SNFS

StorNext® File System

Installation Guide for UNIX Users

StorNext FS Version 2.2

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ADIC USA
Tel.: +1 303-705-3900
Fax: +1-303-792-2465
ATAC: 1-800-827-3822
http://www.adic.com

ADIC Europe
ZAC des Basses Auges
1, rue Alfred de Vigny
78112 Fourqueux, France
Tel.: +33.1.3087.5300
Fax: +33.1.3087.5301

ADIC Germany Beteiligungs
GmbH, KG
Eschenstraße 3
D-89558 Böhmenkirch, Germany
Tel:+00.800.9999.3822

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ADIC CORPORATE • 11431 WILLOWS ROAD, NE • REDMOND, WASHINGTON, USA • 1-800-336-1233
ADIC • 8560 UPLAND DRIVE • ENGLEWOOD, COLORADO, USA • 1-800-827-3822
ADIC • 10 BROWN ROAD • ITHACA, NEW YORK, USA • 1-607-241-4800

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Introduction

Getting Started

Setting Up StorNext FS on AIX

Setting Up StorNext FS on IRIX

Setting Up StorNext FS on Linux

Setting Up StorNext FS on Solaris

Resolving Installation Problems

Customer Assistance

Introduction

StorNext File System (StorNext FS), formerly known as CentraVision™, lets heterogeneous clients share files across high-speed storage Fibre Channel (FC) connections. By eliminating the need to duplicate, manage, and move multiple copies of the same file, StorNext FS increases storage efficiency, improves workflow productivity, and reduces network bottlenecks. StorNext FS is the core file system technology used in the StorNext Management Suite (SNMS).

- To install the StorNext FS in a supported UNIX environment, refer to the installation procedures in this Guide. (Abbreviated installation procedures for StorNext FS in a UNIX environment also appear in the *StorNext Management Suite Installation Guide*, a separate document.)
- To install the StorNext File System in a supported Windows environment, refer to the StorNext FS installation procedures in the *StorNext Management Suite Installation Guide*, a separate document.

Other helpful documents include:

- *StorNext Management Suite Release Notes*
- *StorNext File System Quick Reference Booklet*

Purpose of This Book

This book describes how to install StorNext FS on AIX, IRIX, Linux and Solaris clients in UNIX environments.

Who Should Read this Book

This book is intended as a guide for the StorNext FS installation team, which is usually the site system administrators.

It assumes the system administrators have a strong familiarity with the following items.

- The appropriate operating system: a supported UNIX environment (AIX, IRIX, RedHat or SuSE Linux, or Solaris).
- Applications running in their site environment.

How This Book is Organized

This book contains the following chapters.

- **Chapter 2: Getting Started** — Component descriptions and summary of installation steps.
- **Chapter 3: Setting Up StorNext FS on AIX** — Instructions for installing and configuring the StorNext File System.
- **Chapter 4: Setting Up StorNext FS on IRIX** — Instructions for installing and configuring the StorNext File System.
- **Chapter 5: Setting Up StorNext FS on Linux** — Instructions for installing and configuring the StorNext File System.
- **Chapter 6: Setting Up StorNext FS on Solaris** — What to do if you have trouble with the installation process.
- **Chapter 7: Resolving Installation Problems** — Describes how to resolve problems installing StorNext FS.
- **Chapter 8: Customer Assistance** — Provides information on different types of customer assistance available for StorNext FS.

Explanation of Symbols

The following symbols indicate important information.

Symbol	Description	Definition	Consequence
	**WARNING:**	Advises you to take or avoid a specified action	Failure to take or avoid this action could result in physical harm to the user or hardware
	**CAUTION:**	Advises you to take or avoid a specified action	Failure to take or avoid this action could result in loss of data
	**NOTE:**	Indicates important information that helps you make better use of the software	No hazardous or damaging consequences

Conventions

Conventions used throughout this book are listed below.

Convention	Example
Screen text, file names, program names, and commands are in Courier font.	`# mkdir -p <mount point>`
The root prompt for UNIX is shown as the number/ pound symbol.	`# tar xvf <filename>`
Site-specific or user-defined variables are enclosed within greater than and less than characters, < >.	`# chmod 777 <mount point>`
A menu name with a greater-than character refers to a sequence of menus.	Programs > StorNext File System > Help

Books

The following items comprise the technical documents supporting StorNext FS installed in a UNIX environment. These documents are shipped on CD along with the StorNext FS software.

- *StorNext FS Installation Guide (for UNIX Users)* — Provides procedures to install the StorNext FS in a supported UNIX environment.
- *StorNext File System Quick Reference Booklet* — Summarizes StorNext FS commands, syntax, options, arguments, and command examples.

Online Books

The documentation CD accompanying the StorNext FS product contains StorNext FS technical documents as PDF files. To view and print these PDFs, you need Adobe® Acrobat® Reader, which is available as a download from www.adobe.com.

Related Publications

The publications described in the following table are created and distributed on an as-needed basis.

Related Publications	Description
Release Notes	Information about StorNext FS is contained within the *StorNext Management Suite Release Notes*. The Release Notes provide: • Summary of enhancements. • Description of fixed problems. • Description of known problems.
Product Alerts	Informs customers of technical problems and solutions
Product Bulletins	Conveys technical information — not problems — to customers.

Getting Started

Topic	Refer to Chapter
Getting started: • Component description. • Installation summary. • Power up sequence. • Power down sequence.	2
On AIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	3
On IRIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	4
On Linux: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	5

Topic	Refer to Chapter
On Solaris: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	6
Troubleshooting procedures	7

Supported Platforms

StorNext File System (StorNext FS) is supported on the following platforms: IBM AIX, SGI IRIX, Linux (RedHat and SuSE), Sun Solaris, Windows 2000, and Windows NT.

This Guide provides instructions to install StorNext FS on supported UNIX platforms (AIX, IRIX, Linux or Solaris). For information on installing StorNext FS in a Windows 2000 or NT environment, refer to the *StorNext Management Suite Installation Guide*.

System Requirements

For a list of system requirements and operating system patches, refer to the *StorNext Management Suite Release Notes*.

Disk Space Requirements

To install the StorNext FS in a supported UNIX environment, verify that server and client machines have the required amount of hard disk space:

- Server machines require 350 MB of disk space
- Client machines require 20 MB of disk space

StorNext FS Components

The following components comprise the StorNext FS software.

- **StorNext FS server**. Runs on a machine designated as the server for all StorNext FS activities. The StorNext FS server controls space allocation and regulates meta-data operations for all StorNext file systems.
- StorNext FS client. Runs on all machines that access file systems managed by the StorNext FS server.

The following table lists major StorNext FS files.

File	Description	AIX Directory	IRIX Directory	Linux Directory	Solaris Directory
Base	StorNext FS server software Manages files and shared access to the StorNext FS network and storage area.	/usr/cvfs	/usr/cvfs	/usr/cvfs	/usr/cvfs
	Program files that contain installation and program files, administrative commands, scripts, utilities, GUI, and communication interfaces.	/usr/cvfs/bin /usr/cvfs/config	/usr/cvfs/bin /usr/cvfs/config	/usr/cvfs/bin /usr/cvfs/config	/usr/cvfs/bin /usr/cvfs/config
	File System Database that contains file system logs.	/usr/cvfs/data	/usr/cvfs/data	/usr/cvfs/data	/usr/cvfs/data

File	Description	AIX Directory	IRIX Directory	Linux Directory	Solaris Directory
	StorNext FS server's startup script.	/etc/rc.cvfs	/etc/init.d/cvfs	/etc/init.d/cvfs	/etc/init.d/cvfs
Client	Software on all StorNext FS clients. Contains the protocol interface required to communicate with the StorNext FS server.	/usr/cvfs	/usr/cvfs	/usr/cvfs	/usr/cvfs
Mount Point	Directory mounted (mapped) by the StorNext FS clients.	(user-defined)	(user-defined)	(user-defined)	(user-defined)

Configure File System Server

The StorNext FS server can be configured as either a dedicated or shared setup.

Dedicated Setup

In a dedicated setup, the StorNext FS server has TCP/IP connectivity to all StorNext FS clients, but it does not have Fibre Channel (FC) connectivity to the Storage Area Network (SAN).

NOTE Failover cannot be used in a dedicated setup. To use failover, the StorNext FS must have a Fibre Channel connection.

Figure 2-1 illustrates a dedicated setup.

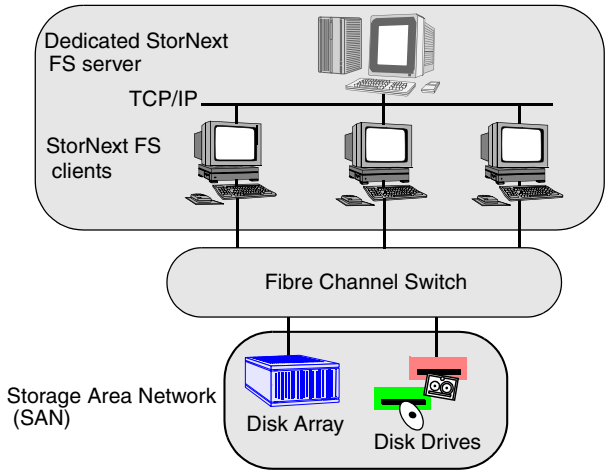


Figure 2-1 StorNext FS server - dedicated setup

Shared Setup

In a shared setup, the StorNext FS server is also set up as a StorNext FS client with Fibre Channel connectivity to the SAN.

Figure 2-2 illustrates a shared setup.

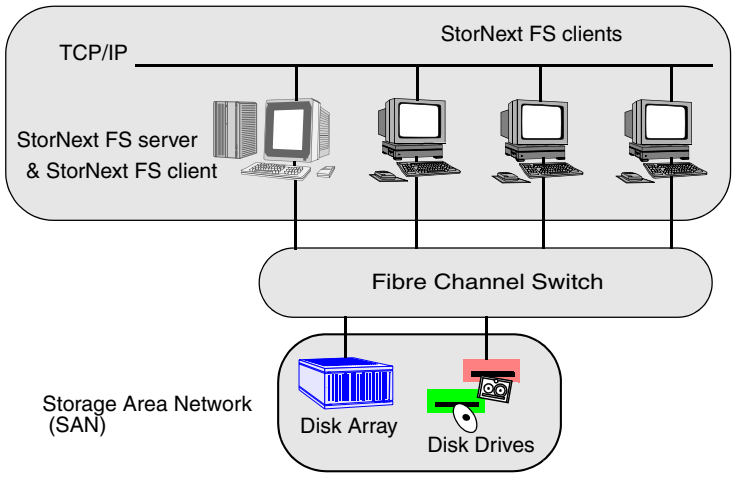


Figure 2-2 StorNext FS server - shared setup

Using Optional Pre-Installation Configuration

StorNext FS requires the user account `www` to exist in the `passwd` file, and the group account `adic` to exist in the `group` file. During installation, StorNext FS uses a system utility to create these accounts if it cannot find them.

