

Welcome to Data ONTAP™ Release 4.0.1c

This *Read Me First* is for Data ONTAP Release 4.0.1c.

Starting with Release 4.0, the Network Appliance filer provides multiprotocol support. Network users on computers supporting NFS (Network File System), CIFS (Common Internet File Service), and HTTP (Hypertext Transfer Protocol) can all access the same files. Release 4.0.1c runs on all Network Appliance filer models, listed below:

- FAServer 450 and 1400
- NetApp™ F220, F330, and F540

When the term “filer” is used in this document, the information applies to all models.



NOTE: Retain this *Read Me First* and keep it with your filer documents. It contains information about slot assignments for expansion cards in the NetApp F220, F330, and F540, and system memory requirements for Release 4.0.1c. The information is only in this document, and you'll need it if you upgrade filer hardware in the future.

This *Read Me First* provides information about these topics:

- product documentation roadmap
- installing a new filer
- software upgrade procedures using diskettes and using downloaded files
- a note on directory conversion before enabling CIFS access to NFS directories
- expansion slot assignments for the NetApp F220, F330, and F540
- system memory requirements
- memory configurations for the NetApp F220
- new features in Release 4.0.1c
- bug fixes in Release 4.0 and in Release 4.0.1c
- known problems and their workarounds (if applicable) in Release 4.0.1c
- procedure to downgrade from Release 4.0.1c to earlier releases

Documentation Roadmap

Use this *Read Me First* along with other documents that ship with your filer. The contents of each document are described in Table 1. Some documents have not been revised for Release 4.0.1c, but the information they contain applies unless specified otherwise in this *Read Me First*.

Table 1. How to use the filer documentation

Document	Contents
<i>Quick Start Guide</i> for Release 4.0	Checklist that helps you set up the filer for the first time. The guide also contains quick reference material about filer commands and files.
<i>Hardware Guide for the FAServers, Hardware Guide for the NetApp F220 and F330, or Hardware Guide for the NetApp F540</i>	Detailed procedures for installing the filer and for adding or replacing SCSI devices. The guide also contains information about interpreting LEDs and LCD messages.
<i>System Administrator's Guide</i> for Release 4.0	Detailed information about features in Release 4.0. The guide also contains procedures for customizing the filer software for your environment once the filer has been installed.
<i>Command Reference Guide</i> for Release 4.0	Man pages that describe filer commands and files. (The information in the on-line man pages supersedes that in the <i>Command Reference Guide</i> if there are discrepancies between the two.)
<i>Installation Guide for NetApp F220 and F330 Options</i>	Instructions about how to install hardware options that can be ordered separately for the NetApp F220 and F330.
<i>Field Service Guide for the NetApp F540</i>	Instructions about how to install field replaceable units and hardware options that can be ordered separately for the NetApp F540.

Installing a New Filer

If you purchased a new filer, follow these steps to install and configure it:

- 1. Read the license and warranty information that comes with your filer.**
- 2. Fill out the registration card and mail it to Network Appliance.**
- 3. Configure your filer, following the steps in the *Quick Start Guide*.**
- 4. Store in a safe place the floppy disks that ship with your filer.**

Your filer will then be ready to deliver to network clients the file services that you have enabled. For more information about software features, refer to the *System Administrator's Guide*.

Upgrading a Filer to Data ONTAP Release 4.0.1c

To upgrade the filer's software, you need:

- A Data ONTAP 4.0.1c System Boot disk. (This disk can be used only in the filer's floppy drive.)
- A Data ONTAP 4.0.1c System Files disk. (This disk can be used only in the floppy drive of an NFS or CIFS client; the filer's floppy drive *cannot* use this disk.)

These disks are provided in your upgrade kit. The System Files disk is provided in two versions, one readable from a UNIX workstation and the other readable from a Windows PC.

Upgrade Quick Summary

The following is an outline of the upgrade procedure. For a detailed step-by-step version, turn to page 6 (if you use a UNIX client to do the upgrade) or page 12 (if you use a Windows client to do the upgrade).

1. **Boot the filer from the 4.0.1c boot disk.**
2. **If you haven't yet done so, at the filer's console, enter the license code for each file protocol.**
3. **If you use a PC running CIFS for upgrade, and haven't yet run `cifs setup`:**
 - a. **Reboot the filer.**
 - b. **Run `cifs setup`.**
4. **Extract system files from the 4.0.1c System Files disk to the filer's root directory.**
5. **Use the filer's `download` command to make the new software bootable from the hard disk.**
6. **Reboot the filer from the hard disk.**
7. **If you have a license for CIFS and haven't yet done so, run `cifs setup`.**
8. **If you haven't yet done so, create `/etc/serialnum`.**

Upgrade with Files Received Through the Internet

If you have received Data ONTAP 4.0.1c from Network Appliance through the Internet, from the boot image file that you downloaded, create a Release 4.0.1c System Boot disk as follows:

1. **Insert a write-enabled disk in the UNIX host's floppy drive.**
2. **Copy the boot image to the floppy disk.**

Use the `dd` command, specify the input file, output file, and block size, thus:

```
adminhost# dd if=4.0.1c.boot_image of=/dev/fd0 bs=512
```

For `4.0.1c.boot_image`, substitute the name you gave the file when you received it.

3. **Remove, write-protect, and label the floppy disk.**

Write “System Boot for Release 4.0.1c” and the filer model (for example, “NetApp F330”) on the disk label.



NOTE: It is important to record the filer model on the disk label, especially if you have different models on site. The floppy boot image for the NetApp F540 is not interchangeable with the floppy boot images for other models.

Use the boot disk thus created in the same way as a boot disk supplied by Network Appliance. Use the downloaded system files in the same way as the files on the System Files disk supplied by Network Appliance. Their use is described in the sections that follow.

Upgrade Step-by-Step (from a UNIX client)

This section is relevant only if you use a UNIX workstation to extract the System Files. If you're using a Windows PC, go to "Upgrade Step-by-Step (from a Windows Client)" on page 12, where the same material is treated from a Windows perspective.

To carry out the installation, you need both access to the filer's system console and to a client system. The client system is a workstation equipped with a floppy drive. It should have write permission to the filer's root directory. In this section, the client system is shown with the name **adminhost**, and is shown running SunOS 4.1.x. If you use a client running another operating system, the syntax of UNIX commands might differ.

