XEROX

Preface

Purpose	The File Service booklet describes all that you need to know to set up and maintain your File Service. This booklet explains all the service commands and shows how these commands are used to perform service-related tasks. In addition, this booklet lists messages that can be generated while running this service and tells you what to do when a message is displayed.
Intended audience	This publication is intended for System Administrators who are responsible for starting up and keeping the File Service running efficiently.
Before you read this booklet	There is some general information about services that you will need to be familiar with before you can understand this booklet. Read the "Services Executive" section in the *Server Operation and Maintenance* booklet, and the *Introduction to Network Administration* booklet. All of these publications can be found in the *Network Basic Services* volume.
Before you can use this service	As part of the preparation for setting up the File Service, you need to perform the procedures described in the *Server Software Installation* booklet. This booklet is also part of the *Network Basic Services* volume.

(This page intentionally blank)

Table of contents

List of figures

(This page intentionally blank)

List of tables

(This page intentionally blank)

Overview of File Service

The File Service provides an efficient means of consolidating and sharing documents produced at any networked workstation or non-networked personal computer. Since your network is composed of many distributed and interconnected workstations, it is important to establish this convenient means for centralizing and sharing data files.

File drawers

The File Service provides users with file drawers. These electronic file drawers are similar to an office file cabinet providing users with supplemental storage and retrieval capability. You can use file drawers, for example, to store backup copies of documents and file folders from your workstation, to move files not currently in use to free up workstation space, or to archive files. They also provide an efficient means for users to share files with any other workstation or personal computer on the network, including any remote device that is using the Interactive Terminal Service to communicate with the network.

File drawer names and sizes

You can give file drawers any name desired. The names may contain any characters, with the exception of the asterisk (*) or the chart sign (#). However, it is recommended that you avoid special characters and punctuation characters in general, such as apostrophes, parentheses, and so forth. You can also set the page limit per file drawer at the time the file drawer is created. (For more information, refer to the "Creating file drawers for users" procedure in the "Setting up your File Service" section.)

Access controls

You can specify access controls for each file drawer so that only designated users can read or alter a file. Thus, any individual not listed is denied all access to the file drawer and its contents. You can "read," "write," "add," and "remove" privileges by user name or group name. (For more information on access controls, refer to the "Creating file drawers for users" procedure in the "Setting up your File Service" section.)

Typically, users will back up, archive, or store their documents into private file drawers to which access is limited. Public file

drawers on the other hand, are file drawers to which many people have access. To share a document with other network users, a user can store the file in a public file drawer. You can create public file drawers for small or large groups of users; for instance, all the users in a department or an entire company.

File Service backup

To protect data stored on the File Service, it is *essential* that you perform backup procedures routinely. If information is lost or accidentally deleted, it can be restored from the backup copy.

For detailed information on File Service backup, refer to the "Maintaining your File Service" section.

File Service configuration

The File Service software runs on a server with a single 10, 29, or 42 Mb rigid disk, or any mixture of 80 Mb, 300 Mb removable disk drives and 300 Mb rigid disks, with a maximum of four 80 or 300 Mb disk drives per server. A terminal must be attached to the server processor.

Before running the File Service, you must partition the disk and load the software. (Refer to the "Disk drive and volumes" section below.) For multiple drive servers, you must format and partition each of the disk packs individually and load at least one of them with software. Use the Installation Utility to partition and load software.

Disk drive and volumes

A disk drive is the physical device that contains a removable disk pack or a fixed disk which provides the storage capacity for the File Service. Disk drives are connected to an NS 8000 server processor. Each drive connected to a server can be partitioned into one volume per drive and then initialized to contain a file system managed by the File Service. (Refer to the "Partitioning drives into volumes" section which follows.) When you bring a volume on-line, it becomes available as a File Service to users on the network. A File Service volume contains file drawers.

Only one File Service program runs on a server. On a single drive server, the File Service manages one volume. On a multiple drive server, it can manage up to four volumes. One to four volumes can be accessed at the same time. You can connect one to four drives to a server. The first drive is the primary drive, and the others are secondary drives.

Bring a File Service secondary volume to an on-line state by partitioning the volume and then using the **Create Volume** command. The fully-qualified name you specify for the volume is then registered in the Clearinghouse. When a

volume is on-line, users reference the volume (File Service) by this name.

Example   A volume may be named Finance:Unit1:Acme.

You can mount a volume on a removable disk pack on any removable disk drive associated with the local server, or a different server. You can mount different volumes on the same drive at different times.

Example   One volume named Finance:Unit1:Acme may be used by the finance department as shared files storage during the day; another volume named Backup1:Unit1:Acme may be mounted at night and used as a backup volume during the night.

Partitioning drives into volumes

Before you can use a disk drive connected to a server as a File Service, it must be partitioned into three areas. The largest of the three is the services volume. When that volume is opened for the first time, it is initialized for use as a file system and becomes the File Service volume, or known to users as simply the File Service.

The disk is partitioned by the System Administrator as described in the *Server Software Installation* booklet in the *Network Basic Services* volume.

(This page intentionally blank)

This chapter lists all the File Service commands. The commands are listed below in alphabetical order, followed by a brief explanation. To address the File Service commands, you must be in the File Service context. File Service activity commands are described in more detail in the "File Service activity commands" section.

Add File Drawer

Available to the enabled user when the File Service is started or stopped. Used to create a file drawer. Contains prompts for the file drawer name, the owner of the file drawer, and the page limit to be set on the file drawer.

Backup File System

Available to the enabled user when the File Service is started or stopped. Starts the backup process. The source File Service volume must be open for this operation to begin. If the backup medium is a secondary volume on the same processor as the source volume, the destination volume (backup volume) can be either on-line or open; it cannot be closed.

If the backup medium is a secondary volume on a remote processor, the backup volume must be on-line.

Change File Drawer

Available to the logged on user when the File Service is started or stopped. The wild card asterisk works with this command. Used to change the name, the owner, the page limit, and/or the access list for a file drawer.

Note: Any user can change the access list if he or she has change access control. Only a System Administrator can change name, owner, and page limit. The System Administrator can also change the access list.

Copy Container

Available to the enabled user when the File Service is started or stopped. Used to copy a file drawer, a folder in the file drawer, or a single file to a floppy disk.

Delete Desktop

Available to the logged on user when the File Service is started or stopped. Used to delete the logged on user's 6085/8010 desktop stored on the File Service. A System Administrator can delete other users' desktops. Any user can delete their own desktop.

Delete File Drawer

Available to the enabled user when the File Service is started or stopped. The wild card asterisk works with this command. Used to delete one or more file drawers.

Delete Obsolete Backup Increments	Available to the enabled user when the File Service is started or stopped. Used to delete old backup data from backup volumes and to identify obsolete backup floppy disks so they may be reused.
Delete Old Versions	(File Service activity command) Users with remove and/or write access rights can discard old versions of files in a directory. The command allows users to delete older versions of each file, while retaining the most recent version and one or more previous versions specified by the user.
List Desktops	Available to the logged on user when the File Service is started or stopped. Allows users to list the 6085/8010 desktops stored on the File Service.
List File Drawers	Available to the logged on user when the File Service is started or stopped. The wild card asterisk works with this command. Allows users to list all the names and attributes of file drawers, such as current size in pages, owner, and access list.
Offline Volume	Available to the enabled user when the File Service is started or stopped. Used to make a volume inaccessible to remote clients. Only those File Service volumes that are in the on-line state are offered to the System Administrator as choices.
Online Volume	Available to the enabled user when the File Service is started or stopped. Used to make a volume accessible to remote clients. A list of open volumes is offered, from which the System Administrator may choose a volume to be brought on-line. If the desktop validation is set to true, the desktop directory is examined each time the service is brought on-line. Refer to the "Validating desktops" procedure for a description of desktop validation.
Report Disk Usage	(File Service activity command) An enabled user can create a report describing file drawer space usage patterns on a File Service using this command.
	The report describes the total number of files and pages, total number of files and pages for old versions of files; the number of pages referenced within the last 30, 60, 90, and 180 days; and the number of pages not referenced in the last 180 days. The report is helpful to determine which versions of files can be deleted or archived. The report will be titled "Disk Usage Report Date-Time" using the date and time when it is created.
Reset Statistics	(File Service activity command) An enabled user can reset the activity counters at any time. These counters are used to compare activity at the File Service. They can, for example, be reset on a regular basis to compare activity at the File Service from day-to-day, from week-to-week, or at various times of the day.

Restore Container	Available to the enabled user when the File Service is started or stopped. Enables the System Administrator to restore a file drawer, a folder, or a single file from the backup medium to a volume.
Restore File System	Available to the enabled user when the File Service is started or stopped. Allows the System Administrator to restore files that were damaged on the volume from the backup medium.
Set Backup Parameters	Available to the enabled user when the File Service is started or stopped. Enables the System Administrator to set default backup parameters for a particular volume.
Show Activity	(File Service activity command) Any user can view the current remote connections with this command. For each remote connection, this command lists the user who initiated the connection, the volume with which the connection was established, the time the connection was initiated, and the time of the last actual activity via the connection.
Show Backup Index	Available to the enabled user when the File Service is started or stopped. Allows the System Administrator to look through the backup increments of the source volume. The prompts are dependent on the backup medium type.
Show Backup Parameters	Available to the enabled user when the File Service is started or stopped. Allows the System Administrator to display backup parameters for the particular volume.
Show Statistics	(File Service activity command) Any user can view File Service statistics. This command lists the statistics compiled since the last reset or the last reboot of the server, whichever is later.
	The statistics include the total number of connections to the File Service; the maximum, minimum, and average length of connections; the number of file accesses (called the total number of Open operations), the number of files deleted, the number of files stored, the number of files retrieved, and the number of list operations. The statistics are cumulative for all the volumes which are managed by a File Service and are not available for individual volumes.
Stop Backup	Available to the enabled user when the File Service is started or stopped. Allows a System Administrator to interrupt the backup process when backup is running in background mode.

(This page intentionally blank)

3.   Setting up your File Service

After you have installed File Service software as described in the *Server Software Installation* booklet, you can set up the File Service. The first step is to initialize each of the volumes which the File Service will manage. If you have a multi-drive server, initialize the primary volume and then the auxiliary volumes. When these steps are done, you can create file drawers for your users and assign additional access rights to the file drawers as needed.

The procedures described in this section should be performed to set up this service:

- Initializing the File Service

- Creating file drawers for users

- Changing information about file drawers

After you complete these procedures, refer to the section titled, "Maintaining your File Service." This section describes common File Service operations and is designed to assist you in developing a regular backup routine to protect your File Service from possible data loss.

Comment: Use the forms contained in Appendix A to organize the information you need to set up your network.

Initializing the File Service

This procedure describes how to initialize the File Service for the first time, as well as how to initialize a second, third, or fourth drive on a multi-drive server.

The first step in initializing a File Service is to initialize each of the volumes which the File Service will manage. When a volume is initialized, the file system structures are created on the volume and you are prompted to name it. A volume can be a removable disk pack or a fixed disk.

In the procedures that follow, you will see references to the terms *open, closed, on-line* and *off-line*. These are the various states of the file system volumes. When a volume is open (files are only available to local System Administration operations), the files it contains can be brought on-line (available for remote user access) or off-line (not available to users). When the volume is closed, files are not accessible to users, and the disk pack, for example, can be removed from the disk drive.

Note: Determine the name you will give the File Service, using FS Form 1, Directory of Services on a Specific Server, in Appendix A. This form contains all the pertinent information for this procedure.

Use Procedure A to initialize a primary File Service volume. Use Procedure B to initialize auxiliary (or secondary) File Service volumes.

Note: On a multi-drive server, the volume in drive 1 is a special volume called the "primary volume" in which software for each service is stored. During initialization, this drive is called "Primary::"; however, it is renamed when it is initialized by the File Service.

Procedure A. Initializing a primary File Service volume

---

1. Type the name you wish to call the volume (File Service) to the "Enter service name" prompt and press < RETURN >. The name you enter must be a unique name within a given domain from others in the specified domain. The comma (,), the parentheses (), the asterisk (*), and the chart sign (#) cannot be used in a local volume name.

   Note: Use the **Change Volume** command if you need to alter a volume name. In general, the File Service only prompts for the name if it is run with normal startup and the volume has not been properly named. This command is only used for a volume that is open and off-line.

2. Type a description to the "description" prompt, if desired. Otherwise, press < RETURN >.

---

3. Type **Y** to the confirmation prompt and press <RETURN>. The File Service registers itself with the Clearinghouse Service, bringing the primary volume on-line.

Procedure B. Initializing auxiliary (secondary) File Service volumes

Note: The disk must first be partitioned by the System Administrator as described in the *Server Software Installation* booklet. If you are using a drive with removable packs, this procedure assumes you have already formatted the disk pack and have it spinning in the drive before you proceed. Refer to Appendix B for information about mounting a disk pack and Appendix C for instructions on formatting a removable disk pack.

CAUTION: If you are using a 300 Mb fixed rigid disk drive, do not format at this time. Your disk will already be formatted when you receive it.

1. Log on and enable.

2. Use step a to create a new volume. Use step b to open an existing volume.

    a. If you wish to create a new volume, or if you no longer want data on the volume:

        •   Type **Create Volume** and press <RETURN>. Use this command for a new volume, or when you no longer want data on the volume.

            CAUTION: Any previous information recorded on the volume is lost. **Create Volume** leaves the volume in the open state.

        •   Type the number of the drive containing the volume, along with a fully-qualified name (or only the local name if domain and organization are the same as the server's domain and organization). Press <RETURN>. Continue with step 3.

            Note: You cannot use a comma (,), parenthesis (), an asterisk (*) or a chart sign (#) in a local volume name.

    b. If you wish to open an existing volume:

        •   Type **Open Volume** and press <RETURN>. This command is applied to a drive whose volume is not already open or otherwise in use. **Open Volume** is used to prepare an auxiliary volume for local access.

        •   Type the number of the drive to be opened and press <RETURN>. The volume is then opened. Continue with step 3.

3. Repeat step 2 for each volume (removable disk pack or fixed disk).

4. Enter the File Service context if you have not already done so.

5. Type **Online Volume** and press <RETURN>. The **Online Volume** command registers the volume (File Service) in the appropriate Clearinghouse Service domain and also makes it accessible to network users.

6. If the File Service is running on a multi-drive server, type the number that corresponds to the volume you wish to bring on-line and press <RETURN>. (You are given a list of volumes currently open and not already on-line from which to choose.)

   Note: When the File Service starts on a multi-drive server, it tries to open secondary volumes and bring them on-line. If it cannot open a volume for any reason, it does not report the error. The only indication of a problem is that there is no message indicating the volume was brought on-line. Use the **Open Volume** command to determine the problem. Messages such as "Drive not ready" and "Duplicate volume name" appear on the display to alert you of the problem.

Creating file drawers for users

File drawers are created and deleted by the System Administrator. Depending on the storage capacity of the File Service, each member of a local network can be assigned a "personal" file drawer. Other drawers, such as public file drawers, can be shared among a group of users. As the System Administrator, you can establish a storage limit for each file drawer, allowing some drawers more storage capacity than others.

Each file drawer you create has an owner associated with it. The owner is used for administrative purposes only. It does not imply any access rights. The "owner" is automatically added to the access list with full (Read, Write, Add, Remove, or Change) access when the drawer is first added. After that, the owner may be removed from the access list. The owner only has access to the drawer if the owner's name appears on the access list.

Note: The File Service does not allow file drawer names containing asterisks.

Access rights, described below, ensure the privacy and security of work stored in file drawers. For example, some users can be given only partial access rights (such as the right to read files), or more extensive rights (the right to delete, move or add new files) to the file drawer. The System Administrator, owner, or user having change access list privileges to the file drawer can place additional access rights for other users to use the file drawer.

Comment: Use the **Change File Drawer** command to change the file drawer name or to change access list privileges. Refer to the "Changing information about file drawers" procedure.

Note: You must add the user and group names that will be given ownership or access to file drawers to the Clearinghouse database before you create file drawers.

Note: Only the first 34 bytes (34 English characters, possibly fewer foreign language characters) of the file name are relevant when it is sorted alphabetically within a directory or file drawer. Consequently, some longer files might appear to be out of order.

Description of file drawer access rights

A user may have any combination of the five different types of access rights: read, write, add, remove, and the ability to change the access list of the drawer.

Note: When a user appears several times in the access list of a file drawer (such as an individual with read access and also as a member of a group that can read, write, and remove), the user

gets the most general access, but the lists are parsed only on an as-needed basis.

- **Read** - Allows the user to list and copy objects from a file drawer.

- **Write** - Allows the user to change the attributes of objects in the file drawer (such as the name). To perform this operation, the user also needs read access to the drawer so that he or she can list the current contents of the file drawer before changing the attributes of anything in it.

- **Add** - Allows the user to place new files in a file drawer or folder.

- **Remove** - Allows the user to remove a file from the file drawer or folder. The user must also have read access in order to list the files in the file drawer, and write access in order to change the number of files in the file drawer.

- **Change the access list** - Allows the user to change the access list of the file drawer.

Note: You can organize the access list entries to optimize the access determination process. This can help cut down the time users spend waiting for access to a file drawer. Order the names with wildcard entries first, group entries second, and individual entries last. Order the group names so that groups giving the most widespread access in the most efficient fashion appear first. The order of the wildcard and individual entries themselves does not matter.

The table below summarizes the access rights needed for various operations.

Operation	Minimum Required Access				
	Read	Write	Add	Remove	Change
Open Drawer/Copy out	X				
Change Properties	X	X			
Copy/Move in	X		X		
Move out/Delete	X	X		X	
Change Access List					X

Table I. Access rights

Procedure

Note: File drawers can be created on an open volume. The volume may be either on-line or off-line.

1. Use FS Form 2, File Drawer/Access Rights, in Appendix A to document the names of the file drawers and the name of the owner responsible for each. Discuss with the users which drawers are to be shared by other users or groups of users, and what naming scheme they wish to use. No two file drawers on the same File Service volume can have the same name.

2. Log on and enable in the File Service context.

3. Type **Add File Drawer** and press < RETURN >.

    Note: The asterisk character cannot be entered when adding file drawers.

4. If the File Service is running on a multiple drive server, type the number corresponding to the File Service you wish and press < RETURN >.

5. Respond to the system prompts for the file drawer name, the owner's name, and the page limit set for the file drawer. Specifying 0 for a storage limit implies there is no limit on the number of pages the file drawer can occupy. When the file drawer is created, the specified owner is given full access to the drawer by default.

```
FS!Add File Drawer RETURN
    Select Volume
    1   Finance
    2   Planning
    Enter choice number:  1 RETURN
    File drawer name:  Ledger Forms RETURN
    Owner's name:  Jim J. Jones:Unit 3:Acme RETURN
    Page limit (0..2147483647):  0 RETURN
    Done
```

6. Repeat steps 3 through 5 for each file drawer you wish to create.

    Note: Although it is possible to set individual file limits which cumulatively equal the capacity of the volume, page limits are more often established based on other criteria. For example, it might be appropriate to limit file drawers of individual users to less than 1,000 pages if most work is to be stored in shared file drawers. Since the set page limit does not actually reserve storage space, cumulative page limits are permitted to exceed the volume capacity. Thus, a volume may fill even though no file drawer exceeds its limit. The file storage limit restricts the maximum amount of storage space that can be used by the file drawer owner.

Changing information about file drawers

Use the **Change File Drawer** command to change the name, owner, page limit, and/or access list of an existing file drawer. (Entries in the access lists for a file drawer may be modified or deleted, and new entries may be added to the access list.)

Note: For a detailed description of access rights, refer to the "Creating file drawers for users" procedure.

The command displays the current values for the attributes (name, owner, page limit, and access list) and allows the user to input new values if he or she wishes to change them. The System Administrator may change the attributes of any file drawer, even if his or her name does not appear on the access list. Any user with change access list privileges to a drawer may change that file drawer's access list.