- If you want the system utility to create the accounts, skip this section.
- If you prefer to manually add these accounts, use the procedure described below. You must not only perform this procedure for each machine on which you install the StorNext FS software, but also on each machine that you set up as a client.

Step 1 Add the user account `www`.

Username	UserID	GroupID	Login Shell	Home Directory
www	101	100	/bin/ksh	/usr/adic/www

Step 2 Add the group account `adic`.

Group Name	GroupID	Members List
adic	100	root, tdlm, www

Summary of Installation Steps

The steps listed below summarize the StorNext FS installation process. These steps are only guidelines, since the actual steps required for your site are unique.

Step	Task
1	CAUTION: Back up the system data of all client machines before changing or installing any hardware or software.
2	Connect all client machines that will access the StorNext FS to a TCP/IP network, such as Ethernet. The StorNext FS software uses the TCP/IP connection to control and manage data access and data sharing on the Fibre Channel SAN. For assistance with your TCP/IP network connections to your client machines, contact your StorNext FS reseller.
3	Install the Fibre Channel disk arrays and disk drives according to the instructions shipped with the equipment. The disk arrays and disk drives must be powered up and ready for use before installing StorNext FS.
4	Set up the Fibre Channel hardware and software components for each machine according to the instructions shipped with the equipment. The machines must be powered up and ready to use before installing the StorNext FS software.

Step	Task
5	Set up the SAN machine components, which include the following items: • Install a Fibre Channel card. • Connect Fibre Channel optical and copper cables to the switches or hubs. • Install Fibre Channel software and drivers. • If required, configure the Fibre Channel software for a loop or switch network.
6	Select one of your machines to run the StorNext FS server component. This machine is referred to as the StorNext FS server. Select the machines to run the StorNext FS client component. These machines are referred to as the StorNext FS clients. Install the appropriate StorNext FS software components on the selected machines. For instructions: • Refer to Install StorNext FS on AIX on page 3-3. • Refer to Install StorNext FS on IRIX on page 4-3. • Refer to Install StorNext FS on Linux on page 5-9. • Refer to Install StorNext FS on Solaris on page 6-3.
7	Generate a host ID string for the StorNext FS server and email this information to **support@adic.com**. Customer Support will respond with a license. For instructions: • Refer to Obtain License for AIX Server on page 3-4. • Refer to Obtain License for IRIX Server on page 4-5 • Refer to Obtain License for Linux Server on page 5-11. • Refer to Obtain License for Solaris Server on page 6-4.

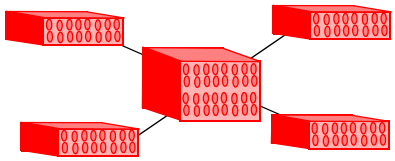
Step	Task
8	Label all the Fibre Channel disk drives used by StorNext FS. For instructions: • Refer to Label Drives on AIX on page 3-5. • Refer to Label Drives on IRIX on page 4-6. • Refer to Label Drives on Linux on page 5-12. • Refer to Label Drives on Solaris on page 6-4.
9	The StorNext FS server maintains operation and file structure integrity of the shared StorNext File Systems. Configure the StorNext FS software for all machines. For instructions: • Refer to Configure StorNext FS Software on AIX on page 3-7. • Refer to Configure StorNext FS Software on IRIX on page 4-8. • Refer to Configure StorNext FS Software on Linux on page 5-14. • Refer to Configure StorNext FS Software on Solaris on page 6-7.
9A	Optional: For failover scenarios, use the fsnameservers file in the config directory to list the primary and secondary host names of the StorNext FS server used in your failover environment.
9B	To create a StorNext FS-managed file system, modify the example.cfg file in the examples directory on the StorNext FS server. **NOTE**: Make sure you use a unique, descriptive, ***<file_system_name>***.cfg for each StorNext File System on the StorNext FS server.

Step	Task
10	Mount the StorNext File System on each client machine. For instructions, • Refer to Mount StorNext FS on AIX on page 3-11. • Refer to Mount StorNext FS on IRIX on page 4-12. • Refer to Mount StorNext FS on Linux on page 5-18. • Refer to Mount StorNext FS on Solaris on page 6-11.
11	**On all StorNext FS clients**: Add the uniquely named StorNext File System to the list of devices to be mounted at boot.
12	IRIX and Linux users: At startup, use the `ckconfig cvfs` command to enable the StorNext File System on the StorNext FS server.
13	Reboot the StorNext FS clients.

Power Up Sequence

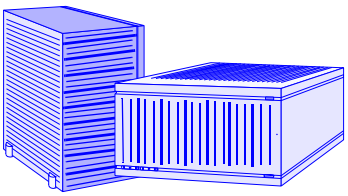
To power up StorNext FS as part of a Fibre Channel environment:

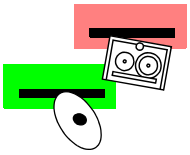
Step 1 Enable FC fabric switches, if present.



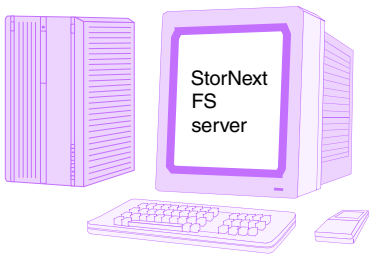
Step 2 Enable FC hubs, if present.

Step 3 Enable FC disk arrays or disk drives.

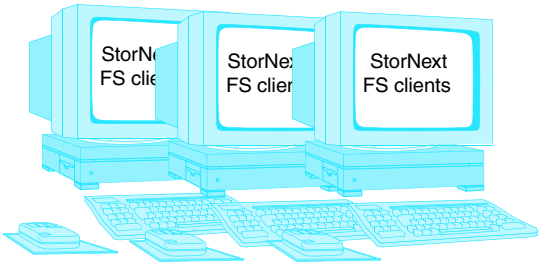




Step 4 Start the StorNext FS server.



Step 5 Start all StorNext FS clients, in any order.



Power Down Sequence

To power down StorNext FS:

Step 1 Unmount all StorNext FS clients.

Step 2 Shut down all StorNext FS clients, in any order.

Step 3 Shut down the StorNext FS server.

Step 4 Disable FC disk arrays or disk drives.

Step 5 Disable FC hubs, if present.

Step 6 Disable FC fabric switches, if present.

Setting Up StorNext FS on AIX

Roadmap

Topic	Refer to Chapter
Getting started: • Component description. • Installation summary. • Power up sequence. • Power down sequence.	2
On AIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	3
On IRIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	4
On Linux: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	5

Topic	Refer to Chapter
On Solaris: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	6
Troubleshooting procedures	7

Installation Procedure for AIX

The installation and configuration of the StorNext File System (StorNext FS) on AIX includes the following procedures.

Install StorNext FS on AIX

NOTE For upgrade instructions, refer to the *StorNext Management Suite Release Notes*.

To install StorNext FS on AIX:

Step 1 Designate one AIX machine as the StorNext FS server.

Step 2 Log onto the machine as `root`.

Step 3 Insert the StorNext File System CD into the drive and wait for the hardware to access it.

Step 4 Run the `installp` utility to start the AIX installation.

```
# installp -ac -d cdrom path all
```

Step 5 When the installation is complete, set up the path to the StorNext FS man pages by including `/usr/cvfs/man` in the global MANPATH environment variable.

For a list of man pages about the StorNext FS commands, refer to the `/usr/cvfs/man` directory. To display a man page about a specific command, enter:

```
# man command_name
```

Step 6 Set up the path to the StorNext FS binaries by including `/usr/cvfs/bin` in the global PATH environment variable.

Step 7 Remove the CD from the CD drive.

Step 8 Reboot the machine.

Step 9 Return to Step 1 to install StorNext FS on another AIX machine.

Obtain License for AIX Server

The StorNext FS server must have a valid license.

To obtain the license file:

Step 1 Run the StorNext FS host identifier utility. Enter:

```
# usr/cvfs/bin/cvfsid
```

The output looks similar to this.

```
690CB94A sun 1 <host_name>
```

The hexadecimal number is unique to the server and the *host_name* parameter should match the server's host name. This number is known as the ID string.

Step 2 Email the ID string and the number of client machines to ATAC at support@adic.com. If you cannot access email, call ATAC for assistance at 1-800-827-3822.

An ATAC Technical Support representative will provide a license.dat file.

Step 3 Place license.dat in the `/usr/cvfs/config` directory on the server.

NOTE If you have a temporary StorNext license, remove the temporary license file and replace it with the permanent license file.

Label Drives on AIX

You must label each drive to be used by StorNext FS. A new drive needs to be labeled only one time. Drive labeling can be performed from any StorNext client that has a Fibre Channel connection to the drive.

CAUTION **The process of disk labeling re-partitions the drives. If you select an incorrect drive, you may lose data.**

To label a drive:

Step 1 From the system prompt on any StorNext FS client, display a list of connected drives. Enter:

```
# /usr/cvfs/bin/cvlabel -1
```

Step 2 From the output information, identify any drives that are unused or do not have a recognized Volume Type and write down their associated device names.

CAUTION **Identify any drives that already contain a recognized Volume Type. Do not write a label to these drives or you may lose data.**

Step 3 Create `/usr/cvfs/config/cvlabels` from the copy of the StorNext FS label file example. Enter:

```
# cd/usr/cvfs/config
# cp ../examples/cvlabels.example ./cvlabels
```

Step 4 Edit `/usr/cvfs/config/cvlabels` so that it contains a list of StorNext FS label names that correspond to the device names of the drives identified in Step 2.

You can create any convention for the label names. For example, if a site consists of 12 Fibre Channel drives, you can use `CvfsDisk[n]` for each label name. Replace [n] with a decimal number starting at 0 and increment the number for each drive. In this case, the label name entries in the file would be: `CvfsDisk0`, `CvfsDisk1`, `CvfsDisk2`, and so on. For example:

```
# AIX Example

# Drives 0 through 11 will be used for Regular Stripe Groups,
# so the entire volumes are used (total sector sizes are used
# since optional sector sizes are not specified).

#
# Regular file disks - use entire volume

CvfsDisk0 [device_name0]
CvfsDisk1 [device_name1]
CvfsDisk2 [device_name2]
CvfsDisk3 [device_name3]
CvfsDisk4 [device_name4]
CvfsDisk5 [device_name5]
CvfsDisk6 [device_name6]
CvfsDisk7 [device_name7]
CvfsDisk8 [device_name8]
CvfsDisk9 [device_name9]

CvfsDisk10 [device_name10]
CvfsDisk11 [device_name11]
```

Step 5 After the cvlabels file is complete, use the `cvlabel` command to label the disk drives.

```
# cd /usr/cvfs/bin
# ./cvlabel
```

Follow the on-screen instructions to label the disk drives.

Configure StorNext FS Software on AIX

To configure the StorNext FS software on an AIX machine, you have to configure the software on both the StorNext FS server and clients.

Server Configuration

Step 1 Create a StorNext FS-managed file system by copying `/usr/cvfs/examples/example.cfg` and renaming it. Enter:

```
# cd/usr/cvfs/config
# cp ../examples/example.cfg ./<file_system>.cfg
```

NOTE The example.cfg file supplied by ADIC contains commented text (entries that begin with a `#`) with descriptions of the various sections and parameters in the file.

