XEROX

Network Administration Library
Backup and Restore Guide

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Changes are periodically made to this document. Changes, technical inaccuracies, and typographic errors will be corrected in subsequent editions.

The content of this book is based on the Services 11.0 Release.

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Preface

Purpose

The *Backup and Restore Guide* describes all that you need to know to set up and perform backup or restore operations for your network services. For each service requiring backup, this book provides the following information:

- An overview of how backup and restore work
- Your duties as System Administrator for backup or restore
- Guidelines for setting up and performing backup
- Instructions for filling out the service-related backup and restore worksheets and activity logs
- Step-by-step procedures for performing backup and restore

Intended audience

This book is intended for System Administrators who are responsible for backing up the various service databases, and restoring them when necessary.

1. Introduction

The *Backup and Restore Guide* contains all the information and step-by-step procedures you need to back up and restore the following services on your Xerox network:

- Services System Software
- Clearinghouse Service
- File Service
- Mail Service
- Server Monitor Service
- Librarian Service

An important part of the *Backup and Restore Guide* are the worksheets and activity logs for each service. Use the information in the guide to fill out the worksheets before you begin any backup operations. The worksheets help you perform backup and restore operations. The activity logs help you keep an up-to-date record of these operations.

System Administrator duties

The System Administrator has responsibility for network management. Duties include:

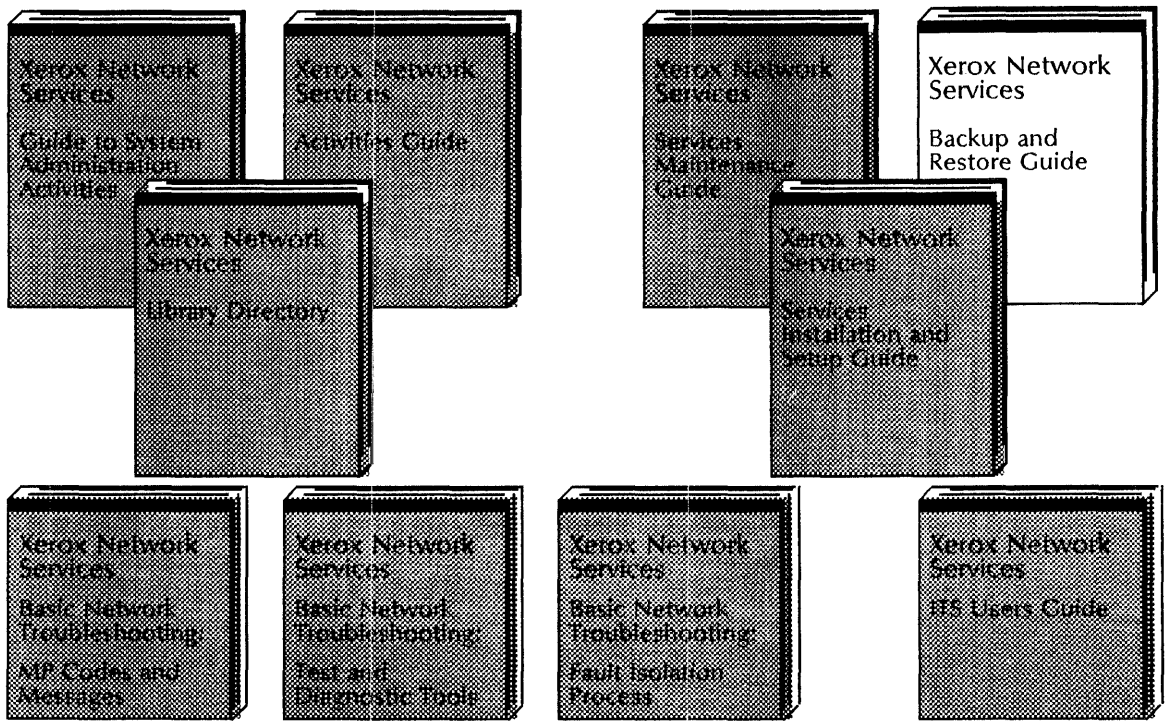
- Performing regularly scheduled backups for particular services
- Restoring databases when they are damaged
- Completing and maintaining the services worksheets and activity logs

These duties can be regularly scheduled. Use this book to understand the particular tasks you need to be doing, and the steps and parameters involved.

Network Administration Library organization

The *Backup and Restore Guide* is one of the books that make up the Network Administration Library (Figure 1-1).

Figure 1-1. **Network Administration Library organization**



The *Guide to System Administration Activities* contains background and task-related information for daily network operations. Store completed worksheets, activity logs, and other server or service-related information in the *Activities Guide*. The *Library Directory* contains command and procedure summaries, a cumulative index, and a glossary.

The *Services Installation and Setup Guide, Services Maintenance Guide, Backup and Restore Guide,* and *Basic Network Troubleshooting* contain step-by-step procedures for your duties as System Administrator.

How to use this book

Each chapter in this book covers the step-by-step backup and restore procedures for a particular service.

Contents

Each chapter in this book is organized for ease of use. Before you begin to use the procedures in this book, familiarize yourself with the contents of a typical service chapter.

Overview

The sections "Overview," "Planning for backup," and "Planning for restore" explain how the backup and restore operations for a particular service work. The sections also introduce the backup and restore worksheets and activity logs, and any backup parameters you need to set.

Commands

The section "Commands" lists all the commands you may need to use to backup and restore a particular service. An illustration shows you at a glance which commands are available to you when you are logged off, logged on, or enabled, and when the service is stopped or started. The command descriptions also identify the procedures that use each command.

Procedures

The section "Procedures" begins with a list of the procedures described in the section, along with the purpose of each. The individual procedures in this section have these components:

- An overview of the purpose of the procedure, which may include a flowchart of the major steps.
- A list of specific prerequisites you need before beginning the procedure, when applicable.
- The step-by-step procedure, with screen prompts and graphic aids where needed. The procedure refers you to required procedures in other services, if applicable.
- A wrap-up summarizing what you have just accomplished, recommending administrative tasks you should perform to keep your records up-to-date. The wrap-up refers you to required procedures in other services, when applicable.
- An example screen showing a hypothetical application of the procedure.

Chapters for services with many types of procedures may have several of these sections.

Documentation conventions

The books in the Network Administration Library use these conventions to help you recognize information.

⇐| This symbol means "press Return." When you see it after a procedural step, press the RETURN key on the terminal keyboard.

BREAK Words appearing in all capital letters represent the actual keys or switches on your equipment.

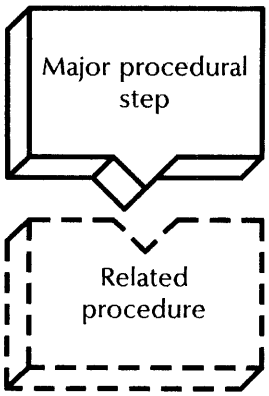
<service name> Words appearing in angled brackets represent system-supplied information.

WARNING: Warnings appear immediately before any action that may cause physical harm to you or your equipment. Make sure you understand the warning before you perform the action.

CAUTION: Cautions appear immediately before any action that may destroy to the data stored on your network. Make sure you understand the potential impact of the action before you perform it.

Notes are helpful hints that help you perform a task or understand the text.

This symbol means that you can perform the procedure from a workstation using Remote System Administration (RSA). If you need to record any information while performing the procedure, you can use the RSA Make Document (or Make Screen) feature.



This symbol represents a major step in a procedure. Flowchart boxes outlined with a solid rule represent major steps in the current procedure.

Flowchart boxes outlined with a dashed rule represent other procedures you need to perform before or after the current procedure.

The flowcharts are not a substitute for the step-by-step instructions. The flowcharts do not include details that may be crucial to the success of a procedure.

Logging on and enabling in a service context

Many procedures require you to have logged-on and enabled status, be in the context of the service, or both. To perform these procedures, you must know how to use the server commands **Logon** and **Enable**, and how to enter the context of a service. The **Logon** and **Enable** commands are common to all services.

See the Services System Software chapter in the *Guide to System Administration Activities* for more information about commands and contexts.

Logged-on and enabled status

Your status determines which commands you can use.

Any user A user who has not logged on.

Logged-on user A user who has issued the **Logon** command and has been successfully authenticated as a member of any Clearinghouse domain.

Enabled user A logged-on user who has successfully issued the **Enable** command as a result of having administrative access to the server's domain.

Service context

- You must be in the context of a particular service to use its commands.
- You do not need to be logged on or enabled to type in and enter the context of a service.

Step-by-step

1. Type **Logon** ⇐|.

```
User name:
```

2. Type your registered name at the "User name" prompt ⇐|.

```
Password:
```

3. Type your registered password at the "Password" prompt ⇐|.

```
>
```

   You are now logged on.

4. Type **Enable** if you need and have permission to access a System Administrator command ⇐|.

```
!
```

   You are now logged on and enabled.

5. Type the service name ⇐|.

   You are now logged on and enabled in the context of the service. You can use any of the service commands.

Example

The following example shows what you see when you log on and enable in the Interactive Terminal Service context. Note that when you type your password, asterisks are displayed to protect your password. Note also that when you enter **Enable**, the prompt changes from > to ! to show that you are enabled.

```
>Logon
        User name:  Ginny Martin
        Password:  *******
>Enable
!Interactive Terminal Service
ITS!
```

Using Remote System Administration

You can perform your administrative tasks at the server running the service. However, when you do not have convenient access to the server, you can use the Remote System Administration (RSA) facility of the network system. To use Remote System Administration, follow the steps below.

RSA capabilities

Remote System Administration lets you access a server from a 6085/8010 workstation. If you have the Asynchronous Communication Protocol option of the External Communication Service (ECS), you can configure one or more ECS ports to receive incoming asynchronous calls that are answered by the "Greeter." Then you can perform remote administration from your home personal computer.

When you use Remote System Administration, you have access to all the functions available to you at the server terminal. In addition, Remote System Administration enables you to capture the entire session in a document for your records.

You cannot use Remote System Administration for procedures that involve:

- Booting the server
- Installing or floppy disks or cartridge tapes
- Performing activities at one of the server's initialization interrupt points (after booting)

If you have more than one server, you can open one remote administration (emulation) window for each server.

Prerequisites

- If you will be using RSA from a remote workstation, ensure that the Asynchronous Communication Protocol software is loaded and running in the loader icon.
- Ensure that the Remote System Administration software is loaded and running in the loader icon.
- Ensure that a port icon and a TTY icon are on your desktop.
- Ensure that the Remote Executive option in your server profile is greater than zero. See the "Changing the server profile" section in the Services System Software chapter of the *Guide to System Administration Activities* for information about the server profile.

Step-by-step

1. At your workstation, copy the Network Management Terminal Emulator TTY icon to your desktop.
2. Open the Network Management Terminal Emulator TTY icon, and then the port icon.

3. Copy the port icon representing the server you want to your desktop.
4. Open the port icon.
5. Select [Start] on the TTY options sheet to begin communication with the server and open a remote administration (emulation) window.
6. Select a location inside the window and begin your session.
7. Perform the System Administration functions just as you would at the server.
8. If the VP Document Editor is running, you can make a copy of all or some of your session. Select [Make Document] or [Make Screen] from the emulation window.

If you use the Make Screen feature, you capture only what is displayed on the screen.

9. When the session is complete, log off the server.
10. Type **Quit** ⇐|.
11. Select [Close] from the emulation window header.

References

For complete information on Remote System Administration, see the Workstation Administration chapter in the *Workstation Administration and System Resources* volume of the VP Series Reference and Procedures Library.

For information about loading workstation applications software, see the *ViewPoint* volume of the VP Series Reference and Procedures Library.

For information about TTY emulation, see the VP Terminal Emulations chapter in the *Host Interfaces* volume of the VP Series Reference and Procedures Library.

Correcting mistakes

At an 8000 server, if you make a mistake while typing a command or responding to a prompt, you can:

- Delete one character at a time by holding down the CTRL key and simultaneously pressing H, or by holding down the SHIFT key and simultaneously pressing RUB.
- Delete a full word by simultaneously pressing CTRL and W.
- Delete a full line by simultaneously pressing CTRL and X.

If you type a command and press RETURN, then decide you do not want to complete the command, hold down the CTRL key and simultaneously press C. This key sequence cancels the command and returns the current Executive prompt.

At an 8090 server, if you make a mistake while typing a command or responding to a prompt, you can:

- Delete one character by holding down the CTRL key and simultaneously pressing H, by pressing the DEL key, the left arrow key, or the backspace key.
- Delete a full line by simultaneously pressing the CTRL and the DEL LINE keys on the numeric keypad.

2. Overview

This chapter introduces you to the backup and restore operations for Xerox Network Services. After reading this overview, turn to the service-specific chapters in this book. Read the overview sections to learn how backup and restore works for each service.

Backup operations

This section describes the importance of backup, how the backup operation works, and the service information you backup.

The importance of backup

Think for a moment of all the information in your network services as your possessions, objects you value. The backup operation is the insurance policy you carry to protect you in case any of these possessions is lost or stolen. This policy contains a clause that says that anything you lose can be replaced (restored) with an exact copy. To take out this insurance policy and protect the information on your network, you must back up your services regularly.

The backup operation performs three functions:

- Ensures reliable storage of information, protecting you from data loss caused by a server crash or accidental deletion.
- Makes copies of the service databases so your network can continue to operate after loss of your database.
- Archives information that is important to your organization but rarely accessed.

How the backup operation works

The backup insurance policy differs from other insurance you may have. With regular insurance, you pay a premium to the insurance company. If an insured item is damaged or lost, the company gives you the money to buy another item. You cannot buy all the information stored on a service.

To protect this information, backup makes a copy of it. The copy is stored in a different location, which safeguards the copy when the original information is damaged or destroyed. The different location can be on another server or on a portable storage medium such as a floppy disk.

The services you back up

Six services use the backup and restore operations.

Services System Software

The Services System Software maintains the server profile, which contains information about all the services on a server. The server profile is backed up by making a copy and storing it in a special file drawer on a File Service.

Clearinghouse Service

The Clearinghouse database contains detailed information about every network client, including servers, services, and users. If your network has only one Clearinghouse Service, a copy of its database is stored in a special file drawer on a File Service.

If your network has more than one Clearinghouse Service, a copy of the local Clearinghouse domain is stored in the database of a remote Clearinghouse. The remote copy is automatically notified whenever information in the local Clearinghouse changes.

File Service

Of all the services, the File Service stores the most information. You can store a wide variety of information on a File Service, including desktops, folders, documents, PC File Service directories, spreadsheets, and graphic canvases.

The File Service backup operations enable you to back up all or part of your File Service. You can back up the information on a File Service onto another server volume on a rigid disk. Depending on your configuration you can also back up onto floppy disk, cartridge tape, or high-capacity cartridge tape.

Mail Service

The Mail Service database contains all the mail that users are sending or have not yet retrieved. This database is backed up by making a copy and storing it in a special file drawer on a File Service.

Server Monitor Server

The Server Monitor Service database stores all the information about the servers being monitored and the users to be notified when the status of a server changes. This database is backed up by making a copy and storing it in a special file drawer on a File Service.

Librarian Service

The Librarian Service database contains all the information that tracks and controls document sharing by a group of users. This database is backed up by making a copy and storing it in a special file drawer on a File Service.

Restore operations

This section describes the importance of the restore operation and how it works.

The importance of restoring information

The service databases that are backed up contain information that is critical to the functioning of your network. Should a server crash, you must restore the backup copies of the services databases to bring the network back to full operation.

How the restore operation works

Before you can restore any information, you must determine what caused the data loss and correct the problem. Refer to *Basic Network Troubleshooting* and follow closely the instructions there. *Basic Network Troubleshooting* will direct you to perform the appropriate restore procedure after you correct the problem.

CAUTION: The restore operation for any service is a time-consuming emergency operation. Do not perform any of the restore procedures in this book unless *Basic Network Troubleshooting* directs you to do so.

The restore operation consists of moving a copy of the backup information to the correct service. The goal of the restore operation is the same for all services. The method used to restore information varies from service to service.

3. Services System Software

This chapter helps you prepare to manage and perform the backup and restore procedures for the Services System Software server profile.

This information is based on services release version 11.0. The procedures are available using an 8000 or 8090 server.

Overview

This section describes the importance of the server profile backup. It also reviews the role of the System Administrator in backup and restore activities.

How backup works

After you configure a server and the services on it, all the configuration information resides in the server profile. The server profile has several sections, one for the server itself and one for each service installed. The server profile saves you from reentering all the configuration information each time you boot the server.

The backup operation protects you from losing all this information. Otherwise, you would have to recreate the configuration information if the server profile were damaged or destroyed.

How restore works

When you restore the server profile, you move a copy of the configuration information from its backup file drawer to the server. Restoration is the last step in the troubleshooting process.

System Administrator duties

As System Administrator, your duties and responsibilities include:

- Completing and maintaining the Services System Software Backup and Restore Worksheet.
- Manually backing up the server profile as needed.
- Restoring the server profile when it is damaged.
- Updating the Services System Software Backup and Restore Activity Log whenever you back up or restore the server profile.

Services System Software Backup and Restore Worksheet

Use the Services System Software Backup and Restore Worksheet to record information that helps you back up and restore the server profile. The worksheet is at the end of this chapter.

Fill out a separate copy of the worksheet for each server for which you have System Administrator responsibility. Retain the original worksheet for future use, and store the completed worksheet in your *Activities Guide*.

Using the worksheet

Before you back up or restore the server profile complete the Services System Software Backup and Restore Worksheet. It is important that you fill out the worksheet accurately and update it whenever changes occur.

The completed worksheet saves you time as you perform the backup and restore procedures. It also serves as an information source for new System Administrators unfamiliar with your network configuration.

Filling out the worksheet

As you read this chapter, you are directed to make entries on the Services System Software Backup and Restore Worksheet. The worksheet section number appears with these directions so you know where to make each entry.

Use section ① for information about the server and the services installed on the server. Copy this information, including the server name, from the Services Installation Worksheet you filled out while reading the *Guide to System Administration Activities*.

Use section ② for information about the location for storing the backup copies of the server profile. The name "SSSbackup" is recommended for the backup folder. The name "SSSbackup" is recommended for the backup file drawer.

Services System Software Backup and Restore Activity Log

Use the Services System Software Backup and Restore Activity Log to keep track of the backup and restore procedures you perform. The log is at the end of this chapter.

Make several copies of the log to keep by the server. Whenever you backup or restore the server profile, record your activity on the log. Store completed logs in your *Activities Guide* for easy reference.

Planning for backup

This section helps you prepare for backing up the server profile. See the "Procedures" section in this chapter for the complete procedure.

Backing up the server profile

Backup saves all the configuration information on a server in another location, a file drawer on a File Service. As you run regular File Service backup, the backup copy of the server profile is saved along with all other files on the File Service.

It is particularly important to back up the server profile when the server is running the External Communication Service or the Internetwork Routing Service. The profile section for each of these services contains port and line information that is time-consuming to enter.

Backup file drawer

Before you can back up the server profile, you must create a file drawer to store the profile. See the "Creating private file drawers for users" and the "Creating public file drawers for users" procedures in the File Service chapter of the *Services Installation and Setup Guide* for step-by-step instructions on creating file drawers. As you create the backup file drawer, keep this information in mind:

- Name the file drawer "SSSbackup."
- Specify yourself as the owner of the file drawer.
- Specify a page limit of zero (0).
- Give yourself and the administrative user group (if you have one on your network) full access to the file drawer.

You also need to create a folder for each server for which you are backing up the profile. The folder name should be easily associated with each server you are working with. All servers have the file named "Server.Profile," which contains the server profile. You cannot change this name. Do not store more than one of these files in a folder. Otherwise, you may be unable to retrieve the correct server profile.

Know the full name of the File Service remote directory which contains the backup file drawer and folders. The directory name takes this format:

(File Service name:domain:organization)file drawer/file folder

The server applies its own domain and organization names as defaults if you do not specify them. You can specify as many descendant folders (directories) to the right of the file drawer name as necessary to specify the folder in which your server profile is to be stored.

Related procedures: Backing up the server profile, Creating private file drawers for users, Creating public file drawers for users (see the File Service chapter in the *Services Installation and Setup Guide*)

Filling out the worksheet

② Record the pathname to the File Service containing the Services System Software backup file drawer on the Services System Software Backup and Restore Worksheet.

Planning for restore

This section helps you prepare for restoring the server profile. See the "Procedures" section in this chapter for the complete procedure.

Restoring the server profile

Restore the server profile when the server profile has been damaged or you have to repartition the server. When you repartition a disk, restore the server profile only if you want to have the same services with the same names running on the server.

CAUTION: Do not restore the server profile when you repartition a server disk with a Mail Service. Otherwise, the Mail Service may crash. Instead, reenter all the server profile information.

Know the full name of the File Service remote directory which contains the backup file drawer and folders. The directory name takes this format:

(File Service name:domain:organization)file drawer/file folder

The server applies its own domain and organization names as defaults if you do not specify them. You can specify as many descendant folders (directories) to the right of the file drawer name as necessary to specify the folder in which your server profile is stored.

Related procedure: Restoring the server profile

Commands

This section alphabetically lists the commands you use to back up and restore the server profile. To access these commands, you must be in the server context.

Table 3-1 shows the Services System Software backup and restore commands, along with the logged on status and the service state (started or stopped) for accessing them.

Table 3-1. **Services System Software backup and restore commands**

Command	Logged off		Logged on		Enabled	
	Started	Stopped	Started	Stopped	Started	Stopped
Delete Files					•	•
Retrieve Files					•	•
Set Remote Directory					•	•
Store Files					•	•

Delete Files

Available to the enabled user. Deletes files from the working directory you specify. You can specify all the files in a directory by entering the wildcard symbol (*). You cannot delete a file that is in use.

Related procedure: Restoring the server profile

Retrieve Files

Available to the enabled user. Copies files from the remote directory to the working directory. This command fails if you have not set the remote directory.

Related procedure: Restoring the server profile

Set Remote Directory

Available to the enabled user. Prompts you to specify a remote directory on a coresident or remote File Service. You use this command before storing working directory files to the File Service, or retrieving them from the File Service.

Related procedure: Backing up the server profile, Restoring the server profile

Store Files

Available to the enabled user. Copies files from the working directory to the remote directory. This command fails if you have not set the remote directory.

Related procedure: Backing up the server profile

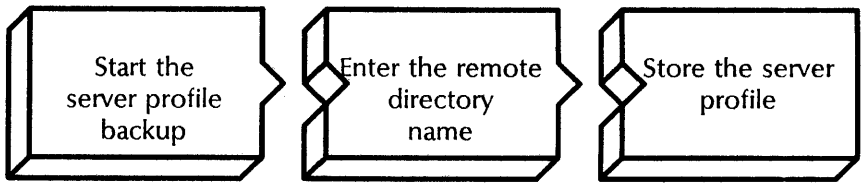
Procedures

This section contains the two procedures for backing up and restoring the server profile.

Backing up the server profile
Use this procedure to make a backup copy of the server profile.

Restoring the server profile
Use this procedure to restore the backup copy of the server profile to its original server.

Backing up the server profile



This procedure makes a backup copy of the server profile.

All servers have the file named "Server.Profile," which contains the server profile. You cannot change this name. Do not store more than one of these files in a folder. Otherwise, you may be unable to retrieve the correct server profile. The **Retrieve Files** command retrieves only the most recently stored profile.

Prerequisites

- If you are backing up the server profile for the first time, perform the procedures "Creating private file drawers for users" and "Creating public file drawers for users" in the File Service chapter of the *Services Installation and Setup Guide*. Name the file drawer "SSSBackup." Make yourself the owner of the drawer, and give all Domain Administrators full access to it.
- Create a folder for each server for which you are responsible.
- See the Services System Software Backup and Restore Worksheet in your *Activities Guide* for the full name of the remote directory.
- Update the Services System Software Backup and Restore Activity Log with the date and reason for the backup.

Step-by-step

1. Log on and enable.
2. Type **Set Remote Directory** ⇐|.

```
Remote Directory:
```

3. Type the fully qualified name of the remote directory in the format (File Service:Domain:Organization)file drawer/file folder ⇐|.
4. Type **Store Files** ⇐|.

```
File List:
```

5. Type **Server.Profile** ⇐|.

```
Server.Profile . . . stored
!
```

6. Log off.

Wrap-up

When you see the message "Server.Profile...stored," the server profile has been backed up.

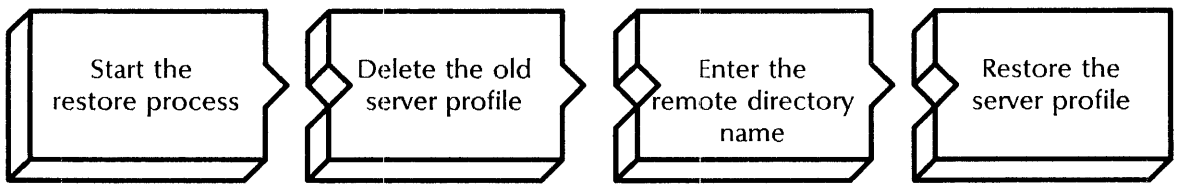
You may want to make a copy of this information for your records. If you are using Remote System Administration, use the Make Document or Make Screen option. Store a copy in the *Activities Guide*.

Example

This example shows a backup of a server profile to a remote directory. Note that the pathname can be longer than one line.

```
!Set Remote Directory
    Remote Directory: (Foxdale:OurDomain:OurOrg)SSSBackup/
    CambridgeStatsJuly86
!Store Files
    File List: Server.Profile
Server.Profile . . . stored.
!
```

Restoring the server profile



This procedure restores the server profile from a remote directory to its original server.

Prerequisites

- If you have repartitioned your server disk, perform the following procedures in the Server Software Installation chapter in the *Services Installation and Setup Guide*:
  - "Step 4. Installing system software"
  - "Step 5. Starting the system"
  - "Step 6. Setting software options"
  - "Step 7. Entering your network number and server name"
  - "Step 8. Installing the services"

- See the Services System Software Backup and Restore Worksheet in your *Activities Guide* for the full name of the remote directory.
- Update the Services System Software Backup and Restore Activity Log with the date and reason for the restore.

Step-by-step

1. Boot the server:
   a. Hold down the Boot Reset (B RESET) and Alternate Boot (ALT B) buttons at the same time.
   b. Release the Boot Reset (B RESET) button.
   c. When the maintenance panel displays 0001, release the Alternate Boot (ALT B) button.

```
Normal startup? (Y/N):
```

2. Type **N** at the "Normal startup" prompt ⇐|.

```
Enter interrupt point
1   Interrupt before opening primary volume
2   Interrupt before processing profile
3   Interrupt before running services
Enter one or more choices:
```

3. Type **2** for the "Interrupt before processing profile" option ⇐|.
4. Log on and enable.
5. Type **Delete Files** ⇐|.

```
File List:
```

6. Type **Server.Profile** ⇐|.
7. Type **Set Remote Directory** ⇐|

```
Remote Directory:
```

8. Type the fully qualified name of the remote directory in the format (File Service:Domain:Organization)file drawer/file folder ⇐|.
9. Type **Retrieve Files** ⇐|.

```
File List:
```

10. Type **Server Profile** ⇐|.

```
Server.Profile . . . retrieved
!
```

11. Log off.

Wrap-up

When you see the message "Server.Profile...retrieved," the restore operation is complete.

If you performed this procedure after repartitioning a disk, boot the server again. Perform a non-normal startup, select interrupt point three (interrupt before running services). The values from the restored server profile take effect during the server initialization.

Then use the Services System Software **List Services** command to record which services were on the server before you repartitioned the disk. Log on and install those services as described in the Server Software Installation chapter in the *Services Installation and Setup Guide*. Be sure to use the **Proceed** command to complete the server initialization after reinstalling services.

You may want to make a copy of this information for your records. If you are using Remote System Administration, use the Make Document or Make Screen option. Store a copy in the *Activities Guide*.

Example

This example shows the restoration of a server profile.

```
Boot the server
Normal startup? (Y/N): N
Enter interrupt point
1   Interrupt before opening primary volume
2   Interrupt before processing profile
3   Interrupt before running services
Enter one or more choices: 2
Opening volume...done
Server is attached to Network Number 1-901
>Logon
    User name: Eliza Brown
    Password: *****
>Enable
!Delete Files
    File List: Server.Profile
    Server.profile...deleted
!Set Remote Directory
    Remote Directory: (Foxdale:OurDomain:OurOrg)SSSBackup/Cambridge
    StatsJuly 87
!Retrieve Files
    File List: Server.Profile
Server.Profile . . . retrieved
!
```

4. Clearinghouse Service

This chapter helps you prepare to manage and perform the Clearinghouse Service backup and restore procedures.

This information is based on services release version 11.0. The procedures are available using an 8000 or an 8090 server.

Overview

This section describes the Clearinghouse system structure, and the importance of Clearinghouse Service backup. It also summarizes the different types of backup and restore operations, and reviews the role of the System Administrator in backup and restore activities.

The backup and restore operations you use depend on whether you have a single or a multiple Clearinghouse network. In a single Clearinghouse network, the Clearinghouse Service resides on a single server. In a multiple Clearinghouse network, the Clearinghouse Service resides on several servers. The Clearinghouse Services on the internetwork actively cooperate, forming a unified Clearinghouse system.

If you have a single Clearinghouse network, you manually back up and restore the Clearinghouse database. If you have a multiple Clearinghouse network, you use domain replication to back up the database and manually restore it.

How backup works

The Clearinghouse Service stores:

- Network addresses of all equipment attached to the network
- Services names, descriptions, and other setup information for all services on the network
- Complete information on all users in every domain served by the Clearinghouse
- Complete information on all user groups in the domains served by the Clearinghouse

The backup operation protects you from losing all this important information. Otherwise, you would have to reenter all the information to recreate the Clearinghouse database if it were damaged or destroyed.

Manual backup

When you back up the Clearinghouse Service, you make a copy of the Clearinghouse database. You store the copy in a file drawer dedicated to Clearinghouse Service backups.

Perform this procedure whenever the information in the Clearinghouse database changes.

Domain replication

Domain replication duplicates a domain on multiple servers. Replication provides:

- A reliable database despite inadvertent damage to any copy of the domain information
- Readily available domain information despite server or communication failures
- Efficient access to the database despite geographically dispersed users

Replication also eliminates the need for manual backup of the database.

Replicate domains whenever you add a new domain. To minimize service interruptions, perform the procedure during off-peak hours.

After you replicate a domain, a process known as Clearinghouse propagation continually sends changes to the replicated domains. See the Clearinghouse Service chapter in the *Guide to System Administration Activities* for more information on domain replication.

How restore works

In a single Clearinghouse network, you restore the Clearinghouse database. In a multiple Clearinghouse network, you restore replicated domains.

Database restoration

When you restore the Clearinghouse database, you move the copy of the database from its backup file drawer to the Clearinghouse Service.

Domain restoration

If you lose your Clearinghouse database, you can rebuild it by re-initializing the Clearinghouse Service and then copying back all the domains that resided there. Clearinghouse propagation ensures that you will always be able to restore up-to-date Clearinghouse information.

System Administrator duties

As System Administrator, you perform a variety of tasks to manage the Clearinghouse Service backup and restore operations. Your duties and responsibilities include:

- Completing and maintaining the Clearinghouse Service Backup and Restore Worksheet at the end of this chapter.
- Backing up the Clearinghouse database or replicating domains as needed.

- Restoring the Clearinghouse database or a replicated domain when the database or domain is damaged.
- Updating the Clearinghouse Service Backup and Restore Activity Log whenever you back up the Clearinghouse database, replicate a domain, or restore the database or a replicated domain.

Clearinghouse Service Backup and Restore Worksheet

Use the Clearinghouse Service Backup and Restore Worksheet to record information that helps you back up and restore the Clearinghouse Service. The worksheet is at the end of this chapter.

Fill out a separate copy of the worksheet for each Clearinghouse Service for which you have System Administrator responsibility. Retain the original worksheet for future use, and store the completed worksheet in your *Activities Guide*.

Using the worksheet

Before you back up or restore the Clearinghouse Service, complete the Clearinghouse Service Backup and Restore Worksheet. It is important that you fill out the worksheet accurately and update it whenever changes occur.

The completed worksheet saves you time as you perform the backup and restore procedures. It also serves as an information source for new System Administrators unfamiliar with your network configuration.

Filling out the worksheet

As you read this chapter, you are directed to make entries on the Clearinghouse Service Backup and Restore Worksheet. The worksheet section number appears with these directions so you know where to make an entry.

Use section ① for information about the server and the services installed on the server. Copy this information, including the name of the Clearinghouse Service, from the Clearinghouse Service Worksheet and from the Services Installation Worksheet you filled out while reading the *Guide to System Administration Activities*.

Use section ② for information about the location storing the backup copy of the Clearinghouse database for a single Clearinghouse network.

Clearinghouse Service Backup and Restore Activity Log

Use the Clearinghouse Service Backup and Restore Activity Log to keep track of the backup and restore procedures you perform. The log is at the end of this chapter.

Make several copies of the log to keep by the servers running the Clearinghouse Service.

Whenever you back up or restore the Clearinghouse Service, record your activity on the log. Store completed logs in your *Activities Guide* for easy reference.

Planning for backup

This section helps you prepare for the Clearinghouse Service backup procedures. See the "Procedures" section in this chapter for the complete procedures.

Single Clearinghouse database

Backup saves the entire Clearinghouse database in the Clearinghouse file drawer on a File Service. As you run regular File Service backup, the Clearinghouse database is saved along with all other files on the File Service.

Run backup immediately after you set up your Clearinghouse Service, and whenever you update or change the database. This backup frequency ensures that you maintain a current copy of all Clearinghouse information. You cannot run Clearinghouse backup on a network with more than one Clearinghouse, regardless of whether the domain served by that Clearinghouse is replicated.

Backup file drawer

Before you can back up the Clearinghouse database, you must create a file drawer to store the information. See the "Creating private file drawers for users" and "Creating public file drawers for users" procedures in the File Service chapter of the *Services Installation and Setup Guide*. As you create the backup file drawer, keep this information in mind:

- Name the file drawer "Clearinghouse."
- Specify yourself as the owner of the file drawer.
- Specify a page limit of zero (0).
- Give yourself and the administrative user group (if you have one on your network) full access to the file drawer.

Related procedures: Backing up a single Clearinghouse Service, Creating private file drawers for users, Creating public file drawers for users (see the File Service chapter in the *Services Installation and Setup Guide*)

Filling out the worksheet

② Record the name of the File Service containing the Clearinghouse backup file drawer on the Clearinghouse Service Backup and Restore Worksheet.

Adding a domain copy

If you have more than one Clearinghouse on your network, you can copy a Clearinghouse database from the local server to a remote server that is also running the Clearinghouse Service.

This is the only way you can backup your Clearinghouse database in this case.

CAUTION: Do not replicate a Clearinghouse Service running services release version 4.2 or 5.0 to Clearinghouse Service running services release version 8.0 or later. If you need to perform this operation, see *Basic Network Troubleshooting*.

Related procedure: Adding a copy of a domain (replicating)

Planning for restore

When the local Clearinghouse Service database is damaged, the server usually malfunctions. Consult the Clearinghouse Service chapter in *Basic Network Troubleshooting* before performing any restore procedure.

Single Clearinghouse database

You can restore a Clearinghouse database from the Clearinghouse file drawer on a File Service.

Related procedure: Restoring a single Clearinghouse database

Replicated domains

You can also delete a damaged Clearinghouse database, reinstall the Clearinghouse Service, and then restore the domains on the server from replicated copies on the other network servers.

Related procedure: Restoring replicated domains

Commands

This section alphabetically lists the commands you use to perform backup and restore operations for the Clearinghouse Service. To access these commands, you must be in the Clearinghouse Service context.

Table 4-1 shows the Clearinghouse Service backup and restore commands, along with the logged on status and the service state (started or stopped) for accessing them.

Table 4-1. **Clearinghouse Service backup and restore commands**

Command	Logged off		Logged on		Enabled	
	Started	Stopped	Started	Stopped	Started	Stopped
Add Domain						•
Add User					•	•
Backup						•
Change Domain Access					•	•
Change Organization Access					•	•
Compare Databases					•	•
Delete Domain						•
Expunge Service					•	•
List Services	•	•	•	•	•	•
Proceed					•	•
Restore				•		•
Run Service					•	•
Show Domain			•	•	•	•
Start Service						•
Stop Service					•	

Add Domain Available to the enabled user when the Clearinghouse Service is stopped. Creates a new domain, or replicates an existing one, and adds it to the local database.