Note: The current access list is not displayed unless the user wishes to change it.

Any logged on user may change the access list using the **Change File Drawer** command if he or she has change access privileges to the drawer. An enabled System Administrator may change any attributes, including access list, name, page limit, and owner's name. If the System Administrator changes the owner field, the new owner does not automatically gain any default privileges. The former owner does not automatically lose any default privileges.

Using patterns

Patterns may be specified in access list entries. A pattern is created by typing an asterisk into a string of characters; the asterisk is treated as a wild card and matches any character or group of characters. Thus, any individual whose user name matches the given pattern has the specified access to the file drawer.

For access list entries, the only patterns that are allowed are those in which asterisks replace the local, domain, or organization part of the name. If an asterisk is used for the organization name, asterisks must be specified for the local and domain names. Similarly, if an asterisk is used for the domain name, an asterisk must also be specified for the local name.

Example	Patterns that can be used	Patterns that cannot be used
	*:Chicago:Acme	*Smith:Chicago:Acme
	::Acme	Smith:*:Acme
	::*	*:Chicago:*

Thus:

*:Chicago:Acme - Specifies all users within the Chicago domain of the Acme organization.

::Acme - Specifies all users and all domains of the Acme organization.

::* - Specifies all users, all domains, and all organizations within the internetwork.

Procedure

1. Log on and enable in the File Service context.

2. Type **Change File Drawer** and press <RETURN>.

3. If the File Service is running on a multi-drive server, type the number corresponding to the File Service you wish and press <RETURN>.

4. Enter the name of the file drawer for which you wish to change attributes and press <RETURN>.

5. Respond to the applicable system prompts to change file drawer, owner, page limit, and access list control. If you wish to add a group to the access list, type the group name in response to the "Enter User, Alias, or Group Name" prompt. The access list may include individual or group names. Where an alias for an individual is specified, the corresponding user name is entered into the access list. An example appears on the following page.

   Note: The access given to a particular group or individual may be any combination of read, write, add, remove, and change access list privileges.

   If a drawer is created for several users, any one of them can be considered the owner of the drawer.

```
FS> Change File Drawer RETURN
    Select Volume
    1 Finance
    2 Planning
    Enter choice number: 1 RETURN
    File drawer name: Ledger Forms RETURN
    New file drawer name: Ledger Templates RETURN
    New owner's name: Jim J. Jones: Unit 3: Acme RETURN
    New page limit (type 0 for no limit) (0..2147483647): 0 RETURN
    Change Access List? Y RETURN
    Enter User, Alias, or Group Name: *:Unit 3:Acme RETURN
    Adding new name to access list.
        Permission to read? (Y/N): Y RETURN
        Permission to write? (Y/N): Y RETURN
        Permission to add? (Y/N): Y RETURN
        Permission to remove? (Y/N): Y RETURN
        Permission to change the access list? (Y/N): Y RETURN
    Make another change to the access list? (Y/N): N RETURN
    Confirm the above changes? (Y/N): Y RETURN
    Done
```

6. Log off from the File Service context.

7. Inform users about existing common drawers. Ask them to let you know if they wish to have additional drawers created.

Comment: To see a list of all file drawers in your File Service, type **List File Drawers**. This command is also useful to view settings on individual file drawers or a set of file drawers. Any logged on user may use the command. The name and any or all of the other attributes (current size in pages, owner, and access list) of the file drawer can be optionally listed.

The specified file drawer name can contain an asterisk. If the asterisk is used, all file drawers matching the pattern are listed. If the file drawer has a page limit, the limit is also displayed when the file drawer size is listed. The size of a file drawer shows the actual amount of space used by the file drawer including filing overhead, which is at least one page per each file contained in the file drawer and one page for the file drawer itself.

4. Maintaining your File Service

To keep your File Service running at its best and to protect it from possible data loss, it is essential for you to develop a regular File Service backup routine. The sections titled "What is a backup?" and "Backup configuration guidelines" provide information on how backup is used and things that must be determined before you can set the backup configuration. It is important that you read through these sections before you begin the backup.

The remaining File Service maintenance tasks should be performed on an as-needed basis. File drawer maintenance is the most common activity you perform. This includes listing and deleting existing file drawers and changing file drawer attributes (such as the name of a file drawer). You can also list and delete 6085/8010 desktops that have been stored at the File Service. Other File Service operations include monitoring File Service activity.

Note: Refer to the "Setting up your File Service" section if you wish to create file drawers or change file drawer attributes. Be sure users are already registered in the Clearinghouse Service before you proceed.

These sections are contained in this chapter:

- What is a backup?

- Restoring files

- Backup configuration guidelines

- Adding a backup user and backup Volume Group to the Clearinghouse

- Preparing a backup file drawer

- Setting backup parameters

- Backing up the File Service volume using floppy disks

- Backing up the File Service volume using the Copy Volume command

- Backing up a File Service volume to a rigid disk (another File Service volume)

- Interrupting the backup process

- Managing backup media: deleting obsolete backup increments

- Using the Show Backup Index command

- Restoring File Service data

- Restoring File Service data from a floppy disk

- Restoring File Service data from a rigid disk

- Copying a portion of the File System to a floppy disk

- File Service activity commands

- Validating desktops

- Recovering File Service disk space for multiple drive servers

- Listing file drawers

- Moving a File Service volume

- Deleting file drawers

- Expunging a File Service

- File Service normal and non-normal startup

What is a backup?

To ensure the reliable storage of user data, the File Service contains a backup feature that enables you to duplicate user files onto floppy disks or to a rigid disk (another File Service) at defined intervals determined by you. This backup method, called the incremental backup process, helps to provide a level of protection in the event of damage to, or accidental deletion of individual files or the entire file system. If loss of information occurs, you can restore the data from the backup copy.

A second backup method uses the **Copy Volume** command. Depending upon the type of disk drives you have on a server and how the server is used, you may use only incremental backup, only **Copy Volume**, or a combination of these methods to protect a volume. You can also use these techniques to make copies of files for your archives. Both of these methods are described below.

Note: Backup data created by 10.0 servers cannot be examined or restored on 8.0 servers. The following error messages will occur when an 8.0 File Service is presented with backup data created by a 10.0 File Service:

Floppy Restore and Floppy Restore Container:
The message "Not a backup floppy" is displayed and the server asks for another floppy disk.

Rigid disk Restore:
After the first increment, the server displays the message "Done" and stops. No error message is displayed.

Rigid disk Restore Container:
The messages "Container not found in this increment" and "Done" are displayed, and the Restore Container stops.

Backup method 1. The incremental backup process

The incremental backup process copies files from the File Service volume to the backup medium of your choice at intervals you specify. Each time backup is run, an increment (or a snapshot) of the backed up files is created. For each File Service volume, you must determine what your specific needs are, and then set up the appropriate parameters to control the backup process. The backup medium, frequency, cycle, and epoch parameters are all described after the example.

Example To describe what occurs when a backup is run for the first time, assume the following: "backup epoch" is not set; the backup medium is rigid disk; "Days in cycle" parameter is set to 7; and a File Service called Primary File Service will be backed up to a file drawer called BackupFD on another File Service

volume called Backup File Service. (Refer to the "Setting backup parameters" procedure for details.)

Day 1: The first time backup is run, everything on the Primary File Service will be backed up to the BackupFD on the Backup File Service. (Refer to the "Epoch" procedure in this section for further explanation on backup epoch.)

Day 2: Files that are new or have changed since the backup ran the day before will be backed up.

Days 3 - 7: Only files that are new or have changed since the previous day's backup will be backed up to the BackupFD on the Backup File Service.

Result: Seven increments (snapshots) of the files that were backed up are completed for the 7 day cycle. This represents a complete copy of all the files on Primary File Service. For additional information, refer to the "Backup cycle" description which follows in this section.

In the event of accidental deletion, or damage to a File Service, you can use the backup data to restore the information by processing the data of backup increments in reverse order. (Refer to the "Restoring files" section for complete information to restore the File Service.)

The following describes the backup parameters you must set for the incremental backup process.

Backup medium

The backup medium refers to the type of medium used in storing backup data. You specify the medium type for each File Service volume when you set up the backup parameters for that volume. The choices are:

Rigid disk When you backup to a rigid disk, you are backing up to one or more File Service volumes, either on the same multi-drive server or on another server on the network. More than one volume can be backed up to the same backup volume.

If you choose a rigid disk as your backup medium, you must also specify: the backup Volume Group, a backup file drawer, and a backup user name and password. (Refer to the following descriptions of these parameters.) You can configure the backup process to run automatically (without your assistance) so that the backup starts and stops at the times you specify. If you do not specify a stop time, the backup process runs until a backup increment is complete, or you use the **Stop Backup** command to stop the process.

Floppy disk When you use floppy disks as your backup medium, you must use the **Backup File System** command to start the backup process. Your assistance is required in order to backup to floppy disk.

Backup frequency

If you do an automatic backup, you can specify the backup frequency and the number of days between each execution of backup. Each time the backup is executed, a backup increment is created. If the backup is run more often, then each backup increment will be smaller and take less space on the backup media (for example, fewer floppy disks). However, the increased number of increments requires more total space on the backup media. If you want backup to execute daily, for example, specify a frequency of 1.

Backup cycle

The backup cycle is the maximum number of days you allow a file that has not changed to go without being copied to the backup medium. Each time the backup executes, it creates a backup increment that contains a backup copy of any file that has been created or changed since the last backup. The backup process also copies any file that has not been backed up for the number of days specified as the cycle. A file on the source volume is marked with its most recent backup date.

In the following example, assume that the cycle is 7 days; every file will be copied to the backup medium at least once every 7 days. Thus, 7 days constitutes a full cycle of increments (backup data).

Example

If a file is created on May 1 and changed on May 3 and May 25, the file will be copied to a backup increment on May 1, May 3, May 10, May 17, May 24, and May 25. On any given day that a complete backup increment is created, you can be sure that the increments created during the last 7 days contain a complete snapshot of the File Service volume.

The backup cycle is also used to determine when it is safe to reuse backup media. (Refer to the description of "Backup increments" that follows for more information.)

Epoch

The epoch is a point in time after which only new and changed files will be backed up during incremental backup. If the parameter is left blank, every file in the File Service which has not been backed up within the last 7 days, for example, will be backed up again. If a date and time is typed in, only new or changed files added to the File Service since that date and time will be backed up again.

Note: If you have files that do not change, for example, read only files, you can put an increment that contains these files or a complete copy of the volume away for safekeeping. Then you can use the epoch parameter to prevent these files from being copied to the backup medium and thus save space on the backup media.

Example   If you set an epoch date of April 25, 1985, only those files created or changed after this date will be copied to the backup medium. A folder of files created on April 3, 1985 will not be copied even after the number of days in the cycle have passed. (Refer to the "Backup configuration guidelines" section for more detailed information.)

Backup increments

A backup increment is defined as a partial copy of the volume that is produced during a single execution of the backup software.

A backup increment on rigid disk consists of one or more files on the backup volume. If an increment is larger than the maximum increment size, it is divided into split increments. The split increments are numbered sequentially. All split increments of a specific backup increment are on the same backup volume.

Split increments   Since a backup may take some time to run, you want to preserve the data for each increment as it is being created to prevent a complete loss of effort in case of failure during backup execution. For this reason, the backup increment is physically divided into smaller units, called split increments. Each split increment contains a backup index file as well as the data for files that were examined during that split increment and found to require backup. If the backup is restarted after failure, the files that were backed up in completed split increments will not be backed up again. Refer to Figure 1 for a diagram of the internal structure of a backup increment.
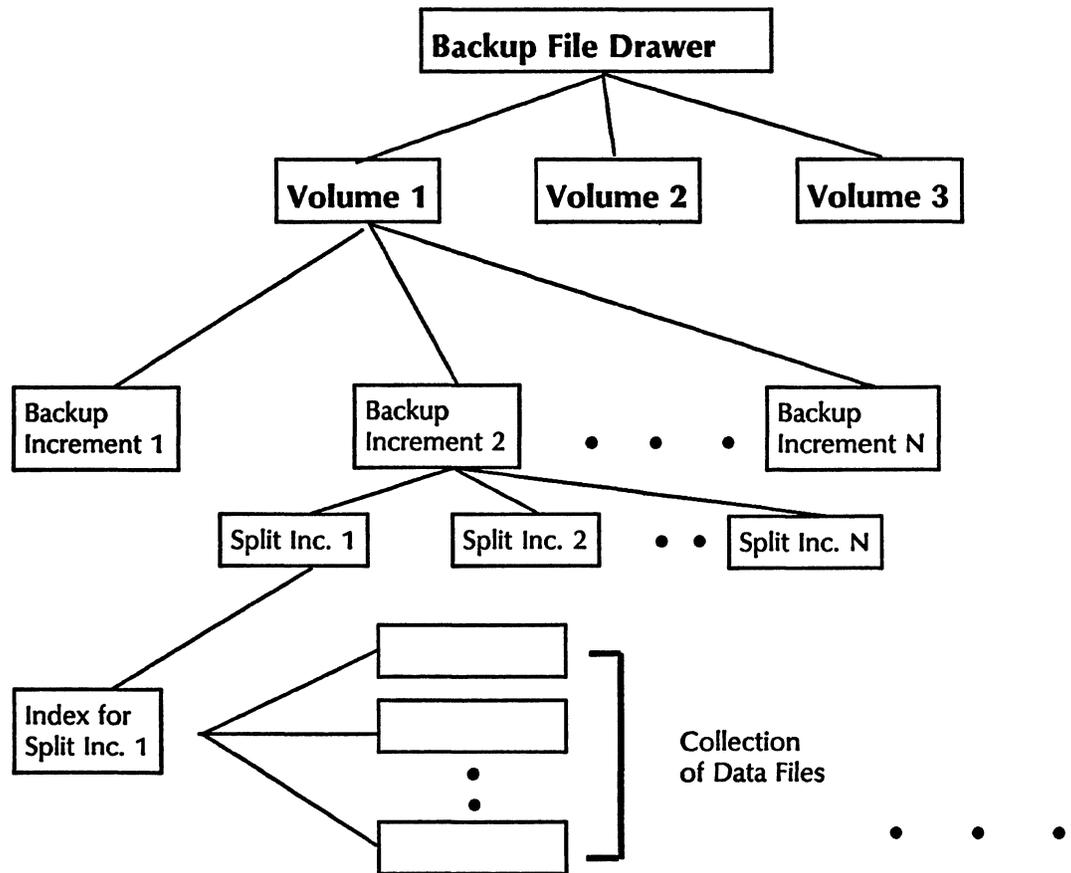
Figure 1. Backup increment structure

A backup increment on a floppy disk may consist of one floppy disk or a set of floppy disks, depending on how many files are backed up. One split increment is created on each floppy disk. Each floppy disk is numbered sequentially, and the set of split increments (floppies) comprises a single backup increment.

Obsolete Increments You should determine when a backup increment is obsolete and can be reused (floppy disk) or deleted (rigid disk) by using the **Delete Obsolete Backup Increments** command. A backup increment becomes obsolete when the date of the increment is equal to the date of the most recent complete increment minus the number of days in the cycle.

Example If the most recent complete increment is created on May 17, the **Delete Obsolete Backup Increments** command will not delete any backup increments created after May 10 (assuming a 7-day cycle). Refer to the "Backup configuration guidelines" section for more information about when to reuse floppy disks containing backup increments.

Incomplete Increments   If the backup process is interrupted because the allotted time runs out, or for some other reason an incomplete increment results, you should never use the date of an incomplete increment as the end of a cycle when determining which increments are obsolete. However, incomplete increments in the middle of a cycle do not affect the calculation of which increments are obsolete.

Example   You may want to stop the backup for some reason. A command is provided that allows you to request a manual interruption of the backup process for the specified volume on the File Service. As soon as the backup reaches the point where it can stop, the appropriate message is issued and the process stops. The next time, the backup will start normally backing up the files that were not previously stored or were changed since the last backup was done.

Automatic Interruption also allows you to stop backup by specifying backup stop time when setting backup parameters for the volume. This is possible only when the backup media selected is a rigid disk. For example, a user wants to run backup only between midnight and 4:00 a.m. because of performance degradation. You can specify backup start and stop times when setting up backup parameters for the volume. In this case, even if the backup is not complete by 4:00 a.m., it will stop.

In both cases, you may want to run a backup a second time during the day. You may do this by manually starting the backup at the File Service. If there is another backup process already running, you will not be allowed to start the second one for the same volume, and an appropriate message is issued.

Backup Volume Group

Several File Service volumes can be members of a backup volume group. This group, named in the Clearinghouse Service, is used by the backup to locate an accessible backup volume to store backup data. When the backup is automatically run, the backup process looks at the members of the backup Volume Group in alphabetical order, and then determines which of the members is an accessible backup volume. The first available volume from the group (a volume that is on-line and open) is used to store the backup data. Increments for a specific File Service may be distributed on several backup volumes, and a specific backup volume may contain backup data from several source volumes. (Refer to the "Backup increments" section.)

Note: For multi-drive servers backing up from one drive to another on the same server, the backup volume must be open but it does not need to be on-line.

If there is only one backup Volume Group for the network, the suggested group name can simply be "Backup Volumes." If all of the volumes on a multi-drive server are to be backed up to

the same backup volume, a suggested group name is "<server name> Backup Volume."

Backup file drawer

Every volume in the backup Volume Group must have a backup file drawer (the file drawer designated for backup data storage). Just one backup file drawer is needed per backup volume. The suggested name of the backup file drawer is "FSBackup." You must create this file drawer with exactly the same name on each of the file service volumes in the backup Volume Group. It is suggested that you set the ownership of the backup file drawer to the backup user entity defined below. In any case, the backup user entity must have full access to the backup file drawer.

Backup user and password

If there is more than one person managing the backup in your organization, you can set up a user entry in the Clearinghouse so that anyone running backup activities can log in and access the backup file drawer under one common name. The backup user must have full access to any backup file drawer that may be used during backup.

Backup increments log and backup index

Each time a backup is run, a backup increments log is created. The log contains information on what date and time the backup began, what files were backed up in each increment, and to what backup volume the files were backed up. This information is used to locate increments or delete obsolete increments. You can look through increments, for example, to determine whether they are complete. You restore the backup increments log before you perform a complete restore of a File Service.

A backup index is stored with each backup increment. It contains a list of the files backed up in the increment. You can use the **Show Backup Index** command to display a list of backup increments for a specific volume and a list of the files backed up in a given increment. You should use this command frequently to see what has occurred during automatic backup.

Backup Method 2. Using Copy Volume

You can also backup by using the **Copy Volume** command. This command copies the entire contents of one File Service volume to another volume. **Copy Volume** can only be used on a multi-drive server containing 80 Mb and/or 300 Mb disk drives. It is recommended that you copy to removable disk packs only. You cannot use this command to copy a volume to a File Service on a remote server or to floppy disks.

Using **Copy Volume** has no effect on incremental backup or the backup date of a specific file. Refer to the "Backup configuration guidelines" section for more information about using **Copy Volume** and incremental backup together in your backup procedure.

Note: You can also create a copy of a complete volume by setting the cycle to zero, removing the epoch date, and running incremental backup. You can use a remote volume or floppy disks as your backup medium. In this booklet, this type of backup is called a full incremental backup. After you run this type of backup, you should reset the cycle and epoch date.

Restoring files

The restore feature allows you to recreate a particular state of a File Service volume. This is done by processing the data of backup increments in reverse order to obtain the most recent state of the volume first, and then restoring the files that were backed up earlier and whose contents were not modified since then.

Note: This feature is not performed on a routine basis. It is an emergency feature, and consumes large amounts of time.

How are files restored?

When all or a large portion of your File Service volume has been accidentally deleted or damaged, you must first use the **Restore Container** command to restore the backup increments log to the source volume. You then use the **Restore File System** command to restore lost data to its original location on the volume by copying files from the backup increments.