1. Boot the filer from the Release 4.0.1c System Boot Disk.

- a. Insert the Release 4.0.1c System Boot disk in the filer's floppy drive.



NOTE: The Release 4.0.1c disks are specific to the model of filer that you are updating. The disks for the NetApp F540 differ from those for the other models. You should have received disks appropriate to the model you are updating. If you have different models, be sure to check the labels to make sure you're using the correct disk for the filer.

- b. At the system console, enter the reboot command.
- c. When the filer displays a list of options, select option 1, "Normal boot."

2. Enter licenses.

If you have already entered the licenses (for Release 4.0), you do not need to do so again; skip to step 3.

At the system console, use the `license` command to enter your licenses as shown in the following example:

```
toaster> license nfs=XXXXXXX cifs=YYYYYYY http=ZZZZZZZ
```

In the command you type, use the license keys included in your upgrade kit instead of the ones used in the example. An `=` sign is required between the type of license and the license code; don't insert a blank before or after the `=` sign. Also, enter license keys only for those protocols that you have purchased.

The filer responds with an acknowledgment for each license:

```
nfs site license enabled.  
    nfs enabled.  
cifs site license enabled.  
    Run cifs setup after rebooting to enable cifs.  
http site license enabled.  
    Use "options httpd.enable" to enable http.
```



NOTE: After you enter the license keys, NFS service is automatically enabled. However, CIFS and HTTP services are not. Steps for enabling CIFS and HTTP services are provided later in this procedure; see page 9 and page 11.

3. Read and install the system files.

At the client system:

- a. Insert the disk labeled "Data ONTAP 4.0.1 System Files (UNIX format)."



NOTE: Network Appliance distributes the System Files disk in two versions, one formatted for UNIX systems and the other for PCs. Check the floppy disk label to be sure that you insert the appropriate disk.

- b. Mount the filer's root file system to the client's */mnt* directory:

```
adminhost# mount toaster:/ /mnt
```

- c. Change directory to */mnt*.

```
adminhost# cd /mnt
```

- d. Install the System Files. From the client system, enter the following commands:

```
adminhost# tar xvf /dev/fd0
```

The tar command reports the names of files it has copied from the disk; they are *tar_image.Z* and *install_netapp*.

- e. Run the script *install_netapp* with an argument that tells the script where to install the files: that is, to the mount point for the filer's root directory:

```
adminhost# ./install_netapp /mnt
```

The install script reports its steps as it goes:

```
install_netapp: uncompress tar_image.Z
install_netapp: cd "/mnt"; tar xvf "/mnt/tar_image"
```

The script invokes tar, which reports the files it extracts, like this:

```
x etc/boot/netapp-x86 symbolic link to netapp_4.0.1c-x86
x etc/boot/0-x86, 1804 bytes, 4 tape blocks
```

The last few messages are similar to the following:

```
x etc/firmware/pca200em.bin, 41288 bytes, 81 tape blocks
x etc/syslog.conf.sample, 542 bytes, 2 tape blocks
x etc/httpd.mimetypes.sample, 3163 bytes, 7 tape blocks
install_netapp: cd "/"; rm -rf tar_image install_netapp
```

4. Eject disks and unmount the filer's root directory.

- a. At the client system, eject the System Files disk from the floppy drive.

```
adminhost# eject
```

- b. From the client system, unmount the filer's root file system (/) by entering the following commands:

```
adminhost# cd /
adminhost# umount /mnt
```

- c. At the filer, eject the boot disk (by pressing the eject button at the side if the floppy drive).



NOTE: It's essential to remove the boot floppy before you issue the reboot command, or the filer will once again boot from the floppy rather than from its hard drive.

5. Set the filer's boot blocks.

At the system console, enter `download` to copy the executables to the boot blocks of the filer's hard disks:

```
toaster> download
toaster>
```

The download command doesn't provide an acknowledgment; when copying has finished, the filer prompt appears again.

6. Reboot from the filer's hard disk.

At the system console, reboot the filer:

```
toaster> reboot
```

You'll see the copyright notice followed by "NetApp Release 4.0.1c."

7. Set up CIFS.

This step is relevant only if you have a license for CIFS but have not previously enabled CIFS access to the filer. Otherwise, skip to step 8.

From the filer console, run the setup program for CIFS by entering the following command:

```
toaster> cifs setup
```

The setup program prompts you for information necessary to enable CIFS access to the filer. The effect produced by running `cifs setup` is preserved after filer reboots; you won't need to run it again unless you need to change the setup. For more information about the setup program, refer to Chapter 2 of the *System Administrator's Guide*; for information about CIFS administration, see Chapter 7 of the *System Administrator's Guide*.

8. Clean up some obsolete files.

This step is relevant only if you are upgrading from a release earlier than 3.0. Otherwise, skip to step 9.

a. Edit `/etc/hosts`.

Edit the filer's `/etc/hosts` file to specify a mail host that sends automatic email to Network Appliance Technical Support or to a system administrator or mail alias. For example, if you use the administration host as the mail host, add the following line to the filer's `/etc/hosts` file:

```
192.9.200.1 adminhost mailhost
```

(Write the actual IP address and host name where the example shows **192.9.200.1** and **adminhost**.)

For more information about automatic email, refer to Chapter 4 of the *System Administrator's Guide*.

b. Purge outdated man pages.

In the filer's `/etc/man` directory, remove all files whose names begin with `fas_`. Man pages were renamed in Release 3.0 to have the prefix `na_` rather than `fas_`.

For example, if the filer's root file system (`/`) is mounted at `/mnt` on the administration host:

```
adminhost# cd /mnt/etc/man
adminhost# rm man*/fas_*
```

Now the filer's `/etc/man` directory contains only the man pages for Release 4.0.1c. Their names begin with `na_`.

9. Record the filer's serial number.

This step is relevant only if you have not previously created a file for the filer's serial number (for example, while installing Release 4.0). Otherwise, skip to step 10.

If the file `/etc/serialnum` does not exist on your filer, create it, and put the filer's serial number in it. The file makes it easier for Network Appliance Technical Support to assist you after receiving an autosupport e-mail from your filer.