Related procedures: Adding a copy of a domain (replicating), Restoring a single Clearinghouse database

Add User Available to the enabled user when the Clearinghouse Service is started or stopped. Creates user entries.

Related procedure: Restoring a single Clearinghouse database

Backup Available to the enabled user when the Clearinghouse Service is stopped. Backs up a Clearinghouse database to a File Service. This command is available only on networks with a single Clearinghouse Service.

Related procedure: Backing up a single Clearinghouse database

Change Domain Access

Available to the enabled user when the Clearinghouse Service is started or stopped. Grants or revokes administrative access to a domain. You need administrative access to the domain to use this command.

Related procedure: Restoring a single Clearinghouse database

Change Organization Access

Available to the enabled user when the Clearinghouse Service is started or stopped. Grants or revokes administrative access to an organization. You need administrative access to the organization to use this command.

Related procedure: Restoring a single Clearinghouse database

Compare Databases

Available to the enabled user when the Clearinghouse Service is started or stopped. Compares two Clearinghouse databases and reconciles any differences between them, thereby correcting inconsistencies in a domain. Always use the **Compare Databases** command after you have replicated a domain, whether in its own network or across internetworks.

This command does not change the domain replication configuration among involved Clearinghouses.

Related procedures: Adding a copy of a domain (replicating), Restoring replicated domains

Delete Domain

Available to the enabled user when the Clearinghouse Service is stopped. Removes all copies of the specified domain from the local Clearinghouse Service.

CAUTION: Before the Clearinghouse deletes the last copy of a domain, the Clearinghouse issues a warning and requests a confirmation. The domain ceases to exist when you confirm the deletion. If the domain was the last one in its organization, the Clearinghouse also deletes the organization. You need administrative access to the domain and organization to delete the last copy of the domain or the organization.

Related procedure: Adding a copy of a domain (replicating)

Expunge Service

Available to the enabled user at the third interrupt point. Permanently removes from a server the service you specify. The system deletes all server profile entries for that service, and cancels its registration with the Clearinghouse Service.

Related procedure: Restoring replicated domains

List Services

Available to any user. Lets you list the services currently installed on the server. Also displays the software version running, the network number, the processor number, the server name, and the currently activated and started services.

Related procedure: Restoring replicated domains

Proceed

Available at all initialization interrupt points. Leaves an interrupt point and continues server initialization. All activated services are run during server initialization.

Related procedure: Restoring replicated domains

Restore Available to the logged on user when the Clearinghouse Service is stopped. Restores a Clearinghouse database. The command is available only on networks with a single Clearinghouse Service.

Related procedure: Restoring a single Clearinghouse database

Run Service Available to the enabled user. Runs the software files for a service not currently running, bringing the service to a fully operational state. Use this command to invoke a non-normal service startup, or to run and configure a service before you run other coresident services.

Related procedure: Restoring replicated domains

Show Domain Available to the logged on user when the Clearinghouse Service is started or stopped. Displays in disk pages the size of the domain, its replication status, and its access control settings.

Related procedures: Adding a copy of a domain (replicating), Restoring replicated domains

Start Service Available to the enabled user when the service is stopped. Starts the currently loaded and stopped services you select. This command reverses the effect of a **Stop** command or explicitly starts a service after a service-specific failure.

Related procedures: Adding a copy of a domain (replicating), Restoring replicated domains

Stop Service Available to the enabled user when the service is started. Stops the currently loaded and started services you select. This command reverses the effects of a **Start** command so you can change certain parameters.

Related procedures: Adding a copy of a domain (replicating), Restoring replicated domains

Procedures

This section contains the procedures for backing up and restoring the Clearinghouse Service.

Backing up a single Clearinghouse Service
Use this procedure to back up the Clearinghouse Service in a single Clearinghouse network.

Adding a copy of a domain (replicating)
Use this procedure to back up the Clearinghouse Service in a multiple Clearinghouse network.

Restoring a single Clearinghouse database
Use this procedure to restore the Clearinghouse Service in a single Clearinghouse network.

Restoring replicated domains
Use this procedure to rebuild the Clearinghouse database in a multiple Clearinghouse network.

Backing up a single Clearinghouse database

Use this procedure to back up a Clearinghouse Service to a File Service.

Prerequisites

- If you are backing up your Clearinghouse Service for the first time, perform the procedures "Creating private file drawers for users" and "Creating public file drawers for users" in the File Service chapter of the *Services Installation and Setup Guide*. Make yourself the owner of the drawer, and give all Domain Administrators full access to it. Create the file drawer on a File Service that is not coresident with the Clearinghouse Service.
- Know the name of the File Service containing the Clearinghouse file drawer. See the Clearinghouse Service Backup and Restore Worksheet in your *Activities Guide*.
- Use the File Service **List Volumes** command to ensure that there is enough space available on the File Service where the Clearinghouse backup files are stored.
- Update the Clearinghouse Service Backup and Restore Activity Log with the date and reason for the backup.

The Clearinghouse backup file drawer keeps one or two copies of the most recent backup data, depending on the space available. It discards older versions with each backup.

Step-by-step

1. Log on and enable in the Clearinghouse Service context.
2. Type **Backup** ⇐|.

```
File Service:
```

3. Type the name (does not need to be fully qualified) of the File Service containing the Clearinghouse backup file drawer ⇐|.

```
Opening connection to File Service...Done
Storing this database on the File Service...Done
Database backed up.
CHS!
```

4. Log off.

Wrap-up

When you see the message "Database backed up," the manual backup of the Clearinghouse database is complete.

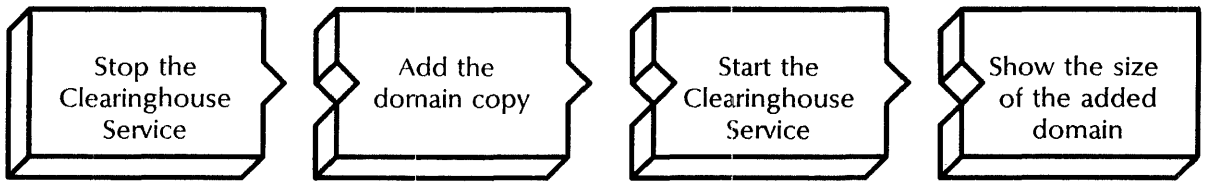
You may want to make a copy of this information for your records. If you are using Remote System Administration, use the Make Document or Make Screen option to make a copy of the backup procedure. Store a copy in the *Activities Guide*.

Example

This example shows a manual backup of a Clearinghouse Service to a File Service.

```
CHS!Backup
    File Service: Dartmouth
Opening connection to File Service...Done
Storing this database on the File Service...Done
Database backed up.
CHS!
```

Adding a copy of a domain (replicating)



This procedure adds a copy of a domain to another Clearinghouse. Perform this procedure during off-peak hours to minimize service interruptions.

Prerequisites

If you are adding a copy of a domain to a Clearinghouse serving the domain that you are replicating:

- Know the name of the domain you are copying.
- Use the **Show Domain** command to check the size of the domain you want to copy and the size of the destination Clearinghouse database. Verify that the database has adequate space for the domain.
- Update the Clearinghouse Service Backup and Restore Activity Log with the date and reason for the domain replication.

If you are adding a copy of a domain to a Clearinghouse serving another domain or organization, in addition to the above prerequisites, you should also:

- Contact the System Administrator of the other network to ensure your access privileges.
- Notify users that you will be stopping the Clearinghouse Service.
- Contact the Domain Administrator on the other network to obtain temporary administrative access to the domain of the destination Clearinghouse. If the other network is in a different organization, you also need temporary administrative access to the organization.
- Initialize the Internetwork Routing Service.

Step-by-step

1. Log on and enable in the Clearinghouse Service context.
2. Type **Stop Service** ⇐|.

```
Select choices
1  Clearinghouse Service
2  <service name>
Enter one or more choices:
```

3. Type the number for the Clearinghouse Service ⇐|.

```
CHS:Stop immediately? (Y/N):
```

4. Type **Y** at the "Stop immediately" prompt ⇐|.

   Y Stops the Clearinghouse immediately; all Clearinghouse Service functions are unavailable to the network.

   N Stops the Clearinghouse after all current activity ends.

```
   Stopping Clearinghouse Service.
   Clearinghouse Service functions are now unavailable to
   the network.
CHS!
```

5. Type **Add Domain** ⇐|.

```
Domain:
```

6. Type the fully qualified name of the domain you want to copy ⇐|.

```
Size = <number> pages
Copying Organization <name> to this CHS.  Confirm? (Y/N):
```

7. Type **Y** at the "Confirm" prompt ⇐|.

   Y Copies the organization.

   N Return to step 6.

```
Size = <number> pages
Copying Domain <domain:organization> to this CHS.
Confirm? (Y/N):
```

8. Type **Y** at the "Confirm" prompt ⇐|.

   Y Copies the domain.

   N Return to step 6.

```
   Done.
CHS!
```

9. Type **Start Service** ⇐|.

```
Select choices
1  Clearinghouse Service
Enter one or more choices:
```

10. Type the number for the Clearinghouse Service ⇐|.

```
    Starting Clearinghouse Service.
Clearinghouse Service functions are now available to the
network.
CHS!
```

11. Type **Show Domain** ⇐|.

```
Name:
```

12. Type the name of the domain you just copied ⇐|.

```
Size = <number> pages.
Administered by:
        <administrator's name:domain:organization>
Served by CHS:
        <CHS name>  <status>
CHS!
```

13. If the domain you copied contains entries, and if the resulting copy is 10 pages or smaller, **continue with step 14.**

    If the copy is larger than 10 pages, **skip to step 19.**

14. Type **Delete Domain** ⇐|.

```
Domain:
```

15. Type the name of the domain you just copied ⇐|.

```
Deleting Domain <domain:organization> from this CHS.
   Confirm? (Y/N):
```

16. Type **Y** or **N** at the "Confirm" prompt ⇐|.

    Y Confirms the deletion.

    N Return to step 15.

```
Warning: This is the only copy of <domain:organization>
   Confirm destruction of this domain? (Y/N):
```

17. Type **Y** or **N** at the prompt for reconfirmation ⇐|.

    Y Deletes the domain copy.

CAUTION: If you type **Y**, you permanently delete the domain.

    N Return to step 15.

```
Done.
CHS!
```

18. Repeat steps 2 through 13 to recopy the domain.

19. Log off.

Wrap-up

When the size of the domain copy matches that of the original domain, you have replicated the domain.

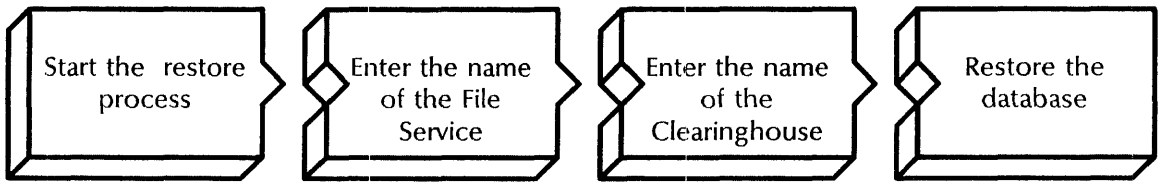
You may want to make a copy of this information for your records. If you are using Remote System Administration, use the Make Document or Make Screen option. Store a copy in the *Activities Guide*.

Example

This example shows replication of a domain named Detroit. The **Show Domain** command indicates that the domain was copied in its entirety.

```
CHS! Stop Service
    Select choices
    1   Clearinghouse Service
    2   Internetwork Routing Service
    Enter one or more choices: 1
    CHS:  Stop immediately? (Y/N): Y
    Stopping Clearinghouse Service.
    Clearinghouse Service functions are now unavailable to the network.
CHS!Add Domain
    Domain: Detroit
Size = 302 pages.
    Copying Organization Acme to this CHS.  Confirm?
    (Y/N): Y
    Size = 300 pages.
    Copying Domain Detroit:Acme to this CHS.  Confirm?
    (Y/N): Y
    Done.
CHS!Start Service
    Select choices
    1   Clearinghouse Service
    Enter one or more choices: 1
    Starting Clearinghouse Service
Clearinghouse Service functions are now available to the network.
CHS!Show Domain
    Name: Detroit
Size = 302 pages.
Administered by:
    System Administrators:Detroit:Acme
Served by CHS:
    Songbird (UP)
    Tonto (UP)
CHS!
```

Restoring a single Clearinghouse database



Use this procedure to restore a single Clearinghouse database.

CAUTION: Do not perform this procedure until instructed to do so in *Basic Network Troubleshooting*.

Prerequisites

- Know the name of the Clearinghouse Service you are restoring.
- Know the name of the File Service containing the backup copy of the Clearinghouse database. See the Clearinghouse Service Backup and Restore Worksheet in your *Activities Guide*.
- Update the Clearinghouse Service Backup and Restore Activity Log with the date and reason for the restore.

Step-by-step

NOTE

This procedure starts at the point indicated by the Clearinghouse chapter of *Basic Network Troubleshooting*.

1. Log on in the Clearinghouse Service context.
2. Type **Stop Service** ⇐|.

```
Select choices
1 Clearinghouse Service
2 <service name>
Enter one or more choices:
```

3. Type the number for the Clearinghouse Service ⇐|.

```
CHS:Stop immediately? (Y/N):
```

4. Type **Y** at the "Stop immediately" prompt ⇐|.

   Y Stops the Clearinghouse immediately; all Clearinghouse Service functions are unavailable to the network.

   N Stops the Clearinghouse after all current activity ends.

```
   Stopping Clearinghouse Service.
   Clearinghouse Service functions are now unavailable to
   the network.
CHS!
```

5. At the server running the Clearinghouse Service, type **Restore** ⇐|.

```
File Service:
```

6. Type the name of the File Service on which the Clearinghouse database was backed up ⇐|.

```
Enter the name of the service to be restored.
    Service name:
```

7. Type the name of the backed up Clearinghouse you want to restore ⇐|.

```
Opening connection to File Service...Done.
Retrieving database from the File Service...Done.
Restarting the Clearinghouse Service with the new database.
Opening Clearinghouse Service with the new database.
Opening Clearinghouse Service database.
The Clearinghouse database has just been restored; its name
may be wrong.
Please confirm or change this Clearinghouse Service's name.
    Name: <service name>
```

8. Press RETURN at the name prompt.

```
Service is registered.
Warning! The domain <domain:organization> is not
replicated.
Done. Clearinghouse database open.
Clearinghouse Service functions are now available to
network.
CHS!
```

9. Type **Start Service** ⇐|.

```
Select choices
1 Clearinghouse Service
Enter one or more choices:
```

10. Type the number for the Clearinghouse Service ⇐|.

```
    Starting Clearinghouse Service.
Clearinghouse Service functions are now available to the
network.
CHS!
```

11. Log off.

Wrap-up

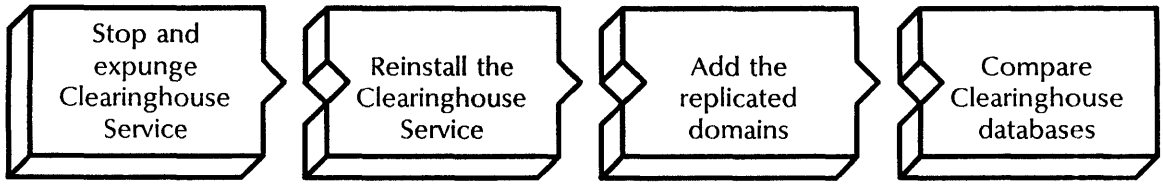
When you see the message "Clearinghouse Service functions are now available to network," you have restored the Clearinghouse database.

Example

This example shows the restoration of a Clearinghouse database.

```
CHS!Stop Service
Select choices
1   Clearinghouse Service
2   Mail Service
Enter one or more choices:  1
CHS:Stop immediately? (Y/N): Y
    Stopping Clearinghouse Service.
    Clearinghouse Service functions are now unavailable to the network.
CHS!Restore
    File Service:  Dartmouth:LA South
Enter the name of the service to be restored.
    Service name:  Melon
Opening connection to File Service...Done.
Retrieving database from the File Service...Done.
Restarting the Clearinghouse Service with the new database.
Opening Clearinghouse Service with the new database.
Opening Clearinghouse Service database.
The Clearinghouse database has just been restored; its name may be wrong.
Please confirm or change this Clearinghouse Service's name.
    Name:  Melon
Service is registered.
Warning!  The domain LASouth:GemSysCo is not replicated.
Done.  Clearinghouse database open.
Clearinghouse Service functions are now available to network.
CHS!Start Service
Select choices
1   Clearinghouse Service
Enter one or more choices:  1
    Starting Clearinghouse Service.
Clearinghouse Service functions are now available to network.
CHS!
```

Restoring replicated domains



Use this procedure to restore replicated domains and rebuild a Clearinghouse database. Perform this procedure only when directed to do so from *Basic Network Troubleshooting*.

Prerequisites

- Notify users that you will be stopping services
- Know the location of the replicated domains on the server. This information is located on the Clearinghouse Service worksheet in your *Activities Guide*.
- If you are using the **Compare Databases** command for the first time, know your network number and the processor number for the remote Clearinghouse. This information is on the Clearinghouse Service Backup and Restore Worksheet in your *Activities Guide*.
- Update the Clearinghouse Service Backup and Restore Activity Log with the date and reason for the restore.

Step-by-step

1. At the server running the Clearinghouse Service, log on and enable.
2. Type **Stop Service** ⇐|.

```
Select choices
1 Clearinghouse Service
2 <service name>
Enter one or more choices:
```

3. Type the numbers for all services (for example, 1-2) ⇐|.

```
<Service name>: Stop immediately? (Y/N):
```

4. For each service, type **Y** or **N** at the "Stop immediately" prompt ⇐|.

   Y Stops the service immediately; all service functions are unavailable to the network.

   N Stops the service after all current activity ends.

```
   Stopping <service name>.
   <service name> functions are now unavailable to the
   network.
CHS!
```

5. Boot the server.

   a. Hold down the Boot Reset (B RESET) and Alternate B (ALT B) buttons at the same time.

   b. Release the Boot Reset (B RESET) button.

   c. When the maintenance panel displays 0001, release the Alternate B (ALT B) button.

```
Normal startup? (Y/N):
```

6. Type **N** at the "CHS: Normal startup" prompt ⇐|.

   Y Normally starts and runs the Clearinghouse Service.

   N Starts the Clearinghouse Service, but requires user interaction for the non-normal startup options.

```
Enter interrupt point
1 Interrupt before opening primary volume
2 Interrupt before processing profile
3 Interrupt before running services
Enter one or more choices:
```

7. Type **3** for the "Interrupt before running services" option ⇐|.

```
Opening volume...done
Server attached to network number: <number>
Server Name:  <name:domain:organization>
Server Description: <description>
Validating server registration...Server entry validated.
>
```

8. Log on and enable.

```
!
```

9. Type **Expunge Service** ⇐|.

```
Select choice
1 Clearinghouse Service
2 <service name>
Enter one or more choices:
```

10. Type the number for the Clearinghouse Service ⇐|.

```
CHS: Confirm? (Y/N):
```

11. Type **Y** or **N** at the "Confirm" prompt ⇐|.

    Y Confirms the expunge.

    N Cancels the operation.

```
Destroy the domains known only to this server (Y/N):
```

12. Type **Y** to verify the destruction of domains and press RETURN. This prompt appears only if the domain is not replicated elsewhere on the network.

    Y Destroys the domains.

    N Cancels the operation.

```
Clearinghouse Service expunged.
>
```

13. Reboot the server ⇐|.

```
Normal startup? (Y/N):
```

14. Type **N** at the "Normal startup" prompt ⇐|.

    Y Normally start and runs the service.

    N Starts the service, but requires user interaction of the non-normal startup operations.

```
Enter interrupt point
1 Interrupt before opening primary volume
2 Interrupt before processing profile
3 Interrupt before running services
Enter one or more choices:
```

15. Type **3** for the "Interrupt before running services" option ⇐|.
16. Log on and enable again.
17. Type **List Services** ⇐|.

    - If the Clearinghouse Service is not listed, **proceed to step 18**.
    - If the Clearinghouse Service is listed, repeat steps 9 through 16 until you expunge the Clearinghouse Service.

18. Reinstall the Clearinghouse Service software by performing the procedure "Step 8. Installing the services" in the Server Software Installation chapter of the *Services Installation and Setup Guide*.
19. Type **Run Service** ⇐|.

```
Select option:
1   <service name>
2   <service name>
Enter choice:
```

20. Type the number for the Clearinghouse Service ⇐|.

```
Normal startup? (Y/N):
```

21. Type **N** at the "Normal startup" prompt ⇐|.

    Y Normally starts and runs the Clearinghouse Service

    N Starts the Clearinghouse Service, but requires user interaction for the non-normal startup options.

```
Select CHS non-normal option:
1   Expand database
2   Run, but don't start
Enter choice:
```

22. Type **2** for the "Run, but don't start" option ⇐|.

```
Name:
```

23. Type a new name for the Clearinghouse Service replacing the damaged Clearinghouse Service ⇐|.

NOTE

Use a name different from the one for the previous Clearinghouse Service. Renaming is important, because the old name remains in the database for 30 days after the expunge.

```
Is this the first Clearinghouse on the net? (Y/N):
```

24. Type **N** at the "Is this the first Clearinghouse on the net" prompt. This prompt appears only if the new Clearinghouse cannot contact another Clearinghouse.

NOTE

Determine why the other Clearinghouse cannot be reached. Resolve the problem, and begin again at step 13. This time, skip steps 17 and 18.

Y Initializes the database for the new Clearinghouse system.

CAUTION: Do not type **Y** if you are adding a new Clearinghouse to an existing internetwork. Doing so may destroy the entire Clearinghouse system and you will have to recreate it from scratch.

N Locates another Clearinghouse to obtain information about the Clearinghouse system of which the new Clearinghouse is becoming a member.

25. Type **Clearinghouse Service** to enter that context ⇐|.

26. Type **Add Domain** ⇐|.

```
Domain name:
```

27. Type the name of the first domain you want this Clearinghouse Service to serve ⇐|.

```
Size = <number> pages
Copying Organization <organization> to this CHS.
Copying Domain <domain:organization> to this CHS.
Confirm? (Y/N):
```

28. Type **Y** at the "Confirm" prompt ⇐|.

    Y Copies the domain.

    N Return to step 27.

```
Done.
CHS!
```

29. Repeat steps 26 through 28 for each domain to reside on the restored Clearinghouse Service.

NOTE

As you restore the domains you may need to increase the size of the Clearinghouse database. If so, perform the procedure "Expanding the Clearinghouse database" in the Clearinghouse Service chapter in the *Services Maintenance Guide*.

30. Type **Start Service** ⇐|.

```
Select choices:
1   Clearinghouse Service
2   <service name>
Enter one or more choices:
```

31. Type the number for the Clearinghouse Service ⇐|.

```
Starting Clearinghouse Service.
Clearinghouse Service functions now available to network.
CHS!
```

32. Type **Compare Databases** ⇐|.

```
Remote CHS name:
```

33. Do not type the name of the remote Clearinghouse containing the domain you copied. Simply press RETURN.

```
Enter remote CHS address:
Network Number:
```

34. Type the network number of the remote Clearinghouse ⇐|.

```
Processor Number:
```

35. Type the processor number of the remote Clearinghouse ⇐|.

```
Comparing Databases.
Done.  Databases are consistent.
CHS!
```

36. Repeat steps 32 through 35 for each Clearinghouse Service that serves the domain you just replicated.
37. Repeat steps 32 through 35 from the remote Clearinghouse Service to this Clearinghouse Service.
38. Type **Proceed** ⇐|.
39. Log off.

Wrap-up

When you compare databases for the last restored domain and see the message "Databases are consistent," you have rebuilt the Clearinghouse database.

Example

This example shows rebuilding a Clearinghouse database by restoring its replicated domain.

```
CHS!Stop Service
    Select choices
    1  Clearinghouse Service
    2  Internetwork Routing Service
    Enter one or more choices: 1-2
    CHS: Stop immediately? (Y/N): Y
    Stopping Clearinghouse Service.
    Clearinghouse Service functions are now unavailable to the network.
CHS!
IRS: Stop immediately? (Y/N): Y
Stopping Internetwork Routing Service.
Internetwork Routing Service functions are now unavailable to the network.
IRS!
Boot the server
    Normal startup? (Y/N): N
Enter interrupt point
1  Interrupt before opening primary volume
2  Interrupt before processing profile
3  Interrupt before running services
Enter one or more choices: 3
Opening volume...done
Server attached to network number:  1-105
Server Name:  Panama:OurDomain:OurOrg
Server Description:  CHS and IRS server
Validating server registration...Server entry validated.
>Logon
    User Name:  Nancy User
    Password:  ***
>Enable
!Expunge Service
Select choice
1  Clearinghouse Service
2  Internetwork Routing Service
Enter one or more choices: 1
CHS: Confirm? (Y/N): Y
Destroy the domains known only to this server? (Y/N): Y
Clearinghouse Service expunged.
Reboot the server
CHS: Normal startup? (Y/N): N
                                                    Screen continued
```

```
Enter interrupt point
1  Interrupt before opening primary volume
2  Interrupt before processing profile
3  Interrupt before running services
Enter one or more choices: 3
>Logon
    User Name:  Nancy User
    Password:  ***
>Enable
!List Services
Reinstall the Clearinghouse Service
!Run Service
Select option
1  Clearinghouse Service
2  Internetwork Routing Service
Enter choice: 1
    CHS:  Normal startup? (Y/N):  N
Select CHS non-normal option:
1   Expand database
2   Run, but don't start
Enter choice: 2
Name:  NewCHS
!Clearinghouse Service
CHS!Add Domain
    Domain:  Los Angeles
Size = 902 pages
Copying Organization Acme to this CHS.
Copying Domain Los Angeles:Acme to this CHS.  Confirm?  (Y/N):  Y
Done.
CHS!Start Service
    Select Choices
    1   Clearinghouse Service
    2   Internetwork Routing Service
    3   File Service
    Enter one or more choices:  1
Starting Clearinghouse Service.
Clearinghouse Service functions are now available to network.
CHS!Compare Databases
    Remote CHS name:
    Enter remote CHS address:
    Network Number:  1-703
    Processor Number:  12-584-766-232
Comparing Databases.
Done.  Databases are consistent.
CHS!Proceed
```

5. File Service

This chapter helps you prepare to manage and perform the File Service backup and restore procedures.

This information is based on services release version 11.0. The procedures are available using an 8000 or an 8090 server.

The PC File Service (PCFS) uses the same backup and restore software as the File Service.

Overview

This section describes how File Service backup and restore works and reviews your role as System Administrator.

The File Service stores information that is critical to the network and its users. The types of information include:

- File drawers containing folders and documents
- File drawers containing backup information for other services (such as the server profiles for every server on your network)
- Complete directories of information for personal computer users on your network
- 6085/8010 desktops for workstation users

Backup protects you from losing this information. If you regularly back up the File Service, you can restore it as necessary using the restore operations. There are two types of backup and restore operations: full and selective.

When a File Service runs on a server, that server is called a file server. The 8000 server running File Service can be a single-drive server, with a 10 Mb, 29 Mb or 42 Mb fixed drive, or a multiple-drive server that supports any combination of up to 4 80 Mb and 300 Mb removable or fixed disk drives. The 8090 server running File Service may be a single-drive server, with a 25 Mb or 85 Mb fixed drive, or a multiple-drive server supporting up to seven devices. These devices can be a combination of high-capacity cartridge tape drives or high-capacity rigid disk drives. An 8090 server can only support four tape drives.

In the File Service, each drive is called a filing volume or simply a volume. There are two types of volumes: primary and auxiliary. A primary volume contains the File Service, backup and restore software, and user information. An auxiliary volume contains only user information.

Information on a volume is stored in file drawers. Workstation users can put file folders or individual documents in a file drawer.

A volume that stores File Service backup information is called a backup volume. Each backup volume has one File Service backup file drawer. A collection of volumes that accept File Service backup information is called a backup volume group.

Backup can be automated so that you do not need to interact with the software or backup media each time backup runs. However, you should still perform regular administrative tasks such as checking the backup completion status and promptly replacing full media. See "System Administrator duties" for more information about administrative tasks.

How full backup works

A full backup saves all File Service information. There are three types of full backup operations:

- A series of incremental backups
- A complete backup, performed by using a zero-day cycle incremental backup or a copy volume operation
- A copy volume operation combined with a series of incremental backups

Incremental backup

An incremental backup copies the portion (or backup increment) of the File Service information that has

- Changed,
- Been added since the last incremental backup was run, or
- Not been backed up in *n* days, where *n* is the number of days in the cycle.

Because only a portion of the File Service information is copied, incremental backup takes less time and less storage media than a complete backup. Your storage medium may be rigid disk, floppy disk, cartridge tape, or high-capacity cartridge tape.

A backup increment is created in parts called split increments. Each split increment contains a list, called a split increment index. The split increment index lists all files considered for backup in that split increment that existed on the volume when backup was run.

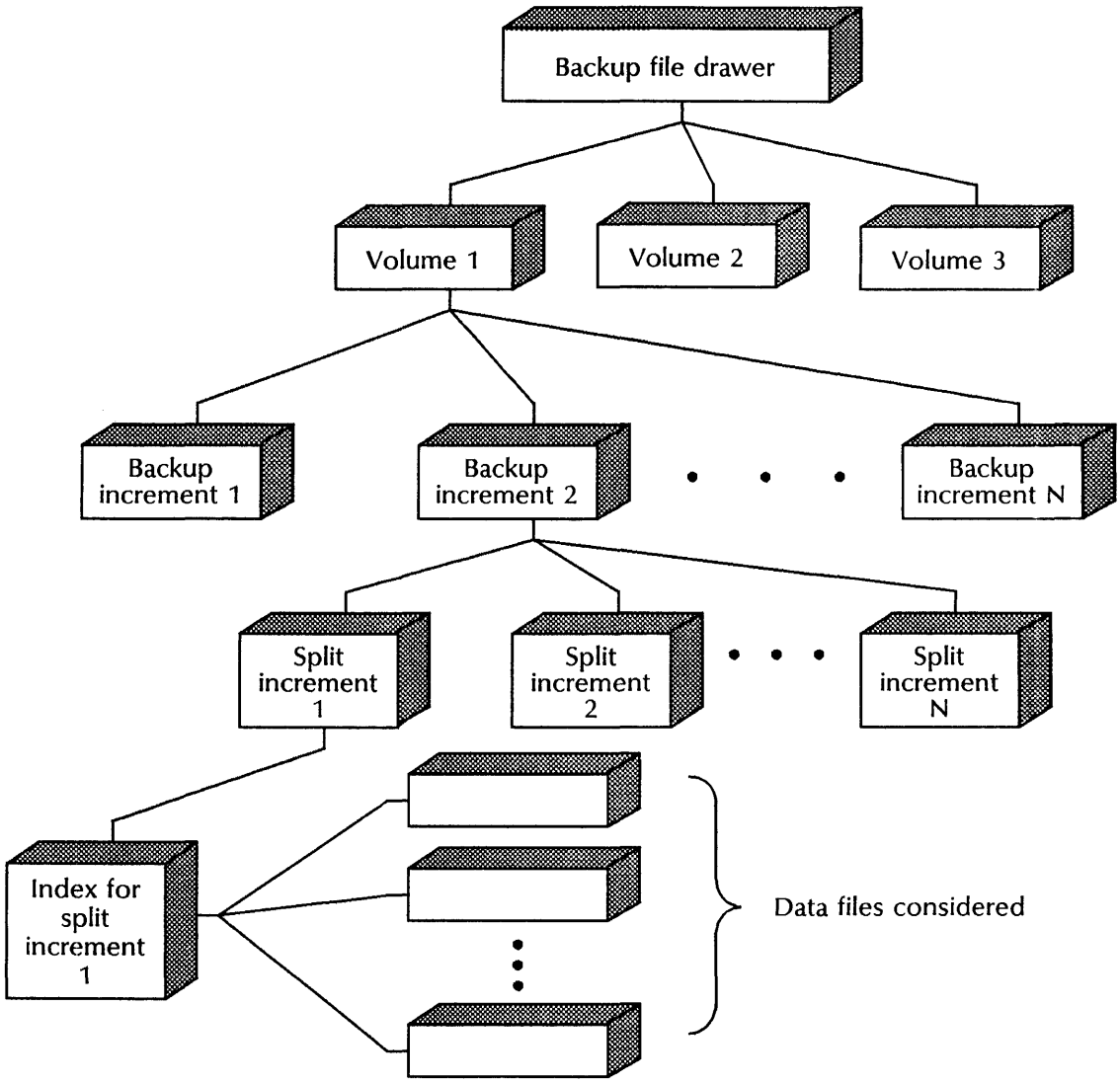
All backup increments are listed in the backup increments log. For each increment, the log includes the type of medium used, the backup date, the name of the backup medium, and the completion status. You can use the backup increments log to check whether incremental backup completed successfully and to identify the increments to be restored.

You can run incremental backup either automatically or manually. You cannot run automatic backup to floppy disks, because you must be at the server to insert the floppy disks as needed.

You can run incremental backup in background or foreground mode. Background mode lets you use other commands at the server while backup is running. Foreground mode dedicates the server to the backup operation; however, you can use Remote System Administration to access other commands. Automatic backup always runs in the background mode.

Figure 5-1 shows the structure of a backup increment.

Figure 5-1. **Backup increment structure**

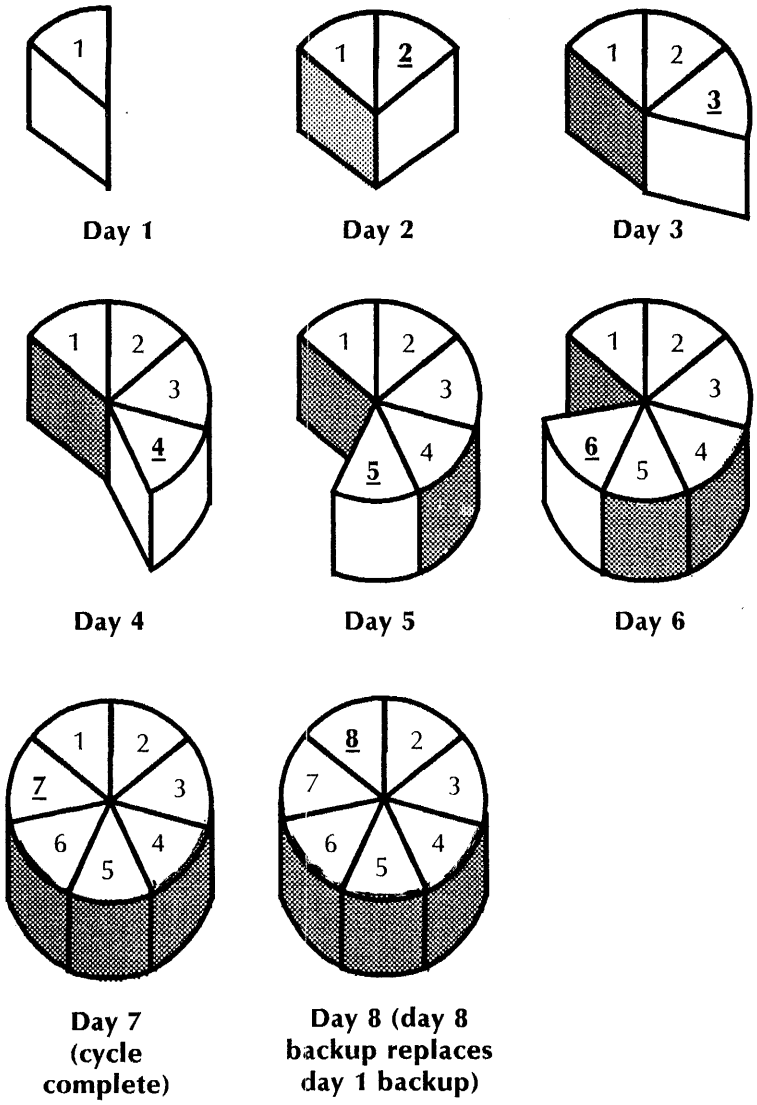


The backup software uses the backup epoch date and the backup cycle information to determine which files to back up. A file created or modified before the epoch date is not backed up. A file created or modified after the epoch date is backed up and is listed in the split increment index with a ModifiedOn date.