Start with the most recent increment and process all of the increments of a cycle in reverse order. If you are restoring from floppy disk, the restore process will give you a warning message if you do not insert the disks in the correct order. This scheme is efficient because only the latest version of a file is restored and files that a user has deleted deliberately before the most recent backup will not be restored.

You can also use the **Restore Container** command to restore a folder or one or more files that a user has accidentally deleted and wants to recover. In addition, if a 6085/8010 desktop has been stored on the File Service, you can use the **Restore Container** command to restore a deleted desktop.

If you use only the **Copy Volume** command for backup, you can copy the most recent backup volume to the source volume.

For procedures on the restore process, refer to the "Restoring File Service data from a floppy disk" or "Restoring File Service data from a rigid disk" sections.

Backup configuration guidelines

There are many ways that a backup can be configured to run on a network. You must determine what backup media to use and what type of backup to run. If you do incremental backup, you must select a cycle and other backup parameters. This section describes the factors that you should consider and provides some guidelines to help you design a backup procedure that meets your specific needs.

Determine what backup procedure to use

Before you determine the backup parameters for a specific source volume, you should decide how the backup procedure will accommodate all of the source volumes that must be backed up. How many volumes are to be used as backup volumes? To determine this figure, you must know how many File Service volumes are to be backed up and how many source volumes can be backed up to the same backup volume.

If you are going to use the **Copy Volume** command and incremental backup, it is reasonable to devote one drive on a multi-drive server to backup. If most files do not change very frequently, one backup volume may be all that is needed for each multi-drive server.

On a network of single drive servers, you can devote one or more servers to backup. In this case, you cannot use **Copy Volume** command. It is recommended that the capacity of the backup volumes be at least twice the capacity of the File Service volumes that are being backed up. (This recommendation also applies to multi-drive servers when you do not use the **Copy Volume** command.)

A File Service can be backed up to itself; however, this does not provide any security against a damaged disk. In general, a backup File Service should not be used as a regular File Service.

Determine the number of volumes to be backed up to a given backup volume (rigid disk only)

More than one volume may be backed up to a given local or remote File Service volume using incremental backup. The number of File Service volumes backed up to one backup volume depends on the quantity and characteristics of the data being backed up and on the desirable turnover of the backup volumes.

The more volumes being backed up to the given backup volume, the more often the rigid disk fills, requiring backup data deletion, or creation of an additional volume if none of the backup data is obsolete.

If you have a multi-drive file server, you can specify one of the four drives to store backup data only. However, if many volumes are backing up data to it and storage space is not adequate to contain all backup data, you can establish additional File Service volumes, for example, to rotate volumes for storing backup data. The volumes should be removable disk packs.

One or more File Service volumes must be specified in a backup Volumes Group in the Clearinghouse Service. The same group can be used to back up several volumes. When a backup is started, the first available volume (alphabetically) from the group is used.

If you are doing automatic backup during the night and have only one backup drive, only one volume (disk pack) will be available unless an operator is present to mount the disk packs, open the volumes and bring them on-line. You must choose the frequency and cycle carefully and monitor the available disk space closely when you back up to one volume. If you have more than one a backup drive either on the same server or a remote server, you can have several a backup volumes available.

Determine the available resources and the operational considerations for a backup to rigid disk or floppy disk

If you have more than one File Service on your network, you can do incremental backup of your File Service to either floppy disks or another local or remote volume (another File Service), depending on the degree of File Service use. If there are infrequent changes to files (for example, a File Service that is used primarily for archiving files), backing up to floppy disks may be sufficient for your needs.

For larger File Service configurations containing 80 or 300 Mb volumes, backing up to floppy disks is not practical. In this case, backup to rigid disk is recommended.

During incremental backup, multi-drive servers can back up locally to a File Service volume on another of its drives. In addition, rigid disk backup media can be shared between several File Service volumes. Also, several File Service volumes can back up to a remote File Service volume. Backing up to a remote volume may take longer because of data transmission across the network. You should allow more time for the backup operation to ensure that a complete increment is created during the time allowed.

Determine the length of the backup cycle

To determine the length of the backup cycle, consider these points:

• Everything on your File Service volume (that has been added or changed since the epoch date) is backed up during a cycle. Unchanged data is backed up once during a cycle. Data that changes is backed up more than once. In a longer cycle, unchanged files are backed up less often. (Refer to "Using the epoch to reduce the amount of backup data" for another way to prevent unchanged files from being backed up.)

• A full cycle of increments must be kept. The longer the cycle, the longer you must keep the backup data. The actual number of increments depends on how often you run backup during the cycle. The size of each increment depends on how often files change.

• To restore a File Service volume, you must restore a full cycle of increments. Typically, a longer cycle has more increments and takes longer to restore if it is ever necessary to do so.

The main considerations in selecting the backup cycle are the amount of backup data you will be collecting during a backup cycle and the time it will take to restore the File Service.

It is recommended that the backup cycle not exceed thirty days.

Determine the backup frequency

To determine how frequently to run backup, consider these points:

• The frequency of running backup depends on how carefully files must be protected from loss and how frequently the files change. If users are making changes to their files each day, you should run backup daily to ensure that important changes are not lost.

• The more often you run a backup, the smaller each backup increment is. A backup takes less time to complete if the increment is small.

• You want to be able to restore the File Service close to its current state. You can only restore your File Service to the state it was in when you last ran a backup. If you run a backup frequently, this will be close to its current state and you will minimize the number of changes that might be lost.

• More increments require more storage on the backup media. In general, if you run a backup frequently, the total size of the increments in a cycle is greater than it would be if you run a backup less frequently during that cycle. This is because files that change are backed up more often. If you

back up to floppy disk, you need at least one floppy disk for each increment.

The main considerations in selecting the frequency are the amount of backup data you will be storing and the vulnerability of files that have changed since they were last backed up.

Guidelines for choosing the backup cycle

The size of each increment is the main consideration in choosing backup parameters. The size of a backup increment is affected by the number and size of files that have been changed between executions of backup. If files change infrequently, you can use the backup epoch to minimize the backing up of these infrequently changed or unchanged files. (Refer to "Using the epoch to reduce the amount of backup data" which follows.)

If a large percentage of the files on the File Service change **infrequently**:

• Choose a long cycle. Choose a frequency that is convenient. In this case, because the files do not change very often, backup increments are small no matter how often a backup is run. You will typically have one large increment in a cycle, when all files that were not changed during the cycle are backed up. Setting the backup epoch may be helpful in this situation (refer to item 7). Using floppy disks for the backup media is more convenient for this type of File Service than for more active File Services because the increments are small.

If a large percentage of the files on the File Service change **frequently**:

• If possible, run a backup every day. Choose a cycle based on the amount of data being backed up. On this type of File Service, the length of the cycle does not greatly affect the size of each increment. Consider the total size of the increments in a cycle and the storage limitations of the backup media. It is also important to consider the time it will take to restore the File Service. It will take longer if the cycle is longer.

It is difficult to determine in advance the frequency and cycle parameters. It may be necessary to experiment before you find a combination that works well for a particular File Service. A good place to start is a 7-day cycle, running a backup every day. If the increments are very large, it may be necessary to shorten the cycle so that there is less backup data stored during the cycle (the obsolete data can be deleted from the backup volume, or the floppy disks can be reused). If the increments are very small, you may find it more convenient to run backup less often. (Refer to "Using the epoch to reduce the amount of backup data" for additional suggestions.)

Determine the time to run backup

Using floppy disks for backup requires manual handling of the disks and causes slight degradation in system performance. It is best to run a backup when the work flow is the lightest.

If rigid disk media is chosen, an automatic backup can be set to run during off hours (for instance, from midnight until completion).

You can schedule the incremental backup of more than one File Service at the same time.

Using the epoch to reduce the amount of backup data

You can set the epoch to prevent files that do not change after the epoch date from being backed up. An efficient way to back up a File Service is to use a 7-day cycle and run backup daily (frequency 1). Once a week, make a complete copy of the File Service volume.

- If the backup volume is on your local server, use the **Copy Volume** command.

- If you have a single-drive server or a multi-drive server with no removable disk packs, you cannot use the **Copy Volume** command. In this case, make a full incremental copy by changing the cycle to zero and removing the epoch date. Use the **Backup File System** command to run an incremental backup and then reset the cycle to 7 days.

After you have copied the volume, reset the epoch date to the current date and time. (Use the Server command, **Show Time**, to display the current time. More information about this command is available in the *Server Operation and Maintenance* booklet.) Store the complete volume copy or set of floppy disks and do not reuse them during the cycle. By using this method, you reduce the amount of unchanged data being copied on the first day of the cycle. Files that were modified, moved, or created before the new epoch date are not backed up again.

It is also possible to use the **Copy Volume** command or make a full incremental backup just once, to take care of all unchanging files, then set the backup epoch to that time and never reset it again. Incremental backup would then be run exclusively. This approach would prevent the entire file system from being backed up the first time a backup is run, and would also prevent files that never change from being backed up repeatedly.

Monitoring disk space

If your backup medium is rigid disk, you should monitor the amount of disk space available on the backup volumes in the backup Volume Group. Use the **Delete Obsolete Backup Increments** command daily (or as frequently as you run incremental backup) in order to make more disk space available on a backup volume.

Note: Do not manually delete information from a backup volume. Refer to the "Managing backup media: deleting obsolete backup increments"section for more information.

After you have set up your backup procedure, it is useful to check how much space is being used. Check the size of your increments each time you run backup to estimate the typical or average size. If you have a 6085/8010 workstation desktop, follow these steps to check for size:

1. Copy the backup drawer icon to your desktop.

2. Open the icon to see the list of increment folders.

3. Select an increment folder.

4. Select [SHOW SIZE] from the upper right hand corner of the desktop auxiliary menu. The number of pages in the folder will be displayed at the top of the screen.

Note: You should never move an increment from the backup file drawer.

By adding the sizes of all increments for all source volumes backed up to the same backup volume, you can determine approximately how much disk space is needed each time you run backup. Since the sizes will vary from one backup to the next, you should look at the increments from several days to see the range of sizes.

Once you have estimated how much disk space will be needed, use the **List Volumes** command to see how many pages of disk space are available on the disk pack. If you need more space, you can use the **Delete Obsolete Backup Increments** command or make a complete copy of the volume and reset the epoch date. You can also shorten the cycle or prepare another File Service volume for backup and add it to the backup volume group. If the new volume is open and on-line when you run backup, more disk space is available for backing up the source volumes.

Determine when to reuse backup media

You should use the **Delete Obsolete Backup Increments** command on the source volume to determine whether a floppy disk contains an obsolete increment (or part of an obsolete increment) and can be reused. Refer to "Backup increments" in the "How does incremental backup work?" section for a description of the criteria that determine if an increment is obsolete. The **Delete Obsolete Backup Increments** command also updates the backup increments log on the source volume.

If you are using a 7-day backup cycle and are running backup daily, an increment becomes obsolete 7 days from the date it was created. On that day, assuming that day's backup completed normally and the cycle did not change, you can reuse the floppy.

Some installations may choose to keep floppy disks for three cycles. In this backup procedure, the complete set of increments for the oldest cycle is called the grandfather, the second oldest is called the father, and the newest set is called the son. The floppy disks to use for the next cycle are always the grandfather set. At that time, the father becomes the grandfather and the son becomes the father. If you have enough floppy disks available to use this technique, it ensures that you have a picture of your file system in different states rather than only the most recent one. In the event that the backup of the most recent state is damaged or accidentally lost, you can recover the data from the next most recent backup.

If you are using the **Copy Volume** command as your only backup method or in addition to an incremental backup, you can also use the grandfather-father-son technique to rotate the volume copies.

Once these considerations are determined, you are ready to perform the procedures described in the "Setting backup parameters" section.

Adding a backup user and backup Volume Group to the Clearinghouse

If you are using a rigid disk as your backup medium, you must make sure a backup user and backup Volume Group are registered in the Clearinghouse database before setting up the backup parameters. The backup Volume Group is a group of selected File Service volumes designated for backup.

If you are using floppy disks as your backup medium, you can skip this procedure, in addition to the "Preparing a backup file drawer" procedure.

Note: Each backup volume must be initialized. Follow the steps in the "Initializing the File Service"procedure to initialize a secondary volume.

Procedure

1. Log on and enable in the Clearinghouse Service context. If the backup Volume Group you will use already exists, skip to step 5.

2. Type **Add Group** and press <RETURN>.

3. Type the name of the group (for example, **Backup Volumes**) at the "Name" prompt and press <RETURN>.

4. Type a description of the group at the "Description" prompt and press <RETURN>.

5. Type **Add Member** and press <RETURN>.

6. Type the name of the backup Volume Group at the "Group" prompt and press <RETURN>.

7. Type the name of the File Service volume where the backup file drawer will be housed at the "Member" prompt and press <RETURN>.

8. Type **N** at the "Add another member?" prompt and press <RETURN>.

```
CHS!Add GroupRETURN
    Name: Backup Volumes:Unit1:GemSysCoRETURN
    Description: Backup Volumes Group RETURN
    Done. Backup Volumes:Unit1:GemSysCo (Group) added
CHS!Add MemberRETURN
    Group: Backup Volumes:Unit1:GemSysCoRETURN
    Member: Backup1:Unit1:GemSysCoRETURN
Done. Backup1:Unit1:GemSysCo added to Backup Volumes:Unit1:GemSysCo
    Add another Member?(Y/N): NRETURN
```

9. If a backup user already exists who has Administrator access to this domain, skip the following steps and continue with the "Preparing a backup file drawer" procedure. To add a backup user, type **Add User** and press <RETURN>.

10. Respond to the prompts, pressing <RETURN> after each step. Enter a first and last name, for example, Backup User. Enter a password. When you type the password, asterisks appear in place of the actual password to ensure confidentiality. Enter any information you wish as the description. The home File Service should be the backup volume.

11. Type **Y** at the "Confirm this user information?" prompt and press <RETURN>. Then type **N** and press <RETURN> to stop adding users.

12. Type **Change Domain Access** and press <RETURN>.

13. Type the name of the domain for the backup Volume Group at the "Domain Name" prompt and press <RETURN>.

14. Type the name of the backup user at the "Name" prompt and press <RETURN>.

15. Type **Y** at the "Admin Access?" prompt and press <RETURN>.

Note: If you do not use the backup user name to log on, enable, and execute backup commands, then the backup user does not have to be the Domain Administrator and should not be.

```
CHS! Add UserRETURN
    First Name (and Middle Name, if desired): BackupRETURN
    Last Name: UserRETURN
    Password: ******RETURN
    Description: Backup User Entity
    "Home" File Service: Backup1:Unit1:GemSysCoRETURN
    Alias:RETURN
    Confirm this User information?(Y/N):YRETURN
Done. Backup User:Unit1:GemSysCo (User) added.
    Add another user?(Y/N): NRETURN
CHS! Change Domain AccessRETURN
    Domain Name: Unit1:GemSysCoRETURN
    Name: Backup User:Unit1:GemSysCoRETURN
    Admin Access?(Y/N): YRETURN
Done. Backup User:Unit1:GemSysCo granted Admin access to Unit1:GemSysCo
CHS!
```

Preparing a backup file drawer

All backup volumes in the backup Volume Group must have a backup file drawer with the same name. If you already have members in the backup Volume Group, use the **List File Drawers** command to determine the file drawer name on the new backup volume you have initialized. If this is the first volume in the group, you can use any valid file drawer name, for example, "BackupFD."

After you create the file drawer, you should make sure it has the right access list set. The backup user must have access, as well as all other Domain Administrators.

Note: If you are using floppy disk as your backup medium, skip this procedure.

Procedure

1. Log on and enable in the File Service context.

2. Type **Add File Drawer** and press <RETURN>.

3. If the File Service is running on a multiple drive server, type the number corresponding to the Backup volume you wish and press <RETURN>.

4. Respond to the system prompts. Remember to use the correct file drawer name. The owner of the drawer must be the backup user you added in the "Adding a backup user and backup Volume Group to the Clearinghouse" procedure. You should specify a page limit of 0 (unlimited).

```
FS!Add File Drawer RETURN
  Select Volume
  1 Finance
  2 Planning
  3 Backup1
  Enter choice number: 3 RETURN
  File drawer name: Backup FD RETURN
  Owner's name: Backup User:Unit 1: GemSysCo RETURN
  Page limit (0-2147483647): 0 RETURN
  Done
```

5. Type **List File Drawers** and press <RETURN> if you wish to validate what you have just added.

6. Respond to the system prompts. Select the backup volume and the name of the backup file drawer. Show the owner, size, and access list to ensure the information is correct.

```
FS!List File Drawers RETURN
    Select Volume
    1. Finance
    2. Planning
    3. Backup1
    Enter choice number: 3RETURN
    File drawer name: Backup FDRETURN
    Show file drawer owner?(Y/N) YRETURN
    Show file drawer sizes?(Y/N) YRETURN
    Show file drawer access Lists?(Y/N): YRETURN
Backup FD
    owner: Backup User:Unit1:GemSysCo
    size: 1 disk pages
    access list:
        Backup User:Unit1:GemSysCo
            permission to read, write, add, remove, change
            access
```

Setting backup parameters

The **Set Backup Parameters** command allows you to set the parameters for the backup process for a specific File Service volume. Once you have set the parameters, you do not need to perform this procedure unless you want to change the current default parameters for the volume. You must set parameters for each File Service volume you are going to back up.

Procedures

1. Log on and enable in the File Service context.

2. Type **Set Backup Parameters** and press < RETURN >.

3. If the File Service is running on a multi-drive server, type the number corresponding to the File Service volume you wish to back up and press < RETURN >.

```
FS!Set Backup Parameters<RETURN>
    Select Volume<RETURN>
    1  Finance
    2  Planning
    Enter choice number:  1<RETURN>
```

4. Type the number corresponding to the backup medium you wish to use (floppy disk or rigid disk) and press < RETURN >.

   If you selected "rigid disk," go to the next step. If you selected "floppy disk," proceed to step 8.

5. Type the name in response to the "Backup volume group" prompt and press < RETURN >. (You must first create the name in the Clearinghouse Service for the purpose of identifying a set of backup volumes using the **Add Group** command. You then add members to it using the **Add Member** command. The backup Volume Group is a group of selected File Service volumes designated for backup.)

6. Type the name of the backup file drawer used to back up the File Service and press < RETURN >.

7. Type the user name and password to the next two applicable prompts and press < RETURN >.

   Note: If there is more than one person managing backup in your domain, add a user in the Clearinghouse database for the specific use of running backup. A common name, such as "Backup user" can be used for log on and access to the file drawer.

8. Type the date in response to the "Backup epoch" prompt and press <RETURN>. (This date specifies when backup begins. Files created or changed before the epoch are not backed up.) It may be left blank, in which case no epoch date is set, and all files are backed up.

9. Type the number of days in your cycle to the "Days in cycle" prompt and press <RETURN>.

10. Type **Y** or **N** to the "Run backup automatically" prompt and press <RETURN>.

   • If you respond **Y**, proceed to step 11.

   • If you respond **N**, proceed to step 12.

11. Respond to the "Start time," and "Stop time" prompts and press <RETURN>. (This enables backup to run at a fixed time automatically as often as the backup frequency indicates. When backup is specified to run automatically, it runs in the background and permits other service commands to be used simultaneously. If you do not specify stop time, backup runs until completion or until it is manually stopped.)

   Note: You can run backup for more than one volume simultaneously. Two or more volumes can have the same start time. Two or more volumes can be backed up to the same backup volume simultaneously.

12. Type the number of days between each execution to the backup "Frequency" prompt and press <RETURN>. (Each time backup is done, a backup increment is created. If you run backup more often, each backup increment is smaller and takes less space on the backup media, but there are more of them in a cycle.)