10. Store the disks.

In a safe place, store the System Boot disk and System Files (UNIX system) disk.

Enable HTTP

If your filer is licensed for HTTP but you have not previously enabled HTTP (for example, while running Release 4.0), you should do so now:

1. **Enable the `httpd` daemon.**
2. **Specify the HTTP root directory.**
3. **Copy `/etc/httpd.mimetypes.sample` to `/etc/httpd.mimetypes`.**

For more information about HTTP administration, refer to Chapter 8 of the *System Administrator's Guide*.

Upgrade Step-by-Step (from a Windows Client)

This section is relevant if you are using a Windows PC for administration of the filer. If you're using a UNIX workstation, go to "Upgrade Step-by-Step (from a UNIX client)" on page 6.

To carry out the installation, you must log in as Administrator. You need both access to the filer's system console and to a client system. The client system must be an IBM-compatible PC equipped with a floppy drive, running Windows 95, Windows NT 3.51, or Windows NT 4.0. (Windows for Workgroups cannot be used to do the installing because the installation uses long file names, not supported in Windows for Workgroups.) In this section, the examples show a client system running Windows NT 4.0.

1. Boot the filer from the Release 4.0.1c System Boot Disk.

- a. Insert the Release 4.0.1c System Boot disk in the filer's floppy drive.



NOTE: The Release 4.0.1c disks are specific to the model of filer that you are updating. The disks for the NetApp F540 differ from those for the other models. You should have received disks appropriate to the model you are updating. If you have different models, be sure to check the labels to make sure you're using the correct disk for the filer.

- b. At the system console, enter the reboot command.
- c. When the filer displays a list of options, select option 1, "Normal boot," to boot the system from the Release 4.0.1c files on the disk.

2. Enter licenses.

If you have already entered the licenses (for Release 4.0), you do not need to do so again; skip to step 3.

At the system console, use the `license` command to enter your licenses as shown in the following example:

```
toaster> license nfs=XXXXXXX cifs=YYYYYYY http=ZZZZZZZ
```

In the command you type, use the license keys included in your upgrade kit instead of the ones used in the example. An = sign is required between the type of license

and the license code; don't insert a blank before or after the = sign. Also, enter license keys only for those protocols that you have purchased.

The filer responds with an acknowledgment for each license:

```
nfs site license enabled.  
    nfs enabled.  
cifs site license enabled.  
    Run cifs setup after rebooting to enable cifs.  
http site license enabled.  
    Use "options httpd.enable" to enable http.
```

3. Reboot the filer so you can set up CIFS.

Steps 3 and 4 are relevant only if you have not previously enabled CIFS access to the filer. Otherwise, skip to step 5.

- a. At the system console, enter the reboot command.
- b. When the filer displays a list of options, select option 1, "Normal boot," to boot the system from the Release 4.0.1c files on the disk.

4. Set up CIFS.

This step is relevant only if you have not previously run `cifs setup`. Otherwise, skip to step 5.

From the system console, run the setup program for CIFS by entering the following command:

```
toaster> cifs setup
```

The setup program prompts you for information necessary to enable CIFS access to the filer. The effect produced by running `cifs setup` is preserved after filer reboots; you won't need to run it again unless you need to change the setup. For more information about the setup program, refer to Chapter 2 of the *System Administrator's Guide*; for information about CIFS administration, see Chapter 7 of the *System Administrator's Guide*.

5. Install the system files.

- a. At the client system, map the filer's root directory to a drive on the client:

Right-click **My Computer** and select **Map Network Drive**.

In the dialog box, select a drive letter. For example:

N:

Write the name of the filer and the name assigned to the hidden share of its root directory, c\$. For example:

\\toaster\c\$

Leave unchanged the "Connect As" field.

- b. Insert the disk labeled "Data ONTAP 4.0.1 System Files (PC format)." It contains the file *setup.exe*.



NOTE: Network Appliance distributes the System Files disk in two versions, one formatted for UNIX systems and the other for PCs. Check the floppy disk label to be sure that you insert the appropriate disk.

- c. Run *setup.exe* (on the System Files disk) to extract files and write them to the filer as follows:

From the **Start** menu, select **Run**, and supply the disk and program name:

a:setup.exe

The *setup.exe* program displays the WinZip dialog box. Press OK.

- d. In the WinZip dialog box, insert the drive letter. For example, if you chose drive N in step a, replace <DRIVE>:\ETC with the following:

N:\ETC

Leave the other options as they are: "Overwrite Files Without Prompting" and "When Done Unzipping Run" should both be checked.

- e. Press the **Unzip** button.

In the dialog box's lower panel, you'll see confirming messages as files are uncompressed, culminating in a message such as the following:

633 file(s) unzipped successfully.

6. Eject disks.

- a. At the client system, eject the System Files disk from the floppy drive.
- b. At the filer, eject the boot disk.



NOTE: It's essential to remove the boot floppy before you issue the reboot command, or the filer will once again boot from the floppy rather than from its hard drive.

7. Set the filer's boot blocks.

At the system console, enter `download` to copy the executables to the boot blocks of the filer's hard disks:

```
toaster> download
toaster>
```

The `download` command doesn't provide an acknowledgment; when copying has finished, the filer prompt appears again.

8. Reboot from the filer's hard disk.

- c. At the system console, reboot the filer:

```
toaster> reboot
```

You'll see the copyright notice followed by "NetApp Release 4.0.1c."

9. Clean up some obsolete files.

This step is relevant only if you are upgrading from a release *earlier* than 3.0. Otherwise, skip to step 10.

- a. From the client system, edit the filer's `/etc/hosts` file to specify a mail host that sends automatic email to Network Appliance Technical Support or to a system

administrator or mail alias. For example, if you use the administration host as the mail host, add the following line to the filer's `/etc/hosts` file:

192.9.200.1 adminhost mailhost

(Write the actual IP address and host name where the example shows **192.9.200.1** and **adminhost**.)

For more information about automatic email, refer to Chapter 4 of the *System Administrator's Guide*.

b. Purge outdated man pages.

In the filer's `/etc/man` directory remove all files whose names begin with `fas_`. Man pages were renamed in Release 3.0 to have the prefix `na_` rather than `fas_`.