The backup cycle determines how many days pass before an unmodified file is backed up again. If you use a seven-day cycle, all files are backed up at least once every seven days, regardless of how often incremental backup is run. If you use a zero-day cycle, all files are backed up during each incremental backup.

Figure 5-2 shows how all the files on a volume are backed up during a seven-day cycle. Note that on day 8, the cycle starts over again. On day 8, any files changed since day 7, and any files left unmodified since day 1 are backed up. Day 8 is not a complete backup.

Figure 5-2. **Backup cycle example (cycle = 7 days)**



Certain files, such as help and training documents, application software, installation drawers, and system software (except the server profile) are never backed up by incremental backup. If necessary, you can restore these files from the original source (installation floppy disks or cartridge tape).

Backup data from other service databases, such as the Clearinghouse Service or the Mail Service is also not backed up. You can preserve the backup data from other service databases by performing a complete backup using the copy volume operation.

Files that should not be backed up have a hidden value NeverBackup for their BackedUpOn attribute. The backup software detects this value and ignores the files. You cannot change the NeverBackup value.

Complete backup

A complete backup copies all the information on the File Service to your backup storage medium at one time.

You can perform a complete backup using incremental backup with the cycle set to zero (0) days or using the copy volume operation.

A zero-day cycle incremental backup takes much longer than an incremental backup with a cycle of five to seven days. Depending on the size of the File Service volume, a zero-day cycle incremental backup could take up to 13 hours (remote rigid disk). Run a zero-day cycle incremental backup only when there is little demand for system resources.

Your backup storage medium may be rigid disk, floppy disk, cartridge tape, or high-capacity cartridge tape. Floppy disks are used for 10 Mb, 29 Mb, and 42 Mb backups. Floppy disk is not recommended for zero-day cycle incremental backup because of the large number of floppy disks needed. For example, you need approximately 80 floppy disks to back up a File Service volume on an 80 Mb server, and 300 floppy disks for a volume on a 300 Mb server.

A copy volume operation is much faster than a zero-day cycle incremental backup. The copy volume operation makes a complete copy of File Service volume in 45 minutes to four hours, depending on the size of the volume. You can perform copy volume only on multiple-drive servers.

To use the copy volume operation, the volume to be backed up (the source volume) and the backup storage medium (destination volume) must be a fixed or removable rigid disk. The source and destination volumes must be on the same server.

Copy volume combined with incremental backup

You can combine the benefits of the copy volume operation with those of incremental backup. This type of backup operation:

- Shortens the time required to make a complete copy of the File Service volume
- Shortens the time required for subsequent incremental backups, because fewer days exist between the epoch date and the current date
- Requires less storage medium
- Makes restore operations easier and faster

As an example, assume you are using incremental backup to cartridge tape. You set the epoch date to the date you installed the File Service volume, specify a backup cycle of seven days and a frequency of one. Backup runs each night and one cartridge tape is required each night. At the end of every cycle, you have 7 tapes to track. If the system crashes during the backup on the ninth night, it could take up to 10 hours to restore 7 tapes.

If you combined copy volume with incremental backup, you would perform a copy volume operation on the first night. Then you could change the epoch date to the date of the copy volume.

The next seven nights, you would run incremental backup. At the end of the cycle, you have one copy volume drive and 7 cartridge tapes. On the ninth night, you perform another copy volume to capture all the information. You can then reuse the cartridge tapes.

If the system crashes during the backup on the eleventh night. you would first restore the File Service volume from the copy volume pack. Then you would restore the backup tape generated on the tenth night. This restore operation would take about five hours.

How selective backup works

Selective backup, also called the copy container operation, lets you copy file drawers, desktops, documents, and the like onto floppy disk, cartridge tape, or high-capacity cartridge tape (you cannot use a rigid disk).

The copy container operation does not affect the incremental backup procedures in place for a volume.

How full restore works

You can perform a restore procedure to recover from damage to or loss of the File Service.

A full restore operation recovers all information that was lost. The problem that caused the loss determines whether you need to restore the entire volume or only a portion of it.

When you restore an entire volume, the volume you are restoring to, which is the destination volume, may still contain some files. The restore operation does not erase the contents of the destination volume, because it assumes you want to save any files already on that volume.

You can fully restore a File Service volume from any backup storage medium. The way you restore a volume depends on the backup procedure you used:

- With a complete or copy volume backup, simply copy the entire backup volume to the destination volume if the destination volume does not contain any files.
- With a copy volume combined with incremental backup, first restore the copy pack containing the destination volume and then restore the backup increments
- With an incremental backup, restore a complete cycle of backup increments

The restore operation processes the backup increments in reverse order to recreate the most recent state of the volume. It then restores the files that were backed up earlier and whose contents had not been modified.

How selective restore works

You can selectively restore data generated by incremental backup or the copy container operation. The data includes: directories, file drawers, folders, desktops, and documents that have been deleted.

When you selectively restore from incremental backup, use the backup increments log for the volume to locate the floppy disks, tapes, or the rigid disks containing the increments you need. The operation restores only the directory or file you specify, not all files in the increment. The backup increments log is not useful if:

- The source volume has been completely lost
- You are restoring the data to a new disk volume
- The backup increments log file is lost

The selective restore operation processes the increment data in reverse chronological order.

Services release version compatibility

Some services release versions can restore data backed up by other versions. For example, services release versions 10.0 and 11.0 can restore data backed up using version 8.0 or 9.0.

Table 5-1 summarizes the backup and restore compatibility of the services release versions in use.

Table 5-1 **Services release version backup and restore compatibility**

Allowed for restore operation	Used for backup operation			
	Pre-version 8.0	**Versions 8.0 and 9.0**	**Version 10.0**	**Version 11.0**
Pre-version 8.0	Yes	No	No	No
Versions 8.0 and 9.0	Yes	Yes	No	No
Version 10.0	No	No	Yes	No
Version 11.0	No	No	Yes	Yes

System Administrator duties

As System Administrator, your duties and responsibilities include:

- Completing and maintaining the File Service Backup Worksheet.
- Setting backup parameters that adequately protect the information on each File Service volume.
- If you are backing up to rigid disk, establishing a backup volume and a backup volume group, and creating a backup file drawer.
- If you are backing up to removable disk pack, formatting and partitioning the disk packs before you need them.
- If you replace a removable disk pack that is serving as a File Service volume for automatic backup, setting backup parameters again to enable automatic backup of the new File Service volume.
- If you are backing up to cartridge tape, formatting cartridge tapes before you need them.
- Checking that each automatic or manual backup completed successfully.
- Rerunning each backup that did not complete successfully.
- Updating the File Service Backup Activity Log.
- Managing your backup media resources.
  - properly labeling and storing all removable disk packs, floppy disks, cartridge tapes, and high-capacity cartridge tapes.
  - deleting obsolete backup increments.
- Restoring the File Service volume as needed.
- Restoring accidentally deleted files as needed.
- Troubleshooting the backup and restore operations for the File Service as described in *Basic Network Troubleshooting*.

File Service Backup Worksheet

Use the File Service Backup Worksheet to record server-related and service-related information. The worksheet is at the end of this chapter.

Fill out a separate copy of the worksheet for each File Service for which you have System Administrator responsibility. Retain the original worksheet for future use, and store the completed worksheet in your *Activities Guide*.

Using the worksheet

Before you perform any backup or restore procedure, complete the File Service Backup Worksheet. It is important that you fill out the worksheet accurately and update it whenever changes occur.

The completed worksheet saves you time as you perform the backup and restore procedures. It also serves as an information source for new System Administrators unfamiliar with your network configuration.

Filling out the worksheet

As you read this chapter, you are directed to make entries on the File Service Backup Worksheet. The worksheet section number appears with these directions, so you know where to make each entry.

Use section ① for information about the server and the services installed on the server. Copy this information, including the name of the File Service, from the File Service Worksheet and from the Services Installation Worksheet you filled out while reading the *Guide to System Administration Activities*.

Use section ② for general File Service backup parameters that do not depend on storage medium.

Use section ③ for parameters specific to rigid disk, and section ④ for parameters that apply to rigid disk, cartridge tape, or high-capacity cartridge tape. Use section ⑤ for additional information for high-capacity cartridge tape only. Use section ⑥ for information about rigid disk copy volume operations.

File Service Backup and Restore Activity Log

Use the File Service Backup and Restore Activity Log to keep track of the backup and restore operations you perform. The log is at the end of this chapter.

Make several copies of the log to keep by the server running the File Service.

Whenever you back up or restore the File Service, record your activity on the log. Store completed logs in the *Activities Guide* for easy reference.

Planning for setup

Before you can back up the File Service, you must set parameters to control the backup process. The parameters you define depend on what backup media you are using. If you are not using incremental backup, you do not need to set these parameters. If you are performing copy volume, you do not need to set the parameters.

As you select the parameter values for a volume, think about the following questions:

- How important is the information on this volume? What would happen if some of this information were lost?
- If your backup medium is rigid disk, how much space is available on the backup volume for storing increments from this File Service volume?
- How often do the files on this volume change?
- If you lost data on the File Service volume, how long could your users wait to access the File Service while you restored the volume?

After you set the backup parameters, their values become the defaults for the volume. You can display the backup parameters for a volume, and you can change them at any time. You can also temporarily change parameters when you want to run a manual backup.

To set backup, you must:

- Add a backup volume group and a backup user
- Prepare a backup file drawer
- Set the backup parameters

If you are using rigid disk as your backup medium, perform all three steps. If you are using floppy disk or cartridge tape, just set the backup parameters.

Table 5-2 briefly describes each parameter and indicates the backup media it affects.

Table 5-2. **Backup parameters**

Parameter	Definition	Media			
		Rigid disk	Floppy disk	Tape	HCC Tape*
Medium	The type of medium you use to store backup data	X	X	X	X
Tape device	The number of the high-capacity cartridge tape device in a tape chaining sequence				X
Epoch	The date and time after which new and changed files are backed up during incremental backup	X	X	X	X
Cycle	The number of days during which the complete File Service volume is backed up	X	X	X	X
Backup volume group name	The group in the Clearinghouse that identifies a set of backup volumes; you can use any volume in the group as a backup volume for the File Service volume	X			
Backup file drawer name	The file drawer where the backup data is stored	X			
Backup user name and password	The name and password of the user responsible for backup operations	X			
Automatic backup	Whether or not backup runs automatically	X		X	X
Backup start time	The time of day when automatic backup starts	X		X	X
Backup stop time	The time of day when automatic backup stops	X		X	X
Frequency	The number of days between automatic backups	X		X	X
Background mode	Whether or not backup runs in background mode	X		X	X

*High-capacity cartridge tape.

Defining the backup parameters

The backup parameters control the incremental backup process for each File Service volume.

Storage medium

To select the most appropriate backup medium, consider the media your hardware configuration supports and how much information you will back up.

Rigid disk - If you are backing up large amounts of data and you do not have cartridge tape or high-capacity cartridge tape capability, back up to rigid disk, if possible. Rigid disk also allows automatic backup.

If you have a fixed rigid disk and a removable rigid disk, use the removable disk for backup. If a fixed disk becomes full, you must add another drive to the system.

Backup to rigid disk stores data in a file drawer on a specified volume. See "Backup volume group and backup volume names" and "Backup file drawer name" later in this chapter.

Floppy disk - If your network includes 8000 servers, you can run backup to floppy disk. Backup to floppy disk is most practical for small amounts of backup data, or when a rigid disk or a tape drive is not available. You can run only manual backups to floppy disks.

Cartridge tape - If your network includes 8090 servers, you can run backup to cartridge tape. Cartridge tape is an excellent backup medium, offering the portability of floppy disk with more storage capacity. Each cartridge tape can store approximately 90,000 disk pages of information. You can run backup to cartridge tape automatically or manually.

High-capacity cartridge tape - If your network includes 8090 servers, you can run backup to high-capacity cartridge tape. High-capacity cartridge tape offers the portability of floppy disk and cartridge tape, but with much greater storage capacity than either medium. You can run backup to high-capacity cartridge tape automatically or manually.

If you have more than one high-capacity cartridge tape device connected to your server, you can run backup to up to four tape drives using a process called tape chaining. With tape chaining, you can set backup to continue using another tape device when the tape in the current device becomes full. This feature enables you to back up automatically as much information onto portable high-capacity cartridge tapes as onto rigid disk.

Use a different backup tape (either cartridge or high capacity) for each File Service volume, so that each backup tape contains data from one source volume. This will make managing the tape media easier, with a set of backup tapes for each File Service volume. If you back up more than one File Service to a single tape, such tasks as determining obsolete tapes become more complicated, and you have to use more tapes to restore a File Service.

Related procedure: Setting backup parameters

Filling out the worksheet:

② Record the type of backup medium you are using.

⑤ Record the high-capacity cartridge tape chaining sequence.

Epoch

Epoch is the date and time after which new and changed files are backed up incrementally. Files created or modified before the epoch are not backed up. If you combine copy volume with incremental backup, the epoch date is the date and time of the last copy volume operation.

Related procedure: Setting backup parameters

Filling out the worksheet:

② Record the date and time of the backup epoch.

Cycle

Cycle is the number of days during which a complete set of backup increments is generated. You must save all backup media for one cycle. For example, if you are using a seven-day cycle, keep all the increments made during that seven-day period.

As you select a backup cycle, consider:

- How much time it takes to perform a backup
- How much time it would take to restore the File Service
- The backup medium resources available
- How often the information on the File Service volume changes

Time for backup - An incremental backup with a short cycle takes much longer than a backup with a long cycle. The exact amount of time depends on the size of the File Service volume, how much of the volume is in use, and how much information has changed.

Do not use the time for backup as the deciding factor in choosing a cycle. If you do not have time for a manual backup, run an automatic backup to rigid disk or tape.

The backup cycle should never exceed 30 days. For 300 Mb or 310 Mb disks, the backup cycle should not exceed seven days, because of the amount of backup data that must be retained and the time it would take to restore the data.

Time for restore - When you restore a File Service, you must restore a full cycle of increments. If you run backup every day with a seven-day cycle, you would need to restore seven increments, which may take several hours. If you run backup every day with a 30-day cycle, you would need to restore 30 increments, which may take several days.

Availability of backup medium resources - A longer cycle uses more backup medium resources, which you must then track and store. If you are backing up to rigid disk, this tracking is fairly simple. However, if you are backing up to floppy disk or tape,

you must set up a storage system so you can locate floppy disks or tapes when you need them.

Changing information - Only you can decide the correct cycle length to protect the changing information on a File Service volume. As a guideline, if 5 percent or more of the information on the volume changes daily, use a cycle of five to seven days.

Use the File Service **Show Statistics** command over a period of time and check the "Total Store operations" parameter to determine how often the information changes.

Related procedure: Setting backup parameters

Filling out the worksheet:

② Record the number of days in the backup cycle.

Backup volume group and backup volume names

The backup volume group name identifies a set of volumes used to store backup data. If you have only one backup volume, that volume is the only member of the backup volume group. If you do not back up to rigid disk, you do not set this parameter.

If your network has only one backup volume group, the suggested group name is Backup Volumes. If all the volumes on a multiple-drive server are backed up to the same backup volume group, the suggested group name is <server name> Backup Volumes.

Because backup volumes are File Service volumes, you must name them so they can be registered in the Clearinghouse. Each name should reflect the data that the volume contains, such as <service name> Backup or <server name> Backup. Use unique names for all backup volumes. If volumes have the same name, you cannot easily restore increments or delete obsolete increments.

A large network may have many backup volumes. All backup volume names appear when a user lists File Service names within a domain. Because users are typically not interested in backup volumes, add a "z" at the beginning of backup volume names so that they appear together at the end of the alphabetical list.

The backup volume group description is optional, but may help to identify the group.

Related procedure: Adding a backup volume group and a backup user

Filling out the worksheet:

③ Record the name and description of the backup volume group.

Record the names of the backup volumes.

Backup file drawer name

Every backup volume must have a backup file drawer. If you do not back up to rigid disk, you do not set this parameter.

Give the backup file drawer a name that clearly describes its purpose.

Each file drawer is associated with an internetwork user, known as the owner of the file drawer. The backup user must have full access to the backup file drawer. Users and group members who will have drawer ownership or access must be registered in the Clearinghouse.

Related procedure: Preparing a backup file drawer

Filling out the worksheet:

③ Record the name of the backup file drawer.

Set the page limit of zero (0) for the file drawer.

Record the names of the Domain Administrators who will have access to the file drawer.

Backup user name and password

The backup user name and password identify the entity responsible for backup and restore operations. This entity need not be an actual user. If you do not back up to rigid disk, you do not set this parameter.

If your organization has more than one System Administrator managing these operations, add a backup user name to the Clearinghouse. All System Administrators can use the name to perform backup and restore operations. The suggested name is Backup User. You can also enter an alias for the user.

To ensure that only authorized individuals perform backup and restore operations, assign a unique password.

You can also enter a description for the user (optional), the user's home File Service on which the user will store his or her 6085/8010 desktop, and an alias.

If you do not create a special backup user, designate an actual user to handle backup and restore activities. Specify that user's name and password as backup parameters. The backup user must have access privileges to the backup file drawer.

Related procedure: Adding a backup volume group and a backup user

Filling out the worksheet:

③ Record the name of the backup user, a description, the home File Service, an alias, and domain name.

Run backup automatically

You can initiate backup manually or, for rigid disk and tape, program it to run automatically. If you select automatic backup, you must also set the backup start time, backup stop time, and frequency parameters. If you do not select automatic backup, you must start each backup manually.

See "Frequency" later in this section to determine how often to run manual backup.

Start time - When you run automatic backup, you must set a time, using a 24-hour clock, for the backup to start. Specify a time when the system is not busy; for example, at 2 a.m. If you

are automatically backing up several File Services to the same backup volume, stagger the backup start times by two to four hours.

Stop time - Backup stop time is the time, using a 24-hour clock, when you want automatic backup for a rigid disk to end. Set this parameter only if you need to stop automatic backup at a certain time, whether or not the backup is complete. If you do not set a backup stop time, backup runs until completion or until you stop it manually. The benefit of setting a stop time is that you can ensure that backup runs only when the system is not busy.

CAUTION: Setting the stop time parameter may cause incomplete increments to be created. Incomplete increments make the restore operation difficult and time consuming.

Related procedure: Setting backup parameters

Filling out the worksheet:

④ Circle whether backup will run automatically.

Record the start and stop times for automatic backup.

Frequency

Frequency determines how often an automatic backup is run. If you do not use automatic backup, you do not set this parameter. Instead, you must run manual backup often enough to protect File Service data.

To determine how often to run automatic or manual backup, consider these points:

- Backup frequency depends on how often the files change. If users change their files every day, run backup daily to ensure that changes are not lost.
- You can only restore the File Service to its state when you last ran backup. If you run backup frequently, the last backup will be close to the current state of the File Service.
- Running backup often creates smaller increments. Backup runs faster if the increment is small.
- If you run backup frequently, the total size of the increments in a cycle is greater than if you run backup less frequently during that cycle. The greater size results because changing files are backed up more often. The more backup increments you have, the more backup medium resources you need.
- Running backup frequently requires more maintenance time for tasks such as replacing disk packs, changing tapes, and deleting obsolete increments.
- Running backup frequently may slow system response, because backup competes with other functions for resources on the server.

Related procedure: Setting backup parameters

Filling out the worksheet:

④ Record the number of days between backups (frequency).

Background mode

Backup can run in background or foreground mode. You can set this parameter only if you perform manual incremental backup. Automatic backup always runs in background mode. If you back up to floppy disk, you do not set this parameter.

If your backup medium is rigid disk or a chain of high-capacity cartridge tape devices, run incremental backup in the background.

If you are using cartridge tape, run incremental backup in the foreground unless you are sure that one tape will store one increment.

Related procedure: Setting backup parameters

Filling out the worksheet:

④ Circle whether you will run backup in background mode.

Planning for backup

If your backup medium is rigid disk, you need to determine the number of backup volumes you need and ensure the availability of adequate space on them. If you are backing up with floppy disks or cartridge tapes, make sure that you have enough of them. You can reuse floppy disks or cartridge tapes containing obsolete increments.

Backup options for an 8000 server

Table 5-3 shows the recommended backup options for an 8000 server. Once you have determined your server disk size and backup option, refer to Table 5-5 to establish the backup times.

Table 5-3. **Backup options for an 8000 server**

Server disk	Backup options
10, 29, 42 Mb	• Incremental backup to floppy • Automatic incremental
80, 300 Mb (single drive)	• Regular incremental backup
80, 300 Mb (multiple-drive)	• Periodic copy volume with regular incremental backup (local or remote, using epoch feature) • Regular incremental backup (local disk)

Backup options for an 8090 server

Table 5-4 shows the recommended backup options for an 8090 server. Once you have determined your server disk size and backup option, refer to Table 5-6 to establish the backup times.

Table 5-4. **Backup options for an 8090 server**

Server disk	Backup options
25, 85 Mb	• Incremental backup to cartridge tape • Incremental backup to remote disk (removable)
310 Mb (single drive, installed)	• Incremental backup to cartridge tape • Incremental backup to remote disk (removable)
80, 300 Mb (multiple-drive, peripheral)	• Incremental backup to high capacity cartridge tape • Incremental backup to cartridge tape • Incremental backup to remote disk (removable)

Determining the number of backup volumes

You need to determine the number of backup volumes required for the copy volume operation. The number depends on how many File Service volumes will be backed up and volume turnover. The number of File Service volumes you back up to one backup volume depends on the quantity and characteristics of the data being backed up.

Volume turnover occurs whenever a backup volume becomes full. You must then replace the volume or create space on it by deleting obsolete backup increments.

If you combine copy volume with incremental backup, devote at least one drive on a multiple-disk server to backup. If the disk is removable, you can alternately use the drive for the disk packs you need for copy volume and for incremental backup.

You cannot use the copy volume operation with incremental backup when you are backing up a volume on a single-drive server.

Depending on the File Service activity, you may need only one backup volume for each multiple-drive server. If you have several single-drive servers, you may need to devote one or more servers to backup data, depending on the number of File Service volumes to be backed up.

The capacity of the backup volumes should be at least twice the capacity of the File Service volumes being backed up.

Ensuring adequate space for backup data

When backup runs automatically, check the completion status after each backup. Be sure that the backup completed successfully, and that the backup medium has enough room for the next increment.

When you store backup increments on a rigid disk, use the Services System Software **List Volumes** command to see how much space is left on the disk. See the Services System Software chapter in the *Services Maintenance Guide* for more information.

If a backup volume on a fixed rigid disk becomes full, you must delete obsolete backup increments. Then use the **List Volumes** command to see if the disk has enough space. If the disk still does not have enough space, consider increasing the number of volumes in the backup volume group containing the full volume.

If a backup volume on a removable rigid disk pack becomes full, use the **Delete Obsolete Backup Increments** command to free disk space. If this does not provide adequate space, replace the full disk pack with an empty disk pack. Label the full pack with its name and note that the pack is a backup volume. Store the pack until you need it for a restore operation, or until the data it contains is obsolete. You can reuse disk packs.

Each floppy disk can contain only one split increment, so you need not monitor the space on a floppy disk. Reuse floppy disks when the increment contained on a set of floppy disks is obsolete.

Determining the number of backup cartridge tapes

To determine how many tapes you will need for each File Service volume you must:

- Determine how many tapes you will need for a full set of backup increments
- Add additional tapes for safety and storage

Estimating backup increments

A full set of backup increments is the number of tapes created during a cycle. You can estimate this from the number of increments per tape, and from the cycle and frequency backup parameters.

To determine the number of increments per tape, you must estimate how much data is stored within each increment. This depends on:

- The cycle
- The frequency
- How full the service is
- The percentage of data that changes between each backup

Because the capacity of a high-capacity cartridge tape varies from 70 to 130 Mb, you can only estimate the amount of data each tape can hold. For your calculations, use an average of 100 Mb capacity for each tape. Use 48 Mb capacity for cartridge tape calculations.

Once you determine how many increments each tape will hold, you can determine the total number of tapes you need for a full set of increments using this formula:

(cycle/frequency) x (tapes per increment) = number of tapes

For example, for a five-day cycle, with a frequency of 1, and 3 estimated increments per tape, you would need (5/1) x (1/3) = 2 tapes. For a five-day cycle with a frequency of 1, and 1 increment per tape, you would need (5/1) x (1) = 5 tapes.

You cannot determine the amount of space left on a high-capacity cartridge tape. Use the **Show Backup Index** command to determine the amount of space left on a cartridge tape. Reuse a cartridge tape or high-capacity cartridge tape when all the increments on the tape are obsolete.

Adding additional tapes

Once you know how many tapes you need for a full set of increments, add two more tapes to your total count. One of these additional tapes is for safety, in case your estimates are too low for a particular cycle of increments. The other tape is for the next time backup runs, since you cannot reuse a tape until the increments stored on it become obsolete.

Examples

These examples show how to determine the number of tapes required for different backup configurations. In each example, all increments are completed successfully. If the most recent increment did not complete successfully, you would have to store an additional increment to make a full set.

Example 1

310 Mb File Service (237 Mb user data)
75% full, cycle 5, frequency 1
Backup medium: High-capacity cartridge tape
25 % of the volume is backed up with each increment.

Calculations:

237 Mb x 75% x 25% = 44.4 Mb data backed up each day

100 Mb average capacity per tape /44.4 Mb = 2 increments per tape

(cycle/frequency) x (tapes per increment) = number of tapes

(5/1) x (1/2) = 3 tapes

Plus one tape for safety

Plus one tape for the next time backup runs

Total: 5 tapes (estimated)

Example 2

310 Mb File Service (237 Mb user data)
75% full, cycle 5, frequency 1
Backup medium: High-capacity cartridge tape
50 % of the volume is backed up with each increment.

Calculations:

237 Mb x 75% x 50% = 89 Mb data backed up each day

100 Mb average capacity per tape /89 Mb = 1 increment per tape

(cycle/frequency) x (tapes per increment) = number of tapes

(5/1) x (1) = 5 tapes

Plus one tape for safety

Plus one tape for the next time backup runs

Total: 7 tapes (estimated)

Example 3 80 Mb File Service (52 Mb user data)
75% full, cycle 5, frequency 1
Backup medium: Cartridge tape
30% of the volume is backed up with each increment

Calculations:

52 Mb x 75% x 30% = 11.7 Mb data backed up each day.

48 Mb average capacity per tape /11.7 Mb = 4 increments per tape

(cycle/frequency) x (tapes per increment) = number of tapes

(5/1) x (1/4) = 1 tape

Plus one tape for safety

Plus one tape for the next time backup runs

Total: 3 tapes (estimated)

Estimating backup time and media requirements for an 8000 server

Backup operations for an 8000 server will take varying amounts of time and backup media, depending on your configuration, the type of backup you are running, and how full your server is. Use Table 5-5 as a guideline for determining your activities.

Table 5-5. **Backup requirements, 8000 server**

Server disk	Incremental backup			Copy volume
	Floppy	Local disk	Remote disk	
10 Mb	4 floppies Max: 15 minutes Typical: 3 minutes	Not supported	1 disk pack Max: 1 hour Typical: 15 minutes	Not supported
29 Mb	20 floppies Max: 1 hour Typical: 10 minutes	Not supported	1 disk pack Max: 2 hours Typical 30 minutes	Not supported
42 Mb	30 floppies Max: 2 hours Typical: 20 minutes	Not supported	1 disk pack Max: 3 hours Typical: 45 minutes	Not supported
80 Mb	Not applicable	2 disk packs Max: 3 hours	2 disk packs Max: 4 hours	2 disk packs Max: 1 hour Typical: 30 min.
300 Mb	Not applicable	2 disk packs Max: 12 hours	2 disk packs Max: 13 hours	2 disk packs Max: 4 hours Typical: 2 hours

The maximum times are for backing up the entire contents of a full disk. The typical times are for backing up 20 percent of a full disk.

You can use the local and remote disk options of incremental backup to back up more than one source disk. For example, more than one 10, 29, or 42 Mb server disk can be backed up to the same 80 or 300 Mb server disk. Note that copy volume is possible only if your configuration supports more than one rigid disk. The copy volume operation requires that the source volume must be offline to users.

Estimating backup time requirements for an 8090 server

Backup operations for an 8090 server will take varying amounts of time and backup media, depending on your configuration, the type of backup you are running, and how full your server is. Use Table 5-6 as a guideline for determining your activities.

Table 5-6. **Backup performance requirements, 8090 server**

Server disk	Incremental backup				Copy volume
	Cartridge tape	High capacity cartridge tape	Local disk	Remote disk	
25 Mb	Max: 1 hour	Not supported	Not supported	Max: 2 hours Typical: 30 min.	Not supported
85 Mb	Max: 3 hours	Not supported	Not supported	Max: 4 hours	Not supported
310 Mb	Max: 13 hours	Max: 4 hours	Max: 13 hours	Max: 14 hours	Max: 4 hours Typical: 2 hours

The maximum times are for backing up the entire contents of a full disk. The typical times are for backing up 20 percent of a full disk.

You can use the local and remote disk options of incremental backup to back up more than one source disk. For example, more than one 25 or 85 Mb server disk can be backed up to an 8000 server with 80 or 300 Mb server disk.

You can only copy volumes between drives connected to the same server. Note that copy volume is possible only if your configuration supports more than one rigid disk. The copy volume operation requires that the source volume must be offline to users.

Preparing for a full incremental backup

You can perform full backup using a rigid disk, a floppy disk, a cartridge tape, or a high-capacity cartridge tape.

Rigid disk

You can incrementally back up a File Service volume onto a rigid disk pack. If the disk is removable, you must format and partition the disk the first time you use it.

Related procedures: Backing up the file system -- rigid disk, Formatting and partitioning a removable disk pack

Floppy disk

You can incrementally back up a File Service volume onto floppy disks according to the backup schedule you establish. Backing up to floppy disk slows system response. Perform these backups when the system load is lightest.

The number of floppy disks needed for incremental backup varies with the volume use since the last backup. The first time you run backup, you will probably need many floppy disks, because you are copying everything from the rigid disk.

The backup process names each floppy disk. Record the name carefully on the floppy disk so that you can identify it. You refer to these names to restore the disks in the correct order.

A backup increment consists of the set of split increments created during one backup operation. Each floppy disk contains a split increment. The split increments are numbered sequentially, starting with 1.

Do not incrementally back up a File Service volume onto floppy disks if you need to back up a volume from an 80 Mb or a 300 Mb disk drive unless absolutely necessary.

Related procedure: Backing up the file system -- floppy disk

Cartridge tape

You can incrementally back up a File Service volume onto cartridge tapes. Preformatted cartridge tapes are available from Xerox.

If you are using a tape for the first time and it is not preformatted, you must first format and initialize it. Formatting prepares a tape to receive data the first time you use it. Initializing names a tape and prepares it to receive backup increments. Format cartridge tapes during non-work hours.

You can also format a tape during foreground backup, which delays the process by an hour or more. You can manually initialize a tape during foreground backup and copy operations. You can automatically initialize a newly-formatted cartridge tape during background backup.

If a tape becomes full when backup is running in the foreground, you are prompted to insert a new tape. Backup performs any required tape formatting and initialization before continuing to process files.

An individual backup increment can be on more than one tape, or a single tape can contain many backup increments.

Related procedures: Backing up the file system -- cartridge tape, Formatting a cartridge tape

High-capacity cartridge tape

You can also incrementally back up a File Service volume onto high-capacity cartridge tapes.

Related procedure: Backing up the file system -- high-capacity cartridge tape

Tape naming conventions

Whenever you format or initialize a cartridge tape or high-capacity cartridge tape, you must enter a name for the tape. Follow these guidelines when naming tapes.

- Use unique names so it is easy to locate data. This helps you identify the tapes you need easily and quickly.
- Tape names must be less than 40 characters in length.
- When you use many tapes for a set of backup increments, name the tapes sequentially; for example, Backup001, Backup002, and Backup003. Sequential naming makes it easier to identify obsolete data and helps you process the tapes in the correct order when you must restore data from them.

For example, if you use a new tape for each backup, you can include the File Service name and the date as a tape name (e.g., Thriller 88-12-13). Or you can base the tape name on the name of the source volume backed up on the tape, and add a sequential number for each new tape (e.g. FS-Finance 0001).

CAUTION: Never format a cartridge tape while any communication services are running on the same server.

Once you name a tape, you cannot change the name until you erase the data by re-initializing the tape.

If you do not assign a name, a tape initialized as part of an automatic or manual incremental backup is automatically assigned a name of "Backup of <date and time of backup>."

Preparing for a complete backup

You can copy an entire File Service volume at one time, if you have at least two rigid disk drives.

8000 servers

If you have 8000 servers on your network, you can copy:

- An 80 Mb volume to an 80 Mb volume
- An 80 Mb volume to a 300 Mb volume
- A 300 Mb volume to a 300 Mb volume

To perform a complete backup of a File Service volume in one run of incremental backup, set the cycle to zero days.

Using copy volume, you can copy the entire file system (including the software) of one volume to a destination volume that is usually a removable disk pack.

Run the copy volume operation as often as necessary to ensure adequate backup. Run the copy volume operation each day files are created or changed.

You can also copy all the information on an auxiliary (source) volume to another auxiliary (destination) volume. The destination volume should be on a removable disk pack (a fixed rigid disk drive can also be used).

After copying a volume, you will be unable to open both the source and the destination volumes because both volumes have the same name. You can access the destination volume by closing the source volume. If the source volume is the server's primary volume, temporarily rename the source volume, rename the destination volume, then rename the source volume with its original name.

8090 servers

If you have 8090 servers on your network, you can only copy a 310 Mb volume on a high-capacity rigid disk drive to another 310 Mb volume. If you are using 8090 high-capacity disk drives, you can store the complete backup on one disk that is dedicated to backup. If other services are on the primary volume, they are also copied to the destination volume.

Use multiple destination packs when making copies of the same source volume to protect against failure during the copy volume operation.

Overall, copy volume is not a recommended method for 8090 backup. It requires additional dedicated disks and drives. There is also some risk, since backup packs are not removable, and remain on the same server as the source data. Use copy volume on an 8090 server only if your restore requirement is less than 3 hours.

Related procedures: Copying a primary volume to an auxiliary volume, Copying an auxiliary volume to an auxiliary volume

Filling out the worksheet

⑥ Record the names of the source and destination volumes for the copy volume operation, if you are using that backup method.

Combining complete and incremental backups

You can back up an entire volume without backing up unmodified files during the incremental backup cycle. You can do this only if you have a backup volume on a multiple-disk drive server (8000) or multiple high-capacity rigid disk drives (8090). You must copy the volume to another volume. This process is most convenient when the source volume is on a removable rigid disk pack.

You combine copy volume and incremental backup operations by changing the epoch date of the incremental backup to the date of the copy volume operation.

Related procedure: Using Copy Volume with incremental backup

Selective backup

Selective backup, also called a copy container operation, can copy an object of any size. Larger objects are split and copied onto multiple floppy disks or tapes.

This operation copies all objects in the specified container, regardless of when they were created, changed, or last backed up.

Selective backup is useful for moving a file drawer from one File Service to another. You can copy the file drawer to floppy disk, cartridge tape, or high-capacity cartridge tape, and then copy the file drawer to a new location if the destination server uses the same medium.

Archiving is another function you can perform with the copy container operation. For example, after printing the annual report for your company, you can archive the report on cartridge tape and use it later as an online model for next year's report.

Each container you copy onto tape is stored in a separate increment, distinguished by the date it was created. Use the **Show Backup Index** command to see the list of increments on the tape. Information about copy container increments is not stored in the source volume backup increments log.

Label the tape with the names of the containers and a copy of the indexes.

Do not combine incremental backup data and copy container data on the same tape. Incremental backup data becomes obsolete sooner than copy container data.