This example displays the resulting dialogue when rigid disk is selected as the backup medium.

```
Select Backup Medium
1   Floppy
2   Rigid Disk
Enter choice number:  2RETURN
Backup volume group:  Backup
Volumes:Unit1:GemSysCoRETURN
Backup file drawer:  Backup FDRETURN
User name:  Backup User1RETURN
User password:  ***** RETURN
Backup epoch:  August 10, 1983 3:31:00RETURN
Days in cycle (0-90):  30RETURN
Run backup automatically (Y/N):  YRETURN
Start time:  1:00:00RETURN
Stop time:  4:00:00RETURN
Frequency (1-30):  1RETURN
Automatic Backup is set to run at:  1:00:00
   Done
```

The next example displays the dialogue when the backup medium is floppy disk.

Note: The Backup Volume Group and the frequency are not requested, and the user is not given the options of running backup automatically or specifying a start and stop time.

```
Select Backup Medium
1  Floppy
2  Rigid Disk
Enter choice number:  1RETURN
Backup epoch:  August 10, 1983  3:31:00RETURN
Days in cycle (0-90):  7RETURN
Done
```

13. Log off from the File Service context.

14. If you selected:

- Floppy disk as your backup medium, continue to the "Backing up the File Service Volume using floppy disks" procedure.

- Rigid disk as your backup medium, continue to the "Backing up the File Service Volume using the Copy Volume command" procedure -- only if you have a multi-drive server.

Note: To display the existing backup parameters for the particular volume, use the **Show Backup Parameters** command. The dialogue displays different information for the medium selected. If the medium is:

- Rigid disk, the resulting dialogue is:

```
FS!Show Backup ParametersRETURN
Select Volume:
1  Finance
2  Planning
Enter choice number:  2RETURN
Backup parameters for volume:  Planning:Unit1:GemSysCo
Backup medium           Rigid Disk
Backup Volume group     Backup Volume:Unit1:GemSysCo
Backup File Drawer      BackupFD
User Name               BackupUser1:GemSysCo
Backup epoch            10-Aug-83 3:31:00
Days in cycle           30
Start Time              1:00:00
Stop Time               4:00:00
Frequency               7
```

- Floppy, the resulting dialogue is:

```
FS!Show Backup Parameters!RETURN
    Select Volume:
    1   Finance
    2   Planning
    Enter choice number:  1RETURN
    Backup parameters for volume:  Finance:Unit1:GemSysCo
    Backup medium               Floppy Disk
    Backup epoch                10-Aug-83 3:31:00
    Days in cycle               30
```

Backing up the File Service volume using floppy disks

Backing up to floppy disks requires your presence. You back up the File Service to floppy disks by typing the **Backup File System** command and inserting floppy disks as you follow the system prompts. New floppy disks are formatted by the backup procedure. Either single or double sided floppy disks may be used.

The number of disks used each time varies with usage since the last backup. The first time backup is run, it is likely to take many floppy disks since it is backing up everything from the rigid disk. When this occurs, each floppy disk contains a split increment. The backup increment consists of the set of split increments created during the same backup operation. Each split increment is numbered sequentially starting with 1.

Once backup floppy disks are created, they must be labeled and stored carefully -- away from heat, strong light, and magnetic objects. You must keep the disks throughout the backup cycle. When the backup increments stored on a floppy disk become obsolete, you can reuse the obsolete floppy disks.

In order to determine which floppy disks are obsolete, you need to use the **Delete Obsolete Backup Increments** command. This command deletes information about obsolete increments from the backup increments log and tells you which disks are obsolete and can be reused for backup. (Refer to the "Managing backup media: deleting obsolete backup increments" section.)

You cannot start backup if another backup process is already running for the same volume. This may occur, for example, if automatic backup is started for the volume and you run the backup manually without first permitting the automatic backup to be completed.

CAUTION: If backup is interrupted for any reason, for example, if the server becomes inoperable or the message "Command canceled" appears, do not reuse the backup floppy disks that you have already used during the current backup operation. These floppy disks contain the files that have been backed up prior to the interruption and the files have been marked on the source volume with the backup date. They will be skipped when you restart the backup operation. Keep the floppies for the rest of the current cycle.

Note: You must have already set up backup parameters as described in "Setting backup parameters" before you continue with this procedure.

Procedure

1. Log on and enable in the File Service context.

2. Type **Backup File System** and press <RETURN>.

3. If the File Service is running on a multiple drive server, type the number corresponding to the File Service volume you wish to back up and press <RETURN>.

4. Type **Y** or **N** to the "Use parameters that have been set for this volume" prompt and press <RETURN>.

    - If you decide to make a change to the default parameters at the time of execution of backup, type **N** and press <RETURN>. This manually substitutes a new setting for one particular execution of backup only.

    To permanently change backup parameters for the volume, use the **Set Backup Parameters** command.

    - If you wish to use the default settings, type **Y**, press <RETURN>, and then proceed to step 8.

5. Type the number corresponding to the floppy disk medium and press <RETURN>.

6. Type the date in response to the "Backup epoch" prompt and press <RETURN>. It may be left blank, in which case no epoch date is set, and all files are backed up

7. Type the number of days in cycle to the "Days in cycle" prompt and press <RETURN>.

8. Insert a floppy disk into the disk drive as prompted. As each backup disk is completed, a message is displayed.

    Note: Be sure the write-enable tab is on the floppy disk. If the tab is not on, you receive a warning message. In this case, remove the floppy disk, add the write-enable tab, and reinsert the disk.

9. Remove the disk and label it with the date and time, sequential number for that day, and the name of the File Service (for example, "Backup #2, 8/10/86 11:53 AM, Coral").

10. Repeat steps 8 and 9 until the "Backup completed normally" prompt displays. When backup is complete, you see a message indicating the number of disks produced as shown in the following example.

```
FS!Backup File System RETURN
  Select Volume:
    1   Finance
    2   Planning
  Enter choice number:  2RETURN
  Use parameters that have been set for this volume?  (Y/N):  NRETURN
  Select Backup Medium
    1   Floppy
    2   Rigid Disk
  Enter choice number:  1RETURN
  Backup epoch:  August 10, 1983  11:53:05RETURN
  Days in cycle (1-32767):  30RETURN
  Backup will be started immediately.
  Insert floppy disk
      Proceed (Y/N):  YRETURN
  Processing floppy...
  Split increment # 1 of August 10, 1983 11:53 for Planning:Unit1:GemSysCo
  complete
  Insert another floppy disk
      Proceed (Y/N):  YRETURN
  Split increment # 2 of August 10, 1983 11:53 for Planning:Unit1:GemSysCo
  complete.
      Insert another floppy disk
      Proceed (Y/N):  YRETURN
  Backup completed normally.
  Source Volume Planning:Unit1:GemSysCo
  Split increment of # 3 of 10-Aug-83 11:53:05 for
  Planning:Unit1:GemSysCo complete
  3 Backup disks created.
```

11. Log off from the File Service context.

12. On FS Form 3, Backup Record, in Appendix A, record the number and date of floppy disks written, server disk space available, and percentage of space used.

Note: The backup process stores not only file drawers, but also 6085/8010 desktops and system files.

Backing up the File Service volume using the Copy Volume command

Copy Volume is a command for multi-drive servers containing 80 Mb or 300 Mb disk drives. The command can be used to copy the entire file system of one volume to another volume.

It is recommended that you have a total of at least three data disk packs for your server, to ensure against loss of a single backup copy. The copy volume operation should be run as often as is necessary to ensure adequate backup. It takes approximately 40 minutes for 80 Mb disks and 2 hours for 300 Mb disks. It takes less time to complete if the disk is not full.

Note: Refer to the "Backing up a File Service volume to a rigid disk" procedure, if you wish to perform incremental backup.

To back up removable disk servers using the **Copy Volume** command, use Procedure A to copy a primary volume to an auxiliary volume. Use Procedure B to copy an auxiliary volume to an auxiliary volume.

You can use **Copy Volume** in combination with an incremental backup or use only **Copy Volume** for backup. (Refer to the "Backup configuration guidelines" section for more information.) If you use **Copy Volume** only, you should copy the File Service as frequently as necessary to ensure that it can be restored as closely as possible to its current state. You should run **Copy Volume** each day that you know new files have been added or existing files have changed. Since all files are copied, **Copy Volume** will not be as efficient as an incremental backup when you have many files that have not changed.

Procedure A. Copying a primary volume to an auxiliary volume

1. Log on and enable in the File Service context.

2. Type **Stop Backup** and press <RETURN> in case backup is currently running.

3. Type **Stop Service** and press <RETURN>. (Select all services so they all will be stopped.)

4. Respond N to the "Stop immediately?" prompt and press <RETURN>. (Use the **Show Activity** command to determine when all activity has stopped, or type Y to the "Stop immediately?" prompt.)

5. Boot the server.

6. Type **N** to the "Normal Startup?" prompt and press <RETURN>.

7. Type the number corresponding to the "Interrupt before opening primary volume" option and press <RETURN> .

8. If the destination drive has a removable pack, place the pack in the drive and spin it up. (This disk pack must already be formatted and partitioned.)

   CAUTION: Do not format a 300 Mb fixed rigid disk drive because the bad page table will be erased. These disks are already formatted when you receive them.

   Note: Both drives must be enabled for reading and writing. Depending on the type of drive you are using, you should either have the switch in the read/write position or turn write protect off by pressing the write protect button in.

9. Type **Copy Volume** and press < RETURN >.

10. Type the numbers corresponding to the source and destination drive numbers and press < RETURN >.

11. After the copy is complete, spin down the destination drive if it contains a removable pack. If the drive does not contain a removable pack, go to step 13.

12. Remove the disk pack from the drive, mark it with the date and the name of the server, and store it in a safe place. It is a good practice to put it in a location away from the servers for protection in case of fire or other mishap.

13. Type **Proceed** and press < RETURN >.

Procedure B. Copying an auxiliary volume to an auxiliary volume

1. Log on and enable in the File Service context.

2. Type **Stop Backup** and press < RETURN > in case backup is currently running.

3. Type **Offline Volume** and press < RETURN >. This command makes a volume inaccessible to users.

4. Type the number corresponding to the source volume you wish to copy and press < RETURN >.

5. Type **Y** or **N** to the "Disconnect active users?" prompt and press < RETURN > if necessary. If you respond **N**, all users must be off-line before you can continue. (Use the **Show Activity** command to determine when all users are off-line.)

6. Type **Close Volume** and press < RETURN >.

7. Type the number corresponding to the source volume you wish to close and press < RETURN >.

8. Repeat steps 2 through 7 for a File Service volume on the destination drive.

Note: Place the pack in the destination drive and spin it up. (This disk pack must have been formatted and partitioned previously.) Both drives must be in the read/write condition.

9. Type **Copy Volume** and press <RETURN>.

10. Type the numbers corresponding to the source and destination volumes and press <RETURN>.

11. When the copy is completed, spin down the destination drive.

12. Remove the disk pack and store it in a safe place.

13. Log off from the File Service context.

Note: If you want to bring the source volume on-line and make it accessible to users after the copy volume is completed, use the **Open Volume** and **Online Volume** commands.

Backing up a File Service volume to a rigid disk

The incremental backup process copies files from the File Service volume to the media of your choice: floppy disk or rigid disk. This procedure describes backing up to rigid disk media, which is a File Service volume on another server (or on the same server if the File Service is running on a multi-drive server). Backing up to rigid disk causes File Service data to be saved in a backup file drawer you create on the selected File Service. Data stored in this file drawer can be used to restore any lost information if necessary.

Typically, a File Service running on a small capacity server can be backed up to a larger one. A File Service running on a 10 or 29 Mb server, for example, can be backed up to a 42 Mb or larger removable disk drive server (80 Mb or 300 Mb). A large server, for instance, can function as the backup destination for many File Services. Thus, several File Service volumes can back up to the same File Service.

Note: It is not recommended that you back up to a File Service which contains other user data. Although this is not prohibited, it makes management of the backup data more difficult.

It is recommended that you back up a File Service each day if the files are changed frequently. See the "Backup configuration guidelines" section for more information.

To execute a backup to a rigid disk, you must have already set the parameters using the **Set Backup Parameters** command. If the parameters are set to start backup automatically at a particular time (backup start time), you do not need to complete the following steps. These steps are used if you wish to initiate backup manually.

Comment: Before you back up to a rigid disk, be sure to create a backup file drawer with appropriate access controls on the File Service on which you wish to back up. You also need to supply a name and password to the backup parameters to perform backup to rigid disk. The backup name and password may be your name or a name created specifically for backup purposes. A suggested name is "Backup user." This name must be registered in the Clearinghouse database and the user must be given full access to the backup file drawer, to enable proper use of this process.

Procedure

1. Log on and enable in the File Service context.

2. Type **Backup File System** and press <RETURN>.

3. If the File Service is running on a multiple drive server, type the number corresponding to the source File Service volume and press <RETURN>.

```
FS!Backup File SystemRETURN
    Select Volume:RETURN
    1   Finance
    2   Planning
    Enter choice number:  2RETURN
```

4. Type **Y** or **N** to the "Use parameters that have been set for this volume?" prompt and press <RETURN>.

   • If you decide to make a change to the default parameter at the time of execution, type **N**. This manually substitutes a new setting for one particular execution of backup only.

   To permanently change backup parameters for the volume, use the **Set Backup Parameters** command.

   • If you wish to use the default setting, type **Y**. If "Rigid disk" is the selected backup medium, an additional "Run in the background?" prompt appears. If you type **Y** to this additional prompt, you are able to execute other File Service commands while backup is running.

A message indicates when the backup is completed. This is an example of the backup dialogue.

```
Automatic backup is waiting to run at 1:00:00
      Use parameters that have been set for this volume? (Y/N): NRETURN
Backup epoch: August 10, 1983  11:53:05RETURN
      Select Backup Medium
      1   Floppy
      2   Rigid Disk
      Enter choice number: 2RETURN
      Days in cycle (1-32767): 7RETURN
Backup will be started immediately.
      Run in the background? (Y/N): YRETURN


FS: Backup is starting.


FS! (NOTE: Backup is running in the background so other service commands
      are permitted)


FS: Backup completed normally.
FS: Source volume Finance:Unit1:GemSysCo
```

5.   Log off from the File Service context.

Note: Only files that have been added or changed since the last incremental backup, and files that have not been backed up for the number of days in the cycle, are backed up in the current increment.

(This page intentionally blank)

Interrupting the backup process

Once backup is running, it should be permitted to complete. However, there may be times when you need to interrupt the process.

Backup can be set to stop automatically, or manually. In both cases, backup must be running in order for it to be terminated. The following describes the two ways to stop backup:

- Automatic interruption - This feature is possible when rigid disk is the selected backup media. It enables you to set the time of the day you want backup to terminate automatically, regardless of whether the backup process has completed or not. If this parameter is not set, the backup process runs until the completion of a backup increment of the volume, or until it is manually stopped. (Refer to "Setting backup parameters" section to set the stop time option.)

- Manual interruption - The **Stop Backup** command is used when you need to to stop the backup process for the specified volume on the File Service. As soon as the backup process reaches the point where it can stop, the appropriate message displays and the process stops. Refer to the procedure below to use the **Stop Backup** command.

If you interrupt a backup for any reason, be sure to run a manual backup for that day.

Procedure

1. Type **Stop Backup** and press < RETURN >.

2. If the File Service is running on a single drive server, the server will ask for confirmation. If the File Service is running on a multiple drive server, type the number corresponding to the source volume on which you wish to stop backup and press < RETURN >.

```
FS!Stop BackupRETURN
    Select Volume:
    1  Finance
    2  Planning
    Enter choice number:  2RETURN
    Stopping backup...
    FS: Backup was cancelled by the user.
    FS: Source volume Planning:Unit1:GemSysCo
```

The "Stopping backup. . ., Backup was cancelled by the user" message displays. There may be a slight delay while backup completes its current action.

3. Log off from the File Service context.

Note: The next time backup is started, any files that were not previously stored or were changed since the last backup are backed up.

Managing backup media: deleting obsolete backup increments

Each time backup is run, increments are created. These increments take up space.

• If you backup to a rigid disk, the **Delete Obsolete Backup Increments** command should be run to delete outdated backup data for each source volume as often as backup is run on that volume. Using this command recovers the disk space taken up by backup data.

You must log on and have read and remove access rights to the backup file drawer that contains the backup data being deleted. The relevant backup volume(s) must be accessible (open if local, or on-line if remote).

Note: Do not manually delete backup information from the backup volume. The **Delete Obsolete Backup Increments** command deletes not only the data, but also the corresponding increment information recorded on the source volume. Both the backup volume and the source volume must be available when you use the **Delete Obsolete Backup Increments** command. If either volume is not available, wait and use the command later.

• If you back up to floppy disk, this command can help determine which floppy disks can be reused. It deletes entries for obsolete increments in the backup increment log on the source volume.

To delete obsolete backup increments, use Procedure A. Use Procedure B for additional instructions to delete backup increments when backup volume becomes full before a backup increment completes.

Procedure A. Deleting obsolete backup increments

1. Log on and enable in the File Service context.

2. Type **Delete Obsolete Backup Increments** and press < RETURN >.

3. If the File Service is running on a multiple drive server, type the number corresponding to the volume you wish to use and press < RETURN >.

4. Type **Y** or **N** to the "confirm each deletion?" prompt and press < RETURN >. Responding **N** causes the automatic confirmation of the deletions. An example appears on the following page.

    Note: The **Delete Obsolete Backup Increments** command only offers increments determined to be obsolete. The only reason you may want to keep obsolete backup increments is to be able to restore a particular file from that period. Obsolete data is not used to restore a complete file system in the event of data loss.

```
FS!Delete Obsolete Backup IncrementsRETURN
    Select Volume:
    1  Finance
    2  Planning
    Enter choice number: 1RETURN
    Confirm each delete (Y/N): YRETURN
        July 27, 1984 13:17:03 on Backup3:Unit1:GemSysCo (Y/N): NRETURN
Not deleted.
        July 21, 1984 11:19:28 on Backup3:Unit1:GemSysCo (Y/N): YRETURN
Deleting.. Done
        July 15, 1984 11:56:24 on Backup2:Unit1:GemSysCo (Y/N): YRETURN
Deleting.. Done
```

5. Log off from the File Service context.

Procedure B. Deleting obsolete backup increments when backup volume becomes full

If a backup volume becomes full before a backup increment is completed, the backup process will stop. If this occurs, you should delete obsolete backup increments.

1. Use the **Delete Obsolete Backup Increments** command at the source File Service, described in Procedure A. This removes any increments no longer needed.

2. Use the **List Volumes** command on the backup File Service to determine how much disk space is available on the backup volume.

    • If there is enough space, run backup again using the **Backup File System** command.

    • If you can get more space by using another backup volume, take the current backup volume off-line (using **Offline Volume** command) and close it (using **Close Volume** command).

3. Remove the disk pack and replace it with a volume that has sufficient free space to complete a backup. Be sure to use a volume that is a member of the backup Volume Group and has a backup file drawer with the same name as the backup file drawers on the other volumes in the group.

4. If necessary, prepare the volume before continuing. Refer to the procedures, "Adding a backup user and backup Volume Group to the Clearinghouse," and "Preparing a backup file drawer." Be sure to label the disk pack clearly.

5. Mount the new backup volume, open it (using the **Open** command), and put it on-line (using the **Online Volume** command). Then run backup again by using the **Backup File System** command.

Note: Refer to Appendix B for details about installing and removing disk packs.

You should monitor the disk space on a backup volume closely to prevent having backup interrupted because a volume is full.

Using the Show Backup Index command

You can use the **Show Backup Index** command to see the contents of the backup increments of the source volume. This is helpful, for example, to discover the exact location of files or directories that need to be restored. When you have the name of a file, you can then restore that particular file to the File Service volume using the **Restore Container** command. (Refer to the "Restoring File Service data from a floppy disk," or "Restoring File Service data from a rigid disk" section.)