Step 2 Edit the example configuration using the following information.

NOTE For information about editing the configuration file, refer to the man page by entering `man cvfs_config` at a system shell prompt.

DISK TYPE section - Defines valid disk types. A disk type describes a category of disks with a capacity specified in number of sectors. The following parts comprise a disk type:

- The required keyword `DiskType` preceded by the open bracket symbol ([ ) and followed by the closed bracket symbol ( ]).
- On the next line, the required keyword `Sectors` and the value of sectors, in terms of 512 bytes per sector, for the disk type.

For example:

```
[DiskType ST318202FC]
Sectors 35563520
SectorSize 512
```

The `SectorSize` should reflect the Sector Format Size of the disk drives, for example: 512, 4096, 8192, 16384.

To obtain the number of sectors where the disks are set, use the `cvlabel -l` command. If you are using disk devices that do not have the same number of sectors, then several disk types can be specified to handle each common number of sectors.

DISK section - Identifies the disk drive that is labeled and available to StorNext FS. A disk type describes a category of disks with a capacity specified in number of sectors. The following parts comprise a disk definition:

- The required keyword `Disk` preceded by the open bracket symbol ([ ) and followed by the closed bracket symbol ( ]).
- On the next line, the words `Status UP`
- On the next line, the required keyword `Type` and the name of the disk type assigned to the disk definition. The name of the disk must match the label name of the drive as displayed by the `cvlabel -l` command. This is how the label names of the Fibre Channel disks are associated with a StorNext FS.

For example:

```
[Disk CvfsDisk0]
Status UP # UP/DOWN
Type 9GB_drive # A type defined in a DiskType Section
```

STRIPEGROUP DEFINITION section - Describes a group of disks that comprise a stripe group. One or more stripe groups describe the entire file system. A stripe group is the smallest entity that can be manipulated by a system administrator using the File System Administration utility (`cvadmin`).

NOTE All disks defined in any given stripe group must have the same number of sectors, as reported by `cvlabel -l`.

Examples of stripe groups appear in the configuration file.

- Find the stripe group named `RegularFiles`.
- Edit the `Node` entries so that all the disk names are listed, with each entry followed by a space and then the stripe order number (0, 1, 2, etc.).

For example:

```
[StripeGroup RegularFiles]
Status UP
Type Regular
Read Enabled
Write Enabled
StripeBreadth 64
Node CvfsDisk0 0
Node CvfsDisk1 1
Node CvfsDisk2 2
Node CvfsDisk3 3
```

Step 3 Save, name and exit the `/usr/cvfs/config/<file_system_name>.cfg` file.

NOTE Make sure you have a `<file_system_name>.cfg` file for each uniquely named StorNext File System on the StorNext FS server .

Step 4 Verify that `fsmpm` is running so that `cvmkfs` works properly. Enter:

```
# ps -ef|grep fsmpm
```

Step 5 Initialize StorNext FS by running the following commands.

CAUTION **This step cannot be undone and all data on the file system will be lost, so make sure you are ready to initialize the file system before you proceed.**

```
# cd /usr/cvfs/bin/cvmkfs <file_system_name>
# cp ../examples/fsmlist.example ./fsmlist
```

Step 6 Create the fsmlist file. Enter:

```
# cd /usr/cvfs/config
# cp ../examples/fsmlist.example ./fsmlist
```

Step 7 Edit `/usr/cvfs/config/fsmlist` so that it contains the names of all StorNext File Systems.

Client Configuration

Step 1 Create the fsnameservers file by copying `/usr/cvfs/examples/fsnameservers.example` and renaming it.

```
# cd /usr/cvfs/config
# cp ../examples/fsnameservers.example ./fsnameservers
```

Step 2 Edit `/usr/cvfs/config/fsnameservers` so that it contains the hostname or IP address of all StorNext FS servers. This file must be identical across all servers and clients.

For information about failover environments, refer to the `cvfs_failover` man page.

Start the System

Manually start the StorNext FS server. Enter: `# /etc/rc.cvfs start`

The StorNext FS service files for the new file system are started and run in the background on the StorNext FS server.

Mount StorNext FS on AIX

To mount StorNext FS:

Step 1 Create the StorNext FS mount directory. For example:

```
# mkdir /usr/clips
```

Step 2 Add the uniquely named StorNext FS-managed file system to the `/etc/filesystems` file. Use `cvfs` as the vfs and file system type. The entry should be similar to this format:

```
/usr/clips:
    dev       = <file_system_name>
    vfs       = cvfs
    mount     = true
    type      = cvfs
    verbose   = true
    acount    = false
```

On startup or reboot of the StorNext FS server, StorNext FS automatically mounts any file systems listed in the `/etc/filesystems` file.

NOTE If you do not want a `cvfs` mount point in your `filesystems` file, manually start a file system using the `cvadmin` command. Then, mount the file system using the mount command.

Step 3 Return to Step 1 to repeat this procedure for each StorNext FS client.

After StorNext FS has been mounted on each client, the `/usr/clips` directory is available to store and share data.

Setting Up StorNext FS on IRIX

Roadmap

Topic	Refer to Chapter
Getting started: • Component description. • Installation summary. • Power up sequence. • Power down sequence.	2
On AIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	3
On IRIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	4
On Linux: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	5

Topic	Refer to Chapter
On Solaris: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	6
Troubleshooting procedures	7

Installation Procedure for IRIX

The installation and configuration of the StorNext File System (StorNext FS) on IRIX includes the following procedures.

Install StorNext FS on IRIX

NOTE For upgrade instructions, refer to the *StorNext Management Suite Release Notes*.

To install StorNext FS on IRIX:

Step 1 Designate one IRIX machine as the StorNext FS server.

Step 2 Log onto the machine as root.

Step 3 Insert the StorNext File System CD into the drive and wait for the hardware to access it.

Step 4 Mount the CD by associating it with a mount point. For example, use CDROM as shown in the example in Step 5.

Step 5 Install StorNext FS using either the `inst` command or the Software Manager from the desktop.

- If using the `inst` command, enter the following commands (where `L` = list and `I all` = install all) and go to Step 13.

```
# inst
inst> f /CDROM/StorNextFS/sgi/dist/dist65[mf]
inst> L
inst> I all
inst> go
```

- If using the Software Manager from the desktop, go to Step 6.

NOTE StorNext FS is shipped as separate, installable versions for the maintenance (m) and feature (f) releases of IRIX. You need to select the correct versions for StorNext FS, otherwise you will encounter problems during installation and while running the product. Use the `uname -R` command to find the running version of IRIX.

- If you are using the maintenance version of StorNext FS, the version will be listed as 6.5 6.5.16m.
- If you are using the feature version of StorNext FS, the version will be listed as 6.5.6.5.16f.

Step 6 Click Toolchest > System > Software Manager.

Step 7 In the Available Software text box, type this path:

```
f /CDROM/StorNextFS/sgi/dist/dist65 [mf]
```

Step 8 Click **Customize Installation**.

Step 9 From the list, select the items you want to install.

- Install the base and services files on all StorNext FS clients.
- Install the base and services files on all StorNext FS clients.

Step 10 Click **Start**.

Step 11 After the installation is complete, close the **Software Manager** utility.

Step 12 Set up paths to the StorNext FS man pages and commands. For example, if you are using `csh`, edit the /etc/.login on the client to look like the following lines.

```
set path= ($path /usr/cvfs/bin)
setenv MANPATH '/usr/share/catman:/usr/cvfs/man'
```

At the system prompt, enter:

```
# source /etc/.login
```

For a list of man pages about the StorNext FS commands, refer to the /usr/cvfs/man directory. To display a man page about a specific command, enter:

```
# man command_name
```

Step 13 Remove the CD from the CD drive.

Step 14 Reboot the machine.

Step 15 Return to Step 1 to install StorNext FS on another IRIX machine.

Obtain License for IRIX Server

The StorNext FS server must have a valid license. To obtain the license file:

Step 1 Run the StorNext FS host identifier utility. Enter:

```
# usr/cvfs/bin/cvfsid
```

The output looks similar to this.

```
690CB94A sgi 1 <host_name>
```

The hexadecimal number is unique to the server and *host_name* should match the server's host name. This number is known as the ID string.

Step 2 Email the ID string and the number of client machines to ATAC at support@adic.com. If you cannot access email, call ATAC for assistance at 1-800-827-3822.

An ATAC Technical Support representative will provide a license.dat file.

Step 3 Place license.dat in the `/usr/cvfs/config` directory on the server.

NOTE If you have a temporary StorNext license, first remove the temporary license file before replacing it with the permanent license file.

Label Drives on IRIX

You must label each drive to be used by StorNext FS. A new drive needs to be labeled only one time. Drive labeling can be performed from any StorNext client that has a Fibre Channel connection to the drive.

CAUTION **The process of disk labeling re-partitions the drives. If you select an incorrect drive, you may lose data.**

To label a drive:

Step 1 From the system prompt on any StorNext FS client, display a list of connected drives. Enter:

```
# /usr/cvfs/bin/cvlabel -l
```

Step 2 From the output information, identify any drives that are unused or do not have a recognized Volume Type and write down their associated device names.

CAUTION **Identify any drives that already contain a recognized Volume Type. Do not write a label to these drives or you may lose data.**

Step 3 Create `/usr/cvfs/config/cvlabels` from the copy of the StorNext FS label file example. Enter:

```
# cd/usr/cvfs/config
# cp ../examples/cvlabels.example ./cvlabels
```

Step 4 Edit `/usr/cvfs/config/cvlabels` so that it contains a list of StorNext FS label names that correspond to the device names of the drives captured in Step 2.

You can create any convention for the label names. For example, if a site consists of 12 Fibre Channel drives, you can use `CvfsDisk[n]` for each label name. Replace [n] with a decimal number starting at 0 and increment the number for each drive. In this case, the label name entries in the file would be: `CvfsDisk0`, `CvfsDisk1`, `CvfsDisk2`, and so on. For example:

```
# IRIX Example

# Drives 0 through 11 will be used for Regular Stripe Groups,
# so the entire volumes are used (total sector sizes are used
# since optional sector sizes are not specified).

#
# Regular file disks - use entire volume

CvfsDisk0 [device_name0]
CvfsDisk1 [device_name1]
CvfsDisk2 [device_name2]
CvfsDisk3 [device_name3]
CvfsDisk4 [device_name4]
CvfsDisk5 [device_name5]
CvfsDisk6 [device_name6]
CvfsDisk7 [device_name7]
CvfsDisk8 [device_name8]
CvfsDisk9 [device_name9]

CvfsDisk10 [device_name10]
CvfsDisk11 [device_name11]
```

Step 5 After the cvlabels file is complete, label the disk drives using the `cvlabel` command.

```
# cd /usr/cvfs/bin
# ./cvlabel
```

Follow the on-screen instructions for labeling the disk drives.

Configure StorNext FS Software on IRIX

To configure the StorNext FS software on an IRIX machine, you have to configure the software on the StorNext FS server and StorNext FS clients.