Naming conventions for selective backup and restore

You must use the correct directory name and filename structure when specifying the object you want to restore:

- A pathname cannot exceed 300 characters. If the pathname of the object you want to restore is too long, restore the lowest-level object that contains the object you want to restore.
- All names except the last one in a path must refer to a directory (file drawer or file folder) with descendants. The directories must exist in the File Service.
- Precede reserved characters in the name with a single quotation mark ('). The diagonal slash (/), the exclamation point (!), the parentheses ( ), and the apostrophe (') are all reserved characters.

  For example, type FILE'!3 to restore a file named FILE!3; type 11'/12'/39'/Birthday to restore a file named 11/12/39/Birthday.
- The source volume name may not contain a right parenthesis.

- If the filename contains any spaces before the name, include the spaces when you type the name. Use the **Show Backup Index** command to see whether a filename begins with spaces. (In the index listing, the first character of a filename is normally indented two spaces from the first character of the file drawer name. If the filename is indented more than two spaces, it begins with spaces.)
- Precede a version number (whole numbers from 1 to 65534) with an exclamation point. For example, Proposal!2 is the name of version 2 of the Proposal file.

Related procedure: Selective backup: copying a container

Planning for maintenance

This section helps you maintain your backup medium resources and control the backup process. In general, to ensure good backup data, you should:

- Check the completion status of each backup as it completes.
- Replace any tapes that have filled.
- Keep a list of the increments stored on each tape for easy reference
- Delete obsolete backup increments to free backup media
- Keep all backup tapes until the data on them becomes obsolete.

Deleting obsolete backup increments

After incremental backup runs for a full cycle, one increment becomes obsolete each time a completed new increment is created with each successful backup. For example, if the backup cycle is seven days, an increment dated July 4 becomes obsolete on July 11. You can then delete the obsolete increment that is stored on any media type.

You can reuse a medium for backup when all of the increments stored on it are obsolete. The backup increments log on the volume includes the name of the medium where an increment is stored. If an increment is stored on multiple tapes or floppies, the log will show the name of the tape or floppy disk containing the last section of the increment. Use the **Show Backup Index** command to list increment sections.

Delete obsolete backup increments using the **Delete Obsolete Increments** command for each source volume. You should do this each time backup completes, or as frequently as convenient. After you delete obsolete increments, use the **Show Backup Index** command on the source volume to see the increments log. When a tape is no longer referenced in the increments log, use the **Show Backup Index** command again on the specific tape to make sure that it does not contain a section of an increment that is still referenced in the log. When you are sure that all increments and increment sections on a tape are obsolete, you can reinitialize and reuse the tape.

Do not manually delete backup information from the backup volume using the File Service **Delete Old Versions** command. When you back up to rigid disk, use the **Delete Obsolete Increments** command to delete both the data and the corresponding increment information on the source volume. Both the backup volume and the source volume must be available when you perform this procedure.

If you back up to floppy disks or tapes, the **Delete Obsolete Increments** command only deletes the entries for obsolete increments from the backup increments log on the source volume. After that you can reuse the floppy disks or tapes.

CAUTION: Do not reuse cartridge tapes or high-capacity cartridge tapes until all the increments on the tape are obsolete.

Related procedure: Deleting obsolete backup increments

Formatting a removable disk pack

You format and partition a removable disk pack using commands available on the floppy disks labeled "8000 Series rigid disk diagnostics" and "Services System Software."

Formatting a disk pack prepares it to store data. The formatting process also identifies bad disk pages. You need to know the address of bad disk pages prior to performing certain troubleshooting procedures. The partitioning process creates three volumes on the disk pack: one for user data, and two others for storing information needed for service operation.

Related procedure: Formatting and partitioning a removable disk pack

Formatting a cartridge tape

You format a cartridge tape using commands that are part of the Online Diagnostics Utility of the Xerox Network System. The Diagnostics Utility is separate from all the network services. You use the Test context to format tapes. After you format a tape, you must initialize it when you first use it for backup.

CAUTION: Never format a cartridge tape while any communication services are running on the same server.

Limit cartridge tape and high capacity cartridge tape names to 40 characters. Make sure that you use a different name for each backup tape, to avoid confusion later.

Clean your 8090 tape drive every 8 hours of use, and whenever a read/write error occurs. Refer to *Basic Network Troubleshooting* for the procedure.

Related procedure: Formatting a cartridge tape

Backup index

If an increment did not complete successfully, you can restart backup immediately to back up any files which were not included in the incomplete increment. If you do not restart backup immediately, these files are backed up the next time that backup runs.

Keep a list of the increments stored on a floppy disk or tape. Use this list to determine the contents of the backup increments for the source volume and the exact location of files or directories you need to restore.

Related procedure: Showing a backup index

Stopping the backup process

You can use Remote System Administration to interrupt File Service backup when backup is running in foreground or background mode. You can also interrupt background backup from the server terminal.

If at all possible, always permit a backup in process to complete. However, you may need to interrupt backup if the system response becomes unacceptable,

You can manually stop the backup process for a specified volume on the File Service. The backup process terminates when it reaches an acceptable stopping point.

Related procedure: Stopping backup

Planning for restore

You can fully or selectively restore the File Service information.

Fully restoring the file system

A full restore recovers all File Service volume information. You can fully restore an entire volume from any backup medium.

The complete increment set

A full restore operation from incremental backup data requires you to process a complete set of increments. All the increments created during a backup cycle make up a full set of increments. Restore the most recent full set of increments.

When the backup increments log is available, use it to identify the complete set of increments you need for restore. The restore operation also uses this log to find the increment data. If the backup increments log is obsolete, you must restore it before starting the restore operation.

When you restore a volume from scratch, the backup increments log is restored when the first increment is processed. You can restore the increments log first, and then use the **Delete Obsolete Backup Increments** command to identify the most recent full set of increments to be restored.

Estimating restore time

A full restore for a full 85 Mb server is less than 5 hours. A full restore for a full 310/300 Mb server from disk drive is less than 18 hours. A full restore for a full 310/300 Mb from high-capacity cartridge tape is less than nine hours.

Increment processing

The restore operation restores the volume to its state at a date and time you specify. You can specify the current date and time (the default), or an earlier date and time. For a full restore operation, use the current date (the default) as the restore date.

Always process increments in reverse chronological order to ensure you are restoring the most recent version of the File Service information.

The restore operation uses the backup increments log in the first increment to identify which files to restore. The restore operation uses the log to process the increments in the correct order, prompting you for instructions. You can skip an increment or restore it. When you restore increments, the last increment will always be listed as incomplete.

As you run restore, messages are displayed indicating any files that are skipped. Skipped files may be damaged, busy, or duplicates. Use Remote System Administration during restore to capture these messages, and keep a record of which files were not restored. The RSA log will also help you with troubleshooting. Keep a copy of the logs in your *Activities Guide*.

The procedure you use to perform a full restore of a volume depends on your backup medium.

Rigid disk

You can restore a File Service volume from increments stored on rigid disk, or from a copy volume pack and increments.

Related procedure: Restoring the file system -- rigid disk

Floppy disk

You can restore a File Service volume from increments stored on floppy disk, or from a combination of a copy volume pack and increments on floppy disk.

Related procedure: Restoring the file system -- floppy disk

Cartridge tape and high-capacity cartridge tape

You can restore a File Service volume from increments stored on cartridge tape or high-capacity cartridge tape, or from a combination of a copy volume drive and increments on cartridge tape or high-capacity cartridge tape.

Related procedure: Restoring the file system -- cartridge tape and high-capacity cartridge tape

Selectively restoring data

When you selectively restore data generated by the copy container operation, you must locate the correct floppy disks, cartridge tapes, or high-capacity cartridge tapes containing the backup increments information. For a selective restore operation, set the restore date to the date the container was deleted.

The procedure you use to restore an accidentally deleted file drawer, desktop, document, or other object depends on the backup medium.

In general, restore copy container data from the same software release version or the previous version that you originally used to copy the data.

Related procedures: Restoring a container -- rigid disk, Restoring a container -- floppy disk, Restoring a container -- cartridge tape or high-capacity cartridge tape

Commands

This section lists alphabetically all the File Service commands you use to set parameters, perform backup and restore operations, and maintain backup medium resources.

Table 5-7 shows the commands, along with the logged on status and the service state (started or stopped) for accessing them.

Table 5-7. **File Service backup and restore commands**

Command	Logged off		Logged on		Enabled	
	Started	Stopped	Started	Stopped	Started	Stopped
Add File Drawer (FS)					•	•
Add Group (CHS)					•	•
Add Member (CHS)					•	•
Add User (CHS)					•	•
Backup File System (FS)					•	•
Change Domain Access (CHS)					•	•
Change Volume					•	•
Close Volume					•	•
Copy Container (FS)					•	•
Copy Volume - non-normal startup, interrupt point 2; normal operation					•	•
Delete Obsolete Backup Increments (FS)					•	•
List Desktops (FS)			•	•	•	•
List File Drawers (FS)			•	•	•	•
List Volumes	•	•	•	•	•	•
Offline Volume (FS)					•	•
Online Volume (FS)					•	•
Open Volume (FS)					•	•
Proceed - only at interrupt point 3						
Restore Container (FS)					•	•
Restore File System (FS)					•	•
Set Backup Parameters (FS)					•	•
Show Activity	•	•	•	•	•	•
Show Backup Index (FS)					•	•
Show Backup Parameters (FS)					•	•
Show Statistics (FS)	•	•	•	•	•	•
Stop Backup (FS)					•	•
Stop Service					•	

Add File Drawer Available to the enabled user when the File Service is started or stopped. Creates a new file drawer, sets its page limit, and optionally, assigns access rights.

Related procedure: Creating a backup file drawer

Add Group Available to the enabled user when the Clearinghouse Service is started or stopped. Creates user groups.

Related procedure: Adding a backup volume group and a backup user

Add Member Available to the enabled user when the Clearinghouse Service is started or stopped. Adds members to user groups. You can use explicit names, aliases, or patterns to add members. This command requires administrative access to the group. The user with self access may add himself to any open group.

Related procedure: Adding a backup volume group and a backup user

Add User Available to the enabled user when the Clearinghouse Service is started or stopped. Lets you register a user by a fully qualified name, password, description, home File Service, and aliases. You must be in the Clearinghouse Service context to use this command.

Related procedure: Adding a backup volume group and a backup user

Backup File System Available to the enabled user when the File Service is started or stopped. Runs incremental backup to rigid disk, floppy disk, cartridge tape, and high-capacity cartridge tape.

Related procedures: Backing up the file system -- rigid disk, Backing up the file system -- floppy disk, Backing up the file system -- cartridge tape, Backing up the file system -- high-capacity cartridge tape

Change Volume Available to the enabled user. Changes the name of an existing volume. The volume you want to change must be open. If the volume is registered as a File Service, the volume must be offline. After you use the command, you may bring the volume back online.

Related procedures: Copying a primary volume to an auxiliary volume, Copying an auxiliary volume to an auxiliary volume

Close Volume Available to the enabled user on multiple drive servers with open auxiliary volumes. Terminates all system use of an open volume. Allows the pack on which the volume is located to be spun down or removed. Closing the volume makes it unavailable to local access, such as the server executive. Use this command before using the **Copy Volume** command or before removing a disk pack from a drive.

Related procedure: Copying an auxiliary volume to an auxiliary volume

Copy Container Available to the enabled user when the File Service is started or stopped. Backs up or copies file drawers, desktops, documents, and the like, selected from a local File Service volume. This command supports only floppy disk, cartridge tape, and high-capacity cartridge tape as the backup medium. The **Copy Container** command stores data in the same format as that used for incremental backup.

Related procedure: Copying a container

Copy Volume Available from a non-normal startup at interrupt point 2 for a primary volume, and during normal server operation for auxiliary volumes. This File Service command copies a volume from one disk to another.

Related procedures: Copying a primary volume to an auxiliary volume, Copying an auxiliary volume to an auxiliary volume

Delete Obsolete Backup Increments Available to the enabled user when the File Service is started or stopped. Removes from the backup increments log on the source volume references to obsolete increment data for all backup media. For rigid disk, this command also rids backup volumes of obsolete backup increments, freeing space for new increment data.

For floppy disk and tape, this command operates only on the backup increments log; you do not need the floppy disks or tapes containing the backup data you want to delete. You can overwrite the floppy disks in later backup operations, or reuse the tapes after you reinitialize the tape once all increments on the tape are obsolete.

Related procedure: Deleting obsolete backup increments

List Desktops Available to the logged on user. Lists the 6085/8010 desktops stored on the File Service.

Related procedure: Selective backup: copying a container

List File Drawers Available to the logged on user. Lists the names and attributes of file drawers, including the owner, page limit, and access lists. You can use the wildcard symbol (*) to list file drawers.

Related procedure: Selective backup: copying a container

List Volumes Available to any user when at least one volume is open. Displays the volume status (open, online, copying, scavenging), and drive number of available volumes. For open and online volumes, this command also displays the number of used and available pages, and the percent of the volume used.

Related procedures: Copying a primary volume to an auxiliary volume, Deleting obsolete backup increments

Offline Volume Available to the enabled user when the File Service is started or stopped. Makes an online volume inaccessible to remote clients. You must be in the File Service context to access this command.

Related procedures: Copying an auxiliary volume to an auxiliary volume, Restoring the file system -- rigid disk, Restoring the file system -- floppy disk, Restoring the file system -- cartridge tape and high-capacity cartridge tape

Online Volume Available to the enabled user when the File Service is started or stopped. Registers an open volume with the appropriate Clearinghouse Service. Makes the volume accessible to network users if the File Service is started. Validates desktops if the File Service profile is set for that option. You must be in the File Service context to access this command.

Related procedure: Copying an auxiliary volume to an auxiliary volume

Open Volume Available to the enabled user when at least one secondary drive is present. Opens a volume, making it available for local access. Use the command only for a drive where the volume is not already open.

Related procedure: Copying an auxiliary volume to an auxiliary volume

Proceed Available at all initialization interrupt points. Leaves an interrupt point and continues server initialization. All activated services are run during server initialization.

Related procedure: Copying a primary volume to an auxiliary volume

Restore Container Available to the enabled user when the File Service is started or stopped. Restores files (such as backup increment logs and accidentally deleted desktops) from incremental data generated by the **Backup File System** command or from data selectively backed up with the **Copy Container** command.

Related procedures: Restoring a container -- rigid disk, Restoring a container -- floppy disk, Restoring a container -- cartridge tape and high-capacity cartridge tape

Restore File System Available to the enabled user when the File Service is started or stopped. Restores volumes from incremental data generated by the **Backup File System** command. This command does not restore data backed up with the **Copy Container** command.

Related procedures: Restoring the file system -- rigid disk, Restoring the file system -- floppy disk, Restoring the file system -- cartridge tape and high-capacity cartridge tape

Set Backup Parameters Available to the enabled user when the File Service is started or stopped. Sets various parameters that control incremental backup. This command does not affect copy container and copy volume operations. You can also use this command to change previously set backup parameters for a volume.

Related procedures: Setting backup parameters, Using Copy Volume with incremental backup

Show Activity Available to any user. Lists current remote connections, including the user who initiated the connection, the volume, the connection time, and the time of last activity.

Related procedures: Copying an auxiliary volume to an auxiliary volume, Restoring the file system -- rigid disk, Restoring the file system -- floppy disk, Restoring the file system -- cartridge tape and high-capacity cartridge tape

Show Backup Index Available to the enabled user when the File Service is started or stopped. Displays the backup increments log, which lists backup increments along with the backup date, the source volume name, the completion status, and optionally, the files they contain. The command also lists the names of files selectively backed up using a copy container operation.

Related procedures: Showing the backup index, Restoring the file system -- rigid disk, Restoring the file system -- floppy disk, Restoring the file system -- cartridge tape and high-capacity cartridge tape

Show Backup Parameters Available to the enabled user when the File Service is started or stopped. Displays the values of the parameters set for incremental backup of the local volume. Parameter values do not affect copy container and copy volume operation.

Related procedure: Showing backup parameters

Show Statistics Available to any user when the File Service is started or stopped. Displays the number of times a file has been stored, retrieved, or read, and the time since the statistics counters were last reset or the File Service initialized.

Related procedure: Stopping backup

Stop Backup Available to the enabled user when the File Service is started or stopped. Manually stops a backup that is running.

Related procedures: Stopping backup, Copying a primary volume to an auxiliary volume, Copying an auxiliary volume to an auxiliary volume

Stop Service Available to the enabled user. Stops the currently loaded and started services you select. This command reverses the effects of a **Start** command so you can change certain parameters.

Related procedure: Copying a primary volume to an auxiliary volume

Setting up backup procedures

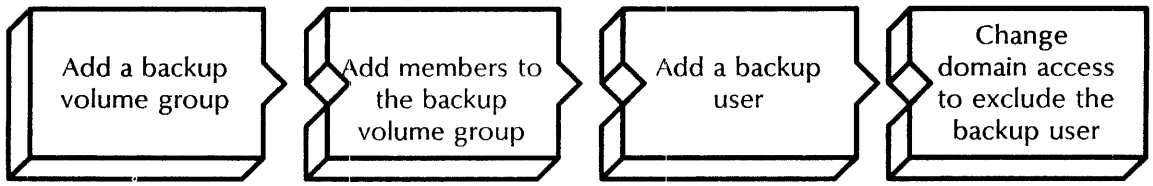
This section contains these procedures for setting up an incremental backup:

Adding a backup volume group and a backup user
Use this procedure to add a backup volume group and a backup user to the Clearinghouse. Perform this procedure only when rigid disk is the backup medium.

Creating a backup file drawer
Use this procedure to add a backup file drawer for File Service backup only on a backup volume. Perform this procedure only when rigid disk is the backup medium.

Setting backup parameters
Use this procedure to set the parameters that control incremental backup. The number of parameters defined varies with the backup media type. Perform this procedure for all media types.

Adding a backup volume group and a backup user



Use this procedure to run incremental backups to rigid disk. You can add a backup volume group and a backup user to the Clearinghouse.

Prerequisites

- See the File Service Backup Worksheet in your *Activities Guide* for the following information:
  - Backup volume group name
  - Backup volume names
  - Backup user name
- Ensure that each backup volume has been initialized. See the File Service chapter in the *Services Installation and Setup Guide*, "Initializing secondary (auxiliary) volumes."

Step-by-step

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

   If the backup volume group you want to use already exists, **skip to step 5**.

2. Type **Add Group** ⇐|.

```
Name:
```

3. Type the name of the backup volume group (for example, **Backup Volumes**) ⇐|.

```
Description:
```

4. Type a description of the group ⇐|.

```
Done. <backup volume group:domain:organization>
(Group) added.
CHS!
```

5. Type **Add Member** ⇐|.

```
Group:
```

6. Type the name of the backup volume group ⇐|.

```
Member:
```

7. Type the name of a backup volume where the backup file drawer is located ⇐|.

```
Done. <volume name:domain:organization> added to
<backup volume group:domain:organization>
Add another Member? (Y/N):
```

8. Type **Y** or **N** at the "Add another member" prompt ⇐|.

   Y Lets you add another backup volume. Return to step 7.

   N Ends the process.

9. If you need to add a backup user, type **Add User** and press RETURN to add a backup user.

```
First Name (and Middle Name, if desired):
```

10. Type the first name of the backup user ⇐|.

```
Last Name:
```

11. Type the last name of the backup user ⇐|.

```
Password:
```

12. Type the backup user's password ⇐|.

```
Description:
```

13. Type a description of the backup user (for example, **Backup user entity**) ⇐|.

```
"Home" File Service:
```

14. Type the name of the backup user's home File Service and press RETURN. Simply press RETURN if you do not want to enter a home File Service.

```
Alias:
```

15. Type an alias for the backup user and press RETURN. Simply press RETURN if you do not want to enter an alias for the backup user.

```
Confirm this User information? (Y/N):
```

16. Type **Y** or **N** at the "Confirm this user information" prompt ⇐|.

    Y Adds the backup user.

    N Return to step 10.

```
Done. <backup user name:domain:organization> (User)
added.
    Add another user? (Y/N):
```

17. Type **Y** or **N** at the "Add another user" prompt ⇐|.

    Y Return to step 10 to add another backup user.

    N Ends the process.

NOTE

To ensure that the information in the backup volume group is secure, do not grant administrative access to any backup user.

```
CHS!
```

Wrap-up

When you see the prompt "CHS!," you have added a backup volume group and a backup user.

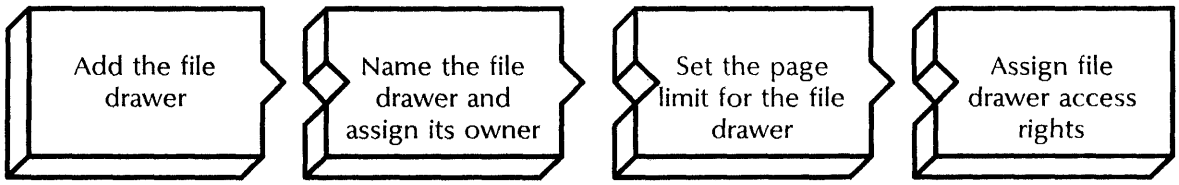
Now perform the procedure "Creating a backup file drawer," next.

Example

This example shows adding a backup volume group and a backup user.

```
CHS!Add Group
    Name: Backup Volumes:Unit1:GemSysCo
    Description: Backup Volumes Group
Done. Backup Volumes:Unit1:GemSysCo (Group) added.
CHS!Add Member
    Group: Backup Volumes:Unit1:GemSysCo
    Member: Backup1:Unit1:GemSysCo
 Done. Backup1:Unit1:GemSysCo added to Backup Volumes:Unit1:GemSysCo
    Add another Member? (Y/N): N
CHS!Add User
    First Name (and Middle Name, if desired): Backup
    Last Name: User
    Password: *****
    Description: Backup user entity
    "Home" File Service: Backup1:Unit1:GemSysCo
    Alias: Bupuser
    Confirm this User information? (Y/N): Y
Done. Backup User:Unit1:GemSysCo (User) added.
    Add another user? (Y/N): N
CHS!
```

Creating a backup file drawer



Use this procedure for incremental backup to rigid disk, to create a backup file drawer on the File Service volume that will store the backup increments.

You must create the backup file drawer on an open volume; the volume can be either online or offline. You cannot use the wildcard symbol (*) in the file drawer name.

The backup user and all Domain Administrators should have full access to the backup file drawer.

Prerequisites

- Perform the procedure "Adding a backup volume group and a backup user."
- See the File Service Backup Worksheet in the *Activities Guide* for the following information:
  - Backup volume group name
  - Backup file drawer name
  - Backup user name
- Know the file drawer name and the owner's name.

- Ensure that the owner is registered in the Clearinghouse.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Add File Drawer** ⇐|.
3. If the File Service is running on a single-drive server, **skip to step 4**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
4   <backup volume name>
Enter choice number:
```

   If the File Service is running on a multiple-drive server, type the number for the backup volume on which you want to add the backup file drawer ⇐|.

```
File drawer name:
```

4. Type the name of the backup file drawer ⇐|.

   Only the first 34 characters of a file drawer name are used to alphabetize File Service directories.

```
Owner's name:
```

5. Type the name or alias of the backup user and press RETURN. If you do not specify the domain and organization, they default to those of the server. The owner has full access to the file drawer by default.

```
Page limit (type 0 for no limit) (0..2147483647):
```

6. Type **0** to assign unlimited disk pages to the file drawer ⇐|.

```
<Backup user name:domain:organization> is granted full
access.
Change Access List? (Y/N):
```

7. Type **Y** or **N** at the "Change Access List" prompt ⇐|.

   Y Lets you grant Domain Administrator access to the backup file drawer. **Continue with step 8.**

   N Ends the process; **skip to the Wrap-up section.**

```
Enter User, Alias, or Group Name:
```

8. Type the name of the Domain Administrator you want to have access to this file drawer, and press RETURN. Type the fully qualified name only if the Domain Administrator is registered in a different domain.

```
Adding new name to access list.
Permission to read? (Y/N):
```

9. Type **Y** at the "Permission to read" prompt ⇐|.

   Y Lets the Domain Administrator read the files in the file drawer.

   N Prevents read access.

```
Permission to write? (Y/N):
```

10. Type **Y** at the "Permission to write" prompt ⇐|.

    Y Lets the Domain Administrator write to the files in the file drawer.

    N Prevents write access.

```
Permission to add? (Y/N):
```

11. Type **Y** at the "Permission to add" prompt ⇐|.

    Y Lets the Domain Administrator add files to the file drawer.

    N Prevents add access.

```
Permission to remove? (Y/N):
```

12. Type **Y** at the "Permission to remove" prompt ⇐|.

    Y Lets the Domain Administrator remove files from the file drawer.

    N Prevents remove access.

```
Permission to change the access list? (Y/N):
```

13. Type **Y** or **N** at the "Permission to change the access list" prompt ⇐|.

    Y Lets the Domain Administrator change the access list.

    N Prevents the Domain Administrator from making changes.

```
Make another change to access list? (Y/N):
```

14. Type **Y** or **N** at the "Make another change to access list" prompt ⇐|.

    Y Lets you make additional access list entries. Return to step 8.

N Ends the process.

```
Done
FS!
```

Wrap-up

When you see the message "Done," you have added a file drawer and given access rights to all Domain Administrators, if you elected to do so.

You may want to make a copy of this information for your records. If you are using Remote System Administration, use the Make Document or Make Screen option. Store a copy in the *Activities Guide*.

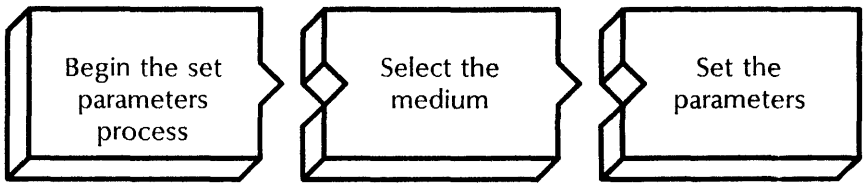
Now perform the "Setting backup parameters" procedure, next.

Example

This example shows preparing a backup file drawer named Backup FD on a multiple-drive server. The backup user is being given administrative access to the file drawer.

```
FS!Add File Drawer
    Select Volume
    1  Finance
    2  Planning
    3  Backup1
    Enter choice number: 3
File drawer name: Backup FD
Owner's name: Backup User:Unit1:GemSysCo
Page limit (type 0 for no limit) (0..2147483647): 0
Backup User:Unit1:GemSysCo is granted full access.
Change Access List? (Y/N): N
Done
FS!
```

Setting backup parameters



Use this procedure to set the parameters for the incremental backup process for a specific File Service volume. After setting the parameters, you need not perform this procedure again unless you want to change them.

You must set backup parameters for each File Service volume you will back up. You set and display the parameters at the server containing the source volume.

As you set the backup parameters, the volume is checked for their existence. If backup parameters exist, their current values appear as default values in the prompts.

Prerequisites

- If you are running incremental backups to rigid disk, perform the "Adding a backup volume group and a backup user" and "Preparing a backup file drawer" procedures.
- See the File Service Backup Worksheet in your *Activities Guide* for the following information:
  - Backup medium
  - For multiple high-capacity cartridge tape devices, the tape chaining sequence
  - For rigid disk, the backup volume group name, the backup file drawer name, and the backup user name
  - Backup epoch (date and time)
  - Backup cycle (days)
  - For automatic backup, the start time, the stop time, and the frequency (days)

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Set Backup Parameters** ⇐|.
3. If the File Service is running on a single-drive server, **skip to step 4.**

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume you want to back up ⇐|.

```
Automatic backup is waiting to run at <hour:minute:
second>
```

If you previously set parameters for the volume, a message may indicate the start time of the next automatic backup.

```
Select Backup Medium
1   Floppy
2   Cartridge tape
3   High Capacity Cartridge Tape
4   Rigid disk
Enter choice number:
```

The media choices displayed depend on your configuration.

4. Type the number for the backup medium you want to use and press RETURN The media listed depend on your hardware configuration.

   - If you selected rigid disk, **skip to step 7.**
   - If you selected floppy disk or cartridge tape, **skip to step 11.**
   - If you selected high-capacity cartridge tape, **continue with step 5.**

```
Tape device <number> will be used.
```

5. If you have only one high-capacity cartridge tape device, **skip to step 11.**

```
Select tape device
1   Tape drive 1
2   Tape drive 2
3   Tape drive 3
4   Tape drive 4
Enter choice number:
```

If you have more than one high-capacity cartridge tape device, type the number for the first device in the tape chaining sequence ⇐|.

NOTE

The list includes only the numbers of tape devices attached to your server.

```
Chain another tape device? (Y/N):
```

6. Type **Y** or **N** at the "Chain another tape device" prompt ⇐|.

   Y Lets you select another tape device in the tape chaining sequence.

   N Displays the tape chaining sequence you have specified. **Skip to step 11.**

```
Backup volume group:
```

7. Type the name of the backup volume group ⇐|.

```
Backup file drawer:
```

8. Type the name of the backup file drawer ⇐|.

```
User name:
```

9. Type the name of the backup user ⇐|.

```
User password:
```

10. Type the backup user's password ⇐|.

```
Backup epoch:
```

11. Type the date (day, month, year) and time (hour:minute:second) for the backup epoch and press RETURN. To consider all files for backup, simply press RETURN if no default value is displayed.

    If you use **Copy Volume** with incremental backup, set the epoch date to the date of the most recent copy volume operation.

    Files created or changed before the epoch date are not considered for backup.

```
Days in cycle (0..90):
```

12. Type the number of days in your backup cycle and press RETURN. To back up all files in the increment, use a cycle of 0 (zero).

```
Run backup automatically? (Y/N):
```

13. If you selected floppy disk in step 4, **skip to the Wrap-up section**.

    If you selected rigid disk, cartridge tape, or high-capacity cartridge tape in step 4, type **Y** or **N** at the "Run backup automatically" prompt ⇐|.

CAUTION: If you are backing up this volume to cartridge tape for the first time, or have a large amount of data to back up, do not set backup to run automatically. Automatic or background backup to cartridge tape cannot continue on a second tape.

Y Sets backup automatically. **Continue with step 14.**

N Lets you run backup manually. **Skip to the Wrap-up section.**

```
Start time:
```

14. Type the time to start automatic backup ⇐|.

    If you are backing up several volumes to the same backup volume, stagger the start times by two to four hours. For example, start the backup for volume 1 at 8:00 p.m., for volume 2 at 11:00 p.m., and volume 3 at 2:00 a.m.

```
Stop time:
```

15. Type the time to stop the backup and press RETURN if you want backup to stop whether or not it is complete. Simply press RETURN if you want backup to run until it is complete.

CAUTION: Setting the stop time parameter may cause incomplete increments to be created. Incomplete increments make the restore operation difficult and time-consuming.

```
Frequency (1..<number of days in your backup cycle>)
```

16. Type the number of days between backups ⇐|.

```
Automatic Backup is set to run at: <hour:minute:second>
    Done.
FS!
```

Wrap-up

When you see the message "Done," you have set the backup parameters.

You may want to make a copy of this information for your records. If you are using Remote System Administration, use the Make Document or Make Screen option. Store a copy in the *Activities Guide*.

If you do not want to perform a backup now, log off.

If you want to perform a backup:

- For rigid disk, see the "Backing up the file system -- rigid disk" procedure.
- For floppy disk, see the "Backing up the file system -- floppy disk" procedure.
- For cartridge tape, see the "Backing up the file system -- cartridge tape" procedure.
- For high-capacity cartridge tape, see the "Backing up the file system -- high-capacity cartridge tape" procedure.

Example

This example shows setting parameters for a volume on a single-drive server. The volume will be backed up to a chain of high-capacity cartridge tapes.

```
FS!Set Backup Parameters
Select Backup Medium
1           Rigid disk
2           Cartridge tape
3           High Capacity Cartridge Tape
Enter choice number: 3
Select tape device
1           Tape drive 1
2           Tape drive 2
3           Tape drive 3
4           Tape drive 4
Enter choice number: 3
Chain another tape device? (Y/N): Y
Select tape device
1           Tape drive 1
2           Tape drive 2
3           Tape drive 4
Enter choice number: 3
Chain another tape device? (Y/N): Y
Select tape device
1           Tape drive 1
2           Tape drive 2
Enter choice number: 2
Chain another tape device? (Y/N): N
Tape devices 3, 4, 2 will be used.
Backup epoch:  6-Jul-87 17:19:32
Days in cycle (0..90): 14
Run backup automatically? (Y/N): Y
Start time: 6:00:00
Stop time: 10:00:00
Frequency (1..14): 1
Automatic Backup is set to run at: 6:00:00
            Done.

FS!
```

Full backup procedures

This section contains the procedures for performing a full backup of the file system.

Incremental backup

Backing up the file system -- rigid disk
Use this procedure to back up incrementally to a backup volume on rigid disk all the files on a File Service volume.

Backing up the file system -- floppy disk
Use this procedure to back up incrementally to floppy disk all the files on a File Service volume.

Backing up the file system -- cartridge tape
Use this procedure to back up incrementally to cartridge tapes all the files on a File Service volume.

Backing up the file system -- high-capacity cartridge tape
Use this procedure to back up incrementally to high-capacity cartridge tapes all the files on a File Service volume.

Complete backup

Copying a primary volume to an auxiliary volume
Use this procedure to make a complete copy of a primary volume on another volume on fixed or removable rigid disk.

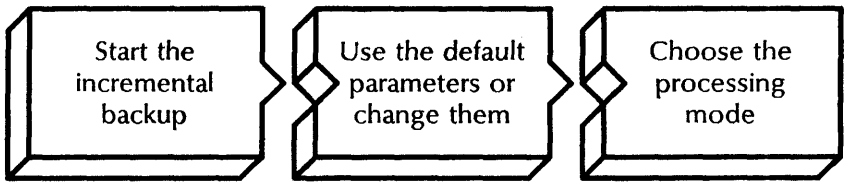
Copying an auxiliary volume to an auxiliary volume
Use this procedure to make a complete copy of an auxiliary volume on another volume on fixed or removable rigid disk.

Using Copy Volume with incremental backup
Use this procedure to make a complete copy of a volume and then generate incremental backups of files that are created or changed after the copy volume operation.

Selective backup

Selective backup: copying a container
Use this procedure to copy objects in a container onto floppy disks, cartridge tapes, or high-capacity cartridge tapes.

Backing up the file system -- rigid disk



Use this procedure to start a manual incremental backup to rigid disk. If you set the backup parameters for automatic backup, you do not need to use this procedure unless an automatic backup has failed.

Backing up to rigid disk saves File Service data in the backup file drawer you created on the backup volume.

Prerequisites

- If you are backing up the volume for the first time, perform these procedures earlier in this chapter:
  - "Adding a backup volume group and a backup user"
  - "Preparing a backup file drawer"
  - "Setting backup parameters"
- If you have previously backed up the volume, perform the "Deleting obsolete backup increments" procedure later in this chapter to free space on the backup volume for the next backup increment.
- Update the File Service Backup Worksheet with any changes you are making to the backup parameters.
- Update the File Service Backup Activity Log with the date and reason for the manual backup.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Backup File System** ⇐|.
3. If the File Service is running on a single-drive server, **skip to step 4**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
4   <backup volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume you want to back up ⇐|.

If automatic backup has been set for the volume, you see the following message:

```
Automatic backup is waiting to run at
<hour:minute:second>
```

```
Use parameters that have been set for this volume? (Y/N):
```

4. Type **Y** or **N** at the "Use parameters that have been set for this volume" prompt ⇐|.

   Y Uses the default parameters. **Skip to step 12.**

```
Backup will be started immediately.
```

   N Lets you change the parameters for this backup. **Continue with step 5.**

To change backup parameters for the volume permanently, use the procedure "Setting backup parameters."

```
Select Backup Medium
1  Floppy
2  Rigid disk
3  Cartridge tape
4  High Capacity Cartridge Tape
Enter choice number:
```

The media displayed depend on your server's configuration.

5. Type **2** for rigid disk ⇐|.

```
Backup volume group:
```

6. Type the name of the backup volume group ⇐|.

```
Backup file drawer:
```

7. Type the name of the backup file drawer ⇐|.

```
User name:
```

8. Type the name of the backup user or a System Administrator who can access the backup file drawer ⇐|.

```
Password:
```

9. Type the password of the backup user or the System Administrator.

```
Backup epoch:
```

10. Type the date (day, month, year) and time (hour: minute:second) for the backup epoch and press RETURN. To consider all files for backup, simply press RETURN if there is no default value displayed.

NOTE

If you use the **Copy Volume** command with incremental backup, set the epoch date to the date of the most recent copy volume operation.

NOTE

Files created or changed before the epoch date are not considered for backup.