10. Record the filer's serial number.

This step is relevant only if you have not previously created a file for the filer's serial number (for example, while installing Release 4.0). Otherwise, skip to step 11.

If the file `/etc/serialnum` does not exist on your filer, create it, and put the filer's serial number in it. The file makes it easier for Network Appliance Technical Support to assist you after receiving an autosupport e-mail from your filer.

11. Store the disks

In a safe place, store the System Boot disk and System Files (UNIX system) disk.

Enable HTTP

If your filer is licensed for HTTP but you have not previously enabled HTTP (for example, while running Release 4.0), you should do so now:

- 1. Enable the `httpd` daemon.**
- 2. Specify the HTTP root directory.**
- 3. Copy `/etc/http.mimetypes.sample` to `/etc/http.mimetypes`.**

For more information about HTTP administration, refer to Chapter 8 of the *System Administrator's Guide*.

Before You First Use the Filer for CIFS

Timing of Directory Conversion for CIFS Access to NFS-Created Files

If you license both NFS and CIFS protocols, your filer supports access via either protocol to the *same* files. File-naming conventions differ between NFS and CIFS; although any CIFS-based file name is valid in NFS, some NFS names are not valid in CIFS. Also, CIFS maintains for each file certain attributes for which there are no NFS equivalents. A filer that runs CIFS maintains a directory in which NFS-style names are assigned equivalents in the 8.3 format.

If you add CIFS access to files that were created by NFS clients, the first time a directory is accessed via CIFS, the filer will automatically convert it to the format required to support CIFS clients. “Accessed” here includes listing the contents of a directory, for example, with the File Manager, Explorer, or DOS `dir` command, or accessing any files or directories contained in that directory.

Under some circumstances, the CIFS client may automatically look at the directory's subdirectories, thereby triggering conversion of the subdirectories as well. (For example, this would happen if the user has set the “Expand All” option under the File Manager “Tree” menu.)

Once a directory has been converted, it will not have to be converted again.

Although this process is automatic, the initial conversion of a directory can take considerable time, especially if the directory contains a large number of files. For example, conversion of a directory of 60,000 files takes the filer about 35 minutes on a NetApp F540, and about 2 hours on a NetApp F330. It is important to take these conversion times into consideration when deciding when to do them.

While a directory is being converted, the filer might not be able to perform any other file system operations until the conversion is complete.

If there are portions of the directory tree that will *never* have CIFS access, there is no need to convert them. However, any future CIFS access to an unconverted directory will immediately trigger its conversion.

If you have a directory that contains more than 50,000 files, before triggering a conversion, use an NFS client to distribute files among a greater number of subdirectories. This speeds up the conversion process and avoids a possible crash (see bug 3564, page 32).

Limits on CIFS Open Files, Sessions, and Shares

The filer is subject to limits on files access through CIFS as summarized in Table 2.

Table 2. CIFS maximums by filer memory configuration

	64 MB	128 MB	192 MB	256 MB
Maximum number of sessions/users	128	523	1,024	2,048
Maximum number of open files	2,560	10,240	20,480	40,960
Maximum number of locked files	2,048	4,096	6,144	8,192
Maximum number of shares	1,000	1,000	1,000	1,000

A maximum of 32 clients may be logged in through each WinDD server connected to the filer. The 32 clients are *not* counted as CIFS clients. The filer treats the WinDD server as a single client (even if 32 users are logged in through it).

Enabling NFS for Ease of System Administration

Even if clients use CIFS exclusively, as Administrator, you will probably find it useful to have NFS access for certain administrative tasks. You should probably enable NFS service on the filer at all times.

Expansion Slot Assignments for Release 4.0.1c

For the FAServer 450 and FAServer 1400, expansion slot assignments for Release 4.0.1c are the same as those for Release 3.0. See the *Hardware Guide for the FAServers* for information about expansion slot assignments.

Expansion Slot Assignments for the NetApp F220

Table 3 lists expansion slot assignments for the NetApp F220. The NetApp F220 supports up to three network cards. However, for each type of network card, you can only install two in the NetApp F220. For example, you can use two FDDI cards and one Ethernet card, or two Ethernet cards and one FDDI card.

Table 3. Expansion slot assignments for the NetApp F220

Expansion card	Slots					
	1 – 4 ^a	5	6	7	8	9
Network card 1				X		
Network card 2					X	
Network card 3		X				
NVRAM card			X			
SCSI card						X

a. Not available for use.

Expansion Slot Assignments for the NetApp F330

You can install expansion cards listed in Table 4 in any combination. However, the number of network cards must not exceed four.

Table 4. Expansion slot assignments for the NetApp F330

Expansion card	Slots								
	1	2	3	4	5 ^a	6	7	8	9
FDDI card 1							X		
FDDI card 2								X	
FDDI card 3	X								
FDDI card 4		X							
NVRAM card						X			
SCSI card 1									X
SCSI card 2				X					
Single-port Ethernet card 1			X						
Single-port Ethernet card 2	X								
Quad-port Ethernet card 1		X							
Quad-port Ethernet card 2			X					X	

a. Reserved for future use.

Expansion Slot Assignments for the NetApp F540

Table 5. Expansion slot assignments for the NetApp F540

Expansion card	Slots								
	1 ^a	2	3	4	5	6	7	8	9
Environmental card									X
Network card 1						X			
Network card 2					X				
Network card 3			X						
NVRAM card				X					
SCSI card 1 for disks								X	
SCSI card 2 for disks							X		
SCSI card for tape		X							

a. Not available for use.

System Memory Requirements

You can install up to 256 MB of memory on the system board of your filer. To find out how much memory the system has, use the `sysconfig` command.

The amount of memory required by your system depends on these factors:

- Maximum number of files the file system can hold, as set by the `maxfiles` command.
- Total disk space. To determine the total disk space on your filer, use the `sysconfig -r` command and add up the first numbers in the “Used (mb/blks)” column for all disks.
- Number of network interfaces on the filer.

Table 6 describes the memory requirements for the filer.

