSWzCswamaum3VZBpyX+uwQp/KyvRo5znAW5WU093myqyShwJKujRWF02sIm6bvn8pI0ZukwMx16etnsLippqttR4ED8SX11W1A3JysXiXw==
sfs-replication@destination::destination_10.182.107.133
```

Enter console IP address of remote cluster::10.182.107.133
SFS Replication SUCCESS V-288-1089 Config import keys command completed successfully

3 To verify the key has been imported correctly, enter the following:

```
Replication> config show
```
To authenticate source cluster and destination clusters for replication

1 This command should be executed only on the source cluster. To authenticate the public keys on the source cluster, enter the following:

```
Replication> config auth conIP link_name
```

- **conIP**: Enter the destination cluster console IP address.
- **link_name**: Both the source cluster and the destination cluster need to be assigned a unique identifier (name). This identifier is used to identify the link that is established between the source and destination clusters. You can use the link name instead of the virtual IP addresses of the source and destination clusters when using the other replication commands. For example: "Pune_Shanghai".

For example:

```
Replication> config auth 10.182.107.133 dest1
Authentication process going on. Please wait...
Authentication completed successfully
SFS Replication SUCCESS V-288-0
Config auth command completed successfully
```

2 To confirm the authentication, enter the following:

```
Replication> config show
```

<table>
<thead>
<tr>
<th>Link name</th>
<th>Remote cluster</th>
<th>ConsoleIP</th>
<th>Remote cluster Replication IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>dest1</td>
<td>10.182.107.133</td>
<td>10.10.20.20</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time of Key Import</th>
<th>Time of Authorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun Jul 12 04:02:05 UTC 2009</td>
<td>Sun Jul 12 04:02:57 UTC 2009</td>
</tr>
</tbody>
</table>

You next need to set up the file systems you want to replicate.

See “Setting up the file systems to replicate” on page 29.

Setting up the file systems to replicate

You need to set up the file systems you want to replicate using the `Replication> repunit` commands.
Make sure that you already set up communication between your source and destination clusters.

See “Setting up communication between the source and destination clusters” on page 23.

A single replication unit can span across multiple directories and multiple file systems.

A replication unit is defined as an ordered set of entries, where each entry is one of the following:

- A single file system
- A single subdirectory
- A single file

**Note:** The replication source has to be one of the entry types mentioned above. It cannot be a snapshot or a checkpoint (ckpt).

FileStore Replication requires that the source and destination replication units of a job definition have the same type of ordered entries, that is, every entry pair (one entry from the source and one entry from the destination replication unit) must be of a similar type.

Both could be files, or both could be directories, as shown in the following example:

<table>
<thead>
<tr>
<th>Replication unit Name</th>
<th>Replication unit Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>ru1</td>
<td>fs1,fs2/dir1,fs2/f1</td>
</tr>
<tr>
<td>ru2</td>
<td>fs4,fs6/dir2,fs5/f2</td>
</tr>
</tbody>
</table>

The entry is identified by the file system name, optionally followed by a slash ‘/’, followed by the path of the directory or the file inside the file system. Member entries are ordered inside a replication unit and such ordering information is used to determine the replication entity pair mapping from the source replication unit to the destination replication unit.

**Note:** The commands in this section apply only to the source replication unit.
To create a replication unit

1. To create a replication unit, enter the following:

   Replication> repunit create repunit_name
   repunit_entry[,repunit_entry,...]

   where the repunit_entry is either a file, folder, or directory.

   For example:

   Replication> repunit create ru3 fs1/dir1,fs2/dir2
   SFS Replication SUCCESS V-288-0
   Replication unit ru3 created successfully.
   Replication>

2. To confirm the creation of the replication unit, enter the following:

   Replication> repunit show
   Replication unit Name   Replication unit Entries
   =-----------------------=-------------------------=
   ru3                    fs1/dir1,fs2/dir2

   You next need to set up the schedule for the replication.
   See “Scheduling the replication” on page 31.

Scheduling the replication

You use the Replication> schedule commands to create a schedule for replicating files from the source to the destination cluster.

Make sure that you already set up the file systems you want to replicate.

See “Setting up the file systems to replicate” on page 29.
To create a replication schedule

- To create a replication schedule, enter the following:

```
Replication> schedule create schedule_name minute
              [hour] [day_of_the_month]
              [month] [day_of_the_week]
```

- `schedule_name`: Specify the name of the schedule to be created.
- `minute`: Enter a numeric value between 0-59, or an asterisk (*), which represents every minute. This variable is not optional.
- `hour`: Enter a numeric value between 0-23, or an asterisk (*), which represents every hour.
- `day_of_the_month`: Schedule the day of the month you want to run the replication. Enter a numeric value between 1-31, or an asterisk (*), which represents every day of the month.
- `month`: Schedule the month you want to run the replication. Enter a numeric value between 1-12, or an asterisk (*), which represents every month. You can also use the names of the month. Enter the first three letters of the month (not case sensitive).
- `day_of_the_week`: Schedule the day of the week you want to run the replication. Enter a numeric value between 0-6, or an asterisk (*), which represents every day of the week. Sunday is interpreted as 0. You can also enter the first three letters of the week (you must use lower case letters).

For example, to create a schedule where the replication job occurs every 30 minutes, enter:

```
Replication> schedule create s1 */30
Replication>
```

To display the list of schedules

- To display the schedule you have set up for replication, enter the following:

```
Replication> schedule show s1
```

```
Schedule Name    Minute    Hour    Day    Month    WeekDay
--------------- ------- ---- ---- ----- --------
s1              */30     *     *     *     *
```

You next need to define what will be replicated.
Defining what will be replicated

You use the Replication> job commands to set up a job definition. This defined job determines what is going to be replicated and when, using the settings from the previous commands.

Make sure that you created a schedule for replicating files from the source to the destination cluster.

See “Scheduling the replication” on page 31.
To set up the replication job

1. To set up the replication job, enter the following:

   Replication> job create job_name src_repunit_name
dest_repunit_name link_name [rep_schedule]

   For example:

   Replication> job create job1 ru1 ru2 Pune_Shanghai s1
   Completed successfully.

2. To enable the job, enter the following:

   Replication> job enable job_name

   For example:

   Replication> job enable job1
   SFS replication SUCCESS V-288-1303 Trying to enable job job1.
   Please check status of job after a few seconds.

3. To check if the job was enabled, enter the following:

   Replication> job show [job_name]

   For example:

   Replication> job show job1
   Jobname      Source wset   Destination wset   Link name
   =========    ===========   =============   =========
   job1        ru1           ru2            Pune_Shanghai

   Replication Freq    State
   =============      =====
   s1                Enabled

Confirming replication compatibility

Because replication always involves two separate FileStore clusters, the clusters may have different versions of FileStore replication software. To ensure replication compatibility, FileStore provides a replication protocol version to track any changes in source and destination interactions. Two different FileStore releases may have the same replication protocol version, provided replication source and destination messages have not changed.
To view the replication protocol version, use the `Replication> config show ip` command.

To check replication protocol version compatibility between the source and destination cluster, use the `Replication> config check linkname` command.

See “Using the configuration commands” on page 45.

About resynchronizing a replication job

The first time a replication job is run, FileStore makes a full copy of the data from the source location to the destination. Subsequent jobs (triggered manually or through a schedule) only copy incremental changes.

In certain rare cases, data is already present at the destination, but the replication cannot make the incremental changes. Examples of this situation include:

- When replication has not been run for several days or weeks, and the changes tracked by the VxFS file change log have been overwritten (or possibly corrupted). This log is required for replication.
- When a replication job is temporarily disabled and started again, the next job run will trigger a full copy of the data.
- When some changes have been made to the replication definition. For example an earlier replication consisted of `fs1/folder1` but you want to replicate data in `fs1/folder2` also. Because `fs1/folder2` requires a full copy, `fs1/folder1` will be copied once again, even though only incremental changes are needed.
- When the direction of the replication has to be reversed from destination to source. Even though most data is present at both the destination and the source, anytime you create a new job at the destination, a full copy is triggered automatically for the first replication.
- If the internal database for replications is accidently deleted by an administrator and no backup is available, creating a new job (even for an existing configuration) triggers a full copy.

In these cases, instead of waiting to initiate a full copy, you can use the `Replication > job resync` command to leverage the existing data at the destination and avoid requiring a full copy. The `Replication > job resync` command returns the replication job to a well-defined state and incremental replication can be used.

After you resync a job, the job is re-enabled and you can use the standard job trigger or replication schedules to trigger incremental replication.
Note: Resynchronization is only supported on enabled jobs. If you are not able to resume from a failed job and you want to use the Replication> job resync command to recover from this state, follow these steps. First, disable the job, then re-enable it. Then, use the Replication> job resync command to resynchronize the job.

Resynchronizing a replication job

To resynchronize an enabled replication job

- To resynchronize an enabled replication job, enter the following:

  Replication> job resync job_name

  where job_name is the name of the enabled replication job you want to resynchronize.

  For example:

  Replication> job resync job14
  Replication>

About Local Replication Initialization

Local replication initialization allows you to initialize replication locally to some locally-attached disk array, then physically transport the disk array to the location of the destination file server, and then resume replication over a network link once the replication is configured correctly.

Given that replicating an existing dataset can require delivering many terabytes of data to a remote site, physically transporting the disk array to a new location, then resuming the replication can save significant set up time and network costs.
Performing Local Replication Initialization

To perform local replication initialization

1. Define the set of disks, pools and file systems you want to use for the destination replication unit.

2. Create a link using the IP address of the local cluster console. This link acts as a local link and is used for local synchronization.
   
   At a later stage, after completion of local synchronization, you will replace this local link with a remote link.

3. Create a job using the local link and destination information you defined in the previous steps.

4. Enable the job and start the replication using a manual job trigger or a schedule-based replication.

5. After the files have been successfully copied to the destination file system, use the `Storage > pool detachset` command to detach the disks, pools, and destination file systems.
   
   This command will first unmount all the destination file systems and disable all associated replication jobs.

6. Physically transport the detached disks to the remote FileStore cluster.

7. Use the `Storage > pool attachset` command to attach the transported disks to the remote cluster.

8. Create a link between the source and remote destination cluster. Modify the job definition at the source to replace the local link with this newly-defined remote link.

9. Re-enable the replication job.

Details about using the `Storage> pool` commands are provided in the *FileStore Command Line Administrator's Guide*

---

**Note:**

The `Storage> pool attachset`, `detachset`, and `showdetached` commands should be used for local replication initialization only and not for other purposes.
Accessing file systems configured as replication destinations

File systems that are used as replication destinations are constantly being updated with changes sent by the source cluster. As a result, for customers who use data in a read-only manner at the destination, Symantec recommends using file system checkpoints as share exports for NFS.

After end of every replication session, a new checkpoint gets created which is a consistent point-in-time image that existed at the source cluster at start of replication session. The checkpoint mount point gets refreshed with the latest checkpoint, and the older checkpoints are deleted.

Because the mount point represents a new checkpoint after every session, this leads to a change in the file system identification portion of the NFS file handle that is exchanged with the NFS clients. Because the file system identification portion changes, older NFS file handles cached by the NFS clients won’t work with the new checkpoint at the NFS server (the FileStore cluster).

To avoid requiring NFS clients to remount, use the `fsid` option of the `NFS> share` command to export the checkpoint mount points that correspond to the replication destination. This allows you to associate a specific number as a file system ID with the share, instead of the file system ID that is generated by the NFS server using checkpoint, device-specific information.

For example, suppose the replication destination file system is named `fs1`, you want to export it using NFS, and you want to keep the file system ID as 25. Also, you have verified that no other file system has been NFS exported on the same cluster with a file system ID of 25.

- To export with the `fsid` option, enter the following:

  ```
  NFS> share add fsid=25,ro /vx/fs1
  Exporting /vx/fs1 with options fsid=25, ro..Success
  ```

- To verify the command, enter the following:

  ```
  NFS> share show
  /vx/fs1 * (fsid=25,ro)
  ```

For more information about using the `fsid` option of the `NFS> share` command, see the Symantec FileStore Command-Line Administrator’s Guide.
Using the destination file system for other purposes

In some cases, you may want to stop replicating data to a destination and use the replicated file system as a read-write file system for applications or to recover some data for the source files system.

The exact steps you take depend on the purpose, but here are some guidelines:

■ First, use the `Replication> job disable` command to disable the replication job and free the destination file system from replication control.
  If the source cluster is available (for example, in a planned, failover-to-destination situation), run the `Replication> job disable` command on the source cluster.
  If the source cluster is not available (for example, in a disaster situation), you can run the `Replication> job disable` command on the destination cluster.
  If you run the `Replication> job disable` command from the destination cluster, include both the `job_name` and the `link_name` to uniquely identify the job.
  See “Disabling a job on the destination cluster” on page 40.

■ Once the replication job is disabled, you can use the destination file system in read-write mode and export writable shares using NFS, CIFS, FTP, and so on.

If you do not want to use destination file system as primary file system, but you want to only restore a small number of files and directories from destination, the simplest approach is to SCP the file from the destination to the restore target. In this case, it does not matter whether the original replication job is enabled or disabled.

When you want to restore large amounts of data (or the entire file system) at the source using the destination file system, do the following:

■ Disable and destroy the original replication job.

■ Create a new replication job using the old destination as the new source and use the old source as the new destination.

■ Enable the new job, then use the `Replication> job resync` command (or the `Replication> job trigger` command) to start replication.

**Note:** If you already have some data present at source file system, you should use the `Replication> job resync` command for the first time instead of the `Replication> job trigger` command to avoid full synchronization (to avoid sending the entire data).
Disabling a job on the destination cluster

1. Use the `Replication> job show all_remote_jobs` command to show which jobs are using the cluster as a replication destination.

For example:

```
Replication> job show all_remote_jobs
Remotely-Created Job Definitions
================================
Job Name  Source Repunit  Target Repunit  Link Name  Schedule Name
========  ==============  ==============  =========  =============
job1      src_ru         tgt_ru         LA_NewYork -
```

2. Use the `Replication> job disable job_name link_name` command to disable a job from the list.

For example:

```
Replication> job disable job1 LA_NewYork
SFS replication WARNING V-288-1379 WARNING: This command must be used only when a replication job was disabled successfully at the source cluster, but could not be disabled at destination cluster because the destination cluster was unreachable at that time. The right way to disable a job is by using the disable command at the source cluster, and this command must be used only under rare cases.

Do you still want to continue with job disable command [Enter yes/no ]:yes

SFS replication SUCCESS V-288-1442 Job disable job1 LA_NewYork command completed successfully.
```
About accessing the FileStore Replication commands

Before using the FileStore Replication commands, make sure that your cluster's SSH port 22 is open across the network.

The FileStore Replication mode commands are listed in Table 4-1.

To access the commands, log into your administrative console (master, system-admin, or storage-admin) and enter Replication mode.
See “About using the FileStore command-line interface” on page 16.

Table 4-1  FileStore Replication commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>service</td>
<td>Starts, stops, and displays the status of the replication service. See “About the service commands” on page 42.</td>
</tr>
<tr>
<td>config</td>
<td>Exports and imports the public keys and authenticates the source and destination clusters for replication service. See “About the configuration commands” on page 44.</td>
</tr>
<tr>
<td>repunit</td>
<td>Creates, displays, and deletes the repunit definitions. See “About the replication unit commands” on page 52.</td>
</tr>
<tr>
<td>schedule</td>
<td>Creates, displays, modifies, and deletes replication schedules. See “About the schedule commands” on page 56.</td>
</tr>
<tr>
<td>job</td>
<td>Creates, displays, modifies, disables, and destroys the job definitions. See “About the job commands” on page 61.</td>
</tr>
</tbody>
</table>

About the service commands

The Replication> service commands start, stop, and display the replication service.

Table 4-2  Service commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>service start</td>
<td>Starts the replication service. The service can only be started after you bind a virtual IP for replication service using the Replication&gt; config bind command. The Replication&gt; service start command must be run on both the source and destination clusters. You must run Replication&gt; service start before you run other commands. See “Using the service commands” on page 43.</td>
</tr>
<tr>
<td>service status</td>
<td>Displays the replication service status. The service status is displayed as RUNNING, PARTIAL, or STOPPED. See “Using the service commands” on page 43.</td>
</tr>
</tbody>
</table>
Table 4-2  Service commands (continued)

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>service stop</td>
<td>Stops the replication service on the cluster the command was executed on.</td>
</tr>
<tr>
<td></td>
<td>See &quot;Using the service commands&quot; on page 43.</td>
</tr>
</tbody>
</table>

Using the service commands

To start the replication service

- To start the replication service, enter the following:

```
Replication> service start [nodename]
```

where `nodename` is the name of the node in the local cluster where you want to start the replication service.

For example:

```
Replication> service start
Please wait. Starting replication service...
SFS replication SUCCESS V-288-0
Replication service started successfully.
Replication>
```

To display status of the replication service

- To display the status of the replication service, enter the following:

```
Replication> service status
```

For example:

```
Status : PARTIAL
Details :
===========================================================
Replication VIP : ONLINE
Replication Daemon : OFFLINE
Replication Database (on Replication node) : ONLINE
Replication Database (on Console node) : ONLINE
```
To stop the replication service

◆ To stop the replication service, enter the following:

Replication> service stop

For example:

Replication> service stop
Replication> service status
Status: STOPPED

About the configuration commands

The Replication> config commands provides a set of cluster authentication-related operations and methods to add and delete a virtual IP.

FileStore Replication authentication strategy is based on RSA-key authentication, and both the source and destination clusters have to export their replication public keys. The source cluster imports the destination cluster's public key and the destination cluster imports the source cluster's public key.

After the source and destination clusters have successfully imported each other’s public keys, you need to run the Replication> config auth command on the source cluster to complete the authentication between the two clusters. This command checks the two-way communication between the source and destination clusters, and authenticates the clusters allowing the FileStore Replication service to begin.

Table 4-3  Configuration commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>config show</td>
<td>Displays the list of imported and authorized clusters.</td>
</tr>
<tr>
<td></td>
<td>See “Using the configuration commands” on page 45.</td>
</tr>
<tr>
<td>config export_keys</td>
<td>Exports public keys for a cluster.</td>
</tr>
<tr>
<td></td>
<td>See “Using the configuration commands” on page 45.</td>
</tr>
<tr>
<td>config import_keys</td>
<td>Imports public keys for a cluster.</td>
</tr>
<tr>
<td></td>
<td>See “Using the configuration commands” on page 45.</td>
</tr>
<tr>
<td>config auth</td>
<td>Authenticares a cluster for replication.</td>
</tr>
<tr>
<td></td>
<td>See “Using the configuration commands” on page 45.</td>
</tr>
</tbody>
</table>
Table 4-3  Configuration commands (continued)

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
</table>
| config deauth | Deauthenticate a cluster for replication.  
\textbf{Note:} You cannot deauthenticate a link name that is currently used by a job.  
See “Using the configuration commands” on page 45. |
| config bind | Adds a virtual IP to the replication service.  
See “Using the configuration commands” on page 45. |
| config unbind | Deletes a virtual IP from the replication service.  
See “Using the configuration commands” on page 45. |
| config check | Verifies communication between the source and destination clusters.  
See “Using the configuration commands” on page 45. |
| config del_keys | Deletes the keys corresponding to a remote cluster from the local cluster.  
See “Using the configuration commands” on page 45. |

**Using the configuration commands**

After you have determined which two FileStore clusters to use, you need to authenticate them.

The `config` commands must be executed in a specific order.

- Use the `config del_keys` after the `config deauth` command, or it fails.
- You can only run the `config unbind` command (to unbind the virtual IP) after you have run the `service stop` command.
- You need to run the `config bind` command (to bind the virtual IP) before you can run the `service start` command.
- You can only run the `config auth` command after both the source and destination have imported each others keys.
To display the configuration settings

1. To display the configuration settings, enter the following:

   Replication> config show [ip|remote_clus]

   **ip**
   Displays information related to the replication virtual IP address of the local cluster.

   **remote_clus**
   Displays information related to the remote cluster replication virtual IP address as well as information related to the key import and authentication status.

For example:

   Replication> config show

   Link name  Remote cluster  ConsoleIP  Remote cluster Replication IP
   =========  ===============  ===========  =============================
   dest1      10.209.105.236  10.209.105.236  10.10.10.10

   Time of Key Import    Time of Authorization
   =====================  =====================
   Sun Jul 12 04:02:05 UTC 2009  Sun Jul 12 04:02:57 UTC 2009
2 To display the virtual IP of the replication service, enter the following:

Replication> config show ip

For example:

Replication> config show ip
Local cluster details:
==================================
Replication VIP : 10.10.10.10
Replication Device : pubeth0
Online On Node : sfs_01
Replication protocol version : 2.0

The definitions of the headings are as follows:

<table>
<thead>
<tr>
<th>Headings</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link name</td>
<td>This is the name you specified when running the <code>Replication&gt; config auth</code> command between the local cluster and the remote cluster.</td>
</tr>
<tr>
<td>Remote cluster ConsoleIP</td>
<td>The management console IP address of the remote cluster.</td>
</tr>
<tr>
<td>Remote cluster Replication IP</td>
<td>The replication virtual IP address of the remote cluster.</td>
</tr>
<tr>
<td>Time of Key Import</td>
<td>The exact time (in Coordinated Universal Time (UTC) format) you imported the keys of the remote cluster using <code>Replication&gt; config import_keys</code> command.</td>
</tr>
<tr>
<td>Time of Authorization</td>
<td>The exact time (in UTC format) you completed the authorization of the remote cluster using the <code>Replication&gt; config auth</code> command.</td>
</tr>
<tr>
<td>Replication Device</td>
<td>Device that the replication service is currently using.</td>
</tr>
<tr>
<td>Online on Node</td>
<td>Cluster node on which the replication service is currently running.</td>
</tr>
<tr>
<td>Replication Protocol Version</td>
<td>Replication protocol version the cluster is currently using.</td>
</tr>
</tbody>
</table>
To authenticate a cluster for replication

To authenticate a cluster for replication, enter the following:

Replication> config auth conIP link_name

<table>
<thead>
<tr>
<th>conIP</th>
<th>Enter the destination (or local) cluster console IP address. To create a local link for local replication initialization, you have to use an IP address for the local cluster console.</th>
</tr>
</thead>
<tbody>
<tr>
<td>link_name</td>
<td>Both the source cluster and the destination cluster need to be assigned a unique identifier (name). This identifier is used to identify the link that is established between the source and destination clusters. You can use the link name instead of the virtual IP addresses of the source and destination clusters when using the other replication commands. An example of a link name is: Pune_Shanghai. Once you set up the link name on the source cluster, it automatically transmits the link name to the destination cluster.</td>
</tr>
</tbody>
</table>

For example:

Replication> config auth 10.182.107.133 dest1
Authentication process going on. Please wait...
Authentication completed successfully
SFS Replication SUCCESS V-288-0
Config auth command completed successfully

To deauthenticate a cluster for replication

To deauthenticate a cluster for replication (performed only on the source cluster), enter the following:

Replication> config deauth link_name

where link_name is the name of the link that was previously established between the source and destination clusters. The public key is no longer recognized.

For example:

Replication> config deauth dest1
Please wait...
SFS Replication SUCCESS V-288-0
Config deauth command completed successfully
To export the keys

- To export the public keys from the source cluster to the destination cluster, enter the following:

  Replication> config export_keys [URL]

  where the **URL** is the path to copy the public keys.

  The SCP and FTP protocols are supported.

  If you do not want to enter a URL, you can cut and paste the output from the
  Replication> config export_keys command into the Replication> config
  import_keys command.

  The output will by default be displayed to your computer screen.

  **For example, if you entered a URL with the command:**

  Replication> config export_keys
  scp://username@hostname:~/
  Password: ******
  SFS Replication SUCCESS V-288-0
  Key file SFSKEY_source_10.209.105.236_2009-05-29
  copied successfully at location username@hostname:~/

  **For example, if you did not enter a URL with the command:**

  Replication> config export_keys
  Displaying replication key. Please use this key with config
  import_keys command.

  ssh-rsa
  AAAAB3NzaC1yc2EAAAABIwAAAQEApUukbe8znGccz9V1UPTwn8JpbtnfQ2eJGQw
  Br0IrI6dYyxPVeIb2MhdkJiwwDoHybYkS6YXHR5AFT+m2goc1KVYgD1fJppip
  6YClBqTa5h7eII89eRS85PCywEXhoMJmoUS4cFzxt3ggAMH80eu3aiZHn+
  PAU7Tu0xpY1vpTOQ1X661GfbtdLp9ZNF+9qbt/x73yh09HjVCgeTBcMHJZhrbNZ2/
  mK7XX8509pM/7y2xSwzCswamuauum3VZBpyX+uwQp/Kyvr05znAW5WU093myqy
  ShwJKujRWF02sIm6bvn8pI0ZukwMx16etnsLippqttR4ED8SXI1W1A3JysXiXw==
  sfs-replication@source::source_10.209.105.236

  Config export keys command completed successfully
To import the keys

◆ To import the public keys to the destination cluster, enter the following:

```
Replication> config import_keys \[URL/keyfile\]
```

where the `URL` is the path to copy public keys and `keyfile` is the filename of the key generated by the export.

If you did not enter a URL, you can cut and paste the output from the Replication> config export_keys command into the Replication> config import_keys command.

For example, if you did enter a URL:

```
Replication> config import_keys
scp://username@hostname:~/SFSKEY_source_10.10.20.20_2009-05-29
Password: ******
SFS Replication SUCCESS V-288-1089 Config import keys command completed successfully
Key file SFSKEY_source_10.10.20.20_2009-05-29 copied successfully at location username@hostname:~/
```

For example, if you did not enter a URL:

```
Replication> config import_keys
Enter replication key of remote cluster:: ssh-rsa
AAAAB3NzaC1yc2EAAAABImwAAQQAeApUukbe8znGccz9V1UPTwn8JpbtntfQ2eJGQw
BrOi16dYyxPVeIb2MhdKjiwwDoHybYkS6YXHR5AFT+m2gociKVYgLpJppip6YClBqTa5h7
e1I89eR85PCYWExhoMjmoUS4CFxT3ggAMH8eu3aiZHn+PAA7Tu0xpX1vPtoQV1x661G
fbtdw39z2f+9qbt/x7y09HjVCgeTbcMHJ2hrbN2Z/2/k7XX8509pM/7yZxSWzCswamuaum
3VZBpyX+uwQp/KyvrO5zniAW5WU93myqyShwJkujRWF02sIm6bn8pI02ukwMx16etns
LippqttR4ED88X11W1A3JysX1xw==
sfs-replication@source::source_10.209.105.236
```

Enter console IP address of remote cluster:: 10.209.105.236

SFS Replication SUCCESS V-288-1089 Config import keys command completed successfully

To delete the keys

◆ To delete the public key from the source cluster, enter the following:

```
Replication> config del_keys conIP
```

where `conIP` is the destination cluster console IP address.
To bind a virtual IP address for the replication service

- To bind a virtual IP address for the replication service on the source cluster, enter the following:

  Replication> config bind ip_addr [device]

  ip_addr  Virtual IP address for the replication service on the source cluster.
  device   Public network interface name that you want the replication IP address to use.

  For this command to run successfully, all jobs on the cluster must be in the Disable state.

  For example:

  Replication> config bind 10.10.10.10
  Please wait...
  Completed

To unbind a virtual IP address from the replication service

- To unbind a virtual IP address from the replication service, enter the following:

  Replication> config unbind ip_addr

  where ip_addr is the IP address of the node you want to delete from the replication service.

  Make sure that you have stopped the service before unbinding the IP address.

  For example:

  Replication> config unbind 10.10.10.10
  Please wait...
  Completed
To check status of communication between source and destination clusters

To check the status of the communication between the source and destination clusters, enter the following:

```
Replication> config check link_name
```

where `link_name` is the unique identifier (name) that was assigned to the source and destination clusters when you ran the `Replication> config auth` command.

```
Replication> config check dest1
Checking local to remote cluster communication ....OK
Checking remote to local cluster communication ....OK
Checking communication between replication vips ....OK
Checking protocol version compatibility between source and destination clusters ....OK
Replication>
```

About the replication unit commands

The `Replication> repunit` commands allow you to define the type of data that you will replicate from the source cluster to the destination cluster. All files and folders belonging to a replication unit are replicated together from the source cluster to the destination cluster.

A single replication unit can span across multiple directories and multiple file systems.

A replication unit is defined as an ordered set of entries, where each entry is one of the following:

- A file system
- A subdirectory
- A single file

**Note:** The replication source has to be one of the entry types mentioned above. It cannot be a snapshot or a checkpoint (ckpt).

FileStore Replication requires that the source and destination replication units of a job definition have the same type of ordered entities, that is, every entity pair (one entry from the source and one entry from the destination replication unit)
must be of a similar type. For example, both could be files, or both could be directories.

The entity is identified by the file system name, optionally followed by a slash ‘/’, followed by the path of the directory or the file inside the file system. Member entities are ordered inside a replication unit and such ordering information is used to determine the replication entity pair mapping from the source replication unit to the destination replication unit.

**Note:** Make sure that the paths in the destination replication unit exist in the destination cluster.

<table>
<thead>
<tr>
<th>Table 4-4</th>
<th>Replication unit commands</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Command</strong></td>
<td><strong>Definition</strong></td>
</tr>
<tr>
<td>repunit create</td>
<td>Creates a replication unit definition. This command determines the exact item (such as a file system) that you want to replicate. See “Using the replication unit commands” on page 54.</td>
</tr>
<tr>
<td>repunit add_entry</td>
<td>Adds additional entries to the existing replication unit definition you created with the Replication&gt; repunit create command. See “Using the replication unit commands” on page 54.</td>
</tr>
<tr>
<td>repunit modify_entry</td>
<td>Changes an entry in an existing replication unit definition. See “Using the replication unit commands” on page 54.</td>
</tr>
<tr>
<td>repunit show</td>
<td>Displays a replication unit definition. See “Using the replication unit commands” on page 54.</td>
</tr>
<tr>
<td>repunit remove_entry</td>
<td>Removes an entry in an existing replication unit definition. See “Using the replication unit commands” on page 54.</td>
</tr>
<tr>
<td>repunit destroy</td>
<td>Destroys a replication unit definition. <strong>Note:</strong> Make sure that you first destroy the job which was using the replication units, or the repunit destroy command fails. See “Using the replication unit commands” on page 54.</td>
</tr>
</tbody>
</table>
Using the replication unit commands

To create a replication unit

To create a replication unit, enter the following:

Replication> repunit create repunit_name
repunit_entry[,repunit_entry,...]

repunit_name Enter the name of the replication unit.
repunit_entry Enter the comma-separated entries you want to create.

For example:

Replication> repunit create ru1
fs1/DB_CONFIG,fs1/SQL_CONFIG,fs2/conf_file
SFS Replication SUCCESS V-288-0 replication unit ru1
created successfully

To add an entry to the replication unit

To add an entry to the replication unit, enter the following:

Replication> repunit add_entry repunit_name repunit_entry

repunit_name Enter the name of the replication unit.
repunit_entry Enter the entry you want to add to the replication unit.

For example:

Replication> repunit add_entry ru1 fs2/new_conf_file
Replication>
To modify an entry in a replication unit

- To modify an entry in an existing replication unit definition, enter the following:

```
Replication> repunit modify_entry repunit_name
            repunit_entry1  repunit_entry2
```

  - `repunit_name`: Enter the name of the replication unit.
  - `repunit_entry1`: Enter the old entry you want to modify.
  - `repunit_entry2`: Enter the new entry you are creating to replace the old entry.

For example:

```
Replication> repunit modify_entry ru1
            fs2/new_conf_file fs2/new_conf_file_1
```

To display the replication unit names

- To display a list of replication unit names, enter the following:

```
Replication> repunit show [repunit_name | all_remote_repunits]
```

  - `repunit_name`: Enter the name of the specific replication unit you want to display.
  - `all_remote_repunits`: Use the optional `all_remote_repunits` parameter to display replication unit definitions for jobs that are currently using the local cluster as their destination cluster.

For example:

```
Replication> repunit show all_remote_repunits
Remotely-created Repunit Definitions:
=======================================

<table>
<thead>
<tr>
<th>Link Name</th>
<th>Replication Unit Name</th>
<th>Replication Unit Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>link1</td>
<td>src_ru1</td>
<td>local_fs</td>
</tr>
<tr>
<td>link1</td>
<td>tgt_ru</td>
<td>tgt_fs</td>
</tr>
</tbody>
</table>
```
To remove an entry in a replication unit

To remove an entry in a replication unit, enter the following:

```
Replication> repunit remove_entry repunit_name repunit_entry
```

- repunit_name: Enter the replication unit name.
- repunit_entry: Enter the name of the entry you want to remove from the replication unit.

For example:

```
Replication> repunit remove_entry ru1 fs2/new_conf_file
Replication>
```

To eliminate a replication unit

To eliminate a replication unit, enter the following:

```
Replication> repunit destroy repunit_name
```

where `repunit_name` is the name of the replication unit you want to eliminate.

For example:

```
Replication> repunit destroy ru1
Replication>
```

**Note:** The `modify-entry`, `remove_entry`, and `destroy` operations are not allowed for replication units that are included in any job definition.

---

**About the schedule commands**

The `Replication> schedule` commands configure the schedules used for one or more jobs. FileStore Replication uses the following parameters to schedule the replication jobs: minute, hour, day-of-the-month, month, and day-of-the-week.

FileStore Replication supports periodic replications, where the data gets replicated from the source to the destination cluster at regular intervals defined by the schedule.

To schedule the replication commands, use the commands in Table 4-5.
### Table 4-5 Schedule commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>schedule create</td>
<td>Creates a schedule.</td>
</tr>
<tr>
<td></td>
<td>See “Using the schedule commands” on page 58.</td>
</tr>
<tr>
<td>schedule show</td>
<td>Displays a list of schedules or one specific schedule.</td>
</tr>
<tr>
<td></td>
<td>See “Using the schedule commands” on page 58.</td>
</tr>
<tr>
<td>schedule modify</td>
<td>Modifies an existing schedule.</td>
</tr>
<tr>
<td></td>
<td>Make sure that the job is first disabled before you modify the schedule.</td>
</tr>
<tr>
<td></td>
<td>See “Using the schedule commands” on page 58.</td>
</tr>
<tr>
<td>schedule delete</td>
<td>Deletes a schedule.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Make sure that no currently running job is using this schedule definition.</td>
</tr>
<tr>
<td></td>
<td>See “Using the schedule commands” on page 58.</td>
</tr>
</tbody>
</table>
Using the schedule commands

To create the replication schedule

- To create a replication schedule, enter the following:

```bash
Replication> schedule create schedule_name minute [hour] [day_of_the_month] [month] [day_of_the_week]
```

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>schedule_name</td>
<td>Specify the name of the schedule to be created.</td>
</tr>
<tr>
<td>minute</td>
<td>Enter a numeric value between 0-59, or an asterisk (*), which represents every minute. This variable is not optional.</td>
</tr>
<tr>
<td>hour</td>
<td>Enter a numeric value between 0-23, or an asterisk (*), which represents every hour.</td>
</tr>
<tr>
<td>day_of_the_month</td>
<td>Schedule the day of the month you want to run the replication. Enter a numeric value between 1-31, or an asterisk (*), which represents every day of the month.</td>
</tr>
<tr>
<td>month</td>
<td>Schedule the month you want to run the replication. Enter a numeric value between 1-12, or an asterisk (*), which represents every month. You can also use the names of the month. Enter the first three letters of the month (not case sensitive).</td>
</tr>
<tr>
<td>day_of_the_week</td>
<td>Schedule the day of the week you want to run the replication. Enter a numeric value between 0-6, or an asterisk (*), which represents every day of the week. Sunday is interpreted as 0. You can also enter the first three letters of the week (you must use lower case letters).</td>
</tr>
</tbody>
</table>

It is possible to enter an interval (two numbers separated by a hyphen) for the `minute`, `hour`, `day-of-month`, `month`, and `day-of-week`. If you want to run the schedule between 1 a.m. and 4 a.m., you can enter a value of 1-4 for the `hour` variable. The range is inclusive.

The parameters also accept a set of numbers separated by a comma. For example, `1,3,5,7` or `1-4,5-10`.

For example, to run the replication job every 30 minutes, enter the following:

```bash
Replication> schedule create s1 */30
Replication>
```
To display the schedule

- To display the list of schedules, enter the following:

```
Replication> schedule show [schedule_name]
```

where `schedule_name` is a specific schedule name. To list all of the schedule names, enter the command without a `schedule_name`.

For example:

```
Replication> schedule show
Schedule Name  Minute  Hour  Day  Month  WeekDay
-------------  ------  ------  -----  ------  -------
s1            */30    *      *      *      *
s2            */45    */1    *      *      *
```
To modify a schedule

To modify a schedule, enter the following:

```
Replication> schedule modify schedule_name minute
 [hour] [day_of_the_month] [month] [day_of_the_week]
```

<table>
<thead>
<tr>
<th>schedule_name</th>
<th>Specify the name of the schedule to be modified.</th>
</tr>
</thead>
<tbody>
<tr>
<td>minute</td>
<td>Enter a numeric value between 0-59, or an asterisk (*), which represents every minute.</td>
</tr>
<tr>
<td>hour</td>
<td>Enter a numeric value between 0-23, or an asterisk (*), which represents every hour.</td>
</tr>
<tr>
<td>day_of_the_month</td>
<td>Schedule the day of the month you want to run the replication. Enter a numeric value between 1-31, or an asterisk (*), which represents every day of the month.</td>
</tr>
<tr>
<td>month</td>
<td>Schedule the month you want to run the replication. Enter a numeric value between 1-12, or an asterisk (*), which represents every month. You can also use the names of the month. Enter the first three letters of the month (not case sensitive).</td>
</tr>
<tr>
<td>day_of_the_week</td>
<td>Schedule the day of the week you want to run the replication. Enter a numeric value between 0-6, or an asterisk (*), which represents every day of the week. Sunday is interpreted as 0. You can also enter the first three letters of the week (you must use lower case letters).</td>
</tr>
</tbody>
</table>

For example, to change the schedule so that the replication job is run every 40 minutes, enter the following:

```
Replication> schedule modify s1 40
Replication> schedule show s1
Schedule Name  Minute  Hour  Day  Month  WeekDay
= ======= == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == == =
To delete a schedule

To delete a schedule, enter the following:

```
Replication> schedule delete schedule_name
```

where you can delete a specific schedule name. To delete all of the schedules, do not enter a schedule name.

Make sure that no currently running job is using this schedule definition.

For example:

```
Replication> schedule delete s1
Replication>
```

**Note:** The `modify` and `delete` operations are not allowed for schedules that are included in any job definition.

---

**About the job commands**

The `Replication> job` commands bind together the source and destination replication units and the source and destination cluster. You use these commands to define which nodes participate in the replication, what gets replicated, and when the replication occurs.

The job is defined on the source cluster.

**Table 4-6**  
**Job commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>job create</td>
<td>Creates a job definition. The job definition defines what will be copied (replicated), the source cluster, the destination cluster, and the frequency of the replication. The job needs to be create only at the source cluster. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>job show</td>
<td>Lists a single job definition, or all of the job definitions for a destination cluster. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>Command</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>job enable</td>
<td>Enables a job definition. After the job name is created, you need to enable the job. By default the job is disabled until you enter this command. The actual replication of the job starts on the next schedule of the job. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>job status</td>
<td>Displays the status of all of the jobs copied during replication and the time the replication occurred. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>job modify</td>
<td>Modifies the replication schedule, source replication unit, or destination replication unit of an existing job. To modify the replication schedule, the job does not need to be in the DISABLED state. You can modify schedules for ENABLED jobs. The job must be in the DISABLED state to change the source replication unit and the destination replication unit. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>job trigger</td>
<td>Triggers a job, created by the Replication&gt; job trigger command, to run out of the defined sequence. For example, you can trigger a job you want to run immediately. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>job pause</td>
<td>Pauses a running job. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>job resume</td>
<td>Resumes a job from the point it was paused or it failed. If the job was paused or is failing because of a minor issue (for example, failing because part of the source file system is offline, the replication service is down, or the destination file system is full), you can start the job again from the point it failed. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>job disable</td>
<td>Disables a job definition which is in one of these states: ENABLED, PAUSED, or FAILED. See “Using the job commands” on page 65.</td>
</tr>
</tbody>
</table>
Table 4-6  
Job commands (continued)

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>job abort</td>
<td>Aborts a job. All files replicated up to that point are destroyed from the destination. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>job resync</td>
<td>Starts a resynchronization of an enabled replication job. See “Using the job commands” on page 65.</td>
</tr>
<tr>
<td>job destroy</td>
<td>Destroys a job definition. The job must first be disabled before it can be destroyed. See “Using the job commands” on page 65.</td>
</tr>
</tbody>
</table>

Figure 4-1  
Job Transition States

Table 4-7  
Job states

<table>
<thead>
<tr>
<th>State</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISABLED (NOT-QUEUED)</td>
<td>The job has been defined, It is not on the scheduler's queue. There is no session state associated with this job.</td>
</tr>
</tbody>
</table>
### Table 4-7  
**Job states (continued)**

<table>
<thead>
<tr>
<th>State</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENABLED (QUEUED)</td>
<td>The job is on the scheduler’s queue, but it is not yet scheduled to run. There is no session state associated with this job.</td>
</tr>
<tr>
<td>RUNNING</td>
<td>The job is scheduled to run and it is in a running state. This is a session of the job. Only one session is active for a job at any given point.</td>
</tr>
<tr>
<td>FAILED (ERROR)</td>
<td>The job encountered an error. An administrator must take action to bring the job out of this state.</td>
</tr>
<tr>
<td>PAUSE</td>
<td>A RUNNING job is stopped. The job can be restarted from the same point where it stopped. The session state, if any, is saved and used when the job is resumed.</td>
</tr>
<tr>
<td>ABORT_FAILED</td>
<td>An attempt to abort a RUNNING job has failed. The two valid job operations allowed from this state are the <code>Replication&gt; job abort</code> command and the <code>Replication&gt; job disable</code> command.</td>
</tr>
</tbody>
</table>

### Table 4-8  
**Job operations**

<table>
<thead>
<tr>
<th>Operation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create</td>
<td>Define a job with all necessary attributes.</td>
</tr>
<tr>
<td>Destroy</td>
<td>Remove all information stored for a job. After this operation, FileStore does not recognize the job.</td>
</tr>
<tr>
<td>Enable</td>
<td>Places the job on the scheduler’s queue.</td>
</tr>
<tr>
<td>Disable</td>
<td>Removes the job from the scheduler’s queue and cleans up all session state information (if any) for the job.</td>
</tr>
<tr>
<td>Pause</td>
<td>If a job is running, stops the job and saves the session state. This state will be used to restart the job when the <code>Storage&gt; job resume</code> command is executed.</td>
</tr>
<tr>
<td>Resume</td>
<td>Restarts a paused (or failed) job using the saved session state.</td>
</tr>
<tr>
<td>Abort</td>
<td>Stops a job (if the job is running), removes all session state information (if any), and queues the job on the scheduler for the next replication session.</td>
</tr>
<tr>
<td>Trigger</td>
<td>Replicates the current point-in-time image of the dataset.</td>
</tr>
<tr>
<td>Resync</td>
<td>Brings the destination data into sync with the source data irrespective of the previous replication sessions.</td>
</tr>
</tbody>
</table>
Using the job commands

To create a replication job

To create a replication job, enter the following:

```
Replication> job create job_name src_repunit_name dest_repunit_name
link_name [rep_schedule]
```

- **job_name**: Enter a name for the job you want to create.
- **src_repunit_name**: Enter the source of the replication unit name.
- **dest_repunit_name**: Enter the destination of the replication unit name.
- **link_name**: This is the name you specified when running the `Replication> config auth` command between the local cluster and the remote cluster.
- **rep_schedule**: Enter the name of the replication schedule created using the `Replication> schedule` command.

For example:

```
Replication> job create job1 ru1 ru2 Pune_Shanghai s1
Completed successfully.
```
To display the job definitions

◆ To display the job definitions, enter the following:

```
Replication> job show [job_name | all_remote_jobs]
```

- **job_name**
  - Enter the name of the job you want to display.
  - If you want to list all of the job definitions, enter the command without a job name.

- **all_remote_jobs**
  - Displays all job definitions that are currently using the local cluster as their destination cluster. Typically you use this command at the destination cluster to list all remote jobs (those jobs using the local cluster as their destination.)

For example, to display a job definition:

```
Replication> job show job1
```

```
Jobname Source wset Destination wset Link name
======= =========== ================ =========
job1    ru1        ru2              Pune_Shanghai
```

```
Replication Freq State
================ =====
s1        Disabled
```

For example, to display remotely-created job definitions:

```
Replication> job show all_remote_jobs
```

```
Remotely-Created Job Definitions
---------------------------------
Job Name Source Repunit Target Repunit Link Name Schedule Name
======== ============== ============== ========= =============
job14    src_ru1      tgt_ru      link1      --
```
To enable a job

- To enable a job, enter the following:

```
Replication> job enable job_name
```

where `job_name` is the name of the job you want to enable.

For example:

```
Replication> job enable job1
SFS replication SUCCESS V-288-1303 Trying to enable job job1.
Please check status of job after a few seconds.
```

To check the status of the jobs

- To check the status of all of the jobs, enter the following:

```
Replication> job status [job_name]
```

where you can display the status of all of the jobs or enter one job name.

For example:

```
Replication> job status
Jobname Job State Start Time Progress
======== ========= =========== ========
job1 Trying_to_enable - -
```

If the `Job State` displays `Trying_to_enable`, then the `job enable` is in progress. Check the `job status` again after a few minutes.

For example:

```
Replication> job status
Jobname Job State Start Time Files/Operations Sent
======== ========= =========== ===============
job1 Enabled Tue Jun 2 17:22:20 IST 2009 -
```
To modify the job

To modify the job, enter the following:

```bash
Replication> job modify job_name
{rep_sched|src_repunit|dest_repunit|link_name} [value]
```

For example:

```bash
Replication> job show j2
Jobname Source repunit Target repunit Link name
======= ============== ============== =========
j2 ru2 ru2 mytest

Schedule name State
================== =====
-- Disabled

Replication> job modify j2 dest_repunit ru3
Job modify completed successfully.

Replication> job show j2
Jobname Source repunit Target repunit Link name
======= ============== ============== =========
j2 ru2 ru3 mytest

Schedule name State
================== =====
-- Disabled
```

**job_name**

Enter the job name you want to modify.

**rep_sched**

Modifies the replication frequency in a the job definition. You need to specify:

*value*: A replication schedule name.

**src_repunit**

Modifies the source repunit of a job definition. You need to specify:

*value*: A new source repunit.

**dest_repunit**

Modifies the destination repunit in a job definition.

*value*: A new destination repunit.

**link_name**

Modifies the link of a job definition. You need to specify:

*value*: A new link name.
To trigger a job

◆ To trigger a job, enter the following:

```
Replication> job trigger job_name
```

where `job_name` is the name of the job you want to trigger.

For example:

```
Replication> job trigger job1
```

To pause a job

◆ To pause a job, enter the following:

```
Replication> job pause job_name
```

where `job_name` is the name of the job you want to pause.

For example:

```
Replication> job pause job1
```

To resume a job

◆ To resume a job, enter the following:

```
Replication> job resume job_name
```

where `job_name` is the name of the job you want to resume.

For example:

```
Replication> job resume job1
```
To disable a job

◆ To disable an enabled, paused, or failed job, enter the following:

Replication> job disable job_name [link_name]

job_name Enter the name of the job you want to disable.

link_name Use the optional link_name parameter when a replication job was disabled successfully at the source replication unit but the replication job could not be disabled at the destination replication unit because the destination replication unit was unreachable at that time, or the job disable operation failed at the destination cluster.

For example:

Replication> job disable job1 link1

SFS replication INFO V-288-1379 WARNING: This command must be used only when a replication job was disabled successfully at the source replication unit, but could not be disabled at destination replication unit because the destination replication unit was unreachable at that time. The right way to disable a job is by using the disable command at the source replication unit, and this command must be used only under rare cases.

Do you still want to continue with job disable command [Enter yes/no ]:yes

SFS replication SUCCESS V-288-1442 Job disable job1 link1 command completed successfully.

To abort a job

◆ To abort a job, enter the following:

Replication> job abort job_name

where job_name is the name of the job you want to abort.

For example:

Replication> job abort job1
To resynchronize an enabled replication job

To resynchronize an enabled replication job, enter the following:

```
Replication> job resync job_name
```

where `job_name` is the name of the enabled replication job you want to resynchronize.

For example:

```
Replication> job resync job1
```

To destroy a job definition

To destroy a job definition, enter the following:

```
Replication> job destroy job_name
```

where `job_name` is the name of the job definition you want to delete.

Make sure that the job is not enabled.

For example:

```
Replication> job destroy job1
```
Using Symantec FileStore Replication commands

Using the job commands
A
abort
  replication job 65
about
  accessing the FileStore Replication commands 41
  configuring replication 44
  FileStore file-level replication 11
  job resynchronization 35
  local replication initialization 36
  replication job 61
  replication schedule 56
  replication service 42
  replication unit 52
  accessing replication destinations 38
  accessing FileStore Replication commands 18
  accessing the FileStore Replication commands about 41
add
  replication unit 54
authenticate
  replication configuration 45

B
bind VIP
  replication configuration 45

C
checking FileStore replication protocol version 34
CLI
  how to use 16
Command-Line Interface (CLI)
  how to use 16
communicating
  source and destination clusters 23
configuring
  job resynchronization 36
  local replication initialization 37
  replication 44
confirming FileStore replication compatibility 34
create
  replication job 65
  replication schedule 58
  replication unit 54

d
deauthenticate
  replication configuration 45
defining
  what to replicate 33
delete
  replication schedule 58
delete keys
  replication configuration 45
description of FileStore Replication 12
destination file system
  using 39
destroy
  replication job 65
  replication unit 54
disable
  replication job 65
display
  replication configuration 45
  replication job 65
  replication schedule 58
  replication unit 54

e
enable
  replication job 65
export keys
  replication configuration 45

F
FileStore file-level replication
  about 11
FileStore Replication
  description of feature 12
FileStore Replication (continued)
   setting up between two clusters 13
   starting 19
FileStore Replication commands
   accessing 18
FileStore replication compatibility
   confirming 34
FileStore Replication license 12
FileStore replication protocol version
   checking 34
I
   import keys
      replication configuration 45
J
   job resynchronization
      about 35
      configuring 36
L
   local replication initialization
      about 36
      configuring 37
M
   modify
      replication job 65
      replication schedule 58
      replication unit 54
P
   pause
      replication job 65
   privileges
      about 15
R
   remove
      replication unit 54
   replicating file systems
      setting up 29
   replication
      scheduling 31
   replication configuration
      authenticate 45
      bind VIP 45
replication configuration (continued)
   deauthenticate 45
   delete keys 45
   display 45
   export keys 45
   import keys 45
   status 45
   unbind VIP 45
replication destinations
   accessing 38
replication job
   abort 65
   about 61
   create 65
   destroy 65
   disable 65
   display 65
   enable 65
   modify 65
   pause 65
   resume 65
   resynchronization 65
      status 65
      trigger 65
replication schedule
   about 56
   create 58
   delete 58
   display 58
   modify 58
replication service
   about 42
   start 43
   status 43
   stop 43
replication unit
   about 52
   add 54
   create 54
   destroy 54
   display 54
   modify 54
   remove 54
resume
   replication job 65
resynchronization
   replication job 65
roles
   about 15
S
scheduling
  replication 31
setting up
  FileStore Replication between two clusters 13
  replicating file systems 29
source and destination clusters
  communicating 23
start
  replication service 43
starting
  FileStore Replication 19
status
  replication configuration 45
  replication job 65
  replication service 43
stop
  replication service 43

T
trigger
  replication job 65

U
unbind VIP
  replication configuration 45
user roles and privileges
  about 15

W
what to replicate
  defining 33