```
Days in cycle (0..90):
```

11. Type the number of days in your backup cycle and press RETURN. To back up all files in the increment, use a cycle of 0 (zero).

```
Backup will be started immediately.
Run in the background? (Y/N):
```

12. Type **Y** or **N** at the "Run in the background" prompt ⇐|.

    Y Runs the backup in background, enabling you to use other commands at the server while backup is running.

    N Runs the backup in foreground mode, enabling you to use other commands at the server during backup only by using Remote System Administration.

```
FS: Backup is starting...
FS:  Backup completed normally.
FS:  Source volume <name:domain:organization>
FS!
```

13. Log off.

Wrap-up

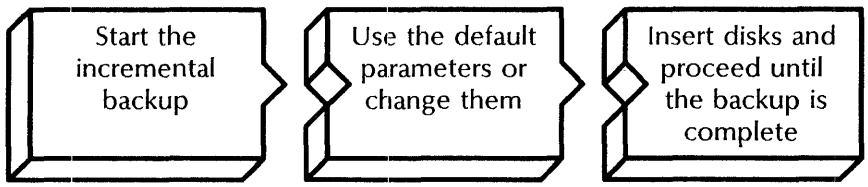
When you see the message "Backup completed normally," you have completed the backup. Make a copy of the procedure using the Make Document or Make Screen feature of Remote System Administration.

Example

This example shows a manual incremental backup. The automatic start time parameter set for this volume is ignored during the manual backup. The backup medium is rigid disk. Parameters are changed for this backup, which is executed in background mode.

```
FS!Backup File System
    Select Volume
    1   Finance
    2   Planning
    3   Engineering
    4   Backup
    Enter choice number: 2
Automatic backup is waiting to run at 1:00:00
    Use parameters that have been set for this volume? (Y/N): N
    Select Backup Medium
    1   Floppy disk
    2   Rigid disk
    Enter choice number: 2
Backup volume group: BUvolumegroup
Backup file drawer: Backup file drawer
User name: S Administrator
Password: ****
    Backup epoch: Nov 12, 1987 11:53:05
    Days in cycle (0..90): 7
Backup will be started immediately.
    Run in the background? (Y/N): Y
FS:  Backup is starting. . .
FS!  (As backup runs in the background, other service commands are permitted.)
FS:  Backup completed normally.
FS:  Source volume Planning:Unit1:GemSysCo
FS!
```

Backing up the file system -- floppy disk



Use this procedure to back up incrementally the File Service volume to floppy disks. Each floppy disk used in the backup contains one split increment.

Prerequisites

- If you are backing up the volume for the first time, perform the procedure "Setting backup parameters" earlier in this chapter.

- If you have previously backed up the volume, perform the procedure "Deleting obsolete backup increments" later in this chapter to remove references to obsolete increments from the volume.
- Have a set of floppy disks, each with a blank label.
- Apply write-enable tabs to the floppy disks.
- Ensure that the floppy disk drive is local to the volume you are backing up.
- Update the File Service Backup Activity Log with the date and reason for backup.

CAUTION: If backup is interrupted, do not reuse these floppy disks when you restart the backup. These floppy disks contain the files backed up before the interruption, which have been marked on the source volume with the backup date. The system will not back up these files when you restart the backup. Keep the floppy disks for the rest of the current backup cycle.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Backup File System** ⇐|.
3. If the File Service is running on a single-drive server, **skip to step 4**.

```
Select Volume
1    <volume name>
2    <volume name>
3    <volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume you want to back up ⇐|.

```
Use parameters that have been set for this volume? (Y/N):
```

4. Type **Y** or **N** at the "Use parameters that have been set for this volume" prompt ⇐|.

   Y Uses the default parameters. **Skip to step 8.**

   N Lets you change the parameters for this backup. **Continue with step 5.**

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

```
Select Backup Medium
1  Floppy disk
2  Rigid disk
Enter choice number:
```

5. Type the number for floppy disk and press RETURN. The media listed depend on your hardware configuration.

```
Backup epoch:
```

6. Type the date (day, month, year) and time (hour:minute:second) from which you want to back up and press RETURN. To consider all files for backup, simply press RETURN if there is no default value displayed.

   If you use the **Copy Volume** command with incremental backup, set the epoch date to the date of the most recent copy volume operation.

   Files created or changed before the epoch date are not considered for backup.

```
Days in cycle (1..90):
```

7. Type the number of days in your backup cycle and press RETURN. To back up all files in the increment, use a cycle of 0 (zero).

```
Backup will be started immediately.
Insert floppy disk
Proceed (Y/N):
```

8. Insert a floppy disk into the disk drive and type **Y** ⇐|.

   Y Starts the backup.

   N Cancels the backup.

   As each backup disk is filled, this message appears:

```
Processing floppy...
Split increment # 1 of <date> <time> <name:domain:
organization> complete.
```

9. Remove the disk and label it with the date and time, the split increment number, and the File Service name.

10. Repeat steps 8 and 9 until the message "Backup completed normally" appears.

```
Backup completed normally.
Source Volume Planning:Unit1:GemSysCo
Split increment of # 3 of 10-Nov-87 11:53:05 for
Planning:Unit1:GemSysCo complete
3 Backup disks created.
FS!
```

11. Log off.

Wrap-up

When you see a message indicating the number of disks produced, you have completed the backup.

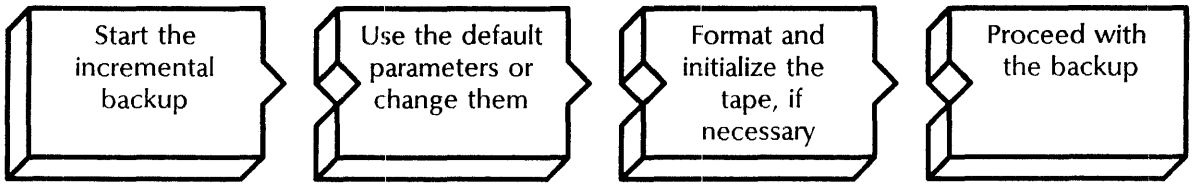
Record the date, number, and names of the floppy disks on the File Service Backup Activity Log. Store the floppy disks in a safe location.

Example

This example shows an incremental backup to floppy disks. The backup epoch and cycle parameters are changed for this backup. The system stores the backup increments in three split increments, one on each floppy disk.

```
FS!Backup File System
    Select Volume
    1   Finance
    2   Planning
    Enter choice number: 2
    Use parameters that have been set for this volume? (Y/N): N
    Select Backup Medium
    1   Floppy disk
    2   Rigid disk
    Enter choice number: 1
    Backup epoch: Aug 10, 1987 11:53:05
    Days in cycle (1..90): 30
    Backup will be started immediately.
    Insert floppy disk
    Proceed (Y/N): Y
    Processing floppy...
    Split increment #1 of 10-Aug-87 15:04:35 for Planning:Unit1:GemSysCo
    complete.
    Insert another floppy disk
    Proceed (Y/N): Y
    Split increment #2 of 10-Aug-87 15:04:35 for Planning:Unit1:GemSysCo
    complete.
    Insert another floppy disk
    Proceed (Y/N): Y
    Backup completed normally.
    Source Volume Planning:Unit1:GemSysCo
    Split increment of #3 of 10-Aug-87 11:53:05 for Planning:Unit1:GemSysCo
    complete
    3 Backup disks created.
FS!
```

Backing up the file system -- cartridge tape



Use this procedure to start a manual incremental backup of the File Service volume onto cartridge tape. If you set the backup parameters for automatic backup, you do not need to use this procedure unless the automatic backup has failed. A backup increment can consist of several split increments. The system may write more than one split increment to the same tape, or may store the backup increment across several tapes. A single tape can store many backup increments.

If you set backup to run automatically, a message appears when backup starts to run and another message appears when backup completes.

Prerequisites

- If you are backing up the volume for the first time, perform the procedure "Setting backup parameters" earlier in this chapter.
- If you have previously backed up the volume, perform the procedure "Deleting obsolete backup increments" later in this chapter to remove references to obsolete increments from the volume.
- Have handy one or more preformatted backup cartridge tapes.
- Insert an empty or partially-full tape in the tape drive.
- Ensure that the tape drive is local to the volume you are backing up.
- Update the File Service Backup Activity Log with the date and reason for the backup.
- If you are not going to use the default parameters for this volume, determine the epoch date and backup cycle.

Step-by-step for starting backup and selecting parameters

1. Log on and enable in the File Service context.
2. Type **Backup File System** ⇐|.

   If the File Service is running on a single-drive server, **skip to step 3**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume you want to back up ⇐|.

If you previously set automatic backup for the volume, a message indicates the start time of the next automatic backup.

```
Automatic backup is waiting to run at
<hour:minute:second>
```

```
Use parameters that have been set for this volume? (Y/N):
```

3. Type **Y** or **N** at the "Use parameters that have been set for this volume" prompt ⇐|.

   Y Uses the default parameters. **Skip to step 7.**

   N Lets you change the parameters for this backup. **Continue with step 4.**

NOTE

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

```
Select Backup Medium
1   Cartridge tape
2   Rigid disk
Enter choice number:
```

4. Type the number for tape and press RETURN. The media listed depend on your hardware configuration.

```
Backup epoch:
```

5. Type the date (day, month, year) and time (hour:minute:second) for the backup epoch and press RETURN. To consider all files for backup, simply press RETURN if a default value is not displayed.

NOTE

If you use the **Copy Volume** command with incremental backup, set the epoch date to the date of the most recent copy volume operation.

NOTE

Files created or changed before the epoch date are not considered for backup.

```
Days in cycle (0..90):
```

6. Type the number of days in your backup cycle and press RETURN. To back up all files in the increment, use a cycle of 0 (zero).

```
Backup will be started immediately.
Run in background? (Y/N):
```

7. Type **Y** or **N** at the "Run in background" prompt ⇐|.

Y Runs the backup in background mode, enabling you to use other commands at the server while backup is running. Skip to "Step-by-step for completing the backup" section later in this procedure.

CAUTION: If you are backing up this volume to cartridge tape for the first time, or have a large amount of data to back up, do not set backup to run automatically. Automatic or background backup to cartridge tape cannot continue on a second tape.

N Runs the backup in foreground at the server during backup mode. To use other commands at the server during backup, connect to the server using Remote System Administration.

```
Insert cartridge tape.
    Proceed (Y/N)?
```

8. Insert the cartridge tape and type **Y** at the "Proceed" prompt ⇐|.

   Y Continues the backup. **Continue with step 9.**

Do not type **Y** at the "Proceed" prompt until the tape is rewound and ready for use. If you type **Y** before the tape is rewound the following message is displayed:

```
Tape not ready.
Please insert tape or wait until tape is ready before
proceeding.
```

   N Cancels the backup.

```
Processing tape...This may take a while
```

If the tape has been formatted and initialized, the name of the tape appears after a two to three minute delay.

```
This tape is named <tape name> and has <number>
remaining free pages.
```

Step-by-step for selecting an initialization choice

```
Select initialization choice
1   Append to existing data on tape
2   Initialize tape
3   Format and Initialize tape
Enter choice number:
```

9. This step provides instructions for selecting an initialization choice. Go to the part of this step that matches your choice.

1 Append to existing data on tape

To add this backup after existing backup data on the tape, type **1** and press RETURN. **Continue with step 10.**

If you select this option but the tape you inserted has not been formatted and initialized, a prompt asks if you want to insert another tape or to format and initialize the current tape.

2 Initialize tape

If you insert a tape that has not been initialized, type **2** and press RETURN. Select this option if you are reusing a tape.

```
Warning: Initializing a tape will delete any files that are on
the tape.
    Proceed (Y/N):
```

a. Type **Y** to start the initialization ⇐|.

Y Continues the initialization.

N Lets you insert another tape.

```
A second confirmation is required to destroy data on this
tape.
    Proceed (Y/N):
```

b. Type **Y** again to confirm the operation ⇐|.

Y Continues the initialization. **Continue with step 10.**

N Gives you the option to insert another tape.

```
Enter new tape name:
```

c. Type the name of the tape and press RETURN. **Continue with step 10.**

```
Initializing tape...Done
```

3 Format and Initialize tape

If you inserted a tape that has not been formatted and initialized, type **3** and press RETURN. Select this option if you did not perform the procedure "Formatting a cartridge tape."

```
Warning: Formatting and initializing a tape will take 60
minutes and will delete any files that are on the tape.
    Proceed (Y/N):
```

a. Type **Y** to start the formatting and initialization ⇐|.

Y Continues the formatting and initialization.

N Gives you the option to insert another tape.

```
A second confirmation is required to destroy data on this
tape.
    Proceed (Y/N):
```

b. Type **Y** again to confirm the operation ⇐|.

Y Continues the formatting and initialization.

N Gives you the option to insert another tape.

```
Enter tape name:
```

c. Type the name of the tape and press RETURN. **Continue with step 10.**

```
Formatting tape...Done
```

Step-by-step for completing the backup

Backup starts immediately after the tape is ready.

```
Backup is starting...
```

As each tape is filled, this message appears:

```
Tape full.
Insert another tape cartridge.
Proceed (Y/N):
```

10. Remove the tape and label it with the date and time and the File Service name.
11. Insert the next tape. Type **Y** at the "Proceed" prompt ⇐|.

    Y Continues the backup on the tape just inserted.

    N Ends the operation.

```
Backup completed normally.
Source volume (name:domain:organization)
FS!
```

12. Log off.

Wrap-up

When you see a message indicating the number of pages remaining on the tape, the backup is complete.

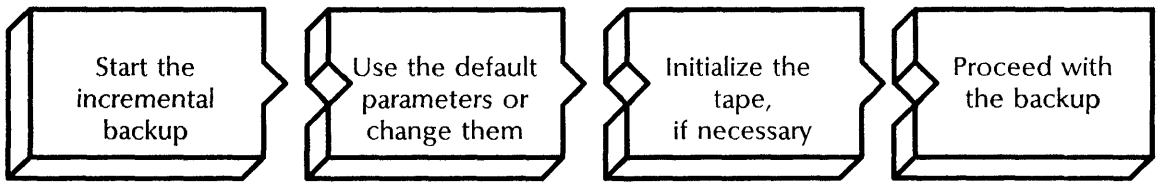
Record the date and names of the tapes on the File Service Backup Activity Log. If you are using Remote System Administration, make a copy of this procedure.

Example

This example shows an incremental backup to tape using the default parameters on a single-drive server. The tape is initialized before the backup starts. The system stores the backup increment on one tape.

```
FS!Backup File System
Automatic backup is waiting to run at 10-Aug-87 17:00.
        Use parameters that have been set for this volume? (Y/N): Y
Backup will be started immediately.
        Run in the background? (Y/N): N
        Insert cartridge tape.
            Proceed (Y/N): Y
Processing tape (This may take a while) ...
This tape is named Backup003 and has 65041 free pages.
Select initialization choice
        1   Append to existing data on tape
        2   Initialize tape
        3   Format and Initialize tape
Enter choice number: 2
Warning:  Initializing a tape will delete any files that are on the tape.
        Proceed (Y/N): Y
A second confirmation is required to destroy data on this tape.
        Proceed (Y/N): Y
        Enter tape name: Backup017
Initializing tape...Done
Backup is starting...
Backup completed normally.
Source volume Queen:BlueNet:Acme
FS!
```

Backing up the file system -- high-capacity cartridge tape



Use this procedure to start a manual incremental backup of the File Service volume to high-capacity cartridge tape. If you set backup parameters for automatic backup, you do not need to use this procedure unless the automatic backup has failed. A backup increment can consist of several split increments. The system may write more than one split increment to the same tape. If you have more than one high-capacity cartridge tape device, you can store the backup increment across several tapes.

If you set backup to run automatically, a message appears when backup starts to run and another message appears when backup completes.

Prerequisites

- If you are backing up the volume for the first time, perform the procedure "Setting backup parameters" earlier in this chapter.
- If you are not going to use the default parameters for this volume, determine the epoch date and backup cycle. Record this information on File Service Backup and Restore Worksheet.
- If you have previously backed up the volume, perform the procedure "Deleting obsolete backup increments" later in this chapter to remove references to obsolete increments from the volume.
- Insert the backup high-capacity cartridge tapes in the tape devices.
- Ensure that the high-capacity cartridge tape devices are local to the volume you are backing up.
- Update the File Service Backup Activity Log with the date and reason for backup.

Step-by-step for starting backup and selecting parameters

1. Log on and enable in the File Service context.
2. Type **Backup File System** ⇐|.

   If the File Service is running on a single-drive server, **skip to step 3**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
Enter choice number:
```

   If the File Service is running on a multiple-drive server, type the number for the volume you want to back up ⇐|.

   If you previously set automatic backup for the volume, a message indicates the start time of the next automatic backup.

```
Automatic backup is waiting to run at
<hour:minute:second>
```

```
Use parameters that have been set for this volume? (Y/N):
```

3. Type **Y** or **N** at the "Use parameters that have been set for this volume" prompt ⇐|.

   Y Uses the default parameters.

   If you previously set a tape chaining sequence for the volume, the order of devices appears. **Skip to step 9.**

N Lets you change the parameters for this backup. **Continue with step 4.**

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

```
Select Backup Medium
1   Rigid disk
2   Cartridge Tape
3   High Capacity Cartridge Tape
Enter choice number:
```

4. Type the number for for high-capacity cartridge tape and press RETURN.

```
Select tape device
1   Tape drive 1
2   Tape drive 2
3   Tape drive 3
4   Tape drive 4
Enter choice number:
```

5. Type the number for the first device in the tape chaining sequence ⇐|.

```
Chain another tape device? (Y/N):
```

6. Type **Y** or **N** at the "Chain another tape device" prompt ⇐|.

   Y Lets you select another tape device in the tape chaining sequence.

   N Displays the tape chaining sequence you have specified.

```
Tape devices <numbers>...will be used.
Backup epoch:
```

7. Type the date (day, month, year) and time (hour:minute:second) for the backup epoch and press RETURN. To consider all files for backup, simply press RETURN if the epoch value is blank.

NOTE If you use the **Copy Volume** command with incremental backup, set the epoch date to the date of the most recent copy volume operation.

NOTE Files created or changed before the epoch date are not considered for backup.

```
Days in cycle (0..90):
```

8. Type the number of days in your backup cycle and press RETURN. To backup all the files in the increment, use a cycle of 0 (zero).

```
Backup will be started immediately.
Run in background? (Y/N):
```

9. Type **Y** or **N** at the "Run in background" prompt ⇐|.

   Y Runs the backup in background mode, enabling you to use other commands at the server while backup is running.

   N Runs the backup in foreground mode. To use other commands at the server during backup, connect to the server using Remote System Administration.

```
Insert High Capacity Cartridge Tape into device <number>.
        Proceed (Y/N):
```

10. Insert the high-capacity cartridge tape into the specified device and type **Y** or **N** at the "Proceed" prompt ⇐|.

    Y Continues the backup. **Continue with step 11.**

    N Ends the process.

```
Processing tape (this may take a while)...
```

If the tape has been initialized, the name of the tape appears.

```
This tape is named <tape name> <date> <time>.
```

Step-by-step for selecting an initialization choice

```
Select initialization choice
1   Append to existing data on tape
2   Initialize tape
Enter choice number:
```

11. This step provides instructions for selecting an initialization choice. Go to the part of this step that matches your choice.

1 Append to existing data on tape To add this backup after existing backup data on the tape, type **1** and press RETURN. Proceed to "Step-by-step for completing the backup" later in this procedure.

2 Initialize tape If you inserted a tape that has not been initialized, type **2** and press RETURN. Select this option if you are reusing a tape.

```
Warning: Initializing a tape will delete any files that are on
the tape.
    Proceed (Y/N):
```

a. Type **Y** to start the initialization ⇐|.

   Y Continues the initialization.

   N Lets you insert another tape.

```
A second confirmation is required to destroy data on this
tape.
    Proceed (Y/N):
```

b. Type **Y** again to confirm the operation ⇐|.

   Y Continues the initialization.

   N Lets you insert another tape.

```
Enter tape name:
```

c. Type the name of the tape and press RETURN. For example, type the name of the File Service volume being backed up. **Continue with the next section.**

```
Initializing tape...Done
```

Step-by-step for completing the backup

Backup starts immediately after the tape is ready.

```
Backup is starting...
Backup completed normally.
Source volume <name:domain:organization>
FS!
```

12. Remove the tape and label it with the date and time of backup and the tape name specified above (if the tape was just initialized).

Wrap-up

When you see the message "Backup completed normally," the backup is complete.

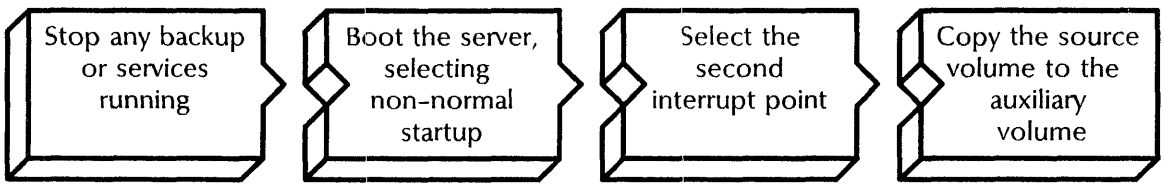
Record the date and name of the tapes on the File Service Backup Activity Log. Make a copy of this procedure using Remote System Administration.

Example

This example shows an incremental backup to high-capacity cartridge tape using the default parameters. The tape is initialized before the backup starts.

```
FS!Backup File System
Select volume
1   Queen
2   King
Enter choice number: 1
Use parameters that have been set for this volume? (Y/N): Y
Backup will be started immediately.
Run in background? (Y/N): N
Insert High Capacity Cartridge Tape device 3.
          Proceed? (Y/N): Y
Processing tape...This may take a while
This tape is named Backup003.
Select initialization choice
1         Append to existing data on tape
2         Initialize tape
Enter choice number: 2
Warning:  Initializing a tape will delete any files that are on the tape.
          Proceed (Y/N)? Y
A second confirmation is required to destroy data on this tape.
          Proceed (Y/N)? Y
Enter new tape name: Backup017
Initializing tape...done.
Backup is starting...
Backup completed normally.
Source volume Queen:BlueNet:Acme
FS!
```

Copying a primary volume to an auxiliary volume



If you have a multiple-drive server with 80 Mb or 300 Mb disk drives, use the **Copy Volume** command to copy the entire file system on one volume to another volume on the same server. You cannot copy a volume on a 42 Mb disk drive to another 42 Mb disk drive.

NOTE All services and volumes are unavailable to users during the copy volume operation.

NOTE This procedure also restores a primary volume from its backup copy.

Prerequisites

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.

- If the auxiliary volume is a removable pack, place the pack in a drive and bring the disk up to full speed.
- Ensure that the destination pack has been formatted and partitioned.
- If you are using a Xerox 300 Mb fixed rigid disk drive, ensure that the drive is enabled for reading and writing. Leave the WRITE PROTECT button in the normal extended position (not pushed in).
- If you are using a Xerox 300 Mb removable disk drive, ensure that the drive is enabled for reading and writing. Leave the READ/WRITE-READ ONLY button in the normal READ/WRITE position.

NOTE

If you are using a Xerox 8090 high-capacity rigid disk drive, no adjustment is necessary to put the drive into READ/WRITE mode.

- Ensure that neither the source nor destination volume need to be scavenged before this procedure.
- Notify all users that the server and services on that server will be down temporarily.
- Ensure that the size of the auxiliary pack is equal to or greater than the space used on the source pack.
- Update the File Service Backup and Restore Activity Log with the date and reason for the restore operation.

Step-by-step

1. Log on and enable in the File Service context.
2. In case backup is running, type **Stop Backup** ⇐|.
3. Type **Stop Service** ⇐|.

```
Select choices:
1   <Service name>
2   <Service name>
Enter one or more choices
```

4. Type the numbers for all services (for example, **1-2)** ⇐|.

```
<Service name>: Stop immediately? (Y/N):
```

5. Type **Y** or **N** at each "Stop immediately" prompt ⇐|.

   Y Stops the service immediately; all service functions are unavailable to the network.

   N Stops the service after all current activity ends.

```
Stopping <service name>.
<service name> is stopped.
```

6. After all the services stop, boot the server.

   a. Hold down the Boot Reset (B RESET) and Alternate Boot (ALT B) buttons at the same time.

   b. Release the Boot Reset (B RESET) button.

   c. When the maintenance panel displays 0001, release the Alternate Boot (ALT B) button.

```
Normal startup? (Y/N):
```

7. Type **N** at the "Normal startup" prompt ⇐|.

   Y Normally starts and runs each activated service on the server.

   N Requires user interaction for the non-normal startup options.

```
Enter interrupt point
1   Interrupt before opening primary volume
2   Interrupt before processing profile
3   Interrupt before running services
Enter one or more choices:
```

8. Type **2** for the "Interrupt before processing profile" option ⇐|.

NOTE

If you have a single-Clearinghouse network, the server enters Genesis mode. Use the **Run Service** command to load and run the Clearinghouse Service.

```
>
```

9. Log on and enable.

```
!
```

NOTE

If you have a single-Clearinghouse network, stop the Clearinghouse Service with the **Stop Service** command.

10. Type **Close Volume** ⇐|.

```
Select Volume
1   <name of primary volume>
Enter choice number:
```

11. Type the number for the primary volume ⇐|.

```
Done.
```

12. Type **Copy Volume** ⇐|.

NOTE

If you are backing up the primary volume, set the primary volume drive as the source drive, and the volume you are copying to as the destination drive. If you are restoring the primary volume, set the drive which holds the backup as the source drive, and the drive holding the primary volume as the destination drive.

```
Enter source drive (1..4):
```

13. Type the number for the source volume ⇐|.

```
Enter destination drive (1..4):
```

14. Type the number for the destination (secondary) drive ⇐|.

```
WARNING: This operation will destroy all previous contents
of the destination volume.
    Confirm? (Y/N):
```

15. Type **Y** at the "Confirm" prompt ⇐|.

    Y Continues the copy volume operation. **Continue with step 16.**

    N Cancels the copy volume operation.

```
Are you sure? (Y/N):
```

16. Type **Y** at the "Are you sure" prompt ⇐|.

    Y Starts the copy volume operation.

    N Cancels the copy volume operation.

```
Copying...done
<number> files copied. <number> total pages.
Elapsed time to copy: <number> hours <number>
minutes <number> seconds.
!
```

17. When the copy volume operation is complete, spin down the destination (backup volume) drive if it contains a removable pack. Otherwise, skip to step 20.
18. Remove the disk pack from the drive, mark the pack with the date and the name of the server, and store it in a safe place.
19. If you will be using the drive, replace the destination (backup volume) disk pack with the desired volume, and bring the drive up.

    If you will not be using the drive, you are done. **Skip to the Wrap-up section.**

    If you need to bring the drive and volume up again, **continue with step 20.**

20. Boot the server:

    a. Hold down the Boot Reset (B RESET) and Alternate Boot (ALT B) buttons at the same time.

    b. Release the Boot Reset (B RESET) button.

    c. When the maintenance panel displays 0001, release the Alternate Boot (ALT B) button.

```
Normal startup? (Y/N):
```

21. Type **Y** at the "Normal startup" prompt ⇐|.

    Y Normally starts and runs each activated service on the server. Type **Y** if you just backed up the primary volume.

    N Requires user interaction for the non-normal startup options. Type **N** if you just restored the primary volume. **Skip to step 40**.

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

```
FS!
```

23. Type **Offline Volume** ⇐|.

```
Select Volume
1   <volume name>
2   <volume name>
Enter choice number:
```

24. Type the number for the primary volume and press RETURN. A message indicates whether users are accessing the volume.

```
User Name          Volume Name   Start time   Last Action
<name:domain:org>  <volume>      <time>       <time>
```

    If no users are accessing the volume, **skip to step 26**.

```
No active users
Done.
```

```
Disconnect active users? (Y/N)
```

25. Type **Y** or **N** at the "Disconnect active users" prompt ⇐|.

    Y Takes the volume offline after the current operation in each user session ends.

    N Keeps the volume online until all users finish with it. Use the **Show Activity** command to confirm that all user sessions have ended.

26. Type **Change Volume** ⇐|.

```
Select Volume
1    <volume name>
2    <volume name>
Enter choice number:
```

27. Type the number for the primary volume ⇐|.

```
Name:
```

28. Type a temporary name for the primary volume ⇐|.

```
    Done
FS!
```

29. Type **Open Volume** ⇐|.

```
Drive (1..4):
```

30. Type the number for the drive containing the backup volume ⇐|.

```
Opening volume...done
FS!
```

31. Type **Change Volume** ⇐|.

```
Select Volume
1    <volume name>
2    <volume name>
Enter choice number:
```

32. Type the number for the backup volume ⇐|.

```
Name:
```

33. Type a new name for the backup volume ⇐|.

```
    Done
FS!
```

34. Type **Change Volume** ⇐|.

```
Select Volume
1    <volume name>
2    <volume name>
Enter choice number:
```

35. Type the number for the primary volume ⇐|.

```
Name:
```

36. Type the original name for the primary volume ⇐|.

```
    Done
FS!
```

37. Type **Online Volume** ⇐|.

```
Select Volume
1    <volume name>
2    <volume name>
Enter choice number:
```

38. Type the number for the primary volume ⇐|.

```
    Volume online
FS!
```

39. If you are bringing the backup volume online, repeat steps 37 and 38 for the backup volume.

    Otherwise, skip to the Wrap-up.

```
Enter interrupt point
1   Interrupt before opening primary volume
2   Interrupt before processing profile
3   Interrupt before running services
Enter one or more choices:
```

40. *(From step 21, **N** at the "Normal startup" prompt.)* Type the number for the "Interrupt before processing profile" option ⇐|.

```
>
```

41. Log on and enable.

42. Type **Change Volume** ⇐|.

```
Select Volume
1    <volume name>
2    <volume name>
Enter choice number:
```

43. Type the number for the primary volume ⇐|.

```
Name:
```

44. Type the original name for the primary volume ⇐|.

```
    Done
FS!
```

45. Type **Proceed** ⇐|.

Wrap-up

When the copy volume operation is complete, you are through with this procedure.

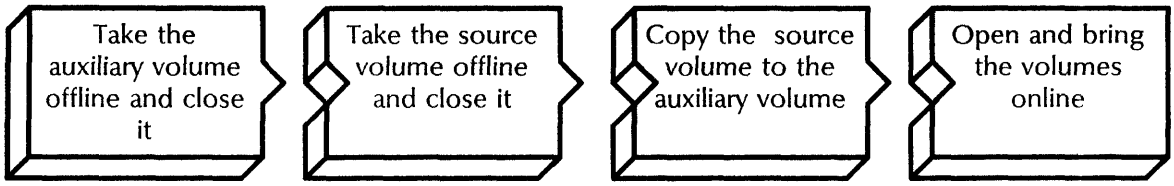
CAUTION: Do not use the auxiliary (destination) volume until you need to restore from it, or have completed the next copy volume operation.

Example

This example shows backing up a primary volume to an auxiliary volume, without bringing either online.

```
FS!Stop Backup
Backup is not running.
FS!Stop Service
Select services
1    File Service
Enter choice: 1
FS:Stop immediately? (Y/N): Y
Stopping File Service
     No active users
File Service is stopped.
Boot the server
Normal startup? (Y/N): N
Enter interrupt point
1    Interrupt before opening primary volume
2    Interrupt before processing profile
3    Interrupt before running services
Enter one or more choices: 2
Log on and enable
!Close Volume
Select Volume
1    Shark
Enter choice number: 1
     done
!Copy Volume
Enter source drive (1..4):  1
Enter destination drive (1..4):  4
WARNING: This operation will destroy all previous contents of the destination
volume.
     Confirm (Y/N): Y
     Are you sure? (Y/N): Y
Copying...done
7588 files copied.  155322 total pages.
Elapsed time to copy 2 hours 55 minutes 30 seconds.
!
```

Copying an auxiliary volume to an auxiliary volume



If you have a multiple-drive server with 80 Mb or 300 Mb disk drives, use this procedure to copy one auxiliary volume to another auxiliary volume on the same server. You cannot use this procedure to copy a volume on a 42 Mb disk drive to another 42 Mb disk drive.

NOTE

Both the source and auxiliary volumes are unavailable to users during the copy volume operation.

NOTE

This procedure also restores a volume from its backup copy.

Prerequisites

- If the auxiliary volume is on a removable pack, format and partition the pack.

  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.

- If the auxiliary volume is on a removable pack, place the pack in a drive and bring the disk up to full speed.
- If you are using a Xerox 300 Mb fixed rigid disk drive, ensure that the drive is enabled for reading and writing. Leave the WRITE PROTECT button in the normal extended position (not pushed in).
- If you are using a Xerox 300 Mb removable disk drive, ensure that the drive is enabled for reading and writing. Leave the READ/WRITE-READ ONLY button in the normal READ/WRITE position.

NOTE

If you are using a Xerox 8090 high-capacity disk drive, no adjustment is necessary to put the drive into read/write mode.

- Ensure that neither the source nor auxiliary volume need to be scavenged before the copy volume operation.
- If you are copying to a removable disk pack, and the backup pack is not in the drive, remove the pack from the drive and replace it with the backup pack to which you will copy.
- Update the File Service Restore Activity Log with the date and reason for the restore operation.

Step-by-step

1. Log on and enable in the File Service context.
2. In case backup is running, type **Stop Backup** ⇐|.
3. Type **Offline Volume** ⇐|.

```
Select Volume
1    <volume name>
2    <volume name>
3    <volume name>
4    <volume name>
Enter choice number:
```

4. Type the number for the source volume and press RETURN. A message indicates whether users are accessing the volume.

```
User Name          Volume Name      Start time     Last Action
<name:domain:org>  <volume>         <time>         <time>
```

If no users are accessing the volume, **skip to step 6.**

```
No active users
Done.
```

```
Disconnect active users? (Y/N)
```

5. Type **Y** or **N** at the "Disconnect active users" prompt ⇐|.

   Y Takes the volume offline after the current operation in each user session ends.

   N Keeps the volume online until all users finish with it. Use the **Show Activity** command to confirm that all user sessions have ended.

6. Type **Close Volume** ⇐|.

```
Select Volume
1    <volume>
Enter choice number:
```

7. Type the number for the source volume ⇐|.
8. Repeat steps 3 through 7 for the auxiliary volume in the destination drive. Wherever a prompt asks you to select a volume, type the number for the auxiliary volume ⇐|.
9. Type **Copy Volume** ⇐|.

```
Enter source drive (1..4):
```

10. Type the number for the source volume ⇐|.

```
Enter destination drive (1..4):
```

11. Type the number for the destination (secondary) volume ⇐|.

```
WARNING: This operation will destroy all previous contents
of the destination volume.
    Confirm? (Y/N):
```

12. Type **Y** at the "Confirm" prompt ⇐|.

    Y **Continue with step 13.**

    N Cancels the copy volume operation.

```
Are you sure? (Y/N):
```

13. Type **Y** at the "Are you sure" prompt ⇐|.

    Y Starts the copy volume operation.

    N Cancels the copy volume operation.

```
Copying...done
<number> files copied. <number> total pages.
Elapsed time to copy: <number> hours <number>
minutes <number> seconds.
```

14. If the auxiliary drive is a fixed drive, **continue with step 15.**

    If the auxiliary drive contains a removable pack; spin down the drive, remove the disk pack from the drive, mark the pack with the date and the name of the server, and store it away from the server to protect it from fire or other mishap. Replace the pack with the pack you wish to bring online.

15. Type **Open Volume** ⇐|.

```
Drive (1..4):
```

16. Type the number for the auxiliary drive ⇐|.

    Skip to step 20 if the auxiliary drive contains a removable pack and a uniquely named volume.

```
FS!
```

17. Type **Change Volume** ⇐|.

```
Select Volume
1   <volume name>
2   <volume name>
Enter choice number:
```

18. Type the number for the auxiliary volume ⇐|.

```
Name:
```

19. Type a new name for the auxiliary volume ⇐|.

NOTE

This action prevents having two volumes with the same name on the server. If volumes have duplicate names, you can access only one of the volumes.

```
FS!
```

20. Type **Online Volume** ⇐|.