Procedure

1. Determine the approximate date on which the desired object was last stored or copied to the File Service.

2. Insert the first backup floppy disk for that date into the disk drive if the medium is floppy disk.

3. Log on and enable in the File Service context.

4. Type **Show Backup Index** and press <RETURN>.

5. Type the number corresponding to the type of index you wish to display and press <RETURN>.

    *   Show the backup increments of a local volume - To see a listing of the increments created for this local volume. If this option is selected, continue with steps 6 through 8.

    *   Floppy disk - To see a display index of any the backup floppy disk, not necessarily one created for this volume. If this option is selected, continue with step 8.

6. Type the number corresponding to the source volume and press <RETURN>.

7. Type the number corresponding to the backup increment index you wish displayed and press < RETURN >. If there is more than one choice, the numbers can be separated by commas and/or the first and last number of a sequence can be separated by a hyphen (for example, 1,3 or 1-3).

```
FS!Show Backup IndexRETURN
   Select:
   1   Show backup increments of a local volume
   2   Show backup index from a floppy
   Enter choice number: 1RETURN
   Select Source Volume:
   1   Finance
   2   Planning
   Enter choice number: 2RETURN
   Show Backup Increment of:
   1   February 19, 1984 10:28:43 on Backup2:Unit1:GemSysCo
   2   February 17, 1984 12:15:21 on Backup1:Unit1:GemSysCo
   3   February 15, 1984 12:42:08 on Backup1:Unit1:GemSysCo
   Enter one or More Choices: 1,2,3RETURN
```

8. Type the file name or pattern to the "File name" prompt and press <RETURN>.

   • If the local volume increments option is chosen, all the chosen backup increments for the given source volume are searched and indexes for each are displayed. Continue with Step 11.

   • If the floppy disk option is chosen, continue with step 9.

```
   File name: *ReportRETURN
Show Backup Increment of 19-Feb-84 10:28:43 onBackup2:Unit1:GemSysCo
This increment completed normally.
Source Volume: Planning:Unit1:GemSysCo
Backup of 19-Feb-84 10:28:43 on Backup 2:Unit1:GemSysCo


                                                    Last Modified On
File DrawerA!1/FolderA!1/
      Finance Report!2                              18-Feb-1984 3:25:17


Show Backup Increment of 17-Feb-84 12:15:21 on Backup2:Unit1:GemSysCo.
This increment completed normally.
Source Volume:Planning:Unit1:GemSysCo
Backup of 17-Feb-84 12:15:21 on Backup2:Unit1:GemSysCo
          •
          •
          •
```

9. Insert the Backup floppy disk whose index you wish to display.

10. Type **Y** to the "Proceed" prompt and press < RETURN >. The increment written to the floppy disk will be displayed.

11. Log off from the File Service context.

This example displays the index for a backup floppy disk.

```
FS!Show Backup Index RETURN
    Select
    1   Show backup increments of a local volume
    2   Show backup index from a floppy
    Enter choice number: 2 RETURN
    File name: * RETURN
Insert floppy disk
    Proceed (Y/N)?: Y RETURN
Source Volume: Finance:Unit 1:Acme
Backup of 1-Aug-83 2:38:19 on floppy disk
Split #1
                                                Last Modified On
    File Drawer1!1/
        Managers!1/
            Tasks!6                             23-Jul-83 10:47:45
            Monthly Successes!8                 24-Jul-83 15:37:33
            Personal Doc!2                      25-Jul-83 11:56:26
        Pete Jones!1/
            Print Doc!3                         27-Jul-83 13:17:37
```

Note: If a file in the index has a "Last Modified On" date next to it, the contents of that file are stored in that increment. If no date appears, the file is there only to reflect the file structure on the source volume.

Comment: One floppy disk will usually contain only a portion of the backup increment for one File Service volume.

Restoring File Service data

This section is not a procedure. It provides some basic information about restoring data to the File Service before you proceed with restoring. Restoring is considered an emergency procedure and is not executed routinely. It requires large amounts of time to execute and handles significant amounts of data.

An entire File Service volume is restored by processing backup increment data in reverse order. The most recent backup information restores the File Service close to its state before the failure. Any documents filed after the most recent backup are not restored. To perform a full restore, you must restore the backup increments log first. This log is used to help the restore mechanism locate all of the backup data for the volume.

It is also possible to restore part of a specific backup disk, or to recover data or a desktop that a user accidentally deletes. Do this using the **Restore Container** command. (Refer to the "Rules for restoring containers" section below for special rules using this command.)

For instructions to restore from floppy disk or rigid disk, continue to the applicable procedure:

- Restoring File Service data from a rigid disk

- Restoring File Service data from a floppy disk

Rules for restoring containers

To restore a portion of a backup disk, use the **Restore Container** command. There are certain rules that must be followed when using this command.

You must use the correct directory and file name syntax as follows:

- Reserved characters in the name must be preceded by a single quote ('). The diagonal slash (/), the exclamation point (!), the asterisk (*), the chart sign (#), the parentheses ( ), and the apostrophe (') are all reserved characters.

  For example, type FILE' # 3 to restore a file named FILE # 3 or type 04'/28'/84'/Birthday for the file named 04/28/84/Birthday.

- If the file name contains any spaces before or after the name, you must include the spaces when you type the name. You can use the **Show Backup Index** command to see whether a file name begins with spaces. The first character of a file name is indented two spaces from the first character of the file drawer name in the index list that appears.

- A pathname cannot exceed 100 characters. If the pathname of the object you want to restore is too long, restore the object at the lowest level that includes the object but has a pathname that does not exceed 100 characters.

- A version number can be from 0 to 65535 (whole numbers only) and must always be preceded by an exclamation point. For example, Proposal!2 is the name of version 2 of the Proposal file.

- All names except the last one in a path must refer to a directory (drawer or folder) with descendants, and the directory must exist in the File Service.

Note: The **Restore Container** command will not work if the source volume has a right parenthesis in the volume name. The workaround is to take the volume off line, change the volume name, run the **Restore Container,** change the volume name back, and put the volume on line again.

Comment: If you used the **Copy Volume** command and the Incremental Backup to back up the File Service you are restoring and you want to retrieve a single file from the copy volume pack, bring the Copy Volume pack on-line as a temporary File Service. You cannot have two volumes with the same name on the same server, therefore, you cannot put it on the same server as the source volume while the source volume is also on-line. You must change the name of the copy before bringing it on-line to avoid overwriting the source volume's Clearinghouse Service entry.

Restoring File Service data from a floppy disk

This procedure describes how to perform a full restore to a File Service volume from a floppy disk, as well as how to restore a specific portion of the File Service.

Be sure you read the "Restoring File Service data" section for an understanding of the restore process and rules involved with restore before continuing with this procedure.

Note: If you used **Copy Volume** in addition to incremental backup to back up the File Service you are restoring, copy the Copy Volume backup pack to the source volume you are restoring before following these procedures. This ensures that files that are older than the epoch date will be restored. If the copy volume operation was your only method of backup, this is all you need to do. If you also used incremental backup, use the following procedure to restore new and changed files.

If you want to restore to an empty volume, you must initialize the volume before initiating the restore operation. Refer to the "Initializing the File Service" procedure.

To restore File Service data from floppy disks, use Procedure A for a full restore. Use Procedure B for a partial restore.

Procedure A. Restoring File Service data (full restore) from floppy disks

Before you perform a full restore to the File Service, you must first restore the backup increments log. The log helps the restore mechanism locate all of the backup data for the volume.

1. Log on and enable in the File Service context.

2. Type **Restore Container** and press < RETURN >.

3. If the File Service is running on a multi-drive server, type the number corresponding to the File Service volume you wish to restore and press < RETURN >.

4. Type **SystemFiles/Backup Increments Log** to the "Container" prompt and press < RETURN >. (Note that "**SystemFiles**" contains no space and that "**Backup Increments Log**" contains spaces.)

5. Type **N** to the "Restore using increment data from this volume" prompt and press < RETURN >.

6. Type the date to which you wish to restore and press < RETURN >. If you wish to restore the latest state of the volume, do not enter any date; simply press < RETURN >.

7. Type **Y** or **N** and press < RETURN > at the "Confirm each restore" and "Suppress feedback" prompts.

Note: The suppress feedback prompt appears only when you respond **N** to the "Confirm each restore" prompt.

8. At the "Select Backup Medium" prompt, type the number corresponding to "Floppy" and press < RETURN >. Respond to the "Insert floppy disk" prompt by inserting the first disk from the set of backup floppy disks that contain the most recent backup increment. If the entire backup increment is on one disk, insert that one. If the backup increment consists of three disks, for example, insert the disk that contains Split increment #1 first.

Note: The backup increments log is backed up with other system files during the backup process. You can use the **Show Backup Index** command to locate in which floppy disks the backup increments log is contained.

9. Type **Y** and press < RETURN > at the "Proceed" prompt.

10. Continue inserting floppy disks when the "Insert next split floppy" prompt appears until the systemfiles/backup increments log is found. Type **Y** and press < RETURN > at the "Restore file" prompt (only if you typed **Y** in step 7).

11. After the "Increment completed" message appears, type **N** and press < RETURN > at the "Proceed" prompt. The backup increments log should be restored successfully. If it is not restored, continue through these steps and note the special instructions at step 16.

```
FS!Restore Container#RETURN
    Select Volume:
    1   Finance
    2   Planning
    Enter choice number:  2RETURN
Restoring to volume Planning
Enter full container name, beginning with file drawer name.
    Container:  SystemFiles/Backup Increments LogRETURN
    Restore using increment data from this volume? (Y/N):  NRETURN
    Restore files through date:  August 23, 1983 13:47:08RETURN
    Confirm each restore (Y/N):  NRETURN
    Suppress feedback (Y/N):  NRETURN
Restore backup increments in reverse order.
Please indicate the Backup source:
    Select Backup Medium:
    1   Floppy
    2   Rigid Disk
    Enter choice number:  1RETURN
Insert floppy disk
    Proceed (Y/N):YRETURN
Processing floppy...
SystemFiles!1/Backup Increments Log!1
Done.
```

12. Type **Restore File System** and press <RETURN>.

13. If the File Service is running on a multi-drive service, type the number corresponding to the File Service volume you wish to restore and press <RETURN>.

14. Type the date up to which you wish to restore and press <RETURN>. If you wish to restore the latest state of the volume, do not enter any date; simply press <RETURN>.

15. Type **Y** or **N** and press <RETURN> to confirm each restore and to suppress feedback.

16. If the backup increments log did not successfully restore, you are prompted for the media type. Type the number corresponding to "Floppy" for the backup medium and press <RETURN>. Respond to the "Insert increment" prompt by inserting the first disk from the set of backup floppy disks that contain the most recent backup increment. If the entire backup increment is on one disk, insert that one. If the backup increment consists of three disks, for example, insert the disk that contains Split increment #1 first.

17. Type **Y** and press <RETURN> at the "Proceed" prompt. A list of all files being restored is displayed if you did not suppress feedback.

18. Continue inserting floppy disks when the "Insert increment" prompt appears. After you have restored all of the disks in the most recent increment (for example, disks #2 and #3 in the previous example), insert the first disk in the next most recent increment. When you have restored the files on all of the floppy disks in the cycle, type **N** and press RETURN> at the "Proceed" prompt.

    For example, if you have a 7-day cycle, you should have restored in reverse order 7 backup increments, each consisting of one or more floppy disks (split increments) inserted in forward order.

19. Log off from the File Service context.

```
FS!Restore File System!RETURN
    Select Volume:
    1  Finance
    2  Planning
    Enter choice number:2!RETURN
        Backup information will be retrieved from the volume.
    Restore files through date: August 1, 1983!RETURN
    Confirm each restore (Y/N): N!RETURN
    Suppress feedback (Y/N): N!RETURN
Restore backup increments in reverse order.
Backup increment information for the volume is unavailable.
Please indicate the Backup source:
    Select Backup Medium
    1  Floppy
    2  Rigid Disk
    Enter choice number: 1!RETURN
Insert increment closest to 1-Aug-83 0:00:00
    Proceed (Y/N): Y!RETURN
Processing floppy...

    (List of files being restored is displayed.)

Split increment #1 of August 1, 1983 10:00:01 for Planning:Unit1:GemSysCo
complete.
Insert next split floppy
    Proceed (Y/N): Y!RETURN
Processing floppy...


Increment completed, ready for next increment.
Insert increment closest to 31-Jul-83 5:00:00
    Proceed (Y/N): Y!RETURN
Processing floppy...

    (Steps repeat for July 30, 29, 28, 27, 26.)


Increment completed, ready for next increment.
Insert increment closest to 25-Jul-83 5:00:00
    Proceed (Y/N): N!RETURN
Done.
```

Note: If you insert a floppy disk out of sequence, messages will appear to indicate the correct floppy to insert.

Example This is split increment #1 of 28-Jul-83 12:15:25

Expecting next split increment #2 of 30-Jul-83 11:00:09

Insert next split floppy

Note: When using the **Restore File System** command to restore the entire file system after the volume was re-created, the systemfiles and desktop directories will not be restored. This is because these directories are re-created automatically

at initialization by the Services System Software and the File Service, respectively, and they have newer creation dates than the ones in the backup increments.

To restore these directories, you must use the **Restore Container** command on each object in the directory. Use the **Show Backup Index** command to determine the names of the objects within these directories. You should have already restored the backup increments log within the systemfiles directory before using the **Restore File System** command.

Procedure B. Restoring part of a File Service volume from floppy disks

1. Log on and enable in the File Service context.

2. Use the **Show Backup Index** command to help you locate the pathname of the file you wish to restore. Refer to the "Using the Show Backup Index Command" section.

3. Note the pathnames of the item you wish to restore. (Write the file drawer name first, then the folder name, then the document name, and so on.)

4. Type **Restore Container** and press <RETURN>.

5. If it is a multi-drive server, type the number corresponding to the volume and press <RETURN>.

6. Type the pathnames with slashes separating each container and press <RETURN> to the "Container" prompt. For example, to restore the folder named "Project 14" within the file drawer named "Peterson," you would type:

    Peterson/Project 14 RETURN

    Note: The hierarchical container of the container you wish to restore must be present. In this example, the "Peterson" file drawer container must exist on the volume in order to use the **Restore Container** command to restore the folder container named "Project 14."

7. Type **N** to the "Restore using increment data from this volume?" prompt and press <RETURN>.

    Note: If you respond **Y** to the "Restore using increment data from the volume?" prompt, the restore feature will display information to indicate which floppy disk should be inserted. This information is not shown in the example on the following page. (If you respond **Y**, skip to step 9.)

8. Type the date to the "Restore files through date" prompt and press <RETURN>.

    Note: If you omit the time of the day or enter time as 00:00:00, the time will be set to 23:59:59.

9. Respond **Y** or **N** to confirm each restore and to suppress feedback, and then press <RETURN>.

Note: The suppress feedback prompt appears only when you respond N to the "Confirm each restore" prompt.

10. Type the number corresponding to "Floppy" for the backup medium and press < RETURN >. Respond to the "Insert floppy disk" prompt by inserting the first disk from the set of backup floppy disks that the version of the container you want to restore is on. If the entire backup increment is on one disk, insert that one. If the backup increment consists of three disks, insert the disk that contains Split increment # 1 first.

Note: If you know which split increment the file is stored on when using the **Restore Container** command, you can insert that floppy disk first.

11. Type **Y** and press < RETURN > at the "Proceed" prompt.

12. Continue inserting floppy disks when the "Insert next split floppy" prompt appears until the file you want to restore is found. Type **Y** or **N** at the "Restore file" prompt and press < RETURN >.

Note: This prompt appears only when you type **Y** to the "Confirm each restore" prompt.

```
FS!Restore ContainerRETURN
    Select Volume:
    1 Finance
    2 Planning
    Enter choice number: 2RETURN
Restoring to volume Planning
Enter full container name, beginning with file drawer name.
    Container: Peterson/Project 14RETURN
    Restore using increment data from this volume?(Y/N): NRETURN
    Restore files through date: August 1, 1983RETURN
    Confirm each restore (Y/N): NRETURN
    Suppress feedback (Y/N): NRETURN
Restore backup increments in reverse order.
Please indicate the Backup source.
    Select Backup Medium
    1 Floppy
    2 Rigid Disk
    Enter choice number: 1RETURN
Insert floppy disk.
    Proceed (Y/N): YRETURN
Processing floppy...
Container was not found on this floppy.
Split increment # 1 of August 1, 83 14:10:37 for Planning:Unit1:GemSysCo
Insert next split floppy
    Proceed (Y/N): YRETURN
Peterson!1/Project 14!1
    Restore file (Y/N): YRETURN
Increment completed, ready for next increment.
Insert floppy disk.
    Proceed (Y/N): NRETURN
```

13. Log off from the File Service context.

Restoring File Service data from a rigid disk

This procedure describes how to perform a full restore to a File Service volume from a rigid disk, as well as how to restore part of a specific backup disk from a rigid disk.

Be sure you read the section titled "Restoring File Service data" for an understanding of the restore process before proceeding.

Note: If you used **Copy Volume** in addition to incremental backup to back up the File Service you are restoring, you must first load software on the Copy Volume pack, then copy the Copy Volume backup pack to the new or empty source volume you are restoring before following these procedures. (All files currently on the source disk will be erased by **Copy Volume.**) This ensures that files that are older than the epoch date will be restored. If the copy volume operation was your only method of backup, this is all you need to do. If you also used incremental backup, use the following procedure to restore new and changed files.

Comment: If you ever have to restore your primary pack in case of database damage, you should be aware that there is a special procedure for restoring a primary pack containing a Clearinghouse or Mail Service. It is possible that the out-of-date database can cause major inconsistencies in the rest of the distributed Clearinghouse system. Refer to the "Restoring a Primary pack containing Clearinghouse Service or Mail Service" section in the *Server Operation and Maintenance* booklet for the procedure, and for further details on the consequences of such a restore.

If you want to restore to an empty volume, you must initialize the volume before initiating the restore operation. Refer to the "Initializing the File Service" procedure to do this.

To restore File Service data, use Procedure A for a full restore. Use Procedure B for a partial restore.

Procedure A. Restoring File Service data

Before you perform a full restore to the File Service, you must first restore the backup increments log. The log helps the restore mechanism to locate all of the backup data for the volume.

1. Log on and enable in the File Service context.

2. Type **Restore Container** and press < RETURN >.

3. If the File Service is running on a multiple drive server, type the number corresponding to the File Service volume you wish to restore and press < RETURN >.

4. Type **SystemFiles/Backup Increments Log** to the "Container" prompt and press < RETURN >. Note that

"SystemFiles" contains no space and that "**Backup Increments Log**" contains spaces.

5. Type **N** to the "Restore using increment data from this volume" prompt and press <RETURN>.

6. Type the date to which you wish to restore and press <RETURN>. If you wish to restore the latest state of the volume, do not enter any date; simply press <RETURN>.

7. Type **Y** or **N** and press <RETURN> at the "Confirm each restore" and "Suppress feedback" prompts.

    Note: The "Suppress feedback" prompt appears only when you respond **N** to the "Confirm each restore" prompt.

8. At the "Select Backup medium" prompt, type the number corresponding to "Rigid Disk" and press <RETURN>.

9. Type the name of the backup volume on which the most recent backup increment is stored, along with the name of the backup file drawer, pressing <RETURN> after each prompt.

10. Type **N** to the "Skip this backup increment" prompt and press <RETURN>. The backup increments log should be restored successfully. (If it is not restored, continue through the following steps and note the special instructions in step 15.)

```
FS!Restore Container RETURN
    Select Volume:
    1   Finance
    2   Planning
    Enter choice number: 2 RETURN
Restoring to volume Planning
Enter full container name, beginning with file drawer name:
    Container: SystemFiles/Backup Increments Log RETURN
    Restore using increment data from this volume? (Y/N): N RETURN
    Restore files through date: August 1, 1983 RETURN
    Confirm each restore (Y/N): Y RETURN
Restore backup increments in reverse order.
Please indicate the Backup source:
    Select Backup Medium:
    1   Floppy
    2   Rigid Disk
    Enter choice number: 2 RETURN
    Backup volume: Backup Volume:Unit1:GemSysCo RETURN
    Backup file drawer: BackupFD RETURN
Backup increment of 28-July-83 11:00:43 on Backup
Volume:Unit1:GemSysCo
    Skip this backup increment (Y/N): N RETURN
SystemFiles!1/Backup Increments Log!1
    Restore file (Y/N): Y RETURN
Done.
```

11. Type **Restore File System** and press <RETURN>.

12. If the File Service is running on a multi-drive server, type the number corresponding to the File Service volume you wish to restore and press <RETURN>.