Server Configuration

Step 1 Create a StorNext FS-managed file system by copying `/usr/cvfs/examples/example.cfg` and renaming it.

```
# cd/usr/cvfs/config
# cp ../examples/example.cfg ./<file_system>.cfg
```

NOTE The `example.cfg` file supplied by ADIC contains commented text (entries that begin with a `#`) with descriptions of the various sections and parameters in the file.

Step 2 Edit the example configuration using the following information.

NOTE For information about editing the configuration file, refer to the man page by entering `man cvfs_config` at a system shell prompt.

DISK TYPE section - Defines valid disk types. A disk type describes a category of disks with a capacity specified in number of sectors. The following parts comprise a disk type:

- The required keyword `DiskType` preceded by the open bracket symbol ([ ) and followed by the closed bracket symbol ( ]).
- On the next line, the required keyword `Sectors` and the value of sectors, in terms of 512 bytes per sector, for the disk type.

For example:

```
[DiskType ST318202FC]
Sectors 35563520
SectorSize 512
```

The `SectorSize` should reflect the Sector Format Size of the disk drives, for example: 512, 4096, 8192, 16384.

To obtain the number of sectors where the disks are set, use the `cvlabel -l` command. If you are using disk devices that do not have the same number of sectors, then several disk types can be specified to handle each common number of sectors.

DISK section - Identifies the disk drive that is labeled and available to StorNext FS. A disk type describes a category of disks with a capacity specified in number of sectors. The following parts comprise a disk definition:

- The required keyword `Disk` preceded by the open bracket symbol ([ ) and followed by the closed bracket symbol ( ]).
- On the next line, the words `Status UP`
- On the next line, the required keyword `Type` and the name of the disk type assigned to the disk definition. The name of the disk must match the label name of the drive as displayed by the `cvlabel -l` command. This is how the label names of the Fibre Channel disks are associated with a StorNext FS.

For example:

```
[Disk CvfsDisk0]
Status UP # UP/DOWN
Type 9GB_drive # A type defined in a DiskType Section
```

STRIPEGROUP DEFINITION section - Describes a group of disks that comprise a stripe group. One or more stripe groups describe the entire file system. A stripe group is the smallest entity that can be manipulated by a system administrator using the File System Administration utility (`cvadmin`).

NOTE All disks defined in any given stripe group must have the same number of sectors, as reported by `cvlabel -l`.

Examples of stripe groups appear in the configuration file.

- Find the stripe group named `RegularFiles`.
- Edit the `Node` entries so that all the disk names are listed, with each entry followed by a space and then the stripe order number (0, 1, 2, etc.).

For example:

```
[StripeGroup RegularFiles]
Status UP
Type Regular
Read Enabled
Write Enabled
StripeBreadth 64
Node CvfsDisk0 0
Node CvfsDisk1 1
Node CvfsDisk2 2
Node CvfsDisk3 3
```

Step 3 Save, name and exit the `/usr/cvfs/config/<file_system_name>.cfg` file.

NOTE Make sure you have a `<file_system_name>.cfg` file for each uniquely named StorNext File System on the StorNext FS server.

Step 4 Enable and start the StorNext File System. Enter:

```
# chkconfig cvfs on
# /etc/init.d/cvfs start
```

For more information, refer to the cvfs man page.

Step 5 Initialize StorNext FS. Enter:

```
# cd /usr/cvfs/bin/cvmkfs <file_system_name>
```

CAUTION **This step cannot be undone and all data on the file system will be lost, so make sure you are ready to initialize the file system before you proceed.**

Step 6 Create the fsmlist file. Enter:

```
# cd /usr/cvfs/config
# cp ../examples/fsmlist.example ./fsmlist
```

Step 7 Edit `/usr/cvfs/config/fsmlist` so that it contains the names of all StorNext File Systems.

Client Configuration

Step 1 Create the fsnameservers file by copying `/usr/cvfs/examples/fsnameservers.example` and renaming it. Enter:

```
# cd /usr/cvfs/config
# cp ../examples/fsnameservers.example ./fsnameservers
```

Step 2 Edit `/usr/cvfs/config/fsnameservers` so that it contains the hostname or IP address of all StorNext FS servers. This file must be identical across all servers and clients.

Start the System

Manually start the StorNext FS server. Enter: `# /etc/init.d/cvfs start`

The StorNext FS service files for the new file system are started and run in the background on the StorNext FS server.

Mount StorNext FS on IRIX

To mount StorNext FS:

Step 1 Create the StorNext FS mount directory. For example, enter:

```
# mkdir /usr/clips
```

Step 2 Add the uniquely named StorNext FS-managed file system to the `/etc/fstab` file. Use cvfs as the file system type.

```
<file_system_name> /usr/clips cvfs rw,threads=6 0 0
```

where:

Option	Description
<file_system_name>	Uniquely named StorNext FS-managed file system.

On startup or reboot of the StorNext FS server, StorNext FS automatically mounts any file systems listed in the `/etc/fstab` file.

NOTE If you do not want a cvfs mount point in your `fstab` file, manually start a file system using the cvadmin command. Then, mount the file system using the mount command.

Step 3 Enable automatic mounting of StorNext FS on the StorNext FS server as startup. Enter:

```
# chkconfig cvfs on
```

For more information, refer to the cvfs `man` page.

Step 4 Return to Step 1 to repeat this procedure for each StorNext FS client.

After StorNext FS has been mounted on each client, the `/usr/clips` directory is available to store and share data.

Setting Up StorNext FS on Linux

Roadmap

Topic	Refer to Chapter
Getting started: • Component description. • Installation summary. • Power up sequence. • Power down sequence.	2
On AIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	3
On IRIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	4
On Linux: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	5

Topic	Refer to Chapter
On Solaris: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	6
Troubleshooting procedures	7

Installation Procedure for Linux

The installation and configuration of the StorNext File System (StorNext FS) on Linux includes the following procedures.

Prerequisites

Consider these prerequisites when working with Linux servers and clients:

- Kernel requirements
- Multiple LUN support

Kernel Requirements

StorNext FS supports two Linux operating systems, RedHat and SuSE, that have separate kernel requirements.

RedHat Linux - Kernel Requirements

To run StorNext FS on RedHat Linux, you must use one of these kernels:

- For uniprocessor and multiprocessor systems, RedHat Linux 7.3, kernels 2.4.17-2.4.27
- For uniprocessor and multiprocessor systems, RedHat Linux 8.0, kernels 2.4.14-2.4.27

StorNext FS is distributed as a loadable kernel module. To build the kernel module, the RedHat Linux software must be installed with the Linux kernel source and tools, including compilers.

To build and install the StorNext FS modules, a symbolic link must exist in the `/usr/src` directory that points to the kernel source for the running kernel. For example, for the Linux 2.4.18-27.8 kernel, the symbolic link in the `/usr/src` directory is: linux-2.4 > linux-2.4.18-27.8.x.

If the symbolic link is missing or if it is pointing to the source of a different kernel, the StorNext FS modules either will not install or will not function.

You must also verify that pdksh is installed.

SuSE Linux - Kernel Requirements

To run StorNext FS on SuSE Linux, use this procedure to determine and install the required kernels, including compilers.

Step 1 Check to see whether the compiler was installed at the same time as the rest of the system.

a. Query the kernel. Enter:

```
# rpm -qi `rpm -qa | grep k_`
```

Output similar to the following displays.

```
Name:         k_smp                    Relocations:(not relocateable)
Version:      2.4.19                   Vendor:UnitedLinux LLC
Release:      113                      Build Date:Mon Oct 21 13:04:32 2002
Install Date: Tue Jul 29 15:13:38 2003 Build Host:D63.suse.de
Group:        System Kernel            Source RPM: k_smp-2.4.19-113.src.rpm
Size:         47672209                 License: GPL
Packager:     http://www.unitedlinux.com/feedback
Summary:      kernel with multiprocessor support
Description:  CONFIG_SMP=y
SuSE series: images
Distribution: UnitedLinux 1.0 (i586)
```

b. Query gcc. Enter:

```
# rpm -qi `rpm -qa | grep gcc`
```

Output similar to the following displays.

```
Name:         gcc-info                Relocations:(not relocateable)
Version:      3.2                     Vendor:UnitedLinux LLC
Release:      45                      Build Date:Wed Oct 16 04:51:46 2002
Install Date: Tue Jul 29 15:10:52 2003 Build Host:D143.suse.de
Group:        Dev/Languages/C and C++  Source RPM: k_gcc-3.2-45.src.rpm
Size:         699504                  License: GPL
Packager:     http://www.unitedlinux.com/feedback
Summary:      GNU info-pages for gcc
Description:  GNU info-pages for gcc
SuSE series:  images
Distribution: UnitedLinux 1.0 (i586)
Name:         libgcc                  Relocations:(not relocateable)
Version:      3.2                     Vendor:UnitedLinux LLC
Release:      45                      Build Date:Wed Oct 16 04:51:46 2002
Install Date: Tue Jul 29 15:11:44 2003 Build Host:D143.suse.de
Group:        System/Base             Source RPM: gcc-3.2-45.src.rpm
Size:         41022                   License: GPL
Packager:     http://www.unitedlinux.com/feedback
Summary:      C compiler runtime library
Description:  Needed for dynamically linked C programs.
Name:         gcc                     Relocations:(not relocateable)
Version:      3.2                     Vendor:UnitedLinux LLC
Release:      45                      Build Date:Wed Oct 16 04:51:46 2002
Install Date: Tue Jul 29 15:10:52 2003 Build Host:D143.suse.de
Group:        Dev/Languages/C and C++  Source RPM: gcc-3.2-45.src.rpm
Size:         5680346                 License: GPL
Packager:     http://www.unitedlinux.com/feedback
Summary:      The GNU C compiler and support files
Description:  NOTE: Be sure to install at least the following packages
              besides this one, or you won't be able to compile: binutils
              and glibc-devel.
```

If the dates are substantially different (hours or days rather than minutes), then the compiler was probably added afterwards and the update will not work. In this situation, SuSE Linux Enterprise 8.1 must be re-installed.

Step 2 Install the base system.

a. Select the language in which to run the install.

A system page displays with an area titled “Timezone” and a place to change the “Software”.

b. Click on “Software” and then click “Detailed Selections”.

A two-paned window displays with check boxes on the left pane and list of packages on the right pane.

c. On the left side, only click the box that is not already checked and click **Accept**.

d. Complete the installation.

Step 3 After installing the initial install of SuSE Linux Enterprise 8.1, update the system by running Online Update. Enter:

```
# yast2
```

When yast2 comes up, Software should be selected in the left pane. In the right pane, select the "Online Update" icon. Another window displays.

Step 4 Select Automatic Update and then click Next.

A prompt for Code and Password displays. The Registration Code is located in the SuSE Installation booklet (on the back of the second page after the plastic cover "1"). To obtain a password, follow the registration procedure described on the page where the Registration Code is printed.

Step 5 If your Registration Code is not registered, navigate to www.suse.de/register and enter in the Registration Code.