```
Select Volume
1    <volume>
Enter choice number:
```

21. Type the number for the auxiliary volume ⇐|.

```
Bringing drive <number> online...
Deleting Clearinghouse entry for <name:domain:org>
Done
Service description unknown.
Enter service description:
```

22. Type the service description ⇐|.

```
Confirm (Y/N):
```

23. Type **Y** to confirm ⇐|.

    Y Confirms the description.

    N Return to step 22.

```
Volume online.
FS!
```

24. Type **Open Volume** ⇐|.

```
Drive (1..4):
```

25. Type the number for the source drive ⇐|.

```
FS!
```

26. Type **Online Volume** ⇐|.

```
Select Volume
1    <volume>
Enter choice number:
```

27. Type the number for the source volume ⇐|.

```
Validating Clearinghouse entry...
Volume online.
FS!
```

Wrap-up

When you see the message "Volume online," after bringing the source volume online, the procedure is complete.

Example

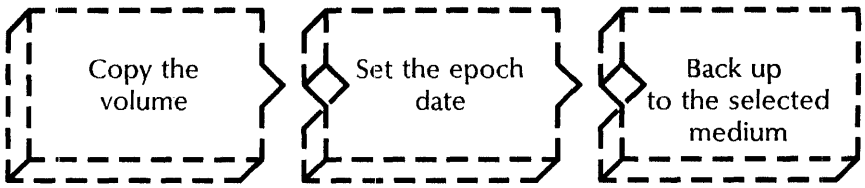
This example shows copying an auxiliary volume to another auxiliary volume on a fixed rigid disk.

```
FS! Stop Backup
Backup is not running.
FS!Offline Volume
    Select Volume
    1   Hokuto
    2   NU
    3   ECC
    4   FSBackup13
    Enter choice number: 4
    No active users.
    Done
FS!Close Volume
    Select Volume
    1   FSBackup13
    Enter choice number: 1
    Done
FS!Offline Volume
    Select Volume
    1   Hokuto
    2   NU
    3   ECC
    Enter choice number: 3
    No active users.
    Done
FS!Close Volume
    Select Volume
    1   ECC
    Enter choice number: 1
    Done
FS!Copy Volume
    Enter source drive  (1..4):  3
    Enter destination drive  (1..4):  4
WARNING: This operation will destroy all previous contents of the destination
volume.
    Confirm? (Y/N): Y
    Are you sure? (Y/N): Y
Copying...done
7588 files copied.  155322 total pages.  Elapsed time to copy: 2 hours 55 minutes
30 seconds.
```

Screen continued

```
FS!Open Volume
Drive (1..4): 4
Opening volume...done
FS!Change Volume
    Select Volume
    1   ECC
    Enter choice number: 1
    Name: ECCBackup
    done
FS!Online Volume
    Select Volume
    1   ECCBackup
    Enter choice number: 1
Bringing drive 4 online...
    Deleting Clearinghouse entry for: ECCBackup:OurDomain:OurOrg
    Done
    Service description unknown.
    Enter service description: backup for ECC
    Confirm? (Y/N): Y
    Validating Clearinghouse entry for: ECCBackup:OurDomain:OurOrg
    A new Clearinghouse entry was created.
    Done
Validating User Desktops...
anydesktop:OurDomain:OurOrg...ok
1 desktops validated.
Volume online.
FS!Open Volume
    Drive (1..4): 3
Opening volume...done
FS!Online Volume
    Select Volume
    1   ECC
    Enter choice number: 1
Bringing drive 3 online...
    Validating Clearinghouse entry for: ECC:OurDomain:OurOrg
    A new Clearinghouse entry was created.
    Done.
Validating User Desktops...
anydesktop:OurDomain:OurOrg...ok
1 desktops validated.
Volume online.
FS!
```

Using Copy Volume combined with incremental backup



Combine the copy volume and incremental backup operations to make backup faster and restoring data easier.

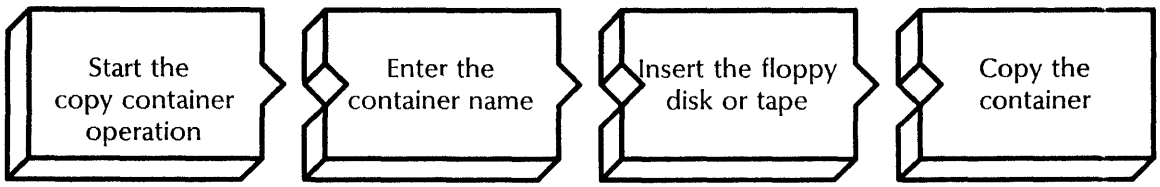
Prerequisites

- Have handy the File Service Backup Worksheet and the File Service Backup Activity Log.
- Determine whether you are copying a primary or secondary volume.

Step-by-step

1. Perform the procedure "Copying a primary volume to an auxiliary volume" or "Copying an auxiliary volume to an auxiliary volume" earlier in this chapter.
2. Perform the procedure "Setting backup parameters" earlier in this chapter to change the backup epoch parameter to the date of the copy volume operation.
3. Record the new epoch date on the File Service Backup Parameters Worksheet.
4. If you automatically back up the volume to rigid disk, cartridge tape, or high-capacity cartridge tape, you are done with this procedure. If you manually back up the volume, perform the incremental backup procedure for the medium you are using. These procedures appear earlier in this chapter.

Selective backup: copying a container



Use the **Copy Container** command to copy file drawers, file folders, documents, and desktops (stored on the File Service), as well as PC File Service (PCFS) directories (available to personal computer clients) onto floppy disks, cartridge tapes, or high-capacity cartridge tapes. The command can copy an object of any size by splitting larger objects and copying them on multiple floppy disks or tapes.

NOTE

You cannot perform more than one copy container operation on a single floppy disk, regardless of how small the copied object is.

The **Copy Container** command copies all the files in the specified container, regardless of when a file was written or last backed up. This command has no effect on incremental backup.

Prerequisites

- Know the name of the container you are copying.

NOTE

If you are unsure of the correct spelling of the container name, use the **List File Drawers** or **List Desktops** command to display it. These commands do not list folders or documents. You can use the wildcard symbol (*) to specify the names to be listed.

- Have handy the storage medium you want to use.
- If you are using an unformatted cartridge tape for the first time, perform the procedure "Formatting cartridge tapes" later in this chapter. If you format the tape during the copy container operation, it will take up to an hour longer.

NOTE

You do not need to format cartridge tapes if they are pre-formatted. Full cartridge tapes do not need to be reformatted; they are erased during initialization.

NOTE

You do not need to format floppy disks. Floppy disks are automatically formatted during the copy container operation.

NOTE

You do not need to format high-capacity cartridge tapes. You initialize high-capacity cartridge tapes during the copy container operation. The initialization takes 15 to 30 seconds.

- Update the File Service Backup Activity Log with the date and reason for selective backup.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Copy Container** ⇐|.

3. If the File Service is running on a single-drive server, **skip to step 4**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume storing the container you want to back up ⇐|.

```
Enter full container name, beginning with file drawer name.
    Container:
```

4. Type the pathname of the container you want to copy and press RETURN. Use slashes in the pathname to separate each container level.

NOTE

You can specify as many descendant file folders (directories) to the right of the file drawer name as necessary to identify the container you want, up to a total pathname length of 300 characters.

NOTE

To copy a desktop, type **desktops/** and then the desktop name. A desktop has the same fully qualified name as its owner.

NOTE

If a container name includes a diagonal slash (/), exclamation point (!), asterisk (*), pound sign (#), apostrophe ('), or parentheses ( ), precede the character with a single quotation mark. For example, type 11'/12'/39'/Birthday for a file named 11/12/39/Birthday.

```
Select Backup Medium
1   Floppy disk
2   Cartridge tape
Enter choice number:
```

5. Type the number for the medium you are using and press RETURN. The media listed depend on your hardware configuration.

```
Insert <floppy disk, tape, or high capacity cartridge tape>
Proceed (Y/N):
```

6. Insert the floppy disk or tape and type **Y** at the "Proceed" prompt ⇐|.

NOTE

Do not type **Y** at the "Proceed" prompt until the tape is rewound and ready for use. If you type **Y** before the tape is rewound the following message is displayed:

```
Tape not ready.
Please insert tape or wait until tape is ready before
proceeding.
```

If you are using floppy disks, the copy container operation starts immediately. **Skip to step 9.**

If you are using cartridge tapes, this message appears. **Continue with step 7.**

```
Processing tape (this may take a while)...
This tape is named <tape name> and has <number>
remaining free pages.
```

If you are using high-capacity cartridge tapes, this message appears. **Skip to step 8.**

```
This tape is named <tape name>.
```

```
Select initialization choice
1  Append to existing data on tape
2  Initialize tape
3  Format and initialize tape
Enter choice number:
```

7. Type the number for the cartridge tape initialization choice you want ⇐|.

   1 Copies the container at the end of a previously formatted and initialized cartridge tape. The copy container operation starts immediately when you choose this option.

   2 Removes all the data on the cartridge tape in a process that takes 1 to 5 minutes. Choose this option if you are reusing a tape.

   3 Formats and initializes the cartridge tape in a process that takes 60 minutes. Choose this option to format an unformatted tape.

   Skip to step 9.

```
Select initialization choice
1  Append to existing data on tape
2  Initialize tape
Enter choice number:
```

8. Type the number for the high-capacity cartridge tape initialization choice you want ⇐|.

   1 Copies the container at the end of a previously initialized high-capacity cartridge tape. The copy container operation starts immediately when you choose this option.

2 Prepares the high-capacity cartridge tape for use in a process that takes 10 to 20 seconds. Choose this option if you are using a new tape or reusing one. This option destroys any data that may be on the tape.

```
Copy Container is starting...
Done.
```

9. If the floppy disk or tape becomes full, the system asks you to insert another floppy disk or tape. Remove the floppy disk or tape and label it. Then repeat steps 6 through 8 until the message "Done" appears.

If you do not have another floppy disk or tape, type **N** at the "Proceed" prompt to stop the copy container operation and press RETURN. The data on the current set of floppy disks or tapes is incomplete. Restart the copy container operation when you have enough storage medium and reuse the current set of floppy disks or tapes.

10. Remove the floppy disk or tape. If you use cartridge tape, the message "<number> pages remaining on tape <tape name>" precedes the message "Done."

Wrap-up

When you see the message "Done," the copy container operation is complete. Label and store the floppy disks or tapes.

Example

This example shows copying a container. The data is added to a cartridge tape storing data from previous copy container operations.

```
FS!Copy Container
Enter full container name, beginning with file drawer name.
    Container: Planning
Select Backup Medium
1   Cartridge tape
Enter choice number: 1
Insert cartridge tape
    Proceed (Y/N): Y
Processing tape (this may take a while)...
This tape is named Archive 1-Sep-87 and has 14003 remaining free pages.
    Select initialization choice
    1   Append to existing data on tape
    2   Initialize tape
    3   Format and initialize tape
    Enter choice number: 1
Copy Container is starting...
9358 pages remaining on tape Archive 1-Sep-87
Done.
FS!
```

Full restore procedures

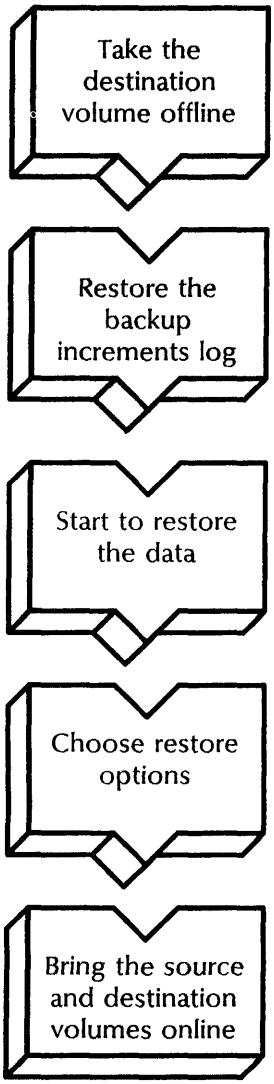
This section contains the procedures for restoring all the data on a File Service volume.

Restoring the file system -- rigid disk
Use this procedure to restore file system data that was backed up incrementally to a backup volume on a rigid disk.

Restoring the file system -- floppy disk
Use this procedure to restore file system data that was backed up incrementally to floppy disks.

Restoring the file system -- cartridge tape and high-capacity cartridge tape
Use this procedure to restore file system data that was backed up incrementally to cartridge tapes or high-capacity cartridge tapes.

Restoring the file system -- rigid disk



This procedure restores all lost information to a File Service volume from a rigid disk. If you combine the copy volume operation with incremental backup, use this procedure to restore new and changed files.

NOTE If you use only the copy volume operation to back up your file system, you need not perform this procedure. Instead, use the procedure "Copying a primary volume to an auxiliary volume" or "Copying an auxiliary volume to an auxiliary volume" earlier in this chapter.

Perform this procedure when a rigid disk hardware failure has damaged the File Service volume. In this case, you restore both the backup increments log and the File Service data.

You can also perform this procedure when the file server has crashed but the backup increments log has not been damaged. In this case you restore only the File Service data.

Prerequisites

- If you want to restore to an empty volume, initialize the volume. See the File Service chapter in the *Services Installation and Setup Guide*.
- If you combine the copy volume operation with incremental backup for the File Service you are restoring, perform the procedure "Copying an auxiliary volume to an auxiliary volume" earlier in this chapter. This procedure copies the backup pack to the File Service volume you are restoring and ensures restoration of files that are older than the epoch date.
- Know the epoch date for the volume you are restoring. This information is on your File Service Backup Worksheet.
- Update the File Service Restore Activity Log with the date and reason for the restore operation.

CAUTION: Ensure that the volume you are restoring is not set to run backup. If automatic backup starts before the restore operation finishes, some files may not be restored.

Step-by-step

1. Log on and enable in the File Service context ⇐|.
2. Type **Offline Volume** ⇐|.

   CAUTION: If you are restoring information from a volume on a remote server, do not take the remote volume offline. Otherwise, you cannot access the information.

3. If the File Service is running on a single-drive server, a message indicates users are accessing the volume.
   - If users are accessing the volume, **continue with step 4**.
   - If no users are accessing the the volume, **skip to step 5**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
4   <backup volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the destination volume (the volume you are restoring to) ⇐|.

A message indicates whether users are accessing the volume.

- If users are accessing the volume, **continue with step 4.**
- If no users are accessing the volume, **skip to step 5.**

```
Disconnect active users? (Y/N)
```

4. Type **Y** or **N** at the "Disconnect active users" prompt ⇐|.

   Y Takes the volume offline after the current operation in each user session ends.

   N Keeps the volume online until all users finish with it. Use the **Show Activity** command to confirm that all user sessions have ended.

5. Repeat steps 2 through 4 for the source volume (the volume you are restoring from) if the source volume is on the same server as the destination volume. Otherwise, skip to step 6.

6. Type **Show Backup Index** ⇐|.

```
Select
1   Show Backup increments of a local volume
2   Show increments from a specific floppy disk
3   Show increments from a specific cartridge tape
4   Show increments from a specific High Capacity Cartridge
    Tape
Enter choice number:
```

7. Type **1** to display a backup index and press RETURN. The media listed depend on your hardware configuration.

   1 Shows a menu of increments from the backup increments log of the source volume.

   2 Lists the names of the files in the increment or split increment stored on a floppy disk.

   3 Shows a menu of increments stored on a cartridge tape.

   4 Shows a menu of increments stored on a high-capacity cartridge tape.

```
Select Volume
1    <volume name>
2    <volume name>
3    <volume name>
4    <backup volume name>
Enter choice number:
```

8. If the File Service is running on a multiple-drive server, type the number for the source volume ⇐|.

```
Show Backup increment of
1    <date> <time> <medium>
2    <date> <time> <medium>
3    <date> <time> <medium>
Enter one or more choices:
```

9. If the backup index is listed, press RETURN and **skip to step 23**.

   Otherwise, the message "Backup increment information for the volume is unavailable" appears. If this happens, you must restore the backup increment log to the source volume from the most recent backup increment, **Return to step 6**, and show the increments for the medium you are using.

10. Type **Restore Container** ⇐|.

```
Restoring to volume <name>.
```

11. If the File Service is running on a single-drive server, **continue with step 12.**

```
Select Volume
1    <volume name>
2    <volume name>
3    <volume name>
4    <backup volume name>
Enter choice number:
```

   If the File Service is running on a multiple-drive server, type the number for the volume you want to restore ⇐|.

```
Enter full container name, beginning with file drawer name.
    Container:
```

12. Type **SystemFiles/Backup Increments Log** at the "Container" prompt ⇐|.

SystemFiles contains no spaces; **Backup Increments Log** contains spaces.

```
Restore using increment data from this volume? (Y/N):
```

13. Type **N** at the "Restore using increment data from this volume" prompt ⇐|.

    Y Uses an obsolete backup increments log (if one exists) on the File Service volume to restore increments.

    N Allows data to be restored from increments not listed in the current backup increments log.

```
Restore files through date: <last backup date>
```

14. Type the date and time through which you want to restore the volume and press RETURN. To restore the latest state of the volume, simply press RETURN on the default of the current date.

NOTE

If you are restoring data from a remote server in another time zone, the default restore date is automatically converted to the correct date and time in your time zone.

```
Confirm each restore (Y/N):
```

15. Type **Y** or **N** at the "Confirm each restore" prompt ⇐|.

    Y Lets you confirm the restoration of each file in each increment you choose to restore. **Skip to step 17.**

    N Automatically restores all files in each increment you choose to restore. **Continue with step 16.**

```
Suppress feedback (Y/N):
```

16. Type **Y** or **N** at the "Suppress feedback" prompt ⇐|.

    Y Suppresses feedback during restoration.

    N Displays feedback during restoration.

```
Restore backup increments in reverse order.
Please indicate the Backup source.
    Select Backup Medium:
    1  Floppy disk
    2  Rigid Disk
    Enter choice number:
```

17. Type the number for rigid disk and press RETURN. The media listed depend on your hardware configuration.

```
Backup volume name:
```

18. Type the name of the backup volume storing the most recent backup increment ⇐|.

```
Backup file drawer:
```

19. Type the name of the backup file drawer on the backup volume ⇐|.

```
Backup increment of <date> <time> on <backup volume:
domain:organization>
    Skip this backup increment (Y/N):
```

20. Type **N** at the "Skip this backup increment" prompt ⇐|.

    Y Does not restore the backup increments log.

    N Continues the process of restoring the backup increments log.

```
SystemFiles!1/Backup Increments Log!1
Ready for next increment. Continue? (Y/N):
```

21. Type **N** at the "Continue" prompt ⇐|.

    Y Continues the restore container operation. **Skip to step 23.**

    N Displays the following prompt.

```
Continue with restore? (Y/N):
```

22. Type **N** at the "Continue with restore" prompt ⇐|.

    Y Continues the restore container operation.

    N Displays the "FS!" prompt.

23. Type **Restore File System** ⇐|.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
4   <backup volume name>
Enter choice number:
```

24. If the File Service is running on a single-drive server, **continue with step 25.**

    If the File Service is running on a multiple-drive server, type the number for the volume you want to restore ⇐|.

```
Restore using increment data from this volume? (Y/N):
```

25. Type **Y** at the "Restore using increment data from this volume" prompt ⇐|.

    Y Continues the restore process.

    N Continues the restore process, but asks for the source information (location where the backup is stored). The fully qualified service name must be identical to that of the service that created the increments.

```
Backup increments will be retrieved from the volume.
Restore files through date:  <last backup date>
```

26. Type the date and time through which you want to restore the volume and press RETURN. To restore the latest state of the volume, simply press RETURN on the default date.

```
Confirm each restore (Y/N):
```

27. Type **Y** or **N** at the "Confirm each restore" prompt ⇐|.

    Y Lets you confirm the restoration of each file in each increment you choose to restore. Select this option if you need to selectively restore individual files. **Skip to step 29.**

    N Automatically restores all files in each increment you choose to restore. **Continue with step 28.**

```
Suppress feedback (Y/N):
```

28. Type **Y** or **N** at the "Suppress feedback" prompt ⇐|.

    Y Suppresses feedback during restoration.

    N Displays feedback during restoration. This option takes longer.

```
Restore backup increments in reverse order.
Backup increment of <date> <time> on rigid disk
<backup volume:domain:organization>
   Skip this backup increment? (Y/N):
```

29. Type **Y** or **N** at the "Skip this increment" prompt ⇐|.

    Y Does not restore the current increment.

    N Restores the current increment.

```
Increment completed, ready for next increment.
Backup increment of <date> <time> on rigid disk
<backup volume:domain:organization>
   Skip this backup increment? (Y/N):
```

30. Type **Y** or **N** at the next "Skip this increment" prompt ⇐|.

    Y Does not restore the current increment. **Continue with step 31.**

    N Restores the current increment.

    Repeat this step until you restore all the increments.

```
Continue with Restore? (Y/N):
```

31. Type **Y** or **N** at the "Continue with Restore" prompt ⇐|.

    Y Returns you to step 29 so you can restore the next increment.

    N Ends the restore process.

32. Log off.

Wrap-up

When you have restored all the increments, the full restore process is complete. Bring the volumes back online by using the **Online Volume** command.

Examples

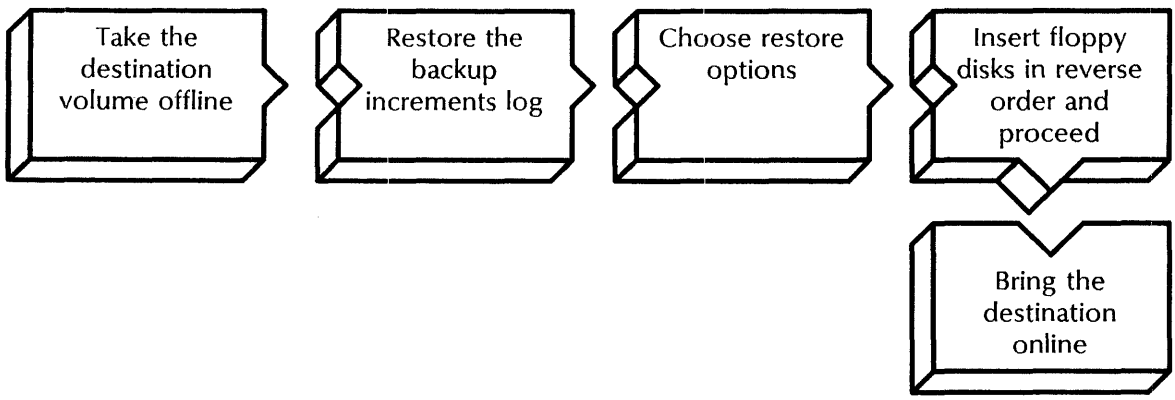
The following examples show a full restoration of a volume from a backup volume. The first example shows the restoration of the backup increments log.

```
FS!Offline Volume
    No active users.
    Done
FS!Show Backup Index
Select
1   Show Backup increments of a local volume
2   Show increment from a specific cartridge tape
3   Show increment from a specific High Capacity Cartridge Tape
Enter choice number: 1
Select Volume:
1   Planning
Enter choice number: 1
Backup increment information for the volume is unavailable.
FS!Restore Container
Restoring to volume Planning.
Enter full container name, beginning with file drawer name.
    Container: SystemFiles/Backup Increments Log
    Restore using increment data from this volume? (Y/N): N
    Restore files through date: August 1, 1987
    Confirm each restore (Y/N): N
    Suppress feedback (Y/N): N
Restore backup increments in reverse order.
Please indicate the Backup source.
    Select Backup Medium
    1   Rigid disk
    2   Floppy disk
    Enter choice number: 1
    Backup volume name: Backup Volume
    Backup file drawer: Bupfile drawer
Backup increment of 27-July-87 10:16:49 on rigid disk Backup Volume:Western
Region:Acme
    Skip this backup increment (Y/N): N
SystemFiles!1/Backup Increments Log!1
Proceed? (Y/N): N
Continue with restore? (Y/N): N
FS!
```

The second example shows the restoration of the increments.

```
FS!Restore File System
    Restore using increment data from this volume? (Y/N): Y
Backup increments will be retrieved from the volume.
Restore files through date: August 1, 1987
Confirm each restore (Y/N): Y
Restore backup increments in reverse order.
Backup increment information for the volume is unavailable.
    Backup increment of 28-July-87 11:00:43 on rigid disk Backup Volume:Western
    Region:Acme
        Skip this backup increment (Y/N): N
    (Here a list of all the files being restored is displayed.  Restore goes through
    all the increments and asks the System Administrator to confirm the restore for
    each file in the increment.)
Increment completed, ready for next increment.
Backup increment of 29-July-87 10:15:30 on rigid disk Backup Volume:Western
Region:Acme
    Skip this backup increment (Y/N): Y
Continue with Restore? (Y/N): N
FS!
```

Restoring the file system -- floppy disk



If you perform incremental backup to floppy disks, use this procedure to restore all backed-up files after a hardware failure.

Perform this procedure when a rigid disk hardware failure has damaged the File Service volume. In this case, you restore both the backup increments log and the File Service data.

You can also perform this procedure when the file server has crashed but the backup increments log has not been damaged. In this case, you restore only the File Service data.

NOTE

If you are restoring multiple backup increments, restore them in reverse chronological order (the most recent increment first, then the next most recent increment, and so on). If the backup copied an increment on several floppy disks, restore the split increment beginning with split number 1.

Prerequisites

- Use the **Show Backup Index** command to identify the floppy disk containing the backup increments log.
- If you want to restore to an empty volume, initialize the volume. See the File Service chapter in the *Services Installation and Setup Guide*.
- If you performed the procedure "Using Copy Volume with incremental backup" to back up the File Service you are restoring, perform the procedure "Copying an auxiliary volume to an auxiliary volume" to copy the backup pack to the source volume you are restoring. This ensures restoration of files that are older than the epoch date.
- Know the epoch date for the volume you are restoring. This information is on your File Service Backup Worksheet.
- Update the File Service Restore Activity Log with the date and reason for the restore.
- Have handy the floppy disks with the increments.

CAUTION: Ensure that the volume you are restoring to is not set to backup automatically. Since the restore process may take more than one day, automatic backup could start before the restore operation finishes. This may cause files not to be restored.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Offline Volume** ⇐|.
3. If the File Service is running on a single-drive server, a message indicates whether users are accessing the volume.
   - If users are accessing the volume, **continue with step 4**.
   - If no users are accessing the volume, **skip to step 5**.

```
Select Volume
1    <volume name>
2    <volume name>
3    <volume name>
4    <backup volume>
Enter choice number:
```

   If the File Service is running on a multiple-drive server, type the number for the destination volume ⇐|.

   A message indicates whether there users are accessing the volume.
   - If users are accessing the volume, **continue with step 4**.
   - If no users are accessing the volume, **skip to step 5**.

```
Disconnect active users? (Y/N)
```

4. Type **Y** or **N** at the "Disconnect active users" prompt ⇐|.

   Y Takes the volume offline after the current operation in each user session ends.

   N Keeps the volume online until all users finish with it. Use the **Show Activity** command to confirm that all user sessions have ended.

5. Type **Show Backup Index** ⇐|.

```
Select
1  Show Backup increments of a local volume
2  Show increments from a specific floppy disk
Enter choice number:
```

6. Type **1** to display a backup index and press RETURN.

   1 Shows a menu of increments from the backup increments log of the source volume.

   2 Lists the names of the files in the increment or split increment stored on a floppy disk.

```
Select Volume
1  <volume name>
2  <volume name>
3  <volume name>
4  <backup volume name>
Enter choice number:
```

7. If the File Service is running on a multiple-drive server, type the number for the source volume ⇐|.

```
Show Backup increment of
1  <date> <time> <medium>
2  <date> <time> <medium>
3  <date> <time> <medium>
Enter one or more choices:
```

8. If the backup index is listed, press RETURN and **skip to step 22**.

   Otherwise, the message "Backup increment information for the volume is unavailable" appears. If this happens, you must restore the backup increment log to the source volume from the most recent backup increment, **Return to step 5**, and show the increments for the medium you are using.

9. Type **Restore Container** ⇐|.

10. If the File Service is running on a single-drive server, **continue with step 11**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
4   <backup volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume you want to restore ⇐|.

```
Restoring to volume <volume name>
Enter full container name, beginning with file drawer name.
    Container:
```

11. Type **SystemFiles/Backup Increments Log** at the "Container" prompt ⇐|.

SystemFiles contains no spaces; **Backup Increments Log** contains spaces.

```
Restore using increment data from this volume? (Y/N):
```

12. Type **N** at the "Restore using increment data from this volume" prompt ⇐|.

    Y Uses an obsolete backup increments log (if one exists) on the File Service volume to restore increments.

    N Allows data to be restored from increments not listed in the current backup increments log.

```
Restore files through date: <last backup date>
```

13. Type the date and time through which you want to restore the volume and press RETURN. To restore the latest state of the volume, simply press RETURN on the default date.

```
Confirm each restore (Y/N):
```

14. Type **Y** or **N** at the "Confirm each restore" prompt ⇐|.

    Y Lets you confirm the restoration of each file in each increment you choose to restore. Select this option if you need to abort the restore process after it has started. **Skip to step 16.**

    N Automatically restores all files in each increment you choose to restore. **Continue with step 15.**

```
Suppress feedback (Y/N):
```

15. Type **Y** or **N** at the "Suppress feedback" prompt ⇐|.

    Y Suppresses feedback during restoration.

    N Displays feedback during restoration. This takes longer.

```
Restore backup increments in reverse order.
Please indicate the Backup source.
    Select Backup Medium
    1   Floppy
    2   Rigid Disk
    Enter choice number:
```

16. Type the number for floppy disk and press RETURN. The media listed depend on your hardware configuration.

```
Insert floppy disk
    Proceed (Y/N):
```

17. Insert the first disk from the set of floppy disks containing the most recent backup increment.

    For example, if the backup increment consists of three disks, insert the disk containing split increment 1. If the entire backup increment is on one disk, insert that disk.

18. Type **Y** at the "Proceed" prompt ⇐|.

    Y Searches this floppy disk for the backup increments log.

    N Prompts you to insert another floppy disk.

```
Processing floppy...
Insert next split floppy.
    Proceed (Y/N):
```

19. Insert the next floppy disk, then type **Y** at the "Proceed" prompt and press RETURN. Repeat this step until you see this message:

```
SystemFiles!1/Backup Increments Log!1
Done.
Restore file? (Y/N)
```

20. Type **Y** at the "Restore file" prompt ⇐|.

    Y Restores the backup increments log.

    N Does not restore the backup increments log.

```
Continue with restore? (Y/N):
```

21. Type **N** at the "Continue with restore" prompt ⇐|.

    Y Continues the restore container operation.

    N Stops the restore container operation.

```
FS!
```

22. Type **Restore File System** ⇐|.

23. If the File Service is running on a single-drive server, **continue with step 24.**

```
Select Volume
1   <volume name>
2   <volume name>
3   <backup volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume you want to restore ⇐|.

```
Restore using increment data from this volume? (Y/N):
```

24. Type **N** at the "Restore using increment data from this volume" prompt ⇐|.

Y Uses an obsolete backup increments log (if one exists) on the File Service volume to restore increments.

N Allows data to be restored from increments not listed in the current backup increments log.

```
Backup information will be retrieved from the volume.
    Restore files through date:  <last backup date>
```

25. Type the date and time through which you want to restore the volume and press RETURN. To restore the latest state of the volume, simply press RETURN on the default value.

```
Confirm each restore (Y/N):
```

26. Type **Y** or **N** at the "Confirm each restore"prompt ⇐|.

Y Lets you confirm the restoration of each file in each increment you choose to restore. Select this option if you need to abort the restore process after it has started. **Skip to step 28.**

N Automatically restores all files in each increment you choose to restore. **Continue with step 27.**

```
Suppress feedback (Y/N):
```

27. Type **Y** or **N** at the "Suppress feedback" prompt ⇐|.

Y Suppresses feedback during restoration.

N Displays feedback during restoration. This takes longer.

```
Restore backup increments in reverse order.
Insert increment closest to <date>  <time>
    Proceed (Y/N):
```

28. If you are restoring to the latest state of the volume, insert the first disk from the set of floppy disks containing the most recent backup increment.

    If you are restoring from an older increment (the date in step 22 is not the current date) insert the disk with the backup date closest to the date in step 22 first.

    For example, if the backup increment consists of three disks, insert the disk containing split increment # 1. If the entire backup increment is on one disk, insert the disk.

29. Type **Y** at the "Proceed" prompt ⇐|.

    Y Continues the restore process.

    N Cancels the restore process.

```
Processing floppy...
Split increment # 1 of <date> <time> for <volume name:
domain:organization> complete.
```

    The list of files being restored appears only if you typed **N** in step 27 to display feedback.

```
Insert next split floppy
    Proceed (Y/N):
```

30. Insert the next floppy disk, then type **Y** at the "Proceed" prompt and press RETURN. Repeat this step until you see this message:

```
Increment completed, ready for next increment.
Insert increment closest to <date> <time>
    Proceed (Y/N):
```

31. Insert the first disk in the set containing the next most recent increment. Type **Y** at the "Proceed" prompt ⇐|.

    Y Continues the restore process. Return to step 30.

    N Ends the restore process.

32. Repeat step 30 until you have restored the files on all the floppy disks for the backup cycle, then type **N** at the "Proceed" prompt ⇐|.

33. Log off.

Wrap-up

When you have restored all the increments in the backup cycle, the full restore process is complete. Bring the volume back online by using the **Online Volume** command. Store the floppy disks in a safe place.

Example

The following examples show a full restoration of a volume from floppy disks. The first example shows the restoration of the backup increments log without confirmation and displaying feedback. The backup increments log was stored on the first floppy inserted.

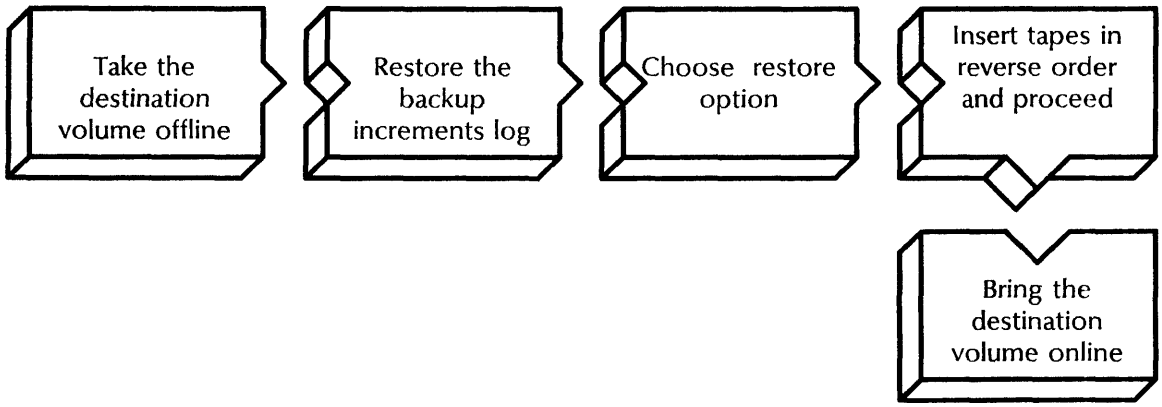
```
FS!Offline Volume
No active users.
Done
FS!Show Backup Index
Select
1   Show Backup increments of a local volume
2   Show increment from a specific cartridge tape
3   Show increment from a specific High Capacity Cartridge Tape
Enter choice number: 1
Select Volume:
1   Finance
2   Planning
Enter choice number: 1
Backup increment information for the volume is unavailable.
FS!Restore Container
    Select Volume:
    1   Finance
    2   Planning
    Enter choice number: 2
Restoring to volume Planning
Enter full container name, beginning with file drawer name.
    Container: SystemFiles/Backup Increments Log
    Restore using increment data from this volume? (Y/N): N
    Restore files through date: 23-Aug-87 13:47:08
    Confirm each restore (Y/N): N
    Suppress feedback (Y/N): N
Restore backup increments in reverse order.
Please indicate the Backup source.
    Select Backup Medium
    1   Floppy
    2   Rigid Disk
    Enter choice number: 1
Insert floppy disk
    Proceed (Y/N): Y
Processing floppy...
SystemFiles!1/Backup Increments Log!1
    Proceed (Y/N): N
FS!
```

The second example shows the restoration of the increments for a seven-day backup cycle. All the files backed up since the end of the previous cycle (July 25, 1987) are restored in reverse chronological order.