13. Type the date up to which you wish to restore and press <RETURN>. If you wish to restore the latest state of the volume, do not enter any date; simply press <RETURN>.

14. Type **Y** or **N** to confirm each restore and to suppress feedback, and then press <RETURN>. Normally, it is suggested you suppress feedback when restoring large amounts of data from the rigid disk.

```
FS!Restore File SystemRETURN
Select Volume:
1    Finance
2    Planning
Enter choice number:  1RETURN
Backup information will be retrieved from the volume.
     Restore files through date:  August 1, 1983 RETURN
     Confirm each restore (Y/N):  NRETURN
     Suppress feedback (Y/N):  NRETURN
Restore backup increments in reverse order.
```

15. If the backup increments log does not successfully restore, you are prompted for media type.

    If you are doing a full restore and the backup increments log is missing, you must enter the backup volume name and press <RETURN>. Then type the backup file drawer name and press <RETURN> again. This must be done for each increment, one at a time by specifying the date of the increment.

16. Depending on your answer in step 7:

    A list of all the files being restored is displayed if you did not suppress feedback,or

    Restore goes through all increments on the backup volume and asks you to confirm the restore from each increment.

17. Log off from the File Service context.

Note: When using the **Restore File System** command to restore the entire file system after the volume was re-created, the systemfiles and desktops directories will not be restored. This is because these directories are re-created automatically at initialization by the Services System Software and the File Service, respectively, and they have newer creation dates than the ones in the backup increments.

To restore these directories, you must use the **Restore Container** command on each object in the SystemFiles

directory. Use the **Show Backup Index** command to determine the names of the objects within these directories. You should have already restored the backup increments log within the systemfiles directory before using the **Restore File System** command.

Procedure B. Restoring part of a specific backup disk from a rigid disk

1. Use the **Show Backup Index** command to help you locate the pathname of the file you wish to restore. Refer to the "Using the Show Backup Index Command" section.

2. Note the pathname of the item you wish to restore. (Write the file drawer name first, then the folder name, then the document name, and so on.)

3. Type **Restore Container** and press < RETURN >.

4. If it is a multi-drive server, type the number corresponding to the volume and press < RETURN >.

5. Type the path of names with slashes separating each container and press < RETURN > to the "Container" prompt. For example, to restore the folder named "Project 14" within the file drawer named "Peterson," you would type:

    Peterson/Project 14 RETURN

    Note: The hierarchical parent of the container you wish to restore must be present on the File Service. In this example, the "Peterson" file drawer container must exist on the volume in order to use the **Restore Container** command to restore the folder container named "Project 14."

6. Type **Y** or **N** to the "Restore using increment data from this volume?" prompt and press < RETURN >. If you answer **Y**, skip steps 9 through 11. You can only process one rigid disk increment.

    Note: Responding **Y** means the data stored in the backup increments log will be used to find the backup data. Responding **N** means you must supply the location of the backup data.

7. Type the date to the "Restore files through date" prompt and press < RETURN >.

    Note: If you omit the time of the day or enter time as 00:00:00, the time will be set to 23:59:59.

8. Respond **Y** or **N** to confirm each restore and to suppress feedback, and then press < RETURN >.

    Note: The "Suppress feedback" prompt appears only when you respond **N** to the "Confirm each restore" prompt.

9. Type the number corresponding to "Rigid Disk" for the backup medium and press <RETURN>.

10. Type the fully-qualified name of the backup volume and press <RETURN>.

11. Type the backup file drawer name and press <RETURN>.

12. Type **Y** or **N** to the "Skip this backup increment" prompt and press <RETURN>.

13. Type **Y** or **N** to the "Restore File" prompt and press <RETURN>.

    Note: This prompt appears only when you type **Y** to the "Confirm each restore" prompt.

14. Log off from the File Service context.

Copying a portion of the file system to a floppy disk

The **Copy Container** command enables you to copy files or entire directories onto floppy disks. This command can copy an object of any size. Larger objects are split and copied over multiple floppy disks. To restore the contents of a disk created with the **Copy Container** command, use the **Restore Container** command. This would be useful, for example, for archiving selected files or directories, as well as for transferring the contents from one file service volume to another.

Note: The **Copy Container** command will not work if the source volume has a right parenthesis in the volume name. The workaround is to take the volume off-line, change the volume name, run the **Copy Container,** change the volume name back, and put the volume on line again.

The **Copy Container** command at the File Service copies everything in the specified container, regardless of when it was written or last backed up. It does not modify the backup process of your File Service; it is an entirely separate procedure.

Note: The **Show Backup Index** command may be performed on floppy disks created with the **Copy Container** command.

The following procedure can be used for both fixed and removable disk servers.

Procedure

1. Log on and enable in the File Service context.

2. Type **Copy Container** and press < RETURN >.

3. If the File Service is running on a multi-drive server, type the number corresponding to the volume from which you wish to copy information and press < RETURN >.

4. Type the name of the container (desktop or individual file drawer name) and press < RETURN >.

   Note: To restore a desktop, type **desktops/** and then the desktop name.

5. Type the name with slashes separating each container level and then press < RETURN >. Desktops have the same fully-qualified names as their owners (for example, Daniel McIntire:Advertising:GemSysCo).

   Note: The diagonal slash (/), the exclamation point (!), the asterisk (*), the chart sign (#), the apostrophe ('), and the parentheses ( ) within all container and file names must be preceded by a single quote. For example, you would type `04'/28'/84'/Birthday` for the file named 04/28/84/Birthday.

6. Insert the floppy disk, type **Y,** and press < RETURN >.

Note: The floppy disk does not need to be preformatted.

7. Remove the floppy disk when the copy is complete.

8. Label and store the floppy disk for future use.

9. If you are asked for another floppy disk, repeat steps 6 through 8 as many times as necessary.

10. Log off from the File Service context.

File Service activity commands

The File Service activity commands described in this section include: **Show Activity, Show Statistics, Reset Statistics, Delete Old Versions,** and **Report Disk Usage.** These commands keep you informed about the status of the File Service and its attributes.

Delete Old Versions

Users with remove and/or write access rights can discard old versions of files in a directory. The command allows users to delete older versions of each file, while retaining the most recent version and one or more previous versions specified by the user. (Refer to Procedure B in this section to use this command.)

Report Disk Usage

An enabled user can create a report describing file drawer space usage patterns on a File Service using this command.

The report describes the total number of files and pages, total number of files and pages for old versions of files; the number of pages referenced within the last 30, 60, 90, and 180 days; and the number of pages not referenced in the last 180 days. The report is helpful to determine which versions of files can be deleted or archived. The report will be titled "Disk Usage Report Date-Time" using the date and time when it is created.

The location for the output of this report can be any file drawer or folder on any file service where you would like the report stored. (Refer to Procedure C in this section to use this command.)

Reset Statistics

An enabled user can reset the activity counters at any time. These counters are used to compare activity at the File Service. They can, for example, be reset on a regular basis to compare activity at the File Service from day-to-day, from week-to-week, or at various times of the day. (Refer to Procedure A in this section to use this command.)

Show Activity

Any user can view the current remote connections with this command. For each remote connection, this command lists the user who initiated the connection, the volume with which the connection was established, the time the connection was initiated, and the time of the last actual activity via the connection. (Refer to Procedure A in this section for this command.)

Show Statistics

Any user can view File Service statistics. This command lists the statistics compiled since the last reset or the last reboot of the server, whichever is later.

The statistics include the total number of connections to the File Service; the maximum, minimum, and average length of connections; the number of file accesses (called the total number of Open operations), the number of files deleted, the number of files stored, the number of files retrieved, and the number of list operations. The statistics are cumulative for all the volumes which are managed by a File Service and are not available for individual volumes. (Refer to Procedure A in this section to use this command.)

Procedure A. Using the Show Activity, Show Statistics, and Reset Statistics commands

1. Log on and enable in the File Service context.

2. Type **Show Activity** and press < RETURN >.

3. Record current users of the File Service, if necessary. The "No active users" message is displayed if there are no remote connections.

4. Type **Show Statistics** and press < RETURN >.

```
FS > Show Activity RETURN
User Name                      Volume Name        Start Time        Last Action
Harry H. James:LA:Acme         Finance            13:00:09          13:25:56
Jim J. Jones:Unit1:Acme        Planning           13:15:27          13:27:14

FS > Show Statistics RETURN
File Service statistics since reset February 18, 1984 8:51:04
       10      Total connections
       60      Minimum connect time (seconds)
     1834      Maximum connect time (seconds)
      459      Average connect time (seconds)
       95      Total List operations
       59      Total Open operations
       15      Total Delete operations
       20      Total Store operations
       32      Total Retrieval operations
```

Note: If you wish to reset the statistics for the File Service, use the **Reset Statistics** command. This causes the counter tracking activity on the File Service to be reset to 0. You must log on as a System Administrator to use this command.

5. Log off from the File Service.

Procedure B. Using the Delete Old Versions command

1. Log on and enable in the File Service context.

2. Type **Delete Old Versions** and press < RETURN >.

3. If the File Service is running on a multi-drive server, type the number corresponding to the File Service volume you wish and press < RETURN >.

4. Type the name with slashes separating each container level to the "Container" prompt and then press < RETURN >. For example: FileDrawerName/FolderName.

5. Type the file name (the name of the file for which you wish to delete old versions) and press <RETURN>.

    Note: The name can be the file name itself, or a pattern. A pattern is created by typing an asterisk into a string of characters. The asterisk is treated as a wild card and matches any character or group of characters. Any file whose name matches the given pattern will be considered for deletion by the command. An asterisk can appear anywhere within the file name when using the **Delete Old Versions** command.

    Patterns that can be used:

*name	specifies all files with a suffix of *name*
name *	specifies all files with a prefix of *name*
na*me	specifies all files with a prefix of *na* and a suffix of *me*

6. Type the number of versions to keep (the versions of each file not to delete) and press <RETURN>.

7. Type **Y** or **N** to the "Consider All Levels" prompt and press <RETURN>. This prompt determines if you wish to delete for all descendants or just immediate descendants of the specified container.

8. Type **Y** or **N** to the "Confirm each delete" prompt and press <RETURN>.

9. Log off from the File Service context.

The following example displays when the user has requested confirmation for each deletion.

```
F5> Delete Old VersionsRETURN
      Select Volume
      1  Finance
      2  Planning
      Enter Choice Number:  1RETURN
      Container:  FileDrawer/FolderRETURN
      File name:  *RETURN
      Number of versions to keep:  1RETURN
      Consider All Levels (Y/N):  YRETURN
      Confirm each delete (Y/N):  YRETURN
FileDrawerName!1/Folder!1
      Delete File1!1?  (Y/N):  YRETURN
...deleted
      Delete File1!2?  (Y/N):  YRETURN
...deleted
      Delete File1!3?  (Y/N):  YRETURN
...deleted
      Delete File2!1?  (Y/N):  YRETURN
...deleted
      Delete File2!2?  (Y/N):  YRETURN
...deleted
FileDrawerName!1/Folder!1/Folder2!1
      Delete File3!1?  (Y/N):  NRETURN
      Delete File3!2?  (Y/N):  NRETURN
      Delete File3!3?  (Y/N):  NRETURN
      Delete File4!1?  (Y/N):  NRETURN
      Delete File4!2?  (Y/N):  NRETURN
FileDrawerName!1/Folder!1
      Delete File5!?  (Y/N):  YRETURN
...deleted
      Delete File5!2?  (Y/N):NRETURN
      Delete File6!1?  (Y/N):YRETURN
...deleted
      Delete File6!2?  (Y/N):YRETURN
...deleted
      Done
```

Procedure C. Using the Report Disk Usage command

1. Log on and enable in the File Service context.

2. Type **Report Disk Usage** and press < RETURN >.

3. If the File Service is running on a multi-drive server, type the number corresponding to the File Service volume you wish and press < RETURN >.

4. Type a number to the "Enter Choice Number" prompt and press < RETURN >.

5. Type the name of the file drawer and press < RETURN >.

    The name can be the file drawer name itself, or a pattern. A pattern is created by typing an asterisk into a string of characters. The asterisk is treated as a wild card and matches any character or group of characters. Any file

drawer whose name matches the given pattern will be included in the disk usage report.

6. The minimum file drawer size may be specified as anything between 0 and 2,147,483,647 disk pages. Only file drawers you specify containing that number of pages or more will be included in the report.

   Note: The page limit may be specified as anything between 0 and 2,147,483,647 disk pages where specifying 0 implies no limit on the number of pages the file drawer can occupy. Specifying a very large number for the page limit is, for all practical purposes, no different than specifying 0 because for large numbers, it is the capacity of the volume and not the drawer page limit which becomes the limiting factor.

7. Type the location for the disk usage output report to the "Report location" prompt and press < RETURN >. The location can be any file drawer or folder on any File Service.

   To specify the location where a disk usage report is to be stored, a fully qualified pathname must be used in this pattern:

   (File Service:Domain:Organization)File Drawer/Folder

   If the file drawer is on a File Service in the same domain, you may omit the Domain:Organization portion of the File Service location. For example:

   (File Service)File Drawer/Folder

   Note: You must have write and add access to the file drawer where the report is to be stored.

```
FS!Report Disk UsageRETURN
   Select Volume
   1  Yale
   2  CIT
   Enter Choice Number:  1RETURN
   File drawer name:  *RETURN
   Enter the minimum file drawer size (0..2147483647):  0RETURN
   Report location:  (Harvard:Unit1:GemSysCo)DiskUsageReports/current
   reportsRETURN
   Alison
   Baker
   Burns
   Deacon
   Denker
   Moore
Done
```

Note: This example gives you a list of all the file drawers on the server.

8. Log off from the File Service context.

9. Retrieve the disk usage output report document at a 6085/8010 workstation. You will need to convert it to ViewPoint format, changing the pitch font to Terminal 8 to properly display it. The source document is in ASCII format.

This is an example of a report:

Table II. Example disk usage output report

Volume Harvard:Unit1:GemSysCo
Disk Usage Report-30-May-84 12:27:02

File Drawer reference	Total		Old Versions		Pages vs. days since last				
	files	pages	files	pages	< 30	< 60	< 90	<180	
< Never									
Alison									
	37	194	12	56	62	24	48	0	60
Baker									
	156	327	25	113	127	41	29	64	136
Burns									
	0	0	0	0	0	0	0	0	0
Deacon									
	0	0	0	0	0	0	0	0	0
Denker									
	0	0	0	0	0	0	0	0	0
Moore									
	156	327	25	113	127	41	29	64	136

Validating desktops

Use the desktop validation process to maintain the desktop directory area of a File Service. If desktop validation is set to true (the default), the desktop directory is examined each time the server is brought on-line to ensure that all desktops stored on the File Service are intact and in usable condition. When a desktop appears to be damaged, the File Service displays a message to notify you of this problem.

Note: When the desktop validation process is enabled, any non-desktop file stored in the desktop directory will get deleted the next time the File Service is brought on-line.

```
FS! Online VolumeRETURN
    Select Volume
    1 Finance
    2 Planning
    Enter choice number: 1RETURN
Bringing drive 2 online. . . .
Validating Clearinghouse entry for Finance:Unit 3:Acme
A new Clearinghouse entry was created.
Validating user desktops. . .
Gary C. Michaelson:Unit 3:Acme...ok
Liz Moorehead:Unit 3:Acme...
Desktop may be damaged; try restoring from backup of May 9, 86.
Lynn A. Needles:Unit 2:Acme...ok
Jon Williamson:Unit 3:Acme
Desktop may be damaged; desktop has never been backed up.
My old file...
Not a desktop; this object will be deleted.
5 desktops validated.
1 non-desktops deleted.
Volume online.
```

If you do not wish to have the desktop validation process set, you need to use the **Change Profile** command to change the validate desktop condition to false.

Procedure

1. Log on and enable in the Server context.

2. Type **Change Profile** and press < RETURN >.

3. Type the number corresponding to "File Service" at the "Section to be changed" prompt and press < RETURN >.

4. Type the number corresponding to "Validate Desktops" at the "Entry to be changed" prompt and press < RETURN >.

5. Type the number corresponding to FALSE at the "Validate Desktops" prompt and press < RETURN >.

6. Press < RETURN > after the "Entry to be changed" and "Section to be changed" prompts to exit the **Change**

Profile command.   Be sure not to enter a number to these prompts.

```
!Change ProfileRETURN
    Section to be changed
    1   File Service
    2   Mail Service
    Enter Choice Number:  1RETURN
    Entry to be changed
    1   Validate Desktops
    Enter Choice Number:  1RETURN
    Validate Desktops
    1   TRUE
    2   FALSE
    Enter Choice number:  2RETURN
    Entry to be changed
    1.  Validate Desktops
    Enter choice number:RETURN
    Section to be changed:
    1   File Service
    2   Mail Service
    Enter choice number:RETURN
!
```

7.   Log off from the Server context.

8.   Reboot the system. (Changes will occur after the system is rebooted.)

Recovering File Service disk space for multiple drive servers

You should regularly check the number of free pages on your File Service volumes. If you have multiple volumes, check each one. The **List Volumes** command displays the number of pages used, the number of free pages, and the percentage of space used. When a volume becomes full, recover disk space by doing one of the following:

• Moving file drawers to another volume - Refer to Procedure A.

• Deleting obsolete desktops - Refer to Procedure B.

You can also request users to delete unnecessary files from their file drawers.

Note: If a volume becomes more than 90 percent full on a regular basis, you should consider expansion to an additional or larger capacity volume.

To recover File Service disk space, use Procedure A to move file drawers to another volume. Use Procedure B to delete obsolete desktops.

Procedure A. Moving file drawers to another volume

1. Use the **Copy Container** command to copy the file drawer you wish to move. (Refer to the "Copying a portion of the file system to a floppy disk" procedure.)

2. Use the **Restore Container** command to copy the drawer from the floppy disk to the new volume. (Refer to the "Restoring File Service data from a floppy disk" procedure.)

   CAUTION: If a file drawer with the same name already exists on the new volume, you receive a warning message and the file drawer is not restored. Go to a workstation and check that the contents of the old and new drawers are the same before deleting the old one.

Procedure B. Deleting obsolete desktops

File Service storage is used if your network includes 6085/8010 workstations, and users store their desktops on the File Service and forget about them.

You can monitor the File Service to see what desktops are stored and how much space they are consuming. If necessary, you can also delete desktops. Be certain the user no longer requires a desktop before you delete it. The **Delete Desktop** command should be used with care. Ensure that important documents will not be accidentally deleted when a desktop is deleted.

Note: Any user can list the desktops stored on the File Service and then delete his or her own desktop via a Remote System Administrator. However, only an enabled System Administrator can delete others' desktops.

1. Log on and enable in the File Service context.

2. If the File Service is running on a multi-drive server, type the number corresponding to the File Service volume you want and press <RETURN>.

3. Type **List Desktops** and press <RETURN>. You will see a complete list of desktops and the total size of desktops displayed at the end of list.

```
FS!List Desktops RETURN
      Jim J. Jones: Unit 1: GemSysCo    342 disk pages
      Harry H. Harrison:Steno Pool:GemSysCo   123 disk pages
```

If after reviewing the desktops, you discover desktops that need to be deleted, you should proceed to steps 4 though 6.