Several prompts display. A password will be sent to you.

Step 6 Once you provide the Code and Password and click Login, the update should launch.

The update is interactive, requiring an administrator, and takes several hours to complete. The update is complete when the Installation Successful dialog window displays.

Step 7 Change directory (`cd`) into `/usr/src` and create a link to the kernel source. Enter:

```
# cd /usr/src
# ln -s linux-2.4.19.SuSE linux-2.4
```

Step 8 Change directory (`cd`) into linux-2.4 and delete any leftover config files in the directory. Copy the original config file into the current directory and re-name the .cfg file. Enter:

```
# cd linux-2.4
# cp /boot/vmlinuz.config /usr/src/linux-2.4/.config
```

Step 9 Configure the kernel, build the kernel, build the modules and install the modules. Enter:

```
# make oldconfig
# make dep bzImage modules modules_install
```

Step 10 Copy the kernel into the `/boot` directory. Edit the `/etc/sysconfig/kernel` line that reads INITRD_MODULES="aacraid reiserfs" to include qla2300.

Step 11 Create a ramdisk. Enter:

```
# pwd
/usr/src/linux-2.4

# cp `find . -name bzImage` /boot/vmlinuz-suse

# grep INITRD /etc/sysconfig/kernel
INITRD_MODULES="aacraid reiserfs"

# vi /etc/sysconfig/kernel

# grep INITRD /etc/sysconfig/kernel
INITRD_MODULES="aacraid reiserfs qla2300"

# cd /boot

# mkinitrd -k vmlinuz-suse -i initrd-suse
```

Step 12 Edit the `/boot/grub/menu.lst` file so the kernel can be booted. Make edits to reflect the new kernel configuration parameters.

file `/boot/grub/menu.lst` before changes:

```
title linux
  kernel (hd1,0)/boot/vmlinuz root=/dev/sdb1   vga=791
  initrd (hd1,0)/boot/initrd
title floppy
  root (fd0)
  chainloader +1
```

file `/boot/grub/menu.lst` after changes (in bold):

```
title linux-suse
  kernel (hd1,0)/boot/vmlinuz-suse root=/dev/sdb1 vga=791
  initrd (hd1,0)/boot/initrd-suse
title floppy
  root (fd0)
  chainloader +1
```

Step 13 Verify that pdksh is installed.

Multiple LUN Support

If your file system storage device user non-zero SCSI Logical Unit Numbers (LUNs), configure the RedHat Linux kernel to scan for all SCSI LUNs. By default, RedHat Linux only scans for LUN 0.

To configure the Linux kernel for multiple LUNs:

Step 1 In the `/etc/modules.conf` file, add the following line:

```
options scsi_mod max_scsi_luns=luns=nLUNs
```

where the `nLUNs` value equals the number of LUNs that are required by your file system storage device.

For example:

```
alias parport_lowlevel parport_pc
alias scsi_hostadapter aic7xxx
alias eth0 eepro100
alias eth1 e1000
alias scsi_hostadapter1 qla2300
options scsi_mod max_scsi_luns=128
```

Step 2 Create a new initial RAM disk file by using the `mkinitrd` command.

For example:

```
# cd /boot
mkinitrd -f initrd-2.4.18.17.7.xsmp.img 2.4.18-17.7.xsmp
```

Step 3 Reboot the system.

Install StorNext FS on Linux

NOTE For upgrade instructions, refer to the *StorNext Management Suite Release Notes*.

To install StorNext FS on Linux:

Step 1 Log onto the machine as `root`.

Step 2 Insert the StorNext File System CD into the drive and wait for the hardware to access it.

NOTE If the RedHat Linux CD automatic facility does not automatically mount the CD to /mnt/cdrom, enter `mount /mnt/cdrom` to mount the CD.

Step 3 Change to the Linux directory.

```
# cd /mnt/cdrom/StorNextFS/linux
```

Step 4 Install the server and client files on your system.

- If you use a Uniprocessor system, install the server and client files, including the word up in the filenames. For example:

```
# rpm -ivh cvfs-server.7.3_2417up-2.1.1-62.i386.rpm
# rpm -ivh cvfs-client.7.3_2417up-2.1.1-62.i386.rpm
```

- If you use a Multiprocessor system, install the server and client files, including the word smp in the filenames.

```
# rpm -ivh cvfs-server.7.3_2419smp-2.1.1-62.i386.rpm
# rpm -ivh cvfs-client.7.3_2418smp-2.1.1-62.i386.rpm
```

Step 5 Add `/usr/cvfs/bin` to root's search path and /usr/cvfs/man to the MANPATH.

Step 6 In the `/etc/profile` file, modify the ulimit command to enable the system to produce core files. Enter:

```
# ulimit -S -c 0 > /dev/null 2 > &1
# ulimit -c unlimited > /dev/null 2 >&1
```

Step 7 Remove the CD from the drive.

Step 8 Edit the `/etc/sysconfig/rawdevices` file to provide mapping from block device to raw device for all Fibre Channel (FC) devices.

CAUTION **To prevent the accidental overwriting of disks and/or LUNs not used by StorNext FS (such as the system boot disk), do not include them in the `rawdevices` file.**

Every FC device that StorNext FS will use must have an entry with the format <rawdev> <blockdev> in this file. For example, to add three SCSI devices to the file, the format would be:

```
/dev/raw/raw1 /dev/sdb
/dev/raw/raw2 /dev/sdc
/dev/raw/raw3 /dev/sdd
```

Step 9 Activate the raw devices. Enter:

```
# /etc/init.d/rawdevices restart
```

Step 10 Return to Step 1 to install StorNext FS on another Linux machine.

Obtain License for Linux Server

The StorNext FS server must have a valid license. To obtain the license file:

Step 1 Verify that `/etc/hosts` has a proper entry for the system name.

NOTE In certain situations, the Linux installation program attaches the system name to 127.0.0.1, instead of an entry for the Ethernet card. The following example illustrates this situation for `/etc/hosts` with the system name, `snpc4`:

```
127.0.0.1 snpc4 localhost.localdomain localhost # bad
```

If this situation occurs, StorNext FS will not work properly. To correct the /etc/hosts entry, edit the file so that the system name is attached to the Ethernet card. For example, if the IP address for the system name, snpc4, is 172.16.50.39, the host file should read:

```
127.0.0.1 localhost.localdomain localhost 172.16.50.39 snpc4 # good
```

Step 2 Run the StorNext FS host identifier utility on the server. Enter:

```
# usr/cvfs/bin/cvfsid
```

Output from this utility for system name `snpc4` looks similar to this.

```
E0290E3F83 linux 0 snpc4
```

The hexadecimal number is unique to the server and *host_name* should match the server's host name. This number is known as the ID string.

Step 3 Email the ID string, number of client machines to ATAC at support@adic.com and product serial number to ATAC at support@adic.com. If you do not have email access, contact ATAC at 1-800-827-3822.

An ATAC Technical Support representative will provide a license.dat file.

Step 4 Place license.dat in the /usr/cvfs/config directory on the server.

NOTE If you have a temporary StorNext license, first remove the temporary license file before replacing it with the permanent license file.

Label Drives on Linux

You must label each drive to be used by StorNext FS. A new drive needs to be labeled only one time. Drive labeling can be performed from any StorNext client that has a Fibre Channel connection to the drive.

CAUTION **The process of disk labeling re-partitions the drives. If you select an incorrect drive, you may lose data.**

To label a drive:

Step 1 From the system prompt on any StorNext FS client, display a list of connected drives. Enter:

```
# /usr/cvfs/bin/cvlabel -l
```

Sample output looks like this:

```
sdb [SEAGATE ST19171FS 0018] unknown Sectors: 17691712. Sector Size: 512.
sdc [SEAGATE ST19171FS 0018] unknown Sectors: 17691712. Sector Size: 512.
sdd [SEAGATE ST19171FS 0018] unknown Sectors: 17691712. Sector Size: 512.
```

NOTE The `cvlabel` command only lists or modifies drives listed in `/etc/sysconfig/rawdevices`. For more information about the rawdevices file, see page 5-10.

Step 2 From the output information, identify any drives that are unused or do not have a recognized Volume Type and write down their associated device names.

CAUTION **Identify any drives that already contain a recognized Volume Type. Do not write a label to these drives or you may lose data.**

Step 3 Create `/usr/cvfs/config/cvlabels` from the copy of the StorNext FS label file example. Enter:

```
# /usr/cvfs/bin/cvlabel -c > /usr/cvfs/config/cvlabels
```

The created file displays an entry for disk located by the `cvlabel` command.

```
CvfsDisk_UNKNOWN sdb
CvfsDisk_UNKNOWN sdc
CvfsDisk UNKNOWN sdd
```

Step 4 Edit `/usr/cvfs/config/cvlabels` file to provide a unique name for each drive used by StorNext FS.

In this example, _UNKNOWN has been changed to a sequential list.

```
CvfsDisk0 sdb
CvfsDisk1 sdc
CvfsDisk2 sdd
```

Step 5 In the `/usr/cvfs/config/cvlabels` file, delete any lines that refer to disks you will not label.

Step 6 Save the `/usr/cvfs/config/cvlabels` file and label the disk drives using the cvlabel command.

Configure StorNext FS Software on Linux

To configure the StorNext FS software on a Linux machine, you have to configure the software on the StorNext FS server and StorNext FS clients.

Server Configuration

Step 1 Create a StorNext FS-managed file system by copying `/usr/cvfs/examples/example.cfg` to `/usr/cvfs/config/<file_system_name>.cfg` where `file_system_name` is a unique, descriptive name. For example:

```
# cd/usr/cvfs/config
# cp ../examples/example.cfg ./projA.cfg
```

NOTE The `example.cfg` file supplied by ADIC contains commented text (entries that begin with a `#`) with descriptions of the various sections and parameters in the file.

Step 2 Edit each configuration file using the following information.

NOTE For information about editing the configuration file, refer to the man page by entering `man cvfs_config` at a system shell prompt.

DISK TYPE section - Defines valid disk types. A disk type describes a category of disks with a capacity specified in number of sectors. The following parts comprise a disk type:

- The required keyword `DiskType` preceded by the open bracket symbol ([ ) and followed by the closed bracket symbol ( ]).
- On the next line, the required keyword `Sectors` and the value of sectors, in terms of 512 bytes per sector, for the disk type.

For example:

```
[DiskType ST31917FC]
Sectors 17780736
SectorSize 512
```

To obtain the number of sectors and the sector size for each storage device, use the cvlabel -1 command. Multiple entries for DiskTypes can be created to support multiple hard disks and RAID LUNs of different sizes.

DISK section - Identifies the disk type to be assigned to a disk drive that is labeled and available for StorNext FS. A disk type describes a category of disks with a capacity specified in number of sectors. The following parts comprise a disk definition:

- The required keyword `Disk` preceded by the open bracket symbol ([ ) and followed by the closed bracket symbol ( ]). The name of the disk must match the label name of the drive as displayed by the `cvlabel -l` command, and the sectors must match the Sectors value defined in DiskType. This is how the label names of the Fibre Channel disks are associated with a StorNext FS.
- On the next line, the words `Status UP`
- On the next line, the required keyword `Type` and the name of the disk type assigned to the disk definition.