```
FS!Restore File System
    Select Volume:
    1  Finance
    2  Planning
    Enter choice number: 2
Restore using increment data from this volume? (Y/N): Y
Backup information will be retrieved from the volume.
    Restore files through date:  1-Aug-87  17:24:31
    Confirm each restore (Y/N): N
    Suppress feedback (Y/N): N
Restore backup increments in reverse order.
Insert increment closest to August 1, 1987 0:00:00
    Proceed (Y/N): Y
Processing floppy...
    List of files being restored appears
Split increment #1 of August 1, 1987 10:08:01 for Planning:Unit1:GemSysCo
complete.
Insert next split floppy
    Proceed (Y/N): Y
Processing floppy...
    List of files being restored appears
Increment completed, ready for next increment.
Insert increment closest to 31-Jul-87 5:00:00
    Proceed (Y/N): Y
Processing floppy...
    Steps repeat for July 30, 29, 28, 27, and 26.

Increment completed, ready for next increment.
Insert increment closest to 25-Jul-87 5:00:00
    Proceed (Y/N): N
Continue with restore? (Y/N): N
FS!
```

Restoring the file system -- cartridge tape and high-capacity cartridge tape



Use this procedure to restore complete backup data from cartridge tape or high-capacity cartridge tape after a hardware failure. Restore increments in reverse chronological order. Because a tape may contain more than one increment, the restore operation first processes the increment at the end of the tape and then those toward the beginning of the tape.

Perform this procedure when a rigid disk hardware failure has damaged the File Service volume. In this case, you restore both the backup increments log and the File Service data.

You can also perform this procedure when the file server has crashed but the backup increments log has not been damaged. In this case, you restore only the File Service data.

Prerequisites

- Use the **Show Backup Index** command to determine the order of the tapes. This command displays the increments and increment sections contained on each tape.
- Know the name of the tape containing the most recent complete increment.
- Know the names of the tapes containing all the other increments.
- Have handy the tapes containing all the increments to be restored.
- If you want to restore to an empty volume, initialize the volume. See the File Service chapter in the *Services Installation and Setup Guide*.
- Know the epoch date for the volume you are restoring. This information is on your File Service Backup Worksheet.
- Update the File Service Restore Activity Log with the date and reason for the restore.

CAUTION: Ensure that the volume you are restoring is not set to run automatic backup. If automatic backup starts before the restore operation finishes, some files may not be restored.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Offline Volume** ⇐|.
3. If the File Service is running on a single-drive server, a message indicates whether users are accessing the volume.
   - If users are accessing the volume, **continue with step 4.**
   - If no users are accessing the volume, **skip to step 5.**

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
4   <backup volume name>
Enter choice number:
```

   If the File Service is running on a multiple-drive server, type the number for the destination volume ⇐|.

   A message indicates whether users are accessing the volume.

   - If users are accessing the volume, **continue with step 4.**
   - If no users are accessing the volume, **skip to step 5.**

```
Disconnect active users? (Y/N)
```

4. Type **Y** or **N** at the "Disconnect active users" prompt ⇐|.
   - **Y** Takes the volume offline after the current operation in each user session ends.
   - **N** Keeps the volume online until all users finish with it. Use the **Show Activity** command to confirm that all user sessions have ended.
5. Type **Show Backup Index** ⇐|.

```
Select
1   Show Backup increments of a local volume
2   Show increments from a specific cartridge tape
3   Show increments from a specific High Capacity Cartridge
    Tape
Enter choice number:
```

6. Type **1** to display a backup index and press RETURN. The media listed depend on your hardware configuration.
   - **1** Shows a menu of increments from the backup increments log of the source volume.
   - **2** Shows a menu of increments stored on a cartridge tape.
   - **3** Shows a menu of increments stored on a high-capacity cartridge tape.

```
Select Volume
1    <volume name>
2    <volume name>
3    <volume name>
4    <backup volume name>
Enter choice number:
```

7. If the File Service is running on a multiple-drive server, type the number for the source volume ⇐|.

```
Show Backup increment of
1    <date> <time> <medium>
2    <date> <time> <medium>
3    <date> <time> <medium>
Enter one or more choices:
```

8. If the backup index is listed, press RETURN and **skip to step 21**.

   Otherwise, the message "Backup increment information for the volume is unavailable" appears. If this happens, you must restore the backup increment log to the source volume from the most recent backup increment, **Return to step 5**, and show the increments for the medium you are using.

9. Type **Restore Container** ⇐|.

10. If the File Service is running on a single-drive server, **continue with step 11**.

```
Select Volume
1    <volume name>
2    <volume name>
3    <volume name>
4    <backup volume name>
Enter choice number:
```

   If the File Service is running on a multiple-drive server, type the number for the volume you want to restore ⇐|.

```
Restoring to volume <volume name>.
Enter full container name, beginning with file drawer name.
    Container:
```

11. Type **SystemFiles/Backup Increments Log** at the "Container" prompt ⇐|.

SystemFiles contains no spaces; **Backup Increments Log** contains spaces.

```
Restore using increment data from this volume? (Y/N):
```

12. Type **N** at the "Restore using increment data from this volume" prompt ⇐|.

    Y Uses an obsolete backup increments log (if one exists) on the File Service volume to restore increments.

    N Allows data to be restored from increments not listed in the current backup increments log.

```
Restore files through date: <last backup date>
```

13. Type the date and time through which you want to restore the volume and press RETURN. To restore the latest state of the volume, simply press RETURN on the default value.

```
Confirm each restore (Y/N):
```

14. Type **Y** or **N** at the "Confirm each restore" prompt ⇐|.

    Y Lets you confirm the restoration of each file in each increment you choose to restore. Select this option if you need to abort the restore process after it has started. **Skip to step 16.**

    N Automatically restores all files in each increment you choose to restore. **Continue with step 15.**

```
Suppress feedback (Y/N):
```

15. Type **Y** or **N** at the "Suppress feedback" prompt ⇐|.

    Y Suppresses feedback during restoration.

    N Displays feedback during restoration. This takes longer.

```
Restore backup increments in reverse order.
Please indicate the backup source
Select backup medium
1  Rigid disk
2  Cartridge tape
3  High Capacity Cartridge Tape
Enter choice number:
```

16. Type the number for the backup medium ⇐|.

```
Select tape device
1  Tape drive <number>
2  Tape drive <number>
3  Tape drive <number>
4  Tape drive <number>
Enter choice number:
```

17. Type the number for the tape device into which you inserted the tape ⇐|.

```
Insert <cartridge tape or high capacity cartridge tape>
named <tape name>
Proceed (Y/N):
```

18. Insert the requested tape. If you insert a cartridge tape, **skip to step 20**.

    If you insert a high-capacity cartridge tape, **continue with step 19**.

```
SystemFiles!1/Backup Increments Log!1
Done.
Proceed? (Y/N):
```

19. Type **N** at the "Proceed" prompt ⇐|.

    Y Restores the backup increments log.

NOTE

Do not type **Y** at the "Proceed" prompt until the tape is rewound and ready for use. If you type **Y** before the tape is rewound the following message is displayed:

```
Tape not ready.
Please insert tape or wait until tape is ready before
proceeding.
```

N Displays the following prompt:

```
Processing tape...This may take a while
Done
Continue with restore? (Y/N):
```

20. Type **N** at the "Continue with restore" prompt ⇐|.

    Y Continues the restore container operation.

    N Ends the restore container operation.

```
FS!
```

21. Type **Restore File System** ⇐|.

22. If the File Service is running on a single-drive server, **skip to step 24**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume you want to restore ⇐|.

```
Restore using increment data from this volume? (Y/N):
```

23. Type **Y** at the "Restore using increment data from this volume" prompt ⇐|.

    Y Continues the restore process.

    N Continues the restore process, but asks for the source information (the location where the backup is stored). The fully qualified service name must be identical to that of the service that created the increments.

```
Backup information will be retrieved from the volume.
Restore files through date:  <last backup date>
```

24. Type the date and time through which you want to restore the volume and press RETURN. To restore the latest state of the volume, simply press RETURN.

```
Confirm each restore (Y/N):
```

25. Type **Y** or **N** at the "Confirm each restore"prompt ⇐|.

    Y Lets you confirm the restoration of each file in each increment you choose to restore. **Skip to step 27.**

    N Automatically restores all files in each increment you choose to restore. **Continue with step 26.**

```
Suppress feedback (Y/N):
```

26. Type **Y** or **N** at the "Suppress feedback" prompt ⇐|.

    Y Suppresses feedback during restoration.

    N Displays feedback during restoration. This takes longer.

```
Restore backup increments in reverse order.
Backup increment of <date> <time> on tape <tape
name>
          Skip this backup increment (Y/N):
```

27. Type **N** at the "Skip this backup increment" prompt ⇐|.

    Y Does not restore the current increment.

    N Continues the restore process for the current increment.

```
Insert <cartridge tape or high capacity cartridge tape>
named <tape name>
```

28. Insert the requested tape. If you are inserting a cartridge tape, **skip to step 30.**

    If you are inserting a high-capacity cartridge tape, **continue with step 29.**

```
Select tape device
1   Tape drive <number>
2   Tape drive <number>
3   Tape drive <number>
4   Tape drive <number>
Enter choice number:
```

29. Type the number for the tape drive into which you inserted the tape ⇐|.

```
Proceed? (Y/N):
```

30. Type **Y** or **N** at the "Proceed" prompt ⇐|.

    Y Restores the increment.

Do not type **Y** at the "Proceed" prompt until the tape is rewound and ready for use. If you type **Y** before the tape is rewound the following message is displayed:

```
Tape not ready.
Please insert tape or wait until tape is ready before
proceeding.
```

    N Displays the following prompt.

```
Continue with restore? (Y/N):
```

    a. Type **Y** or **N** at the "Continue with restore" prompt⇐|.

        Y Continues the restore.

        N **Skip to step 32.**

```
Processing tape...
Increment completed, ready for next increment.
Backup increment of <date> <time> on tape <tape
name>
    Skip this backup increment? (Y/N):
```

31. Repeat steps 25 through 28 until you see this message:

```
Processing increment...
Increment completed.  No more increments to process.
Done.
```

32. Bring the destination volume online.
33. Log off.

Wrap-up

When you see the message "No more increments to process," the restore process is complete.

Examples

The examples show a full restoration of a volume from cartridge tape. The first example shows the restoration of the backup increments log.

```
FS! Offline volume
No active users.
Done.
FS! Show Backup Index
Select
1   Show Backup increments of a local volume
2   Show increment from a specific cartridge tape
3   Show increment from a specific High Capacity Cartridge Tape
Enter choice number: 1
Select Volume:
1   Finance
2   Planning
Enter choice number: 1
Backup increment information for this volume is unavailable.
FS! Restore Container
Select Volume:
1   Finance
2   Planning
Enter choice number: 1
Restoring to volume Planning.
Enter full container name, beginning with file drawer name.
    Container: SystemFiles/Backup Increments Log
    Restore using increment data from this volume? (Y/N): N
    Restore files through date: 30-Mar-88
    Confirm each restore (Y/N): N
    Suppress feedback (Y/N): N
Restore backup increments in reverse order.
Please indicate the backup source
    Select Backup Medium
    1   Rigid disk
    2   Cartridge tape
    3   High Capacity Cartridge Tape
    Enter choice number: 3
    Select tape device
    1   Tape drive 1
    2   Tape drive 2
    3   Tape drive 3
    4   Tape drive 4
    Enter choice number: 3
```

Screen continued

```
Insert High Capacity Cartridge Tape into device 3
    Proceed (Y/N): Y
Processing tape (this may take a while)...
This tape is named Backup003
    Restore from increment
1   27-Mar-88 18:59:59 from Planning:Western:Acme
        Created by incremental Backup (incomplete)
2   25-Mar-88 9:33:07 from Planning:Western:Acme
        Created by incremental Backup (complete)
    Enter choice number: 2
Backup increment of 25-Mar-88 9:33:07 on High Capacity Cartridge Tape
Backup003
    Skip this backup increment (Y/N): N
Processing tape (this may take a while)...
Increment completed, ready for next increment.
    Continue with Restore (Y/N): N
    Done
FS!
```

The second example shows the restoration of the increments for the backup cycle. The increments are stored on three tapes. One increment consists of sections on two tapes.

```
FS!Restore File System
Restore using increment data from this volume? (Y/N): Y
    Backup information will be retrieved from the volume.
    Restore files through date: August 1, 1987
    Confirm each restore (Y/N): N
    Suppress feedback (Y/N): Y
Restore backup increments in reverse order.
Backup increment of 28-July-87 11:00:43 on tape Backup003
    Skip this backup increment (Y/N): N
Insert cartridge tape named Backup003.
    Proceed (Y/N)?: Y
Processing tape...This may take a while
Increment completed, ready for next increment.
Backup increment of 27-July-87 11:00:54 on tape Backup003
    Skip this backup increment (Y/N): N
Processing tape...
Increment completed, ready for next increment.
                                        Screen continued
```

```
Backup increment of 26-July-87 11:00:39 on tape Backup002
     Skip this backup increment (Y/N):  N
Insert cartridge tape named Backup002.
     Proceed (Y/N)?: Y
Processing tape...This may take a while
Increment completed, ready for next increment.
Backup increment of 25-July-87 11:00:40 on tape Backup002 (section 2)
     Skip this backup increment (Y/N):  N
     Proceed (Y/N)?: Y
Processing tape...
Section 2 of this increment completed.  Backup001 contains section 1.
Insert cartridge tape named Backup001.
     Proceed (Y/N)?: Y
Processing tape...This may take a while
Increment completed, ready for next increment.
Backup increment of 24-July-87 11:05:31 on tape Backup001
     Skip this backup increment (Y/N):  N
Processing increment...
Increment completed.  No more increments to process.
Done.
FS!
```

Selective restore procedures

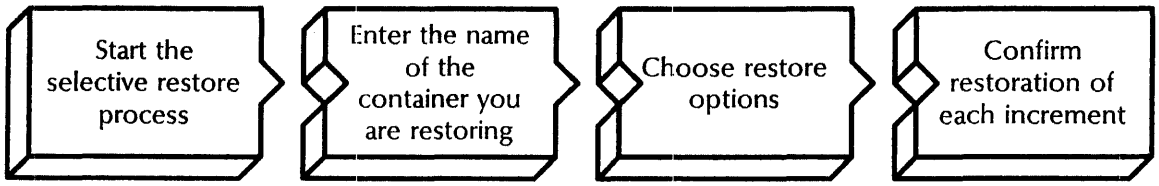
This section contains the procedures for selectively restoring data on a File Service volume.

Restoring a container -- rigid disk
Use this procedure to restore file drawers, file folders, documents, desktops, or directories that were backed up to rigid disk with the **Backup File System** command.

Restoring a container -- floppy disk
Use this procedure to restore file drawers, file folders, documents, desktops, or directories that were backed up to floppy disks using the **Backup File System** or the **Copy Container** command.

Restoring a container -- cartridge tape and high-capacity cartridge tape
Use this procedure to restore file drawers, file folders, documents, desktops, or directories that were backed up to cartridge tapes or high-capacity cartridge tape using the **Backup File System** or the **Copy Container** command.

Restoring a container -- rigid disk



Use this procedure to restore only some of the File Service data from increments stored on rigid disk. You can restore file drawers, file folders, documents, and desktops (stored on the File Service) as well as PC File Service directories (available to personal computer clients) with this procedure.

Prerequisites

- Use the **Show Backup Index** command to identify the pathname of the container you want to restore.
- Record the pathname. Write down the file drawer name first, then the file folder name, then the document name.
- Ensure that all hierarchical elements of the container you want to restore exist on the volume. If you want to restore a file folder, the file drawer storing it must be on the volume. If you want to restore a document that was in a file folder, the file drawer and file folder must be on the volume.
- Make sure that the backup volume containing the files you want to restore is online.
- Update the File Service Restore Activity Log with the date and reason for the restore.
- To restore a file from a copy volume pack created using the copy volume operation combined with incremental backup, do not use the **Restore Container** command. Instead, perform these three tasks:
  - Change the name of the copy volume pack before you bring it online. This action avoids overwriting the source volume's Clearinghouse entry.
  - Bring the copy volume pack online as a temporary File Service.
  - Copy the objects from the temporary File Service to a user workstation.

You cannot have two volumes with the same name on the same server.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Restore Container** ⇐|.
3. If the File Service is running on a single-drive server, **continue with step 4.**

```
Select volume
1   <volume name>
2   <volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume to which you want to restore ⇐|.

```
Restoring to volume <volume name>.
Enter full container name, beginning with file drawer name.
    Container:
```

4. Type the pathname of the container you want to restore and press RETURN. Use slashes in the pathname to separate each container level.

```
Restore using increment data from this volume? (Y/N):
```

5. Type **Y** or **N** at the "Restore using increment data from this volume" prompt ⇐|.

   Y Restores the container using the backup increments log on the volume, if available. **Skip steps 9 through 11.**

   N Requires that you supply the location of the backup data during restore.

```
Restore files through date:  <last backup date>
```

6. Type the date and time through which you want to restore data and press RETURN. To restore the latest data, simply press RETURN at the default.

If you are restoring data from a remote server in another time zone, the default restore date is automatically converted to the correct date and time in your time zone.

```
Confirm each restore (Y/N):
```

7. Type **Y** or **N** at the "Confirm each restore" prompt ⇐|.

   Y Lets you confirm the restoration of each file in each increment you choose to restore. Use this option during special troubleshooting recovery operations and when you were unable to specify the entire pathname because the container pathname exceeded 300 characters. **Skip to step 9.**

   N Lets you confirm only the restoration of each increment.

```
Suppress feedback (Y/N):
```

8. Type **Y** or **N** at the "Suppress feedback" prompt ⇐|.

   Y Suppresses feedback during restoration.

   N Displays feedback during restoration.

```
Restore backup increments in reverse order.
Please indicate the Backup source.
    Select Backup Medium:
    1  Floppy disk
    2  Rigid Disk
    Enter choice number:
```

9. Type the number for rigid disk and press RETURN. The media listed depend on your hardware configuration.

```
Backup volume:
```

10. Type the name of the backup volume storing the most recent backup increment ⇐|.

```
Backup file drawer:
```

11. Type the name of the backup file drawer on the backup volume ⇐|.

```
Backup increment of <date> <time> on <backup volume:
domain:organization>
    Skip this backup increment (Y/N):
```

12. Type **N** at the "Skip this backup increment" prompt ⇐|.

    Y Does not restore the increment. Identifies the next increment for you to restore and repeats the prompt.

    N Restores the increment. **Continue with step 13.**

NOTE

When a container stores more than one file with the same name, each file has a unique version number.

```
<file drawer name>!1/<folder name>/!<version
number>/<document name>!<version number>
    Restore file (Y/N):
```

13. Type **Y** at the "Restore file" prompt for each object ⇐|.

NOTE

If a container has more than one object, this prompt appears for each object. (ie folder or document). Answer **Y** or **N** to the above prompt for each object.

Y Restores the object.

N Does not restore the object.

NOTE

This prompt appears only if you typed **Y** in step 7 to confirm restoration of each file.

```
Increment completed, ready for next increment?
```

14. Type **Y** or **N** at the "Ready for next increment" prompt ⇐|.

    Y Restores the increment.

    N Displays the following prompt.

```
Continue with restore? (Y/N):
```

15. Type **Y** or **N** at the "Continue" prompt ⇐|.

    Y Continues the restore container operation. Return to step 9.

    N Ends the restore container operation.

16. Log off.

Wrap-up

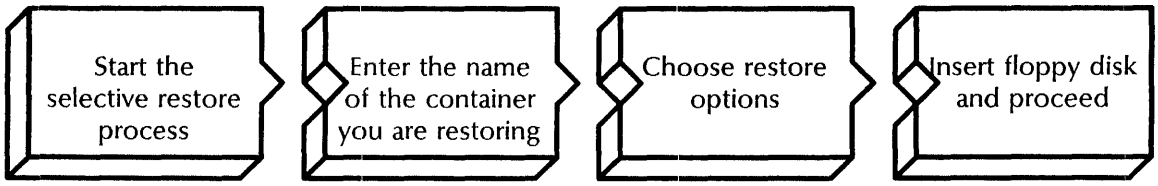
When you see the "FS!" prompt, you have restored the container.

Example

This example shows restoring a container from rigid disk.

```
FS!Restore Container
Restoring to volume Planning
Enter full container name, beginning with file drawer name.
    Container: mydrawer/myfolder/mydoc
    Restore using increment data from this volume? (Y/N): N
    Restore files through date: August 1, 1987
    Confirm each restore (Y/N): N
    Suppress feedback (Y/N): N
Restore backup increments in reverse order.
Please indicate the Backup source.
    Select Backup Medium:
    1  Rigid disk
    2  Tape
    Enter choice number: 1
    Backup volume name: Backup Volume
    Backup file drawer: Bupfile drawer
Backup increment of 27-July-87 10:16:49 on rigid disk Backup Volume:Western
Region:Acme
    Skip this backup increment (Y/N): N
mydrawer!1/myfolder!1/mydoc!1
Increment completed, ready for next increment? (Y/N): N
Continue with restore? (Y/N): N
FS!
```

Restoring a container -- floppy disk



Use this procedure to restore only some of the File Service data from increments stored on floppy disk. You can restore file drawers, file folders, documents, and desktops (stored on the File Service) as well as PC File Service directories (available to personal computer clients) with this procedure.

Prerequisites

- Use the **Show Backup Index** command to identify the pathname of the container you want to restore.
- Record the pathname. Write down the file drawer name first, then the file folder name, then the document name.
- Ensure that all hierarchical elements of the container you want to restore exist on the volume. If you want to restore a file folder, the file drawer storing it must be on the volume. If you want to restore a document that was in a file folder, the file drawer and file folder must be on the volume.
- Have handy the floppy disks containing the files you want to restore.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Restore Container** ⇐|.
3. If the File Service is running on a single-drive server, **continue with step 4**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume to which you want to restore ⇐|.

```
Restoring to volume <volume name>
Enter full container name, beginning with file drawer name.
    Container:
```

4. Type the pathname of the container you want to restore and press RETURN. Use slashes in the name to separate each container level.

```
Restore using increment data from this volume? (Y/N):
```

5. Type **Y** or **N** at the "Restore using increment data from this volume" prompt ⇐|.

   Y Restores the container using the backup increments log on the volume, if available. **Skip to step 9.**

   N Requires that you insert the correct floppy disks that contain the backup increments.

```
Restore files through date: <last backup date>
```

6. Type the date and time through which you want to restore data and press RETURN. To restore the latest data, simply press RETURN at the default.

```
Confirm each restore (Y/N):
```

7. Type **Y** or **N** at the "Confirm each restore" prompt ⇐|.

   Y Lets you confirm the restoration of each file in each increment. Use this option during special troubleshooting recovery operations. Also use this option when you were unable to specify the entire pathname because the container pathname exceeded 300 characters. Select this option if you need to abort the restore process after it has started.

   N Lets you confirm only the restoration of each increment.

```
Suppress feedback (Y/N):
```

8. Type **Y** or **N** at the "Suppress feedback" prompt ⇐|.

   Y Suppresses feedback during restoration.

   N Displays feedback during restoration. This option takes longer.

```
Restore backup increments in reverse order.
Please indicate the backup source.
Select backup medium
1   Floppy disk
2   Rigid disk
Enter choice number:
```

9. Type **1** for floppy disk ⇐|.

```
Insert floppy disk
    Proceed (Y/N):
```

10. Insert the first disk from the set of floppy disks containing the backup increment with the version of the container you want to restore.

    For example, if the backup increment consists of three disks, insert the disk containing split increment 1 first. If the entire backup increment is on one disk, insert that disk.

    If you know which split increment contains the file, insert that floppy disk first.

11. Type **Y** at the "Proceed" prompt ⇐|.

    Y Continues the restore container operation.

    N Cancels the restore container operation.

```
Processing floppy disk ...
Container was not found on this floppy.
Split increment # number of <date> <time> for <volume
name:domain:organization>
Insert next split floppy
    Proceed (Y/N):
```

12. If the floppy disk does not contain the file, insert the next floppy disk, then type **Y** at the "Proceed" prompt and press RETURN. Repeat this step until the system finds the file you want.

    When a container stores more than one file with the same name, each file has a unique version number.

```
<file drawer name>!1/<folder name>/!<version
number>/<folder name>!<number of objects in folder>
    Restore file (Y/N):
```

13. Type **Y** at the "Restore file" prompt ⇐|.

    Y Restores the file.

    N Does not restore the file.

```
Increment completed, ready for next increment.
Insert floppy disk containing increment closest to <date>
<time>
    Proceed ? (Y/N):
```

14. Type **Y** or **N** at the "Proceed" prompt ⇐|.

    Y Continues the restore container operation. Return to step 4.

    N Ends the restore operation.

15. Log off.

Wrap-up

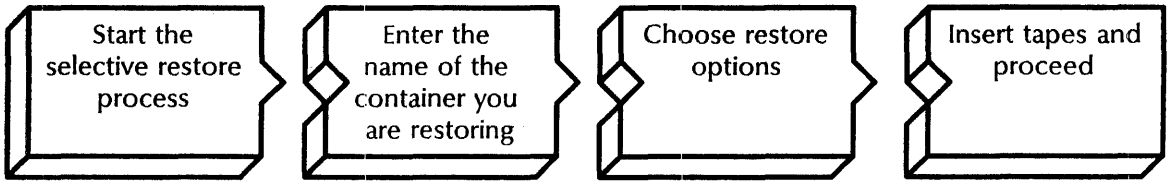
When you see the "FS!" prompt, you are done. Store the floppy disks in a safe place.

Example

This example shows restoring a container from floppy disks. The file to be restored, named Peterson/Project 14, is on the second floppy disk inserted.

```
FS!Restore Container
    Select Volume:
    1 Finance
    2 Planning
    Enter choice number: 2
Restoring to volume Planning
Enter full container name, beginning with file drawer name.
    Container: Peterson/Project 14
    Restore using increment data from this volume?(Y/N): N
    Restore files through date: 01-Aug-87
    Confirm each restore (Y/N): N
    Suppress feedback (Y/N): N
Restore backup increments in reverse order.
Please indicate the Backup source.
    Select Backup Medium
    1 Floppy
    2 Rigid Disk
    Enter choice number: 1
Insert floppy disk
    Proceed (Y/N): Y
Processing floppy disk...
Container was not found on this floppy.
Split increment # 1 of 01-Aug-87 14:10:37 for Planning:Unit1:GemSysCo
Insert next split floppy
    Proceed (Y/N): Y
Peterson!1/Project 14!1
Increment completed, ready for next increment.
Insert floppy disk
    Proceed (Y/N): N
FS!
```

Restoring a container -- cartridge tape and high-capacity cartridge tape



Use this procedure to restore only some of the File Service data from increments stored on cartridge tape or high-capacity cartridge tape. You can restore file drawers, file folders, documents, and desktops (stored on the File Service), and PC File Service directories (network resources to personal computer users) with this procedure.

Prerequisites

- Use the **Show Backup Index** command to identify the pathname of the container you want to restore.
- Record the pathname. Write down the file drawer name first, then the file folder name, then the document name.
- Ensure that all hierarchical elements of the container you want to restore exist on the volume. If you want to restore a file folder, the file drawer storing it must be on the volume. If you want to restore a document that was in a file folder, the file drawer and file folder must be on the volume.
- Have handy the tapes containing the files you want to restore.
- Update the File Service Restore Activity Log with the date and reason for the restore.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Restore Container** ⇐|.
3. If the File Service is running on a single-drive server, **continue with step 4**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume to which you want to restore.

```
Restoring to volume <volume name>.
Enter full container name, beginning with file drawer name.
    Container:
```

4. Type the pathname of the container you want to restore and press RETURN. Use slashes in the name to separate each container level.

```
Restore using increment data from this volume? (Y/N):
```

5. Type **Y** or **N** at the "Restore using increment data from this volume" prompt ⇐|.

   Y Restores the container using the backup increments log on the volume, if available. **Skip to step 9.**

   N Requires that you insert the correct tapes that contain the backup increments.

```
Restore files through date: <last backup date>
```

6. Type the date and time through which you want to restore data and press RETURN. To restore the latest data, simply press RETURN on the default.

```
Confirm each restore (Y/N):
```

7. Type **Y** or **N** at the "Confirm each restore" prompt ⇐|.

   Y Lets you confirm the restoration of each file in each increment you choose to restore. Use this option during special troubleshooting recovery operations, and when you were unable to specify the entire pathname because the container pathname exceeded 300 characters. Select this option if you need to abort the restore process after it has started. **Skip to step 9.**

   N Lets you confirm only the restoration of each increment.

```
Suppress feedback (Y/N):
```

8. Type **Y** or **N** at the "Suppress feedback" prompt ⇐|.

   Y Suppresses feedback during restoration.

   N Displays feedback during restoration. This option takes longer.

```
Restore backup increments in reverse order.
Please indicate the backup source
Select backup medium
1   Rigid disk
2   Cartridge tape
3   High Capacity Cartridge Tape
Enter choice number
```

9. Type the number for the medium you are restoring ⇐|.

```
Insert <cartridge tape or high-capacity cartridge tape>
```

10. Insert the requested tape.

    If you insert a cartridge tape, **skip to step 12.**

```
Select tape device
1   Tape drive <number>
2   Tape drive <number>
3   Tape drive <number>
4   Tape drive <number>
Enter choice number:
```

    If you insert a high-capacity cartridge tape, **continue with step 11.**

11. Type the number for the tape device into which you inserted the tape ⇐|.

```
Proceed? (Y/N):
```

12. Type **Y** at the "Proceed" prompt ⇐|.

    Y Restores the increment.

NOTE

Do not type **Y** at the "Proceed" prompt until the tape is rewound and ready for use. If you type **Y** before the tape is rewound, this message is displayed:

```
Tape not ready.
Please insert tape or wait until tape is ready before
proceeding.
Proceed (Y/N):
```

    N Cancels the restore container operation.

```
This tape named <name>.
Processing tape (this may take a while)...
```

NOTE

If you are using cartridge tape, the above message also gives the remaining free pages.

NOTE

If the container being restored is a file drawer or folder, you may need to restore several increments to restore all the contents.

```
(A list of containers and files being restored if you typed N
in step 3)
Backup increment of <date> <time> on tape <name>
Skip this backup increment (Y/N):
```

13. Type **Y** or **N** at the next "Skip this increment" prompt ⇐|.

    Y Does not restore the current increment. **Continue with step 14.**

    N Restores the current increment. Repeat this step until you restore the container.

```
Continue with Restore? (Y/N):
```

14. Type **Y** or **N** at the "Continue with Restore" prompt ⇐|.

    Y Continues the restore for the next increment.

    N Ends the restore container operation.

```
No more increments to process
    Done.
FS!
```

15. Log off.

Wrap-up

When you see the "FS!" prompt, you have restored the container. Store the tapes in a safe place.

Example

This example shows restoring a container from cartridge tape using increment data on from the source volume.

```
FS!Restore Container
Restoring to volume Planning
Enter full container name, beginning with file drawer name.
    Container: FileDrawer/Manager
    Restore using increment data from this volume? (Y/N): Y
    Restore files through date: August 1, 1987
    Confirm each restore (Y/N): N
    Suppress feedback (Y/N): N
Restore backup increments in reverse order.
Insert cartridge tape named Backup004
    Proceed (Y/N): Y
Processing tape...This may take a while...
This tape is named Backup004 and has 9300 remaining free pages
Backup increment of  28-July-87 11:00:43 on tape Backup004
    Skip this backup increment (Y/N): N
FileDrawer!1/Manager!1
FileDrawer!1/Manager!1/Tasks!2
FileDrawer!1/Manager!1/Monthly!2
Increment completed, ready for next increment.
Backup increment of 22-July-87 14:01:02 on tape Backup003
    Skip this backup increment (Y/N): N
Insert cartridge tape named Backup003
    Proceed (Y/N): Y
Processing tape (this may take a while)...
This tape is named Backup003 and has 93000 remaining free pages
Increment completed, ready for next increment.
Backup increment of 21-July-87 16:00:27 on tape Backup002
    Skip this backup increment (Y/N): N
Insert cartridge tape named Backup002
    Proceed (Y/N): Y
Processing tape (this may take a while)...
FileDrawer!1/Manager!1/Personnel!1
FileDrawer!1/Manager!1/Personnel!1/Activity Reports!1
Increment completed.  Ready for next increment.
Backup increment of 21-July-87 13:55:03 on tape Backup001
    Skip this backup increment (Y/N): Y
Continue with Restore (Y/N): N
Done
FS!
```

Maintenance procedures

This section contains the procedures for maintaining the File Service backup and restore operations.

Deleting obsolete backup increments
Use this procedure to delete obsolete backup increments from the backup volume on a rigid disk. Also use this procedure to delete references to obsolete increments in the backup increments log. The obsolete increments can be stored on rigid disk, floppy disk, cartridge tape, or high-capacity cartridge tape.

Formatting and partitioning a removable disk pack
Use this procedure to prepare a removable disk pack for use as a primary or a secondary volume.

Formatting a cartridge tape
Use this procedure to format cartridge tapes.

Showing the backup index
Use this procedure to locate files before you restore them.

Stopping backup
Use this procedure to stop a manual or an automatic backup in progress.

Deleting obsolete backup increments

If you back up to rigid disk, use the **Delete Obsolete Backup Increments** command to delete outdated backup data for a source volume as often as you run backup on that volume. This command recovers the disk space taken up by backup data on a rigid disk. The command also deletes the corresponding increment information from the backup increments log on the source volume.

If you back up to floppy disk or tape, use the **Delete Obsolete Backup Increments** command to determine which floppy disks or tapes you can reuse. The command deletes entries for obsolete increments from the backup increments log on the source volume. You do not need the floppy disks or tapes to perform this procedure.

Prerequisites

If the backup increment is on rigid disk:

- Ensure that both the backup volume and the source volume are available.
- Ensure that you have read and remove access to the backup file drawer containing the backup data you want to delete.

CAUTION: Backup volumes must have unique names. Even if the increment is not on that volume, the command deletes any reference to the increment from the log. Later, when the volume with the increment comes online, the command will be unable to find and delete the increment.

CAUTION: Backup increments stored at the beginning of a tape become obsolete before increments stored at the end. Do not reuse the tape until *all* backup increments stored on it are obsolete.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Delete Obsolete Backup Increments** ⇐|.
3. If the File Service is running on a single-drive server, **continue with step 4**.

```
Select Volume
1   <volume name>
2   <volume name>
3   <volume name>
Enter choice number:
```

If the File Service is running on a multiple-drive server, type the number for the volume from which you want to delete obsolete backup increments and/or backup increments log entries ⇐|.

```
Confirm each delete (Y/N):
```

4. Type **Y** or **N** at the "Confirm each delete" prompt ⇐|.

   Y Lets you confirm the deletion of each increment. You may want to keep certain obsolete backup increments so you can restore files from a particular backup cycle. **Continue with step 5.**

   N Automatically deletes all obsolete backup increments. **Skip to the Wrap-up section.**

```
<date> <time> on <volume> (Y/N):
```

5. Type **Y** or **N** to delete or save each obsolete increment ⇐|.

   Y Deletes the obsolete increment.

   N Saves the obsolete increment.

```
Deleting...
    Done
FS!
```

Wrap-up

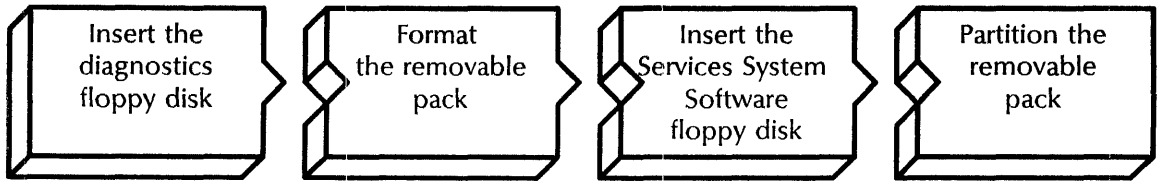
After you delete the obsolete backup increments you want, use the **List Volumes** command to see how much space is available on the volume.

Example

This example shows deleting obsolete backup increments from a volume on a multiple-drive server. The System Administrator confirms each deletion. For the increments on rigid disk, both the increment and its reference in the backup increments log are deleted. For the increment on tape, only its reference in the backup increments log is deleted.