4. Type **Delete Desktop** and press <RETURN>.

5. Type the name of the desktop you wish to delete and press <RETURN>. You can get this name from the listing obtained by the **List Desktops** command. (You can also type an alias, or a pattern, such as: *:LA:GemSysCo.)

```
FS!Delete Desktop RETURN
      Desktop Name: Jim Jones: Unit 1:GemSysCo RETURN
      Confirm? (Y/N): Y RETURN
      Done
```

6. Type **Y** to the "Confirm?" prompt.

7. Log off from the File Service context.

Note: If a 6085/8010 workstation has old desktops stored on it, you or a user can delete those unnecessary desktops at the workstation.

Listing file drawers

If you want to see a list of all current file drawers on your File Service, use the **List File Drawers** command. The name and any or all of the attributes of each file drawer are listed. The specified file drawer name can contain a pattern, created by inserting an asterisk. The asterisk is treated as a wild card and matches any character or group of characters. If it is entered, all file drawers matching the pattern are listed.

Procedure

1. Log on in the File Service context.

2. Type **List File Drawers** and press <RETURN>.

3. If your File Service runs on a multi-drive server, type the number corresponding to the File Service volume you wish to use and press <RETURN>.

```
FS> List File DrawersRETURN
   Select Volume
   1  Finance
   2  Planning
   Enter choice number:  1RETURN
```

4. Type the name of the file drawer or pattern and press <RETURN>. (If the asterisk is used alone, then all file drawers on the volume are listed.)

5. Type **Y** or **N** and press <RETURN> to see the file drawer owner, file drawer size, and file drawer access lists. If the file drawer has a page limit, the limit is also specified when the file drawer size is listed.

```
File Drawer Name:  *FormsRETURN
Show file drawer owners?  (Y/N):  YRETURN
Show file drawer sizes?  (Y/N):  YRETURN
Show file drawer access lists?  (Y/N):  YRETURN
```

A listing of file drawers and information displays according to what you specified.

```
Charts and Forms
    owner:  Harry H. Harrison:Steno Pool:GemSysCo
    size:  194 disk pages used out of 1000
    access list:
        Harry H. Harrison:Steno Pool:GemSysCo
            permission to read, write, add, remove, change
        *:Steno Pool:GemSysCo
            permission to read, add
        *:*:GemSysCo
            permission to read

Ledger Forms
    owner:  Jim J. Jones:Unit1:GemSysCo
    size:  327 disk pages
    access list:
        Jim J. Jones:Unit1:GemSysCo
            permission to read, write, add, remove, change
        *:Unit1:GemSysCo
            permission to read, add

Total space used by listed file drawers:  521 disk pages.
```

Moving a File Service volume

If you have multi-drive servers, you can use the drives with removable disk packs for more than one purpose. For example, a drive can serve as a File Service during the working day and become a backup drive in the evening. This can be accomplished by replacing the File Service disk pack with a specified backup disk pack. Another example might be that if a server were down for repair; it might be necessary to reconfigure the volumes among different servers. Additionally, you might wish to remove a File Service volume temporarily to use its drive for the **Copy Volume** operation.

Procedure

1. Log on and enable in the File Service context.

2. Type **Offline Volume** and press < RETURN >.

3. Type the number corresponding to the volume you wish to place off-line and press <RETURN>.

4. Type **Y** or **N** and press <RETURN> to disconnect active users. If you respond **N**, every user must be off-line before you can continue. (Use the **Show Activity** command to determine that no users are connected to that volume.)

5. Type **Close Volume** and press <RETURN>.

6. Type the number corresponding to the volume and press <RETURN>.

7. Remove the File Service volume (disk pack) from the drive.

8. Put a new disk pack in the new drive. Wait until the green light stops flashing.

9. Log on in the File Service context.

10. Type **Open Volume** and press <RETURN>.

11. Type **Online Volume** and press <RETURN>. (The volume name will be validated in the Clearinghouse Service and you will need to confirm that the Clearinghouse entry can be updated to reflect the new location.)

12. Log off from the File Service context.

Deleting file drawers

To delete an existing file drawer from a File Service, use the **Delete File Drawer** command. If the file drawer is not empty, you need to confirm the deletion a second time. The specified file drawer name can contain the wild card asterisk. All file drawers matching the pattern are listed, and confirmation is required to delete each one.

Procedure

1. Log on and enable in the File Service context.

2. If your File Service is running on a multi-drive server, type the number corresponding to the File Service volume you wish to use and press <RETURN>.

```
FS!Delete File DrawerRETURN
    Select Volume
    1  Finance
    2  Planning
    Enter choice number: 1RETURN
```

3. Type **Delete File Drawer** and press <RETURN>.

4. Type the name of the file drawer you wish to delete and press <RETURN>. (If a pattern is specified, then the name of each file drawer which matches the pattern is displayed and confirmation is required to delete the drawer.)

```
File Drawer Name: *FormsRETURN
Delete Charts and Forms? (Y/N) YRETURN
File drawer is not empty. Delete it anyway? (Y/N): YRETURN
Delete Ledger Forms? (Y/N): NRETURN
Done
```

5. Type **Y** or **N** and press <RETURN> to confirm deletion of the file drawer(s). If a drawer is not empty, an additional confirmation is required.

6. Log off from the File Service context.

Expunging a File Service

The File Service does not provide a complete "expunge" capability. To fully expunge a File Service, use the **Delete File Drawer** command to eliminate any file drawers on the volume, and the Clearinghouse Service **Delete** command to delete the service name from the appropriate domain.

Expunging a File Service does not automatically change or delete the field in a user's Clearinghouse entry which identifies a user's home File Service. System Administrators must update all of the user entries manually. When the home File Service entry is obsolete, it is very difficult to determine what is wrong in storing/retrieving desktops.

The File Service expunge also fails to delete privately stored names of Services Filing Volumes which it has managed. The instances of volume names which it does not delete are stored by the File Service in a private location in the Services Filing Volume to which the name applies. Consequently, subsequent installation of a File Service on a server, which has one or more drives that were formerly managed by a File Service, results in the former names of the Services Filing Volumes being automatically applied by the new File Service.

Note: The user is not prompted to enter a new name for each volume while the new fully-qualified names are being registered in the Clearinghouse Service (CHS). Instead, the operator is told that validation of the existing name is being accomplished. This validation may or may not succeed, depending on whether or not the CHS **Delete** command was used to delete the old names from the CHS.

File Service normal and non-normal startup

This section is not a procedure. It provides information about when you would use a normal startup over a non-normal startup in the File Service.

Whenever you boot a server, the "Normal Startup?" prompt appears. If you respond **Y** to the prompt, the File Service will startup normally as described below. If you respond **N** to the prompt and interrupt the server initialization before running services, you may then run the File Service explicitly using the Services Common Software **Run Service** command. (Refer to the *Server Operation and Maintenance* booklet for details). When you start the File Service with this command, you may choose a non-normal File Service startup as described below.

Normal startup

When you respond **Y** to the "Normal Startup?" prompt, the File Service starts up, and the primary volume is brought on-line. This means the files contained in the volume are available for remote user access.

If the server is a multi-drive server, the File Service checks each of the auxiliary drives. If there is a pack spinning, an attempt is made to open and put the volumes on-line. A message is displayed when a volume is successfully brought on-line.

When a problem is encountered, the File Service skips that drive and no message is posted. In this case, you should correct the reported problem, then attempt to open the volume using the Services Common Software **Open Volume** command. The **Open Volume** command will display a message if there was a problem encountered when attempting to open the volume.

Non-normal startup

When you respond **N** to the "Normal Startup?" prompt, an abbreviated version of startup occurs. The File Service will not bring the primary volume on-line nor try to open the auxiliary volumes. In addition, the File Service will be in the stopped state. This means you can perform local System Administration operations, but the files contained on the volume are not available for remote user access.

Non-normal startup would be used, for example, if you need to handle administrative tasks such as scavenging auxiliary volumes. (Refer to the *Server Operation and Maintenance* booklet for detailed information about scavenging.)

(This page intentionally blank)

This section contains an alphabetical listing of various types of messages that may display for the File Service. Each message is followed by a brief explanation of the probable cause, and if applicable, action that may be taken to resolve the situation specific to the message.

When you see an error or informational message that you do not understand or want additional information about, write it down. Then, look it up in the following File Service Message list. If the listing does not provide the information you are looking for, contact the Network Support Center.

Access problem.

Probable cause: This message appears when there is a problem in accessing a file, either because of insufficient or indeterminate access rights or because the file is in use or not found during backup or restore.

Action: Verify that access rights are set properly and try again.

All backup volumes are full.

Probable cause: All volumes in the backup volume group (accessible to the network - on-line) are full.

Action: Another volume should be added to the backup Volume Group, and backup should be restarted.

All open volumes are already online.

Probable cause: Volumes which are to be brought on-line must be opened first, and all the volumes which are currently open are already on-line.

Action: This is a status message. No action is required.

Authentication service is unavailable or not found.

Probable cause: An attempt to access the authentication service (Clearinghouse) failed because the authentication service was unavailable or not found.

Action: Try the operation again.

Backup file drawer not found.

Probable cause: The specified backup file drawer was not found on the backup volume.

Action: Create a backup file drawer on the backup volume and try the operation again.

Backup is already running.

Probable cause: Someone was trying to run backup for the source volume that is already in the middle of backup.

Action: Wait until backup completes and try the operation again.

Backup is not running.

Probable cause: Backup of the volume was expected to be in progress, but is not running. This may happen when you enter the **Stop Backup** command.

Action: Check the backup parameters on the source volume and try the operation again.

Backup ran out of time before completion.

Probable cause: Backup had not yet completed when the stop time was reached. This can happen only during automatic backup.

Action: Increase the time interval to allow backup to complete.

Backup volume full.

Probable cause: The backup volume became full during backup. It may also appear if the backup file drawer has limited size and became full during backup.

Action: Restart the backup so that the increment will complete on another volume in the backup volume group, or remove the limit on the backup file drawer size.

Bad floppy disk.

Probable cause: The floppy disk is damaged or unusable, or the floppy disk drive was not operating properly during backup or restore.

Action: Try another floppy disk. If failures continue, clean the floppy disk drive or run floppy disk diagnostics. Refer to *Basic Troubleshooting of Network Services* in the *Network Basic Services* volume.

Clearinghouse error.

Probable cause: An attempt to access the Clearinghouse Service failed for an unexpected reason.

Action: Check the state of the Clearinghouse Service.

Clearinghouse problem.

Probable cause: There was an unexpected error while accessing the Clearinghouse Service during backup or restore. This error is sometimes displayed when the user types in the backup Volume Group name instead of the backup volume name. However, it may also occur for other reasons.

Action: Check the state of the Clearinghouse and try the operation again.

Clearinghouse is busy, try again later.

Probable cause: An attempt to access the Clearinghouse Service failed because the Clearinghouse Service was currently being accessed by too many clients.

Action: Wait a few minutes and try the operation again, or schedule the operation during off-peak hours.

Clearinghouse is unavailable, try again later.

Probable cause: An attempt to access the Clearinghouse Service failed because the Clearinghouse Service was unavailable.

The File Service requires that the Clearinghouse be available in order to complete the **Add File Drawer, Change File Drawer,** and **Online Volume** commands.

When a volume is brought on-line and made available to remote clients, the File Service must validate that the name of the volume is properly registered in the Clearinghouse. If the Clearinghouse is unavailable, the File Service will display a warning message, then the volume is automatically brought on-line when the Clearinghouse becomes available.

Action: Wait a few minutes and try the operation again. Check the status of the Clearinghouse.

Command cancelled. The backup volume(s) are unavailable.

Probable cause: All the backup volumes in the backup volume group are currently unavailable.

Action: Check to see that the backup volumes are on-line, and determine why they were unavailable. Try backup again later when one or more backup volumes from the group become available.

Command cancelled. The source volume is unavailable.

Probable cause: This message appears during backup, if the source volume becomes unavailable. This happens if the source volume has closed while backup of that volume is running in the background.

Action: Wait a few minutes and try the operation again.

Command cancelled. The user name is invalid.

Probable cause: The name of the backup user is not registered in the Clearinghouse database.

Action: Register the backup user in the Clearinghouse.

Command cancelled. The user password is invalid.

Probable cause : The backup user's password is invalid.

Action: Check that it is entered correctly in the backup parameters and in the Clearinghouse database. If you have recently changed the password and have more than one serving your domain, initiate the **Compare Database** operation between the serving CHS's.

Command cancelled. There was an authentication problem.

Probable cause: There is a problem in accessing the authentication service during backup or restore.

Action: Check the status of the Clearinghouse. Try the operation again later.

Connection problem.

Probable cause: There is a problem in establishing a connection with a remote service during backup or restore.

Action: Check the status of the remote service and the Clearinghouse. Run the diagnostic echo test. (Refer to *Basic Troubleshooting of Network Services* in the *Network Basic Services* volume.)

Container in use.

Probable cause: The specified container is being used by another user. Command execution will terminate.

Action: Try the command again later.

Container not found.

Probable cause: The specified container does not exist on the chosen volume. The command will prompt the user for a new container. Command execution will continue.

Action: Try the command again later.

Container parent not found on destination volume.

Probable cause: The Restore Container command was used and the parent of the container being restored was not found on the volume being restored to.

Action: Create the file with the same name as the container parent on the destination volume and try the operation again.

Container was not found in this increment.

Probable cause: The **Restore Container** command was used and a container name was specified which was not found in the specified backup increment.

Action: Issue the **Show Backup Index** command and search for the container.

Note: This message (followed by "Done") is displayed and the Restore Container stops when an 8.0 File Service is presented with backup data created by a 10.0 File Service. Backup data created by 10.0 servers cannot be examined or restored on 8.0 servers.

Could not process old version of directory <file name>:

Probable cause: An attempt was made to process a directory for which the user does not have remove and write access. It may be that the correct Clearinghouse is inaccessible. Command execution will continue.

Action: Try the operation again later.

Could not process old version of directory <file name>: File in Use.

Informative message indicating that an attempt was made to process a directory that is currently being used by another user. Command execution will continue.

Cycle may not be less than frequency.

Probable cause: A number that is greater than the length of the backup cycle was specified as the backup frequency.

Action: Enter the proper cycle again.

Desktop busy.

Probable cause: The desktop is currently being accessed by a network client. The desktop cannot be deleted at this time.

Action: Try the operation again later.

Desktop not found.

Probable cause: The specified desktop was not found.

Action: Verify that you have entered the desktop name properly. If you have, then use the **List Desktops** command to see if the specified desktop is stored on the File Service.

Epoch time may not be later than current time.

Probable cause: A time later than the current time was specified as the backup epoch.

Action: Enter the epoch time again.

The File Service is not a currently enabled software option and cannot be started.

Probable cause: The File Service is not enabled and no File Service functions may be accessed.

Action: The File Service must be purchased under separate license agreement from Xerox.

File Drawer already exists.

Probable cause: There is already a file drawer with the specified name; another file drawer cannot be created with the same name.

Action: Add the file drawer with a new name.

File Drawer busy.

Probable cause: The file drawer is currently being accessed by a network client; no command that would change its current state (such as changing its attributes or deleting it) can be performed.

Action: Try the operation again later.

File Drawer not found.

Probable cause: A file drawer having the specified name was not found.

Action: Use the **List File Drawers** command to verify the specified file drawer name.

File name not found.

Probable cause: There is no file with the specified file name in the specified container. Command execution will terminate.

Action: Verify the file name and try the operation again.

File name not found in this split increment.

Informative message showing that an explicit file name or pattern was specified using the **Show Backup Index** command, but no files matching that name/pattern were found in the specified increments. No action is required.

File not found.

Probable cause: A specified file was not found. This error may occur during the restore container operation if the name of the backup file drawer is not specified correctly.

Action: Try again, making sure that you specify the proper name for the backup file drawer. If necessary, check that the file does exist using the **Show Backup Index** command.

File Service unavailable or unknown.

Probable cause: Users or other services attempting to access a remote File Service may receive the response that the File Service is unavailable. This can occur when the:

• File Service is in the stopped state

• Corresponding volume is open but not on-line

• Server is down due to a hardware problem

• Service is down due to a software problem

If the user attempts to access a remote File Service and receives the response that the File Service is unknown, it means that the corresponding volume is closed or that the Clearinghouse entry for the File Service associated with the volume is incorrect.

Action: Try the operation again when the File Service becomes available.

Floppy hardware error.

Probable cause: This message appears when using floppy disk medium during backup or restore.

Action: Run the floppy disk diagnostics. Refer to *Basic Troubleshooting of Network Services* in the *Network Basic Services* volume.

Floppy is not ready.

Probable cause: The floppy disk was placed in the floppy disk drive incorrectly (upside down or backward) or not at all, or the drive door was not closed.

Action: Reposition the floppy disk in the floppy disk drive and check that the door is closed properly.

Floppy is write protected.

Probable cause: The write-enable tab is not correctly fastened.

Action: Fasten the write-enable tab and try the operation again.

Floppy read error.

Probable cause: This message appears while reading data from the floppy disk during backup or restore. The data was read incorrectly. The disk may be damaged.

Action: Try the operation again. If the failure continues, then the floppy disk is damaged and should be discarded.

Floppy was unexpectedly removed from drive.

Probable cause: The floppy disk was removed from the drive before permissible during backup or restore. The system detected that the floppy disk drive door had been opened since the floppy disk was first accessed.

Action: Replace the floppy disk in the disk drive and try the operation again.

Floppy write error.

Probable cause: Either the floppy disk has too many bad spots to be usable for backup, or while writing data on the floppy disk, the data was found to have been written incorrectly.

Action: Replace the floppy disk and try the operation again.

Illegal character.

Probable cause: The specified name of the Clearinghouse Service contains an illegal character. It also appears if the name is malformed in some way (such as more than two colons).

Action: Verify the specified name of the Clearinghouse Service. Refer to the *Clearinghouse Service* booklet for the list of characters which are disallowed in names registered in the Clearinghouse.

Illegal domain name.

Probable cause: The domain name portion of the specified Clearinghouse Service name is too long or contains illegal characters. It may also occur when entering names Clearinghouse Service to access lists of file drawers if an asterisk was specified incorrectly.

Action: Refer to the *Clearinghouse Service* booklet for syntax rules for Clearinghouse Service names. Refer to the description of the **Change File Drawer** command for correct asterisk syntax.

Illegal local name.

Probable cause: The local name portion of the specified Clearinghouse Service name is too long or contains illegal characters. It may also occur when entering Clearinghouse Service names to access lists of file drawers, if an asterisk was specified incorrectly.

Action: Refer to the *Clearinghouse Service* booklet for syntax rules for Clearinghouse Service names. Refer to the description of the **Change File Drawer** command for correct asterisk syntax.

Illegal organization name.

Probable cause: The organization name portion of the specified Clearinghouse Service name is too long or contains illegal characters. It may also occur when entering Clearinghouse Service names to access lists of file drawers if an asterisk was specified incorrectly.

Action: Refer to the *Clearinghouse Service* booklet for syntax rules for Clearinghouse Service names. Refer to the description of the **Change File Drawer** command for correct asterisk syntax.

Illegal pathname.

Probable cause: The pathname for the container input to the **Restore Container** command is not syntactically correct. This message may also occur when entering Clearinghouse Service names to access lists of file drawers if an asterisk was specified incorrectly.

Action: Verify that the pathname is correct and try the operation again.

Illegal pathname specified.

Probable cause: The pathname for the container input to **Copy Container** is not syntactically correct. This message may also occur when entering Clearinghouse Service names to access lists of file drawers if an asterisk was specified incorrectly.

Action: Verify that the pathname is correct and try the operation again.

Indeterminate access.

Probable cause: The access privileges the user has to the file drawer could not be determined because the Clearinghouse is unavailable. (The File Service queries the Clearinghouse in order to determine whether or not the user is a member of a group that has access rights.) This occurs if (1) the user is not explicitly listed in the access list and (2) a group is listed in the access list for that drawer.