Table 6. System memory requirements

maxfiles (in millions)	Disk capacity (in GB)			
	Up to 28	29 – 52	53 – 104	105 – 208
Up to 1.7	64 MB	64 MB	N/A	N/A
1.8 – 12.6	64 MB	64 MB	64 MB	64 MB ^a
12.7 – 20.9	N/A	N/A	64 MB ^b	128 MB
More than 21.0	N/A	N/A	128 MB	128 MB

a. If your filer contains five or more network interfaces, increase the memory from 64 MB to 128 MB.

b. If your filer is a NetApp F540 with two or more network interfaces, increase the memory from 64 MB to 128 MB.

Memory Configurations for the NetApp F220

The NetApp F220 supports from 64 to 256 MB of memory. You can install a mix of 16-MB and 32-MB SIMMs on the system board, as long as the SIMMs in each bank are of the same size. Starting from Release 3.1.4c, use Table 1 on page 16 of the *Installation Guide for NetApp F220 and F330 Options* for the NetApp F330 only. Use the information in this section for configuring system memory in the NetApp F220.

Table 7. Using only 16-MB SIMMs in the NetApp F220

Total memory	Bank 0	Bank 1	Bank 2	Bank 3
64 MB	Two 16 MB	Two 16 MB	Empty	Empty
128 MB	Two 16 MB	Two 16 MB	Two 16 MB	Two 16 MB

Table 8. Using only 32-MB SIMMs in the NetApp F220

Total memory	Bank 0	Bank 1	Bank 2	Bank 3
64 MB	Two 32 MB	Empty	Empty	Empty
128 MB	Two 32 MB	Two 32 MB	Empty	Empty
192 MB	Two 32 MB	Two 32 MB	Two 32 MB	Empty
256 MB	Two 32 MB	Two 32 MB	Two 32 MB	Two 32 MB

Table 9. Using a mix of 16-MB and 32-MB SIMMs in the NetApp F220

Total memory	Bank 0	Bank 1	Bank 2	Bank 3
160 MB	Two 16 MB	Two 16 MB	Two 16 MB	Two 32 MB
192 MB	Two 16 MB	Two 32 MB	Two 32 MB	Two 16 MB
192 MB	Two 32 MB	Two 16 MB	Two 16 MB	Two 32 MB
224 MB	Two 16 MB	Two 32 MB	Two 32 MB	Two 32 MB

New Features in Release 4.0.1c

There have been some additions to the filer's `cifs` commands and `options` command. These new features are summarized in this section.

Changing UNIX-Style Permissions for Files in a CIFS Share

The `cifs chmod` command sets the UNIX-style permissions of a designated file or directory within a share. (Previously, these UNIX-style access controls were settable only from an NFS client running UNIX.) The syntax is:

```
cifs chmod share mode path
```

The arguments are as follows:

- share* The name of a CIFS share.
- mode* The access mode to be applied to the file or directory (as described in the tables below). You can specify the mode in either absolute format or symbolic format.
- path* The path, relative to the root directory of the specified share, to the file or directory whose access is to be set.

Absolute Mode

A mode specified in absolute format is an octal number. The full range of options is represented by a number having four octal digits, but for most purposes a 3-digit number suffices (with an implied leading 0). The significance of digits in the various positions is the same as in UNIX systems, to wit:

Value	Position			
	Execution mode ^a	Owner	Group	Others
4	Set-user-ID-on-execution	Read	Read	Read
2	Set-group-ID-on-execution	Write	Write	Write
1	Sticky bit	Execute/Search	Execute/Search	Execute/Search

a. These bits may be significant when a UNIX system executes the file but do not affect access rights.

For example, the mode 644 gives the owner read and write permission and gives group members and others read permission.

The mode 755 gives the owner read, write, and execute permissions, and group members and others read and execute but not write permission.

Symbolic Mode

A mode specified in symbolic format is a comma-separated list of expressions. Each expression is formed from up to three components, as follows:

Who	Operation	Permission
u User	+ Add	r Read
g Group	– Remove	w Write
o Others	= Set	x Execute/search
a All (that is, ugo)		s Set-user-ID-on-execution and Set-group-ID-on-execution
		t Sticky

For example, the mode expression `go-w` denies write permission to group and others. The mode expression `u=rwx,go=rx` gives the user (that is, the file's owner) permission to read, write, and execute, and gives members of the user's group and others permission to read and execute (but not write). It is thus equivalent to 755.

An expression that uses `=` but omits the permission clears all permissions. For example, the mode expression `go=` turns off all access for group and others, and is equivalent to `go-rwxst`.

An expression that does not indicate who applies to all. For example, the mode `+x` adds execute permission to all, and is thus equivalent to `a+x`.

Changing the Ownership of Files in a Share

The `cifs chown` command changes the owner of a file or directory. The syntax is:

```
cifs chown share owner path
```

The arguments are as follows:

share The name of a CIFS share.

owner The user name of the new owner.

path The path, relative to the root directory of the specified share, to the file or directory whose access is to be set

Changing the Description of a Share

The `-change` option to the `cifs shares` command changes the description of a share. The syntax is:

```
cifs shares -change share description
```

If *description* includes blanks, enclose the description string in double quotes. You can change the description of a share even if the share is in use.

Returning a Report on a Specific Share

Used with no argument, the `cifs shares` command reports on all current shares. The command now accepts an optional argument. The syntax is:

```
cifs shares [share]
```

The argument *share* specifies a single share to be described.

Specifying the Maximum Size of the HTTPD Log

The absolute maximum size of the log file `/etc/log/httpd.log` is 4 GB. However, some NFS clients don't support files larger than 2 GB. A new argument to the `options` command permits you to specify the maximum size for the log file. The syntax is:

```
options httpd.log.max_file_size max
```

The default is 2,147,483,647 (the largest file size that can be supported by all NFS clients). The maximum is 4,294,967,295.

Bug That Were Fixed in Release 4.0

Bug Fixes Common to All File-Sharing Protocols

- 1628 The filer didn't stop booting if its memory was insufficient for the disk space installed.

- 2591 The filer might have crashed with the message `waf1_verify_nvlog: unexpected type in log`. The filer recovered from this error without your intervention.

- 2798 If you used `restore -r` to restore from a dump tape, and one of the directories on the tape already existed on the file system, `restore` silently failed to restore any files or directories in that directory or in subdirectories of that directory. The filer also displayed a "File exists" warning for that directory. This problem could have caused a restore from an incremental dump, performed after a restore of a full dump, to fail to restore files.