For example:

```
[Disk CvfsDisk12]
Status UP
Type ST1917FS
```

STRIPEGROUP DEFINITION section - Describes a group of disks that comprise a stripe group. One or more stripe groups describe the entire file system. A stripe group is the smallest entity that can be manipulated by a system administrator using the File System Administration utility (cvadmin).

NOTE All disks defined in any given stripe group must have the same sector size and number of sectors, as listed in the DiskType section.

Examples of stripe groups appear in the configuration file.

- Find the stripe group named `RegularFiles`.
- Edit the `Node` entries so that all the disk names are listed, with each entry followed by a space and then the stripe order number (0, 1, 2, etc.).

For example:

```
[StripeGroup RegularFiles]
Status UP
Read Enabled
Write Enabled
StripeBreadth 16
Node CvfsDisk12 0
Node CvfsDisk13 1
```

Step 3 Save the configuration file.

NOTE Make sure you have a *<file_system_name>*`.cfg` file for each uniquely named StorNext File System on the StorNext FS server.

Step 4 Launch the StorNext FS software. Enter:

```
/etc/init.d/cvfs start
```

Step 5 Initialize each StorNext FS.

CAUTION **Once this command has been executed, all data on the file system will be lost. Do not initialize the file system until you are ready to proceed.**

For example:

```
# cd /usr/cvfs/bin/cvmkfs_projA
```

Step 6 Create the file system list (fsmlist). Enter:

```
# cd /usr/cvfs/config
# cp ../examples/fsmlist.example ./fsmlist
```

Step 7 In the `fsmlist` file, add the names of all of the StorNext File Systems.

Step 8 Create a nameserver list by copying the `/usr/cvfs/examples/fsnameservers.example` to the `/usr/cvfs/config/fsnameservers` file. Enter:

```
# cd /usr/cvfs/config
# cp ../examples/fsnameservers.example ./fsnameservers
```

Step 9 In the `fsnameservers` file, add the host IP address or name of the StorNext FS server.

For more information about failover environments, refer to the `cvfs_failover` man page.

Client Configuration

Copy `/usr/cvfs/config/fsnameservers` from the StorNext FS server to `/usr/cvfs/config/fsnameservers` on all clients.

Enable and Start the System

Manually re-start the StorNext FS server. Enter:

```
# /etc/init.d/cvfs restart
```

The StorNext FS service files for the new file system are now started and running in the background on the StorNext FS server.

Mount StorNext FS on Linux

To mount StorNext FS:

Step 1 Create the StorNext FS mount directory. This is the path by which users access the file system. For example:

```
# mkdir /usr/clips
# chmod 777 /usr/clips
```

Step 2 Add the StorNext FS name to the `/etc/fstab` file. Use `cvfs` as the file system type. For example:

```
# projA /usr/clips/ cvfs rw,threads=6 0 0
```

When the StorNext FS server starts up or reboots, StorNext FS automatically mounts any file systems listed in the `/etc/fstab` file.

NOTE If you do not want a `cvfs` mount point in your `fstab` file, manually start a file system using the `cvadmin` command. Then, mount the file system using the mount command, as shown in the following example:

During the boot process, the file systems listed in `/etc/fstab` tries to be mounted. On the first mount attempt, StorNext FS fails because the `cvfs`-loadable modules are loaded later in the boot process. These errors can be safely ignored, and StorNext FS mounts toward the end of the system startup process.

Step 3 Repeat Steps 1 and 2 to mount each StorNext FS on all client machines.

Setting Up StorNext FS on Solaris

Roadmap

Topic	Refer to Chapter
Getting started: • Component description. • Installation summary. • Power up sequence. • Power down sequence.	2
On AIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	3
On IRIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	4
On Linux: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	5

Topic	Refer to Chapter
On Solaris: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	6
Troubleshooting procedures	7

Installation Procedure for Solaris

The installation and configuration of the StorNext File System (StorNext FS) on Solaris includes the following procedures.

Install StorNext FS on Solaris

NOTE For upgrade instructions, refer to the *StorNext Management Suite Release Notes*.

To install StorNext FS on Solaris:

Step 1 Designate one Solaris machine as the StorNext FS server.

Step 2 Log onto the machine as `root`.

Step 3 Insert the StorNext File System CD into the drive and wait for the hardware to access it.

Step 4 Run the `pkgadd` utility to start the Solaris installation.

```
# pkgadd -d <cdrom path>
```

Step 5 Select the package for `ADICcvfs`.

Step 6 When the installation is complete, set up the path to the StorNext FS man pages by including /usr/cvfs/man in the global MANPATH environment variable.

For a list of man pages about the StorNext FS commands, refer to the `/usr/cvfs/man` directory. To display a man page about a specific command, enter:

```
# man command_name
```

Step 7 Set up the path to the StorNext FS binaries by including `/usr/cvfs/bin` in the global PATH environment variable.

Step 8 Remove the CD from the CD drive.

Step 9 Reboot the machine

Step 10 Return to Step 1 to install StorNext FS on another Solaris machine.

Obtain License for Solaris Server

The StorNext FS server must have a valid license. To obtain the license file:

Step 1 Run the StorNext FS host identifier utility. Enter:

```
# usr/cvfs/bin/cvfsid
```

The output looks similar to this.

```
690CB94A sun 1 <host_name>
```

The hexadecimal number is unique to the server and *host_name* should match the server's host name. This number is known as the ID string.

Step 2 Email the ID string and the number of client machines to ATAC at support@adic.com. If you cannot access email, call ATAC for assistance at 1-800-827-3822.

An ATAC Technical Support representative will provide a license.dat file.

Step 3 Place license.dat in the `/usr/cvfs/config` directory on the server.

NOTE If you have a temporary StorNext license, first remove the temporary license file before replacing it with the permanent license file.

Label Drives on Solaris

You must label each drive to be used by StorNext FS. A new drive needs to be labeled only one time. Drive labeling can be performed from any StorNext client that has a Fibre Channel connection to the drive.

CAUTION **The process of disk labeling re-partitions the drives. If you select an incorrect drive, you may lose data.**

To label a drive:

Step 1 From the system prompt on any StorNext FS client, display a list of connected drives. Enter:

```
# /usr/cvfs/bin/cvlabel -1
```

Step 2 From the output information, identify any drives that are unused or do not have a recognized Volume Type and write down their associated device names.

CAUTION **Identify any drives that already contain a recognized Volume Type. Do not write a label to these drives or you may lose data.**

Step 3 Create `/usr/cvfs/config/cvlabels` from the copy of the StorNext FS label file example. Enter:

```
# cd/usr/cvfs/config
# cp ../examples/cvlabels.example ./cvlabels
```

Step 4 Edit `/usr/cvfs/config/cvlabels` so that it contains a list of StorNext FS label names that correspond to the device names of the drives captured in Step 2.

You can create any convention for the label names. For example, if a site consists of 12 Fibre Channel drives, you can use `CvfsDisk[n]` for each label name. Replace [n] with a decimal number starting at 0 and increment the number for each drive. In this case, the label name entries in the file would be: `CvfsDisk0`, `CvfsDisk1`, `CvfsDisk2`, and so on. For example:

```
# Solaris Example

# Drives 0 through 11 will be used for Regular Stripe
Groups, # so the entire volumes are used (total sector
sizes are used # since optional sector sizes are not
specified).

#
# Regular file disks - use entire volume

CvfsDisk0 [device_name0]
CvfsDisk1 [device_name1]
CvfsDisk2 [device_name2]
CvfsDisk3 [device_name3]
CvfsDisk4 [device_name4]
CvfsDisk5 [device_name5]
CvfsDisk6 [device_name6]
CvfsDisk7 [device_name7]
CvfsDisk8 [device_name8]
CvfsDisk9 [device_name9]
CvfsDisk10 [device_name10]
CvfsDisk11 [device_name11]
```

Step 5 After the cvlabels file is complete, label the disk drives using the cvlabel command.

```
# cd /usr/cvfs/bin
# ./cvlabel
```

Follow the on-screen instructions for labeling the disk drives.

Configure StorNext FS Software on Solaris

To configure the StorNext FS software on a Solaris machine, you have to configure the software on the StorNext FS server and StorNext FS clients.

Server Configuration

Step 1 Create a StorNext FS-managed file system by copying `/usr/cvfs/examples/example.cfg` and renaming it.

```
# cd/usr/cvfs/config
# cp ../examples/example.cfg ./<file_system>.cfg
```

NOTE The `example.cfg` file supplied by ADIC contains commented text (entries that begin with a `#`) with descriptions of the various sections and parameters in the file.

Step 2 Edit the example configuration using the following information.

NOTE For information about editing the configuration file, refer to the man page by entering `man cvfs_config` at a system shell prompt.

DISK TYPE section - Defines valid disk types. A disk type describes a category of disks with a capacity specified in number of sectors. The following parts comprise a disk type:

- The required keyword `DiskType` preceded by the open bracket symbol ([ ) and followed by the closed bracket symbol ( ]).
- On the next line, the required keyword `Sectors` and the value of sectors, in terms of 512 bytes per sector, for the disk type.

For example:

```
[DiskType ST318202FC]
Sectors 35563520
SectorSize 512
```

The `SectorSize` should reflect the Sector Format Size of the disk drives, for example: 512, 4096, 8192, 16384.

To obtain the number of sectors where the disks are set, use the `cvlabel -l` command. If you are using disk devices that do not have the same number of sectors, then several disk types can be specified to handle each common number of sectors.

DISK section - Identifies the disk drive that is labeled and available to StorNext FS. A disk type describes a category of disks with a capacity specified in number of sectors. The following parts comprise a disk definition:

- The required keyword `Disk` preceded by the open bracket symbol ([ ) and followed by the closed bracket symbol ( ]).
- On the next line, the words `Status UP`
- On the next line, the required keyword `Type` and the name of the disk type assigned to the disk definition. The name of the disk must match the label name of the drive as displayed by the `cvlabel -l` command. This is how the label names of the Fibre Channel disks are associated with a StorNext FS.

For example:

```
[[Disk CvfsDisk0]
Status UP # UP/DOWN
Type 9GB_drive # A type defined in a DiskType Section
```

STRIPEGROUP DEFINITION section - Describes a group of disks that comprise a stripe group. One or more stripe groups describe the entire file system. A stripe group is the smallest entity that can be manipulated by a system administrator using the File System Administration utility (`cvadmin`).

NOTE All disks defined in any given stripe group must have the same number of sectors, as reported by `cvlabel -l`.

Examples of stripe groups appear in the configuration file.

- Find the stripe group named `RegularFiles`.
- Edit the `Node` entries so that all the disk names are listed, with each entry followed by a space and then the stripe order number (0, 1, 2, etc.).