Note: The File Service maintains a limited-size storage area for group membership to help speed access list evaluation. Each time the File Service determines that a user is a member of a particular group, it retains this information so that it does not perform repetitive Clearinghouse lookups. Thus, the File Service will not always need the Clearinghouse Service to determine when a user is a member of a group. This information is contained in this storage area for a maximum of 12 hours and then is deleted.

Action: Check the status of the Clearinghouse and try again later.

Insufficient access for authentication.

Probable cause: An attempt to access the authentication service (Clearinghouse) failed because the authentication service does not recognize the currently logged on user as a System Administrator.

Action: You must be logged on and enabled for the current operation. Check the Clearinghouse Service for consistency.

Insufficient access for the Clearinghouse operation.

Probable cause: The currently logged on user does not have sufficient access privileges to perform the Clearinghouse Service operation.

Insufficient access means the File Service has determined that the user does not have access to the drawer, neither as an individual nor as a member of any group which has access to perform the desired operation on the drawer.

Action: Add the user to the access list for the drawer, as appropriate.

Insufficient rights.

Probable cause: The backup user who is trying to access the backup file drawer on the remote volume during backup or restore does not have sufficient rights to do so.

Action: Change access controls to resolve this error.

Insufficient space on volume.

Probable cause: The volume being restored to is full.

Action: Delete unnecessary files from the volume and restart the restore process.

Invalid backup medium.

Probable cause: The medium being restored from was not initialized by backup (applies to floppy disks only).

Action: Use the floppy disk created by backup.

Invalid or unavailable credentials; use Register Server command before retrying operation.

Probable cause: The server name is not registered properly in the Clearinghouse Service.

Action: Use the **Register Server** command and try the operation again.

Length of name field too large.

Probable cause: The length of one of the fields in the specified name exceeds the maximum length for that field.

Action: Refer to the *Clearinghouse Service* booklet for a list of the maximum field lengths of Clearinghouse Service names.

Name must be an individual.

Probable cause: The name of an individual is required for the given command.

Action: Verify that the name is that of an individual and try the operation again.

No backup data for source volume.

Informative message indicating that the File Service expected to find backup data for the source volume on the backup volume. No action is required.

No floppy drive.

Probable cause: Either the File Service is being run on a hardware configuration without a floppy disk drive, or the drive or its controlling hardware is inoperative.

Action: Check to see that the floppy drive is operational.

No old versions deleted.

Informative message indicating that there were no old versions matching the specified file name to delete. If the "Confirm each delete" prompts were answered "yes," then the user may have negated the deletion of all old versions. Command execution will terminate. No action is required.

No online volumes.

Probable cause: The File Service is expecting to find an online volume.

Action: Verify the state of the volume.

No open or online volumes.

Probable cause: The File Service is expecting to find an online or open volume.

Action: Verify the state of the volume.

Not a backup floppy.

Probable cause: The floppy disk presented to the **Show Backup Index** command does not appear to have been created by one of backup commands. This includes floppy disks that are unformatted or formatted by other products.

Action: Verify that you are using the proper floppy disk.

Note: This message is also displayed (and the server asks for another floppy disk) when an 8.0 File Service is presented with backup data created by a 10.0 File Service. Backup data created by 10.0 servers cannot be examined or restored on 8.0 servers.

Not a pilot volume:

Probable cause: Either the floppy is damaged or it was not formatted correctly.

Action: Try the operation again. You may also try to run the floppy disk diagnostics. If the failure continues, you should replace the floppy. Refer to *Basic Troubleshooting of Network Services* in the *Network Basic Services* volume.

Not enough space for operation.

Probable cause: The local system has run out of space and is unable to complete the operation.

Action: Create space by deleting unnecessary files and then try the operation again.

MESSAGES

Parameters are not set.

Probable cause: The File Service expected to find backup parameters already set tor the volume.

Action: Set the Backup parameters for the source volume. (Refer to the "Setting backup parameters" section.)

Problem with report location: Bad pathname.

Probable cause: The pathname specified by the user when using the Report Disk Usage Command is either not good or illegal.

Action: Verify that the pathname is correct and try the operation again.

Problem with report location: File in use.

Probable cause: This message occurs as a result of the **Report Disk Usage** command. The specified report location is already in use.

Action: Try the command again later.

Problem with report location: File not found.

Probable cause: This message occurs as a result of the **Report Disk Usage** command. The specified report did not exist on the chosen volume.

Action: Verify that the report location exists and then try the operation again.

Problem with report location: Indeterminate access.

Probable cause: The file system could not determine whether the user has sufficient access rights over the specified report location for the command to execute when using the **Report Disk Usage** command.

Action: Try the operation again later.

Problem with report location: Insufficient access.

Probable cause: This message occurs as a result of the **Report Disk Usage** command. The user does not have sufficient access to the specified report location.

Action: You must change the access list for the report location to include the person who is running the report disk usage.

Problem with report location: Not enough space to store report.

Probable cause: This message occurs as a result of the **Report Disk Usage** command. There was not enough space to store the report at the specified report location.

Action: Store the report in another location, remove data from the source location, or increase the page limit on the location file drawer, and then try again.

Problem with report location: That Clearinghouse name is not valid.

Probable cause: This message occurs as a result of the **Report Disk Usage** command. A portion of the specified location pathname was invalid.

Action: Check the supplied pathname (for the report location) and try the operation again.

Problem with report location: That Clearinghouse name was not.found.

Probable cause: This message occurs as a result of the **Report Disk Usage** command. A portion of the specified location pathname was invalid.

Action: Check the supplied pathname (for the report location) and try the operation again.

Problem with report location: That service is unknown.

Probable cause: This message occurs as a result of the **Report Disk Usage** command. The specified report location service is unknown.

Action: Check the supplied pathname (for the report location) and try the operation again.

Restore time may not be later than current time.

Probable cause: The user specified a time later than the current time as a file restoration timeframe.

Action: Enter the correct restore time and continue the operation.

Service unavailable.

Probable cause: The remote service cannot accept any more connections.

Action: Check the status of the remote service and try the operation again later.

That Clearinghouse name is not valid.

Probable cause: The Clearinghouse name specified is not syntactically valid.

Action: Refer to the *Clearinghouse Service* booklet for syntax rules for Clearinghouse Service names.

That Clearinghouse name was not found.

Probable cause: The Clearinghouse Service name specified is not the name of a valid user or group.

Action: Make sure that the name is registered properly in the Clearinghouse and try again.

The Clearinghouse became unavailable during the operation.

Probable cause: While an operation was in progress, the Clearinghouse Service became unavailable and the operation could not be completed.

Action: The operation should be tried again when the Clearinghouse Service becomes available.

The Clearinghouse data base is full.

Probable cause: The volume name cannot be entered into the Clearinghouse Service because the Clearinghouse database is full.

Action: Refer to the *Clearinghouse Service* booklet for information on expanding the Clearinghouse database.

The domain name was not found.

Probable cause: The domain name portion of the specified Clearinghouse Service name is not an existing domain in the specified organization.

Action: Verify that the name is registered in the Clearinghouse and then try the operation again.

The local name was not found.

Probable cause: The local name portion of the specified Clearinghouse Service name was not found in the Clearinghouse database under the specified domain and organization.

Action: Verify that the name is registered in the Clearinghouse and then try the operation again.

The name is too long.

Probable cause: One or more of the fields in the specified Clearinghouse Service name exceeds the maximum number of characters allowed in that field.

Action: Check the length of the name fields and try the operation again.

The organization name was not found.

Probable cause: The organization name portion of the specified Clearinghouse Service name does not name an existing organization.

Action: Verify that the name is registered in the Clearinghouse and then try the operation again.

The registered name has the wrong property.

Probable cause: The specified Clearinghouse Service name does not name an entity of the correct type. This occurs for example, if the user enters a File Service name on the access list.

Action: Verify that the name is registered in the Clearinghouse with the correct property and then try the operation again.

The remote service had an error during the operation.

Probable cause: The remote service failed for some reason during backup or restore and the operation could not complete.

Action: Try the operation again.

The remote service is too busy.

Probable cause: The remote service is currently unavailable.

Action: Try the operation again later.

The remote service is unavailable or not found.

Probable cause: The remote service is currently unavailable during backup or restore.

Action: Try the operation again later.

There was an unexpected error connecting the remote service.

Probable cause: There was an unexpected problem with the connection to the remote service during backup or restore.

Action: Try the operation again. If this error persists, check the state of the service.

Transfer problem.

Probable cause: There was a problem with transferring a file to or from a remote service during backup or restore.

Action: Try the operation again later.

Trouble accessing volume.

Probable cause: A removable disk pack being used as a File Service volume was repartitioned or replaced, but the server was not rebooted, and the backup parameters were not reset. The existing backup parameters cannot recognize the new pack. Automatic backup will be canceled.

Action: Reboot the server or reset the backup parameters.

Unexpected authentication problem.

Probable cause: An attempt to access the authentication service failed due to some unexpected failure.

Action: Try again later. Check the status of the Clearinghouse Service. If the failure persists, contact the Network Support Center.

Volume busy at this time. Try again later.

Probable cause: An attempt was made to add a new file drawer when the volume was locked (by backup).

Action: Try again after backup completes.

Warning: Damaged file backed up.

Informative message that appears during backup when a damaged file is encountered. The pathname for the file will also display, so that the file can be located and the damage repaired, if necessary. No action is required.

CAUTION: If the backup medium is floppy, the damaged file is backed up but cannot be restored. If the backup medium is rigid disk, the damaged file is not backed up and cannot be restored.

Warning: Damaged file skipped.

Probable cause: The file currently being restored was found to be damaged and was skipped (along with all its descendants, if it is a directory).

Action: If you are restoring a rigid disk, running File Check on the volume containing the backup data may repair the damage. If the file is not salvageable, the descendants of the damaged file may be restored individually using the **Restore Container** command.

Warning: Duplicate file skipped.

Informative message indicating that the file currently being restored appears to already exist on the volume; it and all its descendants (if it is a directory) were not restored. No action is required.

Access List	A list of users and/or groups of users who are granted access to specific services.
Archive	A mode of file transfer used by the Remote Batch Service. Archive format data will most likely to sent to and received from a mainframe rather than a word processor.
Backup cycle	A period of time expressed as a number of days. A complete snapshot of a File Service volume is made over the backup cycle. A complete backup consists of the backup data created during the period of time known as the backup cycle. Backup media must be saved for the duration of a cycle. After the number of days in the cycle have passed, floppy disks may be reused and obsolete backup data can be deleted from the backup File Services volumes. The length of the backup cycle affects the usage of the backup media, backup execution time, and the size of a single backup increment.
Backup file drawer	A file drawer created on the backup File Service for the backup data (volume backup only). Before running backup to a rigid disk, each backup File Service in the backup volume group must have a backup file drawer created on the rigid disk. The backup file drawers on File Service volumes of the same backup volume group must all have the same name and the backup user must be given full access privileges to the File drawers.
Backup frequency	The number of days between each backup. Each time backup is executed, a backup increment is created. For a File Service that has a constant level of usage, if backup is run more often, then each backup increment is smaller and takes less space on the backup media (fewer floppy disks if backing up to a floppy).
Backup increment	A partial snapshot of the volume that is produced during a single execution of the backup software. The set of increments produced during a given cycle period constitutes a complete snapshot of the volume.
Backup increments log	A backup record on the source volume about each backup increment. The log includes which backup volume was actually used and the start time for the increment. This information is later used to locate increments, delete obsolete increments, or browse through increments. This information is located in the systemfiles directory, which is contained in the backup increments log.

When restoring a volume, it is necessary to restore the backup increments log before restoring the rest of the volume's contents so that the restore process knows where to retrieve the backup data for the volume. It should be done using the **Restore Container** command. |

Backup index	A special file containing a list of files backed up in a given increment. The contents of a backup index are displayed using the **Show Backup Index** command.
Backup medium	Used for storing backup data. The user has a choice of the type of medium for each File Service volume when setting backup parameters. The choices are floppy disk or rigid disk (another File Service volume). A rigid disk can be remote (another server on the network) or local (another File Service volume on the same multi-drive server).
Backup parameters	The System Administrator-specified set of variables that configure the backup process. These include the medium to be used (floppy disk or rigid disk), duration of a backup cycle, frequency of backup, start and stop times, and others, depending on backup medium.
Backup start time	Time of the day when you want backup to begin automatically (applies only to rigid disk backup).
Backup user/password	The name and password of the user whose identity is to be used for backup (rigid disk backup only). These may directly correspond to the System Administrator or to a "backup user" created specifically for this purpose. The backup user's identity is used to access the local or remote File Service during volume backup. The backup user must also have full access to the backup file drawer on the local or remote service used for backup.
Backup Volume Group	A group of File Service volumes used for backup. The group name, entered in the Clearinghouse database, is used by backup to locate an accessible backup volume. Every time backup is started, the volumes from the group are examined in alphabetical order. The first available volume from the group is used to store the backup data. The backup user needs to supply this parameter only in the case of backup to a rigid disk (another File Service).
Clearinghouse	A service that provides the naming facility for the other services and workstations on the internet. The Clearinghouse maintains a system-wide directory function that allows all the system components to locate needed resources and other registered objects.
Clearinghouse database	The database is organized by domains, which consist of 200-300 users resident in the same geographical location. A domain can reside in multiple Clearinghouses, and each Clearinghouse can hold multiple domains. (See *Domain* for more information.) The specialized database held by the Clearinghouse Service that serves as a global directory for the entire internetwork.
Clearinghouse Service	*(CHS)* A lookup directory service that maintains a database of all users, services, and servers in a network. The Clearinghouse Service cooperates to provide a single unified database system among other Clearinghouse Services.

Domain   A logical grouping (usually geographical) of registered objects in the Clearinghouse database. Domains serve as units of name, scope, administrative responsibility, and replicated database configuration. The data maintained for a particular domain includes the list of administrators of that domain, plus the names and relevant information about all objects that are registered in the domain.

Domain Administrator   The System Administrator assigned access privileges to control the changes to entries within a given domain.

Note: Only the Organization Administrator can create a domain.

Epoch   The point in time after which only new and changed files must be backed up incrementally. Refer to the "Backing up the File Service volume using the **Copy Volume** command" procedure for a description of how this epoch feature can be used in conjunction with the **Copy Volume** command.

File Service   *(FS)* A service installed on a server that allows the sharing of files produced at any networked or non-networked workstation to be shared. The information is stored in a hierarchy of file drawers and folders. There is a limit on the size of the file drawer as established by the System Administrator, but there are no limits to the number of file folders within the size of the file drawer. The File Service is also used to back up the Clearinghouse, Server Monitor, and Mail Services.

Floppy disk   A flexible, removable magnetic disk used for storage of data and loading of software onto the workstation and server.

Font   Typographical design applied to a collection of letters and graphic symbols that share certain characteristics such as style, weight, and stress.

Initializing   A process that occurs each time services are run for the first time after the server has been booted. The initialization procedure includes the determination of the service name, and configuration information specific to that service.

Logoff   The process of stopping a session on a computer system.

Logon   The process of starting a session on a computer system.

Password   A required code in addition to a user's name or number that allows logon.

Pathnames   The means for specifying the route to objects that are nested within other objects.

Rigid disk   A hard disk medium used as the main storage device for software and data on the workstations and servers.

Scavenging   A process invoked by the **Scavenge** command. It can also appear as a prompt after the system determines a file inconsistency. Scavenging repairs the filing system after a system failure by determining the cause of the problem, and the area where it occurred. The problems are reported in the Scavenger Log.

System Administrator   A user with specific network privileges, responsible for setting up and maintaining the network services.

This section contains forms for setting up your File Service. You may make copies of these forms and fill them out by hand. To help you organize these details, the following forms are provided for your use:

FS Form 1.   Directory of Services on a Specific Server

FS Form 2.   File Drawer/Access Rights

FS Form 3.   Backup Record

(This page intentionally blank)

You should read through the following instructions entirely before attempting to install or remove a disk pack for the first time.

Note: These instructions do not apply to a 300 Mb fixed rigid disk drive. You do not install or remove the disk on these drives. To start a 300 Mb fixed rigid disk drive, press the Start button. When the lighted button stops blinking the disk is ready to use. To stop the disk, press the Start button again. The light will turn off.

Use Procedure A to install a disk pack. Use Procedure B to remove a disk pack.

Procedure A. Installing a removable disk pack

1. Be sure the main power of the drive has been on and operating for two minutes before you begin.

2. Open the lid to the pack area of the drive. The lid's latch is located at the top center of the front of the drive.

3. Check the pack area to be certain there are no objects in it.

4. Squeeze together the levers in the center of the bottom dust cover of the disk pack and remove the bottom. Place the bottom in a clean area.

5. Lower the disk pack gently into the pack area of the drive. The pack should be set onto the spindle that rises up from the middle of the pack area.

6. Twist the handle to the storage canister clockwise until the handle can turn no further. Then lift off the storage canister.

7. Close the pack area lid immediately (to prevent entry of dust).

8. Place the storage canister into the bottom dust cover and then set the canister and its cover in the indentation in the top rear cover of the disk drive.

9. Place the Start/Stop switch into the Start position. When the green light stops blinking, the disk drive is ready to use. (The process of waiting for the steady green light is called "spinning up.") You can now boot the server using this disk drive. If it is an auxiliary drive, you do not boot it.

Note: When a removable disk pack that is being used as a File Service volume is repartitioned or replaced by another File Service volume pack, the System Administrator must reboot the server and reset the backup parameters if automatic backup operations for the new File Service volume are to continue. Since each pack (including those which are repartitioned) has a unique identification number, the existing automatic backup parameters will not recognize the new pack. It will report the "Trouble accessing volume" error and automatic backup of that volume will be canceled. Rebooting the server or resetting the backup parameters will put the correct identification number in the automatic backup parameters.

Procedure B. Removing a removable disk pack

1. Place the Start/Stop switch into the Stop position. Wait until the green light goes off. (The process of waiting for the green light to go out is called "spinning down.")

2. Open the pack area lid of the drive.

3. Place the storage canister over the disk pack so that the post at the center of the disk fits into the storage canister handle.

4. Rotate the storage canister handle counter-clockwise until a clicking sound is heard. This means that the pack has separated from the spindle. It is now safe to lift the pack out.

5. Lift the pack vertically out of the drive by the storage canister handle. Attach it to the storage canister while squeezing the levers in the center of the bottom dust cover.

6. Close the pack area lid immediately.

7. Store the disk in an appropriate place.

Note: If the Fault button light on a 300 Mb fixed rigid disk drive comes on, you can reset the button by pressing it. However, if the light comes on again, indicating that the fault has not been fixed, contact your Xerox Technical Representative.

Before you can install software on a removable disk drive, the disk packs must be formatted appropriately. Formatting is done by using a tool found on the diagnostic floppy disk for removable disks.

CAUTION: Do not format a 300 Mb fixed rigid disk. The disk is formatted when you receive it and you will destroy the bad pages table if you reformat it.

Procedure

1. Insert the disk to be formatted in the disk drive and spin it up. (For details on installing disk packs, refer to Appendix B, "Installing and removing a disk pack.")

2. Insert the diagnostic disk in the floppy disk drive of the server processor. Press both the B RESET and ALT B buttons. Release the B RESET button immediately; release the ALT B button when the processor number reads 0005.

3. Log on and enable.

4. Type **Stsnep** in response to the password prompt and press <RETURN>.

5. Type the number corresponding to "Format Disk" option and press <RETURN>.

6. Type the number corresponding to the unit you are going to format and press <RETURN>.

7. Type the number of passes you want and press <RETURN>. One pass is sufficient for formatting a disk.

8. Type **Y** to both confirmation prompts and press <RETURN>. It will ask for two confirmations because formatting a disk destroys any contents already on it. When the message appears that the disk is formatted, it is ready to be used in your disk drive for installation of services.

9. Type any character and press <RETURN> to return to the test selection menu.

10. Type the number corresponding to the "Exit" option and press <RETURN>.

(This page intentionally blank)