- 3062 On NetApp F220 systems with the NetApp System Board IIa, the receive side of the 100Base-T interface (e0) on the system board sometimes hung under heavy traffic.

Bug Fixes Related to NFS

- 2400 Changes to the `nfs.v3.enable` and `nfs.tcp.enable` options took effect only after you set the options in the filer's `/etc/rc` file and rebooted the filer.

- 3186 When the filer running PC (NFS) used the `/etc/passwd` file, it did not disregard entries beginning with "+" or "-".

- 3800 Under rare circumstances, the Ethernet interface could hang on NFS-over-TCP traffic, requiring a reboot of the filer.

Bug Fixes Related to CIFS

- 3774 A bug in Release 4.0 could cause the filer to crash following a TCP output error when a client closed a connection.

- 3768 A bug in Release 4.0 could crash the filer if a search took longer than expected.

- 3788 A bug in Release 4.0 could crash the filer during certain long transaction requests (such as `FindFirst` or `FindNext`).

Bugs Fixed in Release 4.0.1c

Bug Fixes Common to All File-Sharing Protocols

- 2729 The filer could crash because of a spurious SCSI request occasionally arising from the SCSI chip during a SCSI bus reset.
- 3818 The filer could hang because it failed to release unused network buffer space and eventually ran out of network buffer space.

Bug Fixes Related to CIFS

- 2820 The filer didn't provide a `cifs` command for changing the permissions of a file or a directory. This can now be done using the `cifs chmod` or `cifs chown` commands.
- 3226 There was no way to change a share's description. The command `cifs shares -change` can now be used to change the share description.
- 3468 There was no way to change a share's description; if the command `cifs shares -add` was used to change a share, it deleted the share, destroying its access control list, and then re-created it with an empty access control list.
- 3855 If the `Server Manager` utility in Windows NT tried to access the filer, the filer could crash with the message:
- PANIC: "../common/smb/smbutils.c:604: Assertion failure.
- 3871 The `cifs share` command lacked provision to describe a specific share (and always reported on all shares). The command now accepts an optional argument identifying the desired share.

Bug Fix Related to HTTP

- 3795 When the filer tried to write to the HTTP log file, `/etc/log/httpd.log`, after the file reached the 2-GB limit, the filer displayed the error message:
- [httpd_log_main]: /etc/log/httpd.log: Invalid argument
- The maximum size of the log file is now 4 GB. Because some NFS clients don't support files larger than 2 GB, Release 4.0.1c introduces a new option, `httpd.log.max_file_size`, to specify the maximum size to which `/etc/log/httpd.log` can grow.

Known Problems in Release 4.0.1c

Problems Common to All File-Sharing Protocols

- 0914 The system doesn't boot after a crash followed by the removal of a broken disk. To avoid this problem, remove the bad disk only after shutting down the system cleanly with the `halt` command.
- 1185 The file system can enter an inconsistent state following a crash in the `write_alloc.c` module. If the filer does not automatically recover from this problem, call Network Appliance Technical Support for help.
- 1494 When the filer starts the `syslogd` daemon, if the `/etc/syslog.conf` file contains invalid information, the system dumps core and reboots with these messages:
- ```
..... logerror syslogd: unknown priority name ""
PANIC: rc: bad conversion character in printfmt
```
- 1509     The setup program allows you to enter an IP address in a.b or a.b.c dotted decimal format but doesn't display enough information to explain what these formats mean. You should enter addresses in a.b.c.d format only, where a, b, c, and d are decimal numbers in the range from 0 to 255, inclusive.
- 1516     Sometimes a character doesn't make it out of the NetApp F330 serial port. For example, the output of the `date` command might read as follows:
- ```
toaster> date 9505122354.45
Fri May 12 23:5445 GMT 1995
```
- The colon (:) between "54" and "45" is missing.
- 1549 The system crashes with a message of the following type:
- ```
write_alloc.c:xxx: Assertion failure.
```
- The system usually reboots after the crash. But if it fails to reboot, call Network Appliance Technical Support for help.
- 1615     The setup program generates the following confusing error message if any number in an IP address number in the dotted decimal format exceeds 255:

Bad IP address entered  
must be of the format a.b, a.b.c, or a.b.c.d

- 1648 The sysconfig command doesn't list the hot swap, serial, or VGA adapter in the FAServer 1400.
- 1659 If you don't supply a B flag to dump, dump picks a tape file size that is likely to be the wrong size. For example, the file size it selects might prevent you from putting a very large dump file on a single tape.
- 1695 The setup program does not display as the default the netmask previously assigned to an interface.
- 1810 While dumping core, the filer sometimes displays the following message even after finding some valid disks and dumping part of the core:
- No valid disks found --- not dumped.
- The message should be:
- Not enough disk space to dump complete core file.
- 2309 Under heavy load, the NetApp F540 might lose clock ticks and the time displayed in various system messages might be incorrect. Use the date or rdate command to adjust the time if this problem happens.
- 2430 When you use the raid add command successively to add multiple disks, the system allows you to add disks even if the memory required to support the disks is not available. After the disks are added, the system crashes and fails to boot until more memory is added. To avoid this problem, before you issue a raid add command, make sure that the previous raid add command has completed. Or, install additional memory before adding multiple disks in succession according to memory configuration guidelines provided in "System Memory Requirements" on page 22.
- 2470 If you boot the filer from the floppy disk and choose option 2, "Boot without /etc/rc," kernel services such as syslogd, lockd, and statd will not be started automatically. To restore all services, boot from the hard disk, or boot from the floppy disk and choose option 1, "Normal Boot."