For example:

```
[StripeGroup RegularFiles]
Status UP
Type Regular
Read Enabled
Write Enabled
StripeBreadth 64
Node CvfsDisk0 0
Node CvfsDisk1 1
Node CvfsDisk2 2
Node CvfsDisk3 3
```

Step 3 Save, name and exit the `/usr/cvfs/config/<file_system_name>.cfg` file.

NOTE Make sure you have a `<file_system_name>.cfg` file for each uniquely named StorNext File System on the StorNext FS server.

Step 4 Verify that `fsmpm` is running so that cvmkfs works properly. Enter:

```
# ps -ef | grep fsmpm
```

Step 5 Initialize StorNext FS. Enter:

```
# cd /usr/cvfs/bin/cvmkfs <file_system_name>
# cp ../examples/fsmlist.example ./fsmlist
```

CAUTION **This step cannot be undone and all data on the file system will be lost, so make sure you are ready to initialize the file system before you proceed.**

Step 6 Create the fsmlist file. Enter:

```
# cd /usr/cvfs/config
# cp ../examples/fsmlist.example ./fsmlist
```

Step 7 Edit `/usr/cvfs/config/fsmlist` so that it contains the names of all StorNext File Systems.

Client Configuration

Step 1 Create the fsnameservers file by copying `/usr/cvfs/examples/fsnameservers.example` and renaming it. Enter:

```
# cd /usr/cvfs/config
# cp ../examples/fsnameservers.example ./fsnameservers
```

Step 2 Edit `/usr/cvfs/config/fsnameservers` so that it contains the hostname or IP address of all StorNext FS servers. This file must be identical across all servers and clients.

For information about failover environments, refer to the `cvfs_failover` man page.

Start the System

Manually start the StorNext FS server. Enter: # /etc/init.d/cvfs start

The StorNext FS service files for the new file system are now started and running in the background on the StorNext FS server.

Mount StorNext FS on Solaris

To mount StorNext FS:

Step 1 Create the StorNext FS mount directory. For example:

```
# mkdir /usr/clips
```

Step 2 Add the uniquely named StorNext FS-managed file system to the `/etc/vfstab` file. Use `cvfs` as the file system type.

```
<file_system_name> /usr/clips cvfs - yes rw,threads=6
```

where:

Option	Description
<file_system_name>	Uniquely named StorNext FS-managed file system.

On startup or reboot of the StorNext FS server, StorNext FS automatically mounts any file systems listed in the `/etc/vfstab` file.

NOTE If you do not want a `cvfs` mount point in your `vfstab` file, manually start a file system using the `cvadmin` command. Then, mount the file system using the mount command.

Step 3 Return to Step 1 to repeat this procedure for each StorNext FS client.

After StorNext FS has been mounted on each client, the `/usr/clips` directory is available to store and share data.

Resolving Installation Problems

Roadmap

Topic	Refer to Chapter
Getting started: • Component description. • Installation summary. • Power up sequence. • Power down sequence.	2
On AIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	3
On IRIX: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	4
On Linux: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	5

Topic	Refer to Chapter
On Solaris: • Install StorNext FS. • Obtain license for the server. • Label the disk drives. • Configure the StorNext FS software. • Mount StorNext FS.	6
Troubleshooting procedures	7

Resolving Problems with AIX

To resolve problems with a StorNext File System (StorNext FS) installation on AIX:

Check Drive Connectivity

Step 1 On the StorNext FS server, log in as root.

Step 2 Check for access to the Fibre Channel drives. Enter:

```
cvlabel -l
```

Verify that the File System is Active

Step 1 On the StorNext FS server, log in as root.

Step 2 Verify that the file system is active. Enter:

```
cvadmin>
select file_system_name
show long
```

All stripe groups should display a status of “UP.”

Step 3 After verifying the file system’s active status, enter quit.

Check Error Messages

Step 1 On the StorNext FS server, log in as root.

Step 2 Check for error messages in the system log file. Enter:

```
tail -50 /system log
```

Check AIX Patches

If any program errors cannot be resolved, check for AIX patches (or equivalents) in the *StorNext Management Suite Release Notes.*

Verify the StorNext FS Setup

Step 1 On the StorNext FS server, log in as root.

Step 2 Verify the number of active StorNext FS clients using the default file system.

a. Launch cvadmin. Enter: `cvadmin`

Several status messages display.

b. Select the file system. Enter: select *file_system_name*

Output similar to the following displays:

```
Created:                                Date
Active Clients                          3
Fs Block Size                           4K
Msg Buffer Size                         4K
Disk Devices                            16
Stripe Groups                           4
Mirror Groups                           0
Fs Blocks
Fs Blocks Free
```

Step 3 Verify that the number of StorNext FS clients configured during this installation matches the number of StorNext FS clients shown in the Active Clients field.

Verify the Mounted File System

To verify that StorNext FS is correctly mounted on a StorNext FS client:

Step 1 On a StorNext FS client, log in as root.

Step 2 Verify the StorNext FS mount on the client. Enter: `df -k`

A status message, similar to the following, displays:

```
File System          kbytes     Use              Avail   % use   Mounted On
/dev/hd4             65536      47596      28%   2881    22%     /
/dev/hd2             5242880    1988880    63%   35067   8%      /usr
/dev/hd9var          32768      2848       92%   664     48%     /var
/dev/hd3             327680     275064     17%   76      1%      /tmp
/dev/hd1             524288     351836     33%   2328    3%      /home
/proc                       -          -      -       -       - /proc
/dev/hd10opt         32768      19876      40%   376     8%      /opt
/dev/cvfsct1:storz1  72128768   55285152   24%   359     36%     /stornext/snfs1
```

Unmount and Remount All File Systems

To unmount and remount all StorNext File Systems listed in `/etc/filesystems` (such as to troubleshoot or for system maintenance):

Step 1 On a StorNext FS client, log in as root.

Step 2 Unmount all StorNext File Systems listed in the `/etc/filesystems` file. Enter:

```
umount -t cvfs
```

Step 3 Remount all StorNext File Systems on a client. Enter:

```
umount -at cvfs
```

Unmount and Remount Specific File System

To unmount and remount a specific StorNext FS, follow these steps.

Step 1 On a StorNext FS client, log in as root.

Step 2 Unmount a specific StorNext FS. Enter:

```
umount mount_directory
```

For example:

```
umount /usr/clips
```

Step 3 Remount a specific StorNext FS on a client. Enter:

```
mount mount_directory
```

For example:

```
mount /usr/clips
```

Reinitialize StorNext FS

To reinitialize a StorNext FS:

CAUTION **Use caution when performing this procedure because it will erase all existing data on the specified StorNext FS.**

Step 1 On the StorNext FS server, log in as root.

Step 2 Unmount the specific StorNext FS from all clients.

Step 3 In a system shell window, use the File System Administrator utility to stop the specific file system.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Stopr the file system. Enter: `stop` *file_system_name*

c. Exit cvadmin. Enter: `quit`

Step 4 Run the StorNext FS initialize utility. Enter: `cvmkfs` *file_system_name*

Step 5 Reinitialize the specific StorNext FS by following the online instructions.

CAUTION **This step cannot be undone and all data on the file system will be lost, so make sure you are ready to initialize the file system before you proceed.**

Step 6 Start the file system using the File System Administrator utility.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Start the file system. Enter: `start` *file_system_name*

c. Activate the file system. Enter: `activate` *file_system_name*

d. Select the file system. Enter: `select` *file_system_name*

The file system configuration status displays.

e. Exit cvadmin. Enter: `quit`

Step 7 Mount StorNext FS. Enter: mount *mount_directory*

If the configuration status does not display or if the file system does not start, check the `system log` for errors and check `file_system_name.cfg` for syntactic or typographical errors.

Resolving Problems with IRIX

To resolve problems with a StorNext FS installation on IRIX:

Check Drive Connectivity

Step 1 On the StorNext File System (StorNext FS) server, log in as root.

Step 2 Check for access to the Fibre Channel drives. Enter:

```
cvlabel -l
```

Verify that the File System is Active

Step 1 On the StorNext FS server, log in as root.

Step 2 Verify that the file system is active. Enter:

```
cvadmin>
select file_system_name
show long
```

All stripe groups should display a status of “UP.”

Step 3 After verifying the file system’s active status, enter quit.

Check Error Messages

Step 1 On the StorNext FS server, log in as root.

Step 2 Check for error messages in the system’s system log . Enter:

```
tail -50 /var/adm/SYSLOG
```

Check IRIX Patches

If any program errors cannot be resolved, check for IRIX patches (or equivalents) in the *StorNext Management Suite Release Notes.*

Verify the StorNext FS Setup

Step 1 On the StorNext FS server, log in as root.

Step 2 Verify the number of active StorNext FS clients using the default file system.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Select the file system. Enter: select *file_system_name*

Output similar to the following displays:

```
Created:                                Date
Active Clients                          3
Fs Block Size                           4K
Msg Buffer Size                         4K
Disk Devices                            16
Stripe Groups                           4
Mirror Groups                           0
Fs Blocks
Fs Blocks Free
```

Step 3 Verify that the number of StorNext FS clients configured during this installation matches the number of StorNext FS clients shown in the Active Clients field.

Verify the Mounted File System

To verify that StorNext FS is correctly mounted on a StorNext FS client:

Step 1 On a StorNext FS client, log in as root.

Step 2 Verify the StorNext FS mount on the client. Enter: `df -k`

A status message, similar to the following, displays:

```
File System        Type   kbytes     Use       Avail      %use   Mounted On
/dev/root          xfs    1961936    1756840   205096     90     /
file_system_name   cvfs   35561472   2103808   33457664   6      /mount_point
```

Unmount and Remount All File Systems

To unmount and remount all StorNext File Systems listed in `/etc/fstab` (such as for system maintenance or troubleshooting):

Step 1 On a StorNext FS client, log in as root.

Step 2 Unmount all StorNext File Systems listed in the `/etc/fstab` file. Enter:

```
umount -t cvfs
```

Step 3 Remount all StorNext File Systems on a client.

```
umount -at cvfs
```

Unmount and Remount Specific File System

To unmount and remount a specific StorNext FS, follow these steps.

Step 1 On a StorNext FS client, log in as root.

Step 2 Unmount a specific StorNext FS. Enter:

```
umount mount_directory
```

For example:

```
umount /usr/clips
```

Step 3 Remount a specific StorNext FS on a client. Enter:

`mount` *`mount_directory`*

For example:

```
mount /usr/clips
```

Reinitialize StorNext FS

To reinitialize a StorNext FS:

CAUTION **Use caution when performing this procedure because it will erase all existing data on the specified StorNext FS.**

Step 1 On the StorNext FS server, log in as root.

Step 2 Unmount the specific StorNext FS from all clients.

Step 3 In a system shell window, use the File System Administrator utility to stop the specific file system.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Stop the file system. Enter: `stop` *file_system_name*

c. Exit cvadmin. Enter: `quit`

Step 4 Run the StorNext FS initialize utility. Enter: `cvmkfs` *`file_system_name`*

Step 5 Reinitialize the specific StorNext FS by following the online instructions.