```
FS!Delete Obsolete Backup Increments
    Select Volume
    1   Finance
    2   Planning
    Enter choice number: 1
    Confirm each delete (Y/N): Y
    27-Jul-88 13:17:03 on Backup3:Unit1:GemSysCo (Y/N): N
Not deleted.
    21-Jul-88 11:19:28 on Tape Backup017 (Y/N): Y
Deleting...Done
    15-Jul-88 11:56:24 on Backup2:Unit1:GemSysCo (Y/N): Y
Deleting...
    Done
FS!
```

Formatting and partitioning a removable disk pack



You must format and partition a removable disk pack before you can use it as a primary or a secondary volume. This process destroys all data written on a disk pack, so be sure the pack does not contain data you want to keep.

Fixed rigid disks should not be formatted.

One formatting pass takes one hour and 45 minutes. The partitioning process takes about 20 minutes.

Prerequisites

- Format and partition packs in the same drive that they will be used for read and write operations.
- Place the removable pack in the disk drive and bring it up to full speed.
- Have handy the "8000 Series Rigid Disk Diagnostics (80, 300 MB) 7.0" floppy disk.
- Have handy the "Services System Software (80, 300 MB) #1" floppy disk.
- Obtain from the Software Control Center the password you need to access the rigid disk diagnostics.

Step-by-step for formatting a removable disk pack

1. Insert the "8000 Series Rigid Disk Diagnostics (80, 300 MB) 7.0" floppy disk.
2. Reboot the server from the floppy disk.
   a. Hold down the Boot Reset (B RESET) and Alternate Boot (ALT B) buttons at the same time.
   b. Release the Boot Reset (B RESET) button.
   c. When the maintenance panel displays 0002, release the Alternate B (ALT B) button.

```
Person running the test
1  User
2  System Administrator
3  Technical Representative
Enter choice number:
```

3. Type the number for the System Administrator ⇐|.

```
System Administrator
Password:
```

4. Type the password ⇐|.

```
Test Selection
1. Confidence Test
2. Format Disk
3. Physical Volume Scavenge
4. Bad Page Utility
5. Display Bad Page Table
6. Exit
Enter choice number:
```

5. Type the number for the "Format Disk" option ⇐|.

```
Copyright (C) Xerox Corporation
        1983,1984,1985, 1986, 1987, 1988 All rights reserved.
FORMAT DISK
UNIT TO BE SELECTED
1. First unit
2. Second unit
3. Third unit
4. Fourth unit
5. Exit
Enter choice number:
```

6. Type the number for the disk drive containing the removable pack you want to format ⇐|.

```
Passes to run:
```

7. Type the number of formatting passes you want to make over this disk pack ⇐|.

```
WARNING: The following action will be destructive.
Do you still wish to continue? (Yes/No):
```

8. Type **Y** or **N** at the "Do you still wish to continue" prompt and press RETURN. To stop the formatting process, simply press RETURN.

   Y Confirms the formatting process.

   N Cancels the formatting process. Return to step 5.

```
Are you still sure? (Yes/No)?
```

9. Type **Y** or **N** at the "Are you still sure" prompt and press RETURN. To stop the formatting process, simply press RETURN.

Y Starts the formatting process.

N Cancels the formatting process. Return to step 5.

```
Copyright (C) Xerox Corporation
        1983,1984,1985, 1986, 1987, 1988 All rights reserved.
Formatting <number> unit
Passes: <number> Run time: <number> hours <number>
minutes
```

10. Return to the server after the time required to format the pack (the run time in the preceding message) has passed.

```
BAD PAGE Page: <number> Cylinder: <number>
Logging Bad Pages
SUCCESSFUL COMPLETION
Type any character to continue:
```

11. Record the number and address of any bad pages. Keep this information near your disk drive in case you need it for troubleshooting.
12. Type any character ⇐|.

```
LARGE CAPACITY DISK DIAGNOSTIC [version X.0 of
<date>]
A "?" will further explain the menu options.
A "BREAK" will return to the prior menu.
```

13. Press the BREAK key.

```
Test Selection
1. Confidence Test
2. Format Disk
3. Physical Volume Scavenge
4. Bad Page Utility
5. Display Bad Page Table
6. Exit
Enter choice number:
```

14. Type the number for the "Exit" option ⇐|.
15. Remove the diagnostics floppy disk. Store it in a safe place.

Step-by-step for partitioning a removable disk pack

16. Insert the "Services System Software (80, 300 MB) #1" floppy disk.
17. Reboot the server from the floppy disk:
    a. Hold down the Boot Reset (B RESET) and Alternate Boot (ALT B) buttons at the same time.
    b. Release the Boot Reset (B RESET) button.

c. When the maintenance panel displays 0002, release the Alternate B (ALT B) button.

```
Installer version X.0
Copyright (C) Xerox Corporation
        1983,1984,1985, 1986, 1987, 1988 All rights reserved
Processor = <number> = <number> = <number>
Memory size = <number> K bytes
Working on drive number 1 Main Menu
1   Services Tri
Enter choice number, then press RETURN:
```

18. Press RETURN to select the "Services Tri" option ⇐|.

If you are working on a multiple-drive server, the installer will prompt for the drive you wish to work on.

```
Choices available:
1. Install system software
2. Start system
3. Start system with Remote Debugging enabled
4. Enable Remote Debugging
5. Disable Remote Debugging
6. Start services
7. Partition for services
8. Return to main menu
Enter choice number, then press RETURN:
```

19. Type the number for the "Partition for services" option ⇐|.

```
WARNING: Partitioning a system disk destroys all contents.
Continue? (Y/N):
```

20. Type **Y** or **N** at the "Continue" prompt ⇐|.

    Y Continues the partitioning process.

    N Stops the partitioning process. Return to step 19.

```
SECOND CONFIRMATION REQUIRED
Continue? (Y/N):
```

21. Type **Y** or **N** at the second "Continue" prompt ⇐|.

    Y Starts the partitioning process.

    N Stops the partitioning process. Return to step 19.

After 15 to 20 minutes, this message appears:

```
Disk partitioned.
Choices available:
1. Install system software
2. Start system
3. Start system with Remote Debugging enabled
4. Enable Remote Debugging
5. Disable Remote Debugging
6. Start services
7. Partition for services
8. Return to main menu
Enter choice number, then press RETURN:
```

22. Type the number for the "Return to main menu" option ⇐|.
23. Remove the floppy disk. Store it in a safe place.
24. Repeat steps 1 through 23 to format and partition another removable disk pack.
25. After you format and partition the removable disk packs you need, reboot the server:
    a. Hold down the Boot Reset (B RESET) and Alternate Boot (ALT B) buttons at the same time.
    b. Release the Boot Reset (B RESET) button.
    c. When the maintenance panel displays 0001, release the Alternate B (ALT B) button.

Wrap-up

If you formatted and partitioned a primary volume, you must re-install services. See the Server Software Installation chapter in the *Services Installation and Setup Guide*.

If you formatted and partitioned a secondary volume, perform a normal startup.

Examples

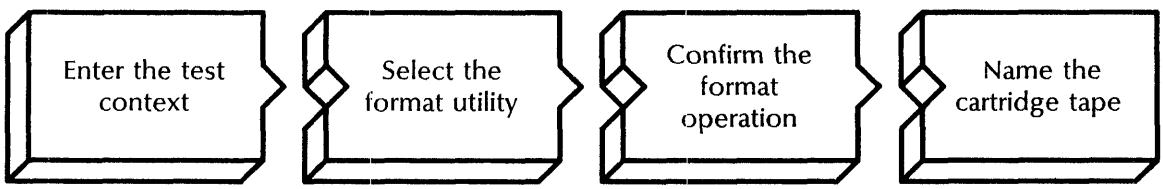
The following examples show the process for formatting and partitioning a removable disk pack. The first example shows the process for formatting the pack.

Insert the "8000 Series Rigid Disk Diagnostics (80, 300 MB) 7.0" floppy disk.
Reboot the server from the floppy disk
Person running the test
1 User
2 System Administrator
3 Technical Representative
Enter choice number: **2**
System Administrator
Password: ****
Test Selection
1 Confidence Test
2 Format Disk
3 Physical Volume Scavenge
4 Bad Page Utility
5 Display Bad Page Table
6 Exit
Enter choice number: **2**
Copyright (C) Xerox Corporation
1983,1984,1985, 1986, 1987, 1988 All rights reserved.
FORMAT DISK
UNIT TO BE SELECTED
1 First unit
2 Second unit
3 Third unit
4 Fourth unit
5 Exit
Enter choice number: **1**
Passes to run: **6**
WARNING: The following action will be destructive.
Do you still wish to continue? (Yes/No): **Y**
Are you still sure? (Yes/No)? **Y**
Copyright (C) Xerox Corporation
1983,1984,1985, 1986, 1987, 1988 All rights reserved.
Formatting first unit
Passes: 6 Run time: 10 hours 30 minutes
Disk formatted
BAD PAGE Page: 3 Cylinder: 3458
Logging Bad Pages
SUCCESSFUL COMPLETION
Type any character to continue: **B**
LARGE CAPACITY DISK DIAGNOSTIC [version 5.0 of 13-October-87]
A "?" will further explain the menu options.
A "BREAK" will return to the prior menu.
Press the *BREAK key.*
Test Selection
1 Confidence Test
2 Format Disk
3 Physical Volume Scavenge
4 Bad Page Utility
5 Display Bad Page Table
6 Exit
Enter choice number: **6**
Remove the "8000 Series Rigid Disk Diagnostics (80, 300 MB) 7.0" floppy disk.

The second example shows the process for partitioning the pack.

```
Insert the "Services System Software (80 and 300 Mb Disks) #1" floppy disk.
Reboot the server from the floppy disk.
Installer version 11.0
Copyright (C) Xerox Corporation
        1983,1984,1985, 1986, 1987, 1988  All rights reserved.
Processor  number is 2-852-162-714
Memory size  =768K bytes
Working on drive number 1 Main Menu
1    Services Tri
Enter choice number, then press RETURN: 1
Choices available:
1.  Install system software
2.  Start system
3.  Start system with Remote Debugging enabled
4.  Enable Remote Debugging
5.  Disable Remote Debugging
6.  Start services
7.  Partition for services
8.  Return to main menu
Enter choice number, then press RETURN: 7
WARNING: Partitioning a system disk destroys all contents.
Continue? (Y/N): Y
SECOND CONFIRMATION REQUIRED
Continue? (Y/N): Y
Disk is partitioned.
Disk partitioned.
Choices available:
1.  Install system software
2.  Start system
3.  Start system with Remote Debugging enabled
4.  Enable Remote Debugging
5.  Disable Remote Debugging
6.  Start services
7.  Partition for services
8.  Return to main menu
Enter choice number, then press RETURN: 8
Remove the "Services System Software (80, 300 MB Disks) #1" floppy disk.
```

Formatting a cartridge tape



Perform this procedure if you are using unformatted tapes.

The Format utility first retensions the tape, making three passes to condition a new tape. This action, which prepares the tape for reliable read and write operations, then formats the tape, verifies the formatted data, and creates a bad page table, entering any bad sectors found.

Formatting takes about 60 minutes. It takes place in background mode, so you have access to other commands during the process.

CAUTION: Do not format a cartridge tape while any communication services are running on the same server.

Prerequisites

- Have handy the cartridge tapes you want to format.
- Format a cartridge tape during non-working hours.

Step-by-step

1. Type **Test** to enter the test context ⇐|.

```
Test>The Diagnostics commands are now available.
```

2. Type **Cartridge Tape** ⇐|.

```
Choose which Cartridge Tape Online Utility
1  Retension
2  Erase
3  Format
4  Verify Read Operation
5  Log Bad Sector
6  Display Bad Sector Table
7  Scavenge
Enter choice number:
```

3. Type **3** for the format utility ⇐|.

```
Warning: Formatting will destroy any data on this tape
cartridge.
    Do you still wish to continue? (Y/N):
```

4. Type **Y** at the "Do you still wish to continue" prompt ⇐|.

   Y Confirms the formatting process.

   N Cancels the formatting process. Return to step 3.

```
Are you sure? (Y/N):
```

5. Type **Y** at the "Are you sure" prompt ⇐|.

   Y Reconfirms the formatting process.

   N Cancels the formatting process.

```
Insert write-enabled cartridge in the tape drive.
Type any character when this is done.
```

6. Insert the cartridge tape you want to format by pushing the tape all the way back into the drive until it stops. Quickly release the tape.

CAUTION: Tape errors may occur if you do not release the tape quickly. An incorrectly inserted tape may not be readable later. Refer to the Appendix in the *Services Maintenance Guide* for more information about inserting a tape.

7. Type any character to proceed ⇐|.

```
Enter label for this tape cartridge:
```

8. Type a name (limit 40 characters) for the tape and press RETURN. There is a delay of about three minutes before the next prompt is displayed.

```
Warning: This cartridge tape is already formatted. Formatting
will destroy any existing data.
This tape cartridge is labeled: <previous tape name>
    Do you still wish to continue? (Y/N):
```

9. If the tape is not already formatted this message does not appear; **skip to step 10**.

   Y Reconfirms the formatting process.

   N Cancels the formatting process. Type **N** if the tape is already formatted. You don't need to reformat a tape to reuse it. Remove the tape from the drive.

```
Are you sure? (Y/N):
```

10. Type **Y** at the "Are you sure" prompt ⇐|.

    Y Starts the formatting process.

    N Cancels the formatting process.

```
<time> Retension started.
Test>
Test: <time> Cartridge Tape Format-Format started.
Test: <time> Cartridge Tape Format -Verify started.
Test: <time> Cartridge Tape Format-Successful completion.
Test: Cartridge Tape Format-Please remove the tape cartridge
from the drive.
```

11. Remove the tape from the drive when the message tells you to do so.

12. To format another cartridge tape, repeat steps 2 through 11.

Wrap-up

After you format all the cartridge tapes, store them in a safe place until you need them.

Example

This example shows formatting a cartridge tape that has already been formatted.

```
>Test
The Diagnostics commands are now available.
Test>Cartridge Tape
        Choose which Cartridge Tape Online Utility
          1  Retension
          2  Erase
          3  Format
          4  Verify Read Operation
          5  Log Bad Sector
          6  Display Bad Sector Table
          7  Scavenge
        Enter choice number: 3
Warning: Formatting will destroy any data on this tape cartridge.
        Do you still wish to continue? (Y/N): Y
        Are you sure? (Y/N): Y
Insert write-enabled cartridge in the tape drive.
Type any character when this is done.
        Enter label for this tape cartridge: My Very Own Tape
11:04:18 Retension started
Test>
Test: 11:07:12 Cartridge Tape Format-Format started.
Test: 11:26:31 Cartridge Tape Format-Verify started.
Test: 11:46:34 Cartridge Tape Format-Successful completion.
Test: Cartridge Tape Format-Please remove the tape cartridge from the drive.
Test>
```

Showing a backup index

Use the **Show Backup Index** command to display portions of the backup increments log on the source volume. You can use this information to discover the exact location of files, containers, or directories you need to restore.

Prerequisites

- If possible. determine the date on which the file, container, or directory, was last backed up or copied to the File Service.
- If you want to show a backup index for a volume backed up to a rigid disk, ensure that the backup volume is online.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Show Backup Index** ⇐|.

```
Select
1   Show Backup increments of a local volume
2   Show increment from a specific floppy disk
3   Show increment from a specific cartridge tape
4   Show increment from a specific High Capacity Cartridge
Tape
Enter choice number:
```

3. Type the number for the medium for which you want to display a backup index and press RETURN. The media listed depend on your hardware configuration.

   1 Shows a menu of increments from the backup increments log of the source volume.

   2 Lists the names of the files in the increment or split increment stored on a floppy disk. **Skip to step 5.**

   3 Shows a menu of increments stored on a cartridge tape. **Skip to step 5.**

   4 Shows a menu of increments stored on a high-capacity cartridge tape. **Skip to step 5.**

4. If the File Service is running on a single-drive server, **continue with step 5.**

```
Select Volume:
1   <volume name>
2   <volume name>
Enter choice number:
```

   If the File Service is running on a multiple-drive server, type the number for the volume whose backup index you want to review ⇐|.

```
Show Backup increment of:
1   <date> <time> on Rigid disk <volume
    name:domain:org> (complete or incomplete)
2   <date> <time> on Tape <tape name> (complete or
    incomplete)
3   <date> <time> on Rigid disk <volume name:domain:
    org> (complete or incomplete)
Enter one or more choices:
```

The media listed depend on your hardware configuration. The listing of the backup increments indicates which medium the increment is stored on. The most recent backup increments are displayed first (up to 63 increments). To not show any increments, press RETURN.

5. Type the number for the increment you want to display ⇐|.

To display more than one increment, separate their numbers with commas (for example, **1,3**) or use a hyphen to separate the first and last numbers of a range (for example, **1-3**).

```
File name:
```

6. Type the name of the file you want to find and press RETURN. To list every file backed up on an increment, type the wildcard symbol (*).

   If you are showing a backup index for a rigid disk, **skip to step 10**.

   If you are showing a backup index for a floppy disk or cartridge tape, **skip to step 8**. If you have only one high-capacity cartridge tape device, **skip to step 8**.

```
Select tape device
1   Tape drive <number>
2   Tape drive <number>
3   Tape drive <number>
Enter choice number:
```

7. Type the number for the high-capacity cartridge tape device you want to use.

```
Insert <floppy disk, cartridge tape, or high-capacity cartridge
tape>
```

8. Insert the medium containing the backup increment.

```
Proceed? (Y/N):
```

9. Type **Y** at the "Proceed" prompt ⇐|.

   Y Continues the show backup index process.

   N Cancels the show backup index process.

If you are showing the backup index for a floppy disk, **continue with step 10.**

If you are showing the backup index for a cartridge tape, this message appears:

```
Processing tape...This may take a while
    This tape is named <tape name> and has <number>
    remaining free pages.
```

If you are showing the backup index for a high-capacity cartridge tape, this message appears:

```
Processing tape...
    This tape is named <tape name>
```

```
Show Backup Increment of <date> <time> on <medium
type>
<volume name:domain:organization>
This increment completed normally.
Source volume <volume name:domain:organization>
Backup of<date> <time> <backup
volume:domain:organization or medium>
Split #1                                  Last Modified On
<File drawer> <folder>
    <filename> <version number>          <date> <time>
    <filename> <version number>
```

10. Read the index to locate the file name you want. If a date appears next to the file name, that file is stored in the increment. If no date appears, that file is not stored in the increment.
11. Log off.

Wrap-up

After you locate the file container, or directory you want, you can restore that object to the File Service volume. See "Selective restore procedures" earlier in this chapter.

If you used Remote System Administration to show the backup index, use the Make Document or Make Screen feature. Place a copy in the *Activities Guide*.

Example

This example shows the backup index for a split increment on a floppy disk. The wildcard symbol (*) is used as the filename so that all filenames appear.

```
FS!Show Backup Index
    Select
    1   Show Backup increments of a local volume
    2   Show increment from a specific floppy disk
    Enter choice number:  2
    File name:  *
Insert floppy disk
    Proceed (Y/N):  Y
Source volume  Finance:Unit 1:Acme
Backup of 1-Aug-87 2:38:19 on floppy disk
Split # 1
                                          Last Modified On
    File Drawer1!1/
        Managers!1/
            Tasks!6                       23-Jul-87 10:47:45
            Monthly Successes!8           24-Jul-87 15:37:33
        Patricia Jones!1/
            Print Doc!3                   27-Jul-87 13:17:37
FS!
```

Stopping backup

Use the **Stop Backup** command to stop an automatic or a manual backup in progress for a specified File Service volume.

If you interrupt an automatic backup, run a manual backup for that day.

The next backup will copy any files excluded from the interrupted backup.

Prerequisite

If the backup is running in the foreground, access the server using Remote System Administration.

Step-by-step

1. Log on and enable in the File Service context.
2. Type **Stop Backup** ⇐|.
3. If the File Service is running on a single-drive server, **continue with step 4**.

```
Select Volume:
1   <volume name>
2   <volume name>
3   <volume name>
Enter choice number:
```

Only those volumes on which backup is running are displayed.

If the File Service is running on a multiple-drive server, type the number for the source volume on which you want to stop backup ⇐|.

If backup is not running on the volume, you see the following message. **Skip to step 5.**

```
Backup is not running.
```

If backup is running, this message appears:

```
Stopping backup...
FS: Backup was cancelled by the user.
FS: Source volume <volume name:Domain:organization>
FS!
```

5. Log off.

Wrap-up

When you see the message "Backup was cancelled by the user," the backup has stopped.

Example

This example shows stopping a backup running on a multiple-drive server.

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

6. Mail Service

This chapter helps you prepare to manage and perform the Mail Service backup and restore procedures.

This information is based on services release version 11.0. The procedures are available using an 8000 or an 8090 server.

Overview

This section describes how Mail Service backup and restore works and reviews your role as System Administrator.

The Mail Service database contains:

- The names of all user mailboxes
- The name of the Postmaster mailbox
- All undelivered mail messages

The information in the Mail Service database changes every time a user sends or receives mail.

How backup works

The backup operation keeps a copy of the Mail Service database information to protect you from loss. If a Mail Service database were damaged or destroyed and you did not have a copy, you could reenter only some of the information. Other information, such as unretrieved mail, would be lost.

You set parameters to indicate the backup location in a file drawer dedicated to the Mail Service and to control backup, which can be automatic or manual.

Automatic backups take place on a schedule you specify. You need only confirm that each automatic backup completed successfully. Automatic backup ensures that a fairly up-to-date copy of the database exists at all times.

If you specify manual backup, you must regularly perform this operation to create an up-to-date copy of the database. You can restore the Mail Service without an up-to-date backup copy, but you lose all the mail that was unretrieved when the database damage occurred.

How restore works

You can recover from damage to or loss of the Mail Service database using the Mail Service restore option of the non-normal server startup. This operation copies to the Mail Service the database saved on the specified File Service.

Perform this procedure only when you are unable to repair the database. See *Basic Network Troubleshooting*.

System Administrator duties

As System Administrator, your major duties and responsibilities include:

- Completing and maintaining the Mail Service Backup and Restore Worksheet at the end of this chapter.
- Setting the Mail Service backup parameters.
- Automatically backing up the Mail Service as often as necessary to protect its database, and checking that automatic backup is completed successfully.
- Manually backing up the Mail Service database as needed.
- Restoring the Mail Service database when it is damaged.
- Updating the Mail Service Backup and Restore Activity Log whenever you back up or restore the Mail Service.
- Troubleshooting the service as described in *Basic Network Troubleshooting*.

Mail Service Backup and Restore Worksheet

Use the Mail Service Backup and Restore Worksheet to record server-related and service-related information. The worksheet is at the end of this chapter.

Fill out a separate copy of the worksheet for each Mail Service for which you have System Administrator responsibility. Retain the original worksheet for future use, and store the completed worksheet in your *Activities Guide*.

Using the worksheet

Before you perform any backup or restore procedure, complete the Mail Service Backup and Restore Worksheet. It is important that you fill out the worksheet accurately and update it whenever changes occur.

The completed worksheet saves you time as you perform the backup and restore procedures. It also serves as an information source for new System Administrators unfamiliar with your configuration.

Filling out the worksheet

As you read this chapter, you are directed to make entries on the Mail Service Backup and Restore Worksheet. The worksheet section number appears with these directions, so you know where to make each entry.

Use section ① for information about the server and the services installed on the server. Copy this information, including the name of the Mail Service, from the Mail Service Worksheet and from the Services Installation Worksheet you filled out while reading the the *Guide to System Administration Activities*.

Use section ② to identify the Mail Service backup location and section ③ to define the Mail Service backup parameters.

Mail Service Backup and Restore Activity Log

Use the Mail Service Backup and Restore Activity Log to keep track of the backup and restore operations you perform. The log is at the end of this chapter.

Make several copies of the log to keep by the server running the Mail Service.

Whenever you back up or restore the Mail Service, record your activity on the log. Store completed logs in the *Activities Guide* for easy reference.

Planning for backup

Before you can back up the Mail Service, you must set parameters to control the backup process. The parameters include the File Service where you want to store the backup copy, whether to run backup automatically, and, if you do, when and how often to run it.

As you select the parameter values for a Mail Service, think about the following questions:

- How important is the information in the Mail Service database? What would happen if some of this information were lost?
- How much mail is sent through the Mail Service each day?
- If you lost data from the Mail Service database, how long could your users wait to send or receive mail while you restored the database?

After you set the backup parameters, their values become the defaults for the Mail Service. You can change the parameters at any time.

Table 6-1 briefly describes each parameter and whether it affects automatic and/or manual backup.

Table 6-1. **Backup parameters**

Parameter	Definition	Backup method	
		Automatic	Manual
File Service	The name of the File Service containing the Mail Service backup file drawer	X	X
File drawer	The name of the Mail Service backup file drawer	X	X
Automatic backups	The indication of whether or not backup runs automatically	X	X
Hour of the day (0-23)	The hour of the day to start automatic backup	X	
Frequency (1-30)	How often (number of days) to run automatic backup	X	

Defining the backup parameters

The File Service that provides the file drawer for the backup copies of the Mail Service database should not be on the same server as the Mail Service, if possible. If the server containing both services crashed, you could still restore the Mail Service from the File Service backup. However, this method is very time-consuming.

If you are setting Mail Service backup parameters for the first time, perform the procedures "Creating private file drawers for users" and "Creating public file drawers for users" in the File Service chapter of the *Services Installation and Setup Guide*. Make yourself the owner of the drawer, and give all Domain Administrators full access to it. The file drawer must exist before you can specify its name as a parameter. To conserve space on the File Service, only the two most recent Mail Service backups are stored in this file drawer.

If you select automatic backup, you must also set the hour of the day when you want backup to start and how often you want it to run. Run backup when the Mail Service is least busy since this operation slows down the response of the Mail Service.

Determine the backup frequency by analyzing the amount of traffic on the Mail Service. Run backup frequently to reduce the risk of losing data if a failure occurs.

Related procedures: Setting Mail Service backup parameters, Creating private file drawers for user, Creating public file drawers for users (File Service chapter of the *Services Installation and Setup Guide*)

Filling out the worksheet

② **File Service name** - Record the name of the File Service containing the Mail Service backup file drawer.

File drawer name - Record the name of the backup file drawer. Use a name that easily identifies the purpose of the drawer, such as MSbackup.

Owner - Record your name as owner of the drawer; this gives you full access rights.

Page limit - Specify a page limit of zero (0).

③ **Automatic backup** - Circle whether you are backing up the Mail Service automatically. If you do not select automatic backup, you must back up your Mail Service manually.

Hour to start - Record the hour (zero is midnight; 23 represents 11 p.m.) you want to begin automatic backup.

Frequency - Record how often (number of days, 1 through 30) you want to run automatic backup. Specify 1 as the backup frequency to backup the database every day.

Confirming automatic backup

You can confirm that automatic backups have completed successfully by using the Mail Service **Show Status** command.

If the automatic backup was successful, record its date on the Mail Service Backup and Restore Activity Log. If the backup was unsuccessful, manually back up the Mail Service database.

Related procedure: Monitoring the Mail Service statistics (see the Mail Service chapter in the *Services Maintenance Guide*).

Performing a manual backup

When you back up the Mail Service manually, you force the copying of the Mail Service database to the File Service and file drawer you specified when you set backup parameters.

Perform this procedure when you need to back up the Mail Service database for a special purpose; for example, before you move the Mail Service to another server, or when automatic backup fails.

Related procedure: Backing up the Mail Service manually

Commands

This section lists the commands you use to set backup parameters and perform backup operations. You must be in the proper context to access these commands.

NOTE

The Mail Service does not use special commands to restore the database. However, you must be in Mail Service context to restore the Mail Service database.

Table 6-2 shows the commands, along with the logged on status and the service state (started or stopped) for accessing them.

Table 6-2. **Mail Service backup commands**

Command	Logged off		Logged on		Enabled	
	Started	Stopped	Started	Stopped	Started	Stopped
Force Backup					•	•
Run Service			•	•	•	•
Set Backup Parameters					•	•
Show Backup Parameters						•
Stop Service					•	

Force Backup Available to the enabled user. Causes a backup to occur immediately, regardless of any automatic backup schedule. The automatic backup schedule starts from the day of the forced backup. For example, if you force a backup on Monday and the automatic backup frequency is 3, the next backup runs on Thursday.

Related procedure: Backing up the Mail Service manually

Run Service Available to the enabled user when the Mail Service is stopped. Runs the software files for a service not currently running, bringing the service to a fully operational state.

Related procedure: Restoring the Mail Service

Set Backup Parameters Available to the enabled user. Records the name of the File Service and the file drawer to which backup copies are stored. This command can also set automatic backup and its start time and frequency.

Related procedure: Setting Mail Service backup parameters

Show Backup Parameters Available to the logged on user. Displays the defined backup parameters.

Related procedure: Setting Mail Service backup parameters

Stop Service Available to the enabled user when the service is started. Stops the service.

Related procedure: Restoring the Mail Service

Procedures

This section contains the three procedures for setting backup parameters and backing up and restoring the Mail Service:

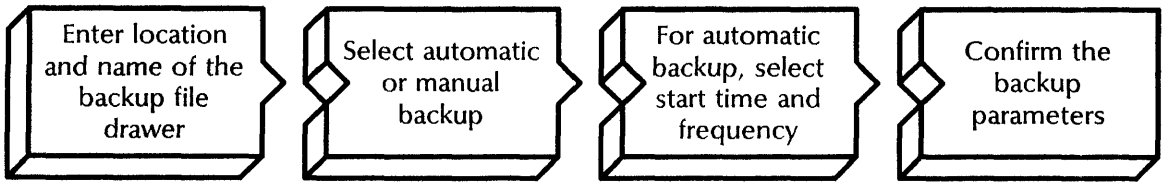
Setting Mail Service backup parameters
Use this procedure to set the parameters that control automatic and manual backup.

Backing up the Mail Service manually
Use this procedure to back up the Mail Service manually when automatic backup is not appropriate or has failed.

Restoring the Mail Service
Use this procedure to restore a damaged Mail Service database you cannot repair.

CAUTION: Do not perform the procedure to restore the database unless you are unable to repair it. Restoring the Mail Service database overwrites the existing Mail Service database. See *Basic Network Troubleshooting* for information about repairing a database.

Setting Mail Service backup parameters



Use this procedure to set the parameters for automatic or manual backup of the Mail Service.

Prerequisites

- Create the file drawer you want to use to store the backup copy. Perform the procedures "Creating private file drawers for users" and "Creating public file drawers for users" in the File Service chapter of the *Services Installation and Setup Guide*. Make yourself the owner of the drawer and give all Domain Administrators full access to it.
- See the Mail Service Backup and Restore Worksheet, which provides the following information:
  - The name of the File Service and the file drawer
  - Whether you are performing automatic backups; if you are, the hour of the day you want backup to start and how many days you want between backups

Step-by-step

1. Log on and enable in the Mail Service context.
2. Type **Set Backup Parameters** ⇐|.

```
File Service:
```

3. Type the name of the File Service containing the backup file drawer ⇐|.

```
File Drawer:
```

4. Type the name of the backup file drawer ⇐|.

If the name of the Mail Service backup file drawer includes the apostrophe, comma, exclamation point, parentheses, pound sign (#), or slash, type an apostrophe before that character. For example, specify the name **MS/backup** as **MS'/backup**.

```
Automatic backups? (Y/N):
```

5. Type **Y** at the "Automatic backups" prompt ⇐|.

Y Enables backup to run automatically. **Continue with step 6.**

N Indicates you will run backup manually. **Skip to step 8.**

```
Hour of the Day (0-23):
```

6. Type the number representing the time you want automatic backup to start ⇐|.

```
Frequency (in days) of backup (1-30):
```

7. Type the number representing how often you want to run automatic backup ⇐|.

```
Confirm (Y/N):
```

8. Type **Y** or **N** at the "Confirm" prompt ⇐|.

Y Sets the parameter values.

N Return to step 3.

```
   Done.
MS!
```

9. Log off.

Wrap-up

When you see the message "Done," you have set the Mail Service backup parameters. Use the **Show Backup Parameters** command to verify that the parameters are correct.

If you have set Mail Service backup parameters for the first time, perform the procedure "Backing up the Mail Service manually," next.

Example

This example shows setting Mail Service backup parameters for automatic backup.

```
MS!Set Backup Parameters
    File Service: Everest:Detroit:GemSysCo
    File Drawer: MS backup
    Automatic backups? (Y/N): Y
    Hour of the Day (0-23): 3
    Frequency (in days) of backup (1-30): 1
    Confirm? (Y/N): Y
    Done
MS!
```

Backing up the Mail Service manually

This procedure forces a manual backup of the Mail Service database. Use this procedure as necessary to supplement automatic backups. Perform this procedure when the Mail Service workload is lowest.

Prerequisites

- Perform the procedure "Setting Mail Service backup parameters" earlier in this chapter.
- Perform the procedure "Monitoring Mail Service statistics" in the Mail Service chapter in the *Services Maintenance Guide* to determine the size of the Mail Service database.
- Update the Mail Service Backup and Restore Activity Log with the date and time of this backup.

Step-by-step

1. Log on and enable in the Mail Service context.
2. Type **Force Backup** ⇐|.

```
File Service:  <File Service name:domain:organization>
File Drawer:  <backup file drawer name>
    Confirm (Y/N):
```

3. Type **Y** or **N** at the "Confirm" prompt ⇐|.

   Y Starts the backup.

   N Cancels the backup.

```
MS: Backup started
MS: Backup finished
```

4. Log off.

Wrap-up

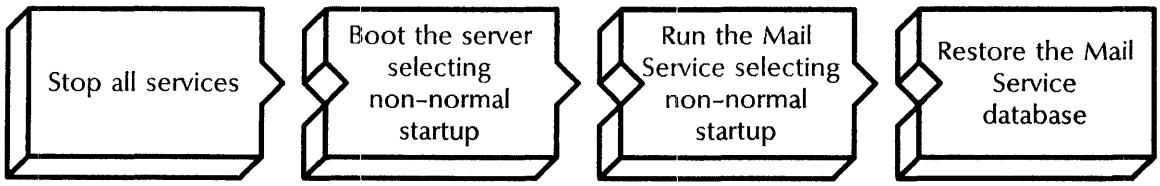
When you see the message "Backup finished," the backup is complete; the "MS!" prompt does not appear. Type **?** to display a list of available commands and return the "MS!" prompt.

Example

This example shows a manual backup.

```
MS!Force Backup
    File Service:  Everest:Detroit:GemSysCo
    File Drawer:  Mail Backup Drawer
    Confirm (Y/N):  Y
MS: Backup started
MS: Backup finished
```

Restoring the Mail Service



Use this procedure to restore a damaged Mail Service database you cannot repair.

CAUTION: Do not restore the Mail Service while the server is in Genesis mode. The restore operation deletes the existing database and then consults the Clearinghouse Service for the address of the File Service containing the backup copy. If the Clearinghouse Service is inaccessible, the restore operation cannot proceed, but the database will have been deleted.

Prerequisites

- Perform the procedures described in *Basic Network Troubleshooting*.
- Alert users that restoring the Mail Service may result in duplicate mail, or the loss of some mail that they have recently sent and received.
- Have access to the Mail Service backup file drawer.
- Update the Mail Service Backup and Restore Activity Log with the date and time of this restore.

Step-by-step

1. Log on and enable in the Mail Service context.
2. Type **Stop Service** ⇐|.

```
Select choices
1   Mail Service
2   <service name>
3   <service name>
Enter one or more choices:
```

3. Type the numbers for all services (for example, **1-3**) ⇐|.

```
<service name>: Stop immediately? (Y/N):
```

4. For each service, type **Y** or **N** at the "Stop immediately" prompt ⇐|.

   Y Stops the service immediately; all service functions are unavailable to the network.

   N Stops the service after all current activity ends.

```
Stopping <service name>.
<service name> functions are now unavailable to the
network.
```

5. Boot the