- 2689 If the interval in the `sysstat` command is large enough that more than 2 GB of data are transmitted or received between successive summary reports, the network summary statistics become incorrect and possibly negative.
- 2729 After a SCSI bus reset, a SCSI firmware problem in the NetApp F220, F330, and F540 causes the filer to reboot with messages similar to the following:
- ```
Fri Jul 5 02:50:08 PDT [rc]: saving 46M to /etc/crash/core.5-small (`trap 13 code = 0 eip = 126462 cs = 8 eflags = 10216 `)
```
- ```
Fri Jul 5 02:50:27 PDT [rc]: saving 199M to /etc/crash/core.5 (`trap 13 code = 0 eip = 126462 cs = 8 eflags = 10216 `)
```
- 2929 During the `raid swap` command, the filer displays incorrect SCSI error messages similar to the following:
- ```
Fri Jul 19 18:15:31 PDT [raid_disk_admin]: Spare disk 1 has been added to the system.
```
- ```
Fri Jul 19 18:15:46 PDT [isp_main]: isp_error_proc: isp 0 (ha #0) completed unsuccessfully (0x0 0x100 0x40)
```
- ```
Fri Jul 19 18:15:51 PDT last message repeated 19 times
```
- ```
Fri Jul 19 18:15:52 PDT [isp_main]: isp_error_proc: isp 9a (ha #1) completed unsuccessfully (0x0 0x100 0x40)
```
- Disregard these error messages.
- 3013 Downgrading to an earlier release following a dirty shutdown can lose data. Workaround: Shut down normally and reboot 4.0.1c before attempting to downgrade (see page 35).
- 3245 If the `/etc/rc` file contains the options `autosupport.doit` command, the filer crashes when it tries to reboot.

## Problems Related to NFS

- 1304     The filer crashes with the following error message:
- `wafL_nfs2_lookup: inconsistent directory entry`
- Call Network Appliance Technical Support for information about how to recover.
- 2241     A Beame and Whiteside NFS client under Windows NT 3.51 crashes the filer when the client tries to resolve a symbolic link that loops to itself.
- 2269     If you enable per-client statistics collection after the filer has been running for a while, `nfsstat -l` reports unexpectedly low percentages because the filer bases the percentages on the total number of NFS operations since the filer was booted.
- 2271     When you use the `nfsstat` command to display per-client NFS statistics, the command output includes clients that have generated RPC (remote procedure call) but no NFS calls to the filer.

## Problems Related to CIFS

- 2914     The `cifs shares` command does not accept the backward slash (\) as the separator used in a pathname. It accepts only the forward slash (/).
- 3180     The filer running CIFS does not support the shadow `/etc/passwd` file.
- 3197     When you use a Windows NT client to check the amount of disk space available on the filer, the information is incorrect if the filer's disks are full.
- 3564     System crashes (with the console message *PANIC: system hung*) when a CIFS client tries to access a directory that was created from NFS and the directory contains more than 60,000 files.

Workaround: From an NFS client, create several temporary subdirectories and group the files into them so that each subdirectory contains only about 10,000 files. From a CIFS client, use the `dir` command to view the directory (now containing only subdirectories), and each of its subdirectories. Finally, move the files from their subdirectories back to the original directory.

## Problems Related to HTTP

- 3141 The filer does not support URL escapes. That is, if you use a percent sign (%) followed by two hex numbers in the URL to represent a character that cannot be typed by the user, the filer cannot map the character. To solve this problem, use the Map rule in the filer's */etc/httpd.translations* file. For example, you can map "7E," the ASCII hex value of "~" (tilde), to the tilde character in the URL by inserting the following in */etc/httpd.translations*:

```
map %7E* *~*
```

- 3272 If the HTTP root directory is a snapshot, deleting the snapshot while the filer is delivering HTTP service might cause the filer to hang. To avoid this problem, disable HTTP service before you delete the snapshot. Enable HTTP service only after you recreate the snapshot.
- 3406 The filer ignores the "If-Modified-Since" header in incoming HTTP requests. As a result, the filer always sends a requested file to the client even though an up-to-date version of the file is in the client's cache.
- 3501 You cannot use a symbolic link as the HTTP root directory. When using the options `httpd.rootdir` command, be sure that the command argument is a directory name.
- 3606 Because the filer does not support CGI, you need to use */etc/httpd.translations* to configure it to redirect CGI requests to another host. However, this strategy does not work for a POST request because the HTTP specs (both 1.0 and 1.1) contain the following restriction on the redirection of a POST:

If the 301 status code is received in response to a request using the POST method, the user agent must not automatically redirect the request unless it can be confirmed by the user, since this might change the conditions under which the request was issued.

When automatically redirecting a POST request after receiving a 301 status code, some existing user agents will erroneously change it into a GET request.

The workaround is to rewrite any HTML code that uses POST so that the HTML identifies the host that will handle the request. For example, if an

HTML file contains a statement such as the following, it fails because the filer is not permitted to redirect the request:

```
<FORM ACTION="/cgi-bin/submit.pl" METHOD="POST">
```

However, if the statement explicitly identifies a host that can handle the CGI request, redirection is not required, and the statement succeeds:

```
<FORM ACTION="http://cgiserver/cgi-bin/submit.pl" METHOD="POST">
```

## Documentation Changes

The *Hardware Guide for the FAServers* should provide the following precautions for disconnecting the disk shelf from the filer:

Static electricity can damage the SCSI card in the filer. Before you disconnect the disk shelf from the filer, shut down the filer and power off the shelf. Because the shelf doesn't have an on/off power switch, detach the power cord from the shelf to turn off the power. In addition, wear an antistatic wrist strap and grounding leash when you disconnect the shelf from the filer.

## Downgrading Your Filer to a Release Earlier Than 4.0

The instructions in this section tell you how to make a filer that is now running Release 4.0.1c revert to a release earlier than Release 4.0.



**CAUTION:** If you downgrade to a previous release following a dirty shutdown (for example, if your filer crashed or you power-cycled a running filer), there is a risk of losing data.

### Restrictions for Software Downgrading

The following are restrictions for downgrading:

- A filer that uses the NetApp RPS 1 cannot downgrade to a release earlier than 3.1.4a.
- A NetApp F220 cannot downgrade to a release earlier than 3.1.
- A NetApp F330 cannot downgrade to a release earlier than 3.0. If you have added a second dual-channel SCSI adapter card to the NetApp F330, you cannot downgrade to a release earlier than 3.0.1.
- A NetApp F540 cannot downgrade to a release earlier than 3.1.4.
- If you enabled the `nfs.big_endianize_fileid` option introduced in Release 3.0.1, after downgrading to Release 2.1.3b all clients must unmount and then remount the file system. Clients that attempt to access files without doing this will receive “stale NFS file handle” messages.
- You cannot run the downgrade on a filer that has snapshots that include CIFS files. You must first delete any snapshots made after the filer first ran CIFS. If you attempt to run the downgrade while CIFS snapshots still exist, the downgrade procedure will terminate and list the snapshots concerned (see page 37, below).