CAUTION **This step cannot be undone and all data on the file system will be lost, so make sure you are ready to initialize the file system before you proceed.**

Step 6 Start the file system using the File System Administrator utility.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Start the file system. Enter: `start` *file_system_name*

c. Activate the file system. Enter: `activate` *file_system_name*

d. Select the file system. Enter: `select` *file_system_name*

File system configuration status displays.

e. Exit cvadmin. Enter: `quit`

Step 7 Mount StorNext FS. Enter: mount *mount_directory*

If the configuration status does not display or if the file system does not start, check the `var/adm/`*`SYSLOG`* for errors and check `file_system_name.cfg` for syntactic or typographical errors.

Resolving Problems on Linux

To resolve problems with a StorNext FS installation on Linux:

Check Drive Connectivity

Step 1 On the StorNext File System (StorNext FS) server, log in as root.

Step 2 Check for access to the Fibre Channel drives. Enter: `cvlabel -l`

Verify File System is Active

Step 1 On the StorNext FS server, log in as root.

Step 2 Verify that the file system is active.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Select the file system. Enter: `select` *file_system_name*

c. Enter: `show long`

In the output, all the stripe groups should display a status of “UP.”

Step 3 After verifying the file system’s active status, enter quit.

Check Error Messages

Step 1 On the StorNext FS server, log in as root.

Step 2 Check for error messages in the system’s system log. For example, enter:

```
tail -50 /var/adm/messages
```

Check Linux Patches

If any program errors cannot be resolved, check for Linux patches (or equivalents) in the *StorNext Management Suite Release Notes.*

Verify the StorNext FS Setup

Step 1 On the StorNext FS server, log in as root.

Step 2 Verify the number of active StorNext FS clients using the default file system.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Select the file system. Enter: select *file_system_name*

Output similar to the following displays:

```
Created:                          <Date>
Active Connections                3
Fs Block Size                     4K
Msg Buffer Size                   4K
Disk Devices                      14
Stripe Groups                     4
Mirror Groups                     0
Fs Blocks
Fs Blocks Free
```

Step 3 Verify that the number of StorNext FS clients configured during this installation matches the number of StorNext FS clients shown in the Active Clients field.

Verify the Mounted File System

To verify that StorNext FS is correctly mounted on a StorNext FS client:

Step 1 On a StorNext FS client, log in as root.

Step 2 Verify the StorNext FS mount on the client. Enter: `df -k`

A status message, similar to the following, displays:

```
File System       Type   kbytes     Use       Avail      %use   Mounted On
/dev/root         xfs    1961936    1756840   205096     90     /
FSS_name          cvfs   35561472   2103808   33457664   6      /mount_point
```

Unmount and Remount the File System

To unmount and remount all StorNext File Systems listed in `/etc/fstab` (such as for system maintenance or troubleshooting):

Step 1 On a StorNext FS client, log in as root.

Step 2 Unmount all StorNext File Systems listed in the `/etc/fstab` file. Enter:

```
/etc/rc.d/init.d/cvfs stop
```

Step 3 Remount all StorNext File Systems on a client. Enter:

```
umount -t cvfs file_system_name mount point
```

Reinitialize StorNext FS

To reinitialize a StorNext FS (such as after making configuration changes):

CAUTION **Use caution when performing this procedure because it will erase all existing data on the specified StorNext FS.**

Step 1 On the StorNext FS server, log in as root.

Step 2 Unmount the specific StorNext FS from all clients.

Step 3 In a system shell window, use the File System Administrator utility to stop the specific file system.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Stop the file system. Enter: `stop` *file_system_name*

c. Exit cvadmin. Enter: `quit`

Step 4 If you want to change file system parameters and global settings, edit and save the `/usr/cvfs/config/file_system_name.cfg` file.

Step 5 Reinitialize the specific StorNext FS:

a. Navigate to `/usr/cvfs/bin`.

b. Run the cvmkfs command and follow the directions that appear on the screen.

CAUTION **This step cannot be undone and all data on the file system will be lost, so make sure you are ready to initialize the file system before you proceed.**

Step 6 Start the file system using the File System Administrator utility.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Start the file system. Enter: `start` *file_system_name*

c. Activate the file system. Enter: `activate` *file_system_name*

d. Select the file system. Enter: `select` *file_system_name*

File system configuration status displays.

e. Exit cvadmin. Enter: `quit`

Resolving Problems on Solaris

To resolve problems with a StorNext FS installation on Solaris:

Check Drive Connectivity

Step 1 On the StorNext File System (StorNext FS) server, log in as root.

Step 2 Check for access to the Fibre Channel drives. Enter: `cvlabel -l`

Verify File System is Active

Step 1 On the StorNext FS server, log in as root.

Step 2 Verify that the file system is active.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Select the file system. Enter: `select` *file_system_name*

c. Enter: `show long`

In the output, all the stripe groups should display a status of “UP.”

Step 3 After verifying the file system’s active status, enter quit.

Check Error Messages

Step 1 On the StorNext FS server, log in as root.

Step 2 Check for error messages in the system’s system log. For example, enter:

```
tail -50 /var/adm/messages
```

Check Solaris Patches

If any program errors cannot be resolved, check for Solaris patches (or equivalents) in the *StorNext Management Suite Release Notes.*

Verify the StorNext FS Setup

Step 1 On the StorNext FS server, log in as root.

Step 2 Verify the number of active StorNext FS clients using the default file system.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Select the file system. Enter: select *file_system_name*

Output similar to the following displays:

```
Created:                        <Date>
Active Connections              3
Fs Block Size                   64K
Msg Buffer Size                 4K
Disk Devices                    1
Stripe Groups                   1
Mirror Groups                   0
Fs Blocks                       2221296 (135.58 GB)
Fs Blocks Free                  1159394 (70.76 GB) (52%)
```

Step 3 Verify that the number of StorNext FS clients configured during this installation matches the number of StorNext FS clients shown in the Active Clients field.

Verify the Mounted File System

To verify that StorNext FS is correctly mounted on a StorNext FS client:

Step 1 On a StorNext FS client, log in as root.

Step 2 Verify the StorNext FS mount on the client. Enter: `df -k`

A status message, similar to the following, displays:

```
File System        Type   kbytes     Use       Avail      %use   Mounted On
/dev/root          xfs    1961936    1756840   205096     90     /
file_system_name   cvfs   35561472   2103808   33457664   6      /mount_point
```

Unmount and Remount All File Systems

To unmount and remount all StorNext File Systems listed in `/etc/fstab` (such as for system maintenance or troubleshooting):

Step 1 On a StorNext FS client, log in as root.

Step 2 Unmount all StorNext File Systems listed in the `/etc/vfstab` file. Enter:

```
umount -F cvfs
```

Step 3 Remount all StorNext File Systems on a client. Enter:

```
umount -a -F cvfs
```

Unmount and Remount Specific File System

To unmount and remount a specific StorNext FS, follow these steps.

Step 1 On a StorNext FS client, log in as root.

Step 2 Unmount a specific StorNext FS. Enter:

`umount` *`mount_directory`*

For example:

`umount` */usr/clips*

Step 3 Remount a specific StorNext FS on a client. Enter:

`mount` *`mount_directory`*

For example:

```
mount /usr/clips
```

Reinitialize StorNext FS

To reinitialize a StorNext FS (such as after making configuration changes):

CAUTION **Use caution when performing this procedure because it will erase all existing data on the specified StorNext FS.**

Step 1 On the StorNext FS server, log in as root.

Step 2 Unmount the specific StorNext FS from all clients.

Step 3 In a system shell window, use the File System Administrator utility to stop the specific file system.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Stop the file system. Enter: `stop` *file_system_name*

c. Exit cvadmin. Enter: `quit`

Step 4 If you want to change file system parameters and global settings, edit and save the `/usr/cvfs/config/file_system_name.cfg` file.

Step 5 Run the StorNext FS initialize utility. Enter: `cvmkfs` *`file_system_name`*

Step 6 Reinitialize the specific StorNext FS by following the online instructions.

CAUTION **This step cannot be undone and all data on the file system will be lost, so make sure you are ready to initialize the file system before you proceed.**

Step 7 Start the file system using the File System Administrator utility.

a. Start cvadmin. Enter: `cvadmin`

Several status messages display.

b. Start the file system. Enter: `start` *file_system_name*

c. Activate the file system. Enter: `activate` *file_system_name*

d. Select the file system. Enter: `select` *file_system_name*

File system configuration status displays.

e. Exit cvadmin. Enter: `quit`

Step 8 Mount StorNext FS. Enter: mount *mount_directory*

If the configuration status does not display or if the file system does not start, check the `var/adm/messages` for errors and check `file_system_name.cfg` for syntactic or typographical errors.

Customer Assistance

ADIC provides the following types of customer assistance for the StorNext File System (StorNext FS).

Contacting Support

If problems cannot be solved with the aid of this document or the online help or if training is desired, contact ADIC Technical Assistance Center (ATAC).

In the USA:	800.827.3822
Outside the USA, toll free:	00.800.9999.3822
Internet:	support@adic.com

Publications

The software distribution CDs contain all StorNext Management Suite (SNMS) documentation in Adobe® Acrobat® Reader format. The Reader is available for download, free of charge, from Adobe, Inc. at **www.adobe.com**.

Website

Additional information about SNMS and other ADIC products is available on our website at **www.adic.com**.

Glossary

A

ATAC (ADIC Technical Assistance Center)

The ADIC customer help desk.

F

FC (Fibre Channel)

A high-speed data transfer architecture for storage area networks (SANs).

G

GUI (Graphical User Interface)

A program interface that takes advantage of the computer's graphics capabilities to make the program easier to use.

M

Managed file system

A file system that enables automatic data movement between the tape library and disk storage.

S

SAN (Storage Area Network)

A SAN is a dedicated, high-performance network whose primary purpose is the transfer of data along FC or high-speed Ethernet connections between servers, interconnect devices, and storage peripherals.

SNMS (StorNext Management Suite)

A scalable, high performance, data management solution that ensures the long-term safety and recoverability of data in SAN environments, while optimizing the use of storage resources. The result is high speed data sharing, improved productivity, and reduced network bottlenecks. It consists of two components, the StorNext Storage Manager (StorNext SM) and the StorNext File System (StorNext FS).

StorNext FS (StorNext File System)

One of the two components comprising the StorNext Management Suite. StorNext FS uses the functionality of a product, formerly known as CentraVision (DSM), to primarily provide Fibre Channel (FC) connections (but can also support other types of connections) in a serverless environment that enable heterogeneous clients to access data and share files. Although StorNext FS is the core file system technology used in SNMS, ADIC supports StorNext FS as a standalone product.

StorNext SM (StorNext Storage Manager)

One of two main components comprising the StorNext Management Suite. StorNext SM combines the functionality of two products known as FileServ (TSM) and VolServ (MSM) to provide high-performance file migration and management services, and to manage automated and manual media libraries, including library volumes.

Stripe group configuration

A set of similar storage devices that can be maintained either as a group or as a characteristic of performance. All disks in a stripe group must have the same number and size of sectors.

U

Unmanaged file system

A file system that never moves any data to the tape storage library.

A

C

D

E

F

H

I

L

P

R

S