**NOTE:** If your filer has run Release 4.0.1c, you *cannot* revert to a release earlier than 4.0 by simply rebooting from the prior release boot disk. The prior release will not be able to recognize the Release 4.0.1c directories, and will terminate after printing an alarming message such as the following:

```
Filesystem is scrambled.
Please contact Network Appliance.
```

(You must boot from floppy to take any further action)  
Program terminated

The necessary step is to run the Release 4.0.1c `revert_to 3.x` command (step 2 in the procedure that follows).

## Downgrade Step-by-Step

To revert to an earlier system, get out the **boot disk** and the **system files disk** for the earlier system to which you will revert (3.1.4d, 3.0.1, or 2.1.3b). For this description, we'll refer to them as:

- Prior-level boot disk
- Prior-level system files disk

To carry out the installation, you need both access to the filer's system console and to a client system. The client system is a workstation equipped with a floppy drive. It should have write permission to the filer's root directory. In this section, the client system is shown with the name **adminhost**, and is shown running SunOS 4.1.x. If you use a client running another operating system, the syntax of UNIX commands might differ.

### 1. Turn off NFS and CIFS services.

At the system console, enter the following commands:

```
toaster> nfs off
toaster> cifs terminate
```

The `cifs terminate` command prompts you for the number of minutes it should delay before turning off CIFS service. (The default is 5 minutes.) During the delay period, you can type Ctrl-C to abort the command if necessary.

### 2. Convert directories from the format introduced in Release 4.0.

Allow time for this step. The time required is roughly proportional to the total number of i-nodes in the snapshots and the active file system. As a very rough rule-of-thumb, estimate about 1 hour per 10 GB.

At the system console, enter the following:

```
toaster> revert_to 3.x
```



**NOTE:** The argument of `revert_to` is always the characters “3.x”, regardless of the version to which you're reverting.

The `revert_to 3.x` command cannot convert snapshot directories that were created while the filer was running CIFS. The `revert_to 3.x` command first scans for such directories. If it finds any, it displays a list of them and exits, leaving the filer unchanged. In that case, you can either abandon the downgrade process, or you can delete the CIFS snapshots and restart `revert_to 3.x`.

- a. If you decide to delete and proceed, use the following command:

```
toaster> snap delete dirname ...
```

In the actual command, substitute the names of the snapshots for *dirname* .... After deleting the snapshots listed, execute the `revert_to 3.x` command.

- b. If you decide to abandon the downgrade, eject the boot diskette from the filer, and issue a reboot command in the usual way.

```
toaster> reboot
```

Then re-enable file services as appropriate.

### 3. Unmount the filer from certain clients.

This step is relevant only if you are downgrading to Release 3.01 or earlier. Otherwise, skip to step 4.

If you have been using NFS over TCP, or NFS Version 3, and you are now downgrading to a release that does not support them—that is, to Release 3.0.1 or earlier—unmount the filer from clients that are using those features. (Otherwise, clients that use NFS over TCP will hang, and clients that use NFS Version 3 will receive many error messages.)

### 4. Reboot the filer from the prior-level boot disk.

- a. At the filer's floppy drive, insert the prior-level system boot disk.

- b. At the system console, enter the reboot command.
- c. When the filer displays a list of options, select option 1, "Normal boot," to boot the system from the prior-level disk.

## 5. Enable NFS.

This step is relevant only if you downgrade to Release 2.1.3b. Otherwise, skip to step 6.

At the system console, enter the enable command to enable NFS service on the filer.

## 6. Read and install the system files.

At the client system:

- a. Insert the prior-level system files disk.
- b. Mount the filer's root file system to the administration host's `/mnt` directory:

```
adminhost# mount toaster:/ /mnt
```

- c. Change to the directory where the filer's root directory is mounted:

```
adminhost# cd /mnt
```

- d. Extract files from the prior-level system files disk into the current directory.

For a prior release earlier than 3.1.4, the command is:

```
adminhost# tar xvf /dev/fd0
```

For prior release 3.1.4 or later, the command is:

```
adminhost# zcat </dev/fd0 | tar xvf
```

The tar function reports each of the files that it extracts.

## 7. Eject disks and unmount the filer's root directory.

- a. At the client system, eject the prior-level system files disk.

```
adminhost# eject
```

- b. From the client system, unmount the filer's root file system (/) by entering the following commands:

```
adminhost# cd /
adminhost# umount /mnt
```

- c. At the filer, eject the boot disk (by pressing the eject button at the side if the floppy drive).



**NOTE:** It's essential to remove the boot disk before issuing the reboot command, or the filer will once again boot from the floppy rather than from its hard drive.

## 8. Set the filer's boot blocks.

At the system console, enter `download` to copy the executables to the boot blocks of the filer's hard disks:

```
toaster> download
toaster>
```

There's no acknowledgment; when copying has finished, the filer prompt appears again.

## 9. Reboot the filer from its hard disk.

At the system console, enter `reboot` to reboot the filer:

```
toaster> reboot
```

You'll see the copyright notice followed by the release number for the prior-level system that you have now restored.

## 10. Clean up some no-longer needed files.

This step is relevant only if you downgrade to Release 2.1.3b. Otherwise, skip to step 11.

- a. Delete later man pages.

Man pages were renamed in Release 3.0; remove man pages for releases 3.0 or later from the filer's `/etc/man` directory. For example, if the filer's root file system

(/l) is mounted at */mnt* on the administration host, enter the following commands:

```
adminhost# cd /mnt/etc/man
adminhost# rm man*/na_*
```

Now the filer's */etc/man* directories contains only man pages for Release 2.1.3b, whose file names begin with *fas\_*.

**b. Remove options.**

Because new options were introduced at each release, edit the filer's */etc/rc* file to remove references to options that are not supported in the release to which you have downgraded your filer. If you don't remove them, the filer will display harmless error messages when it executes */etc/rc*.

Also, remove the word "mailhost" from the filer's */etc/hosts* file because a filer running Release 2.1.3b does not send automatic email messages.

**11. Store the disks.**

Store in a safe place the prior-level system boot disk and system files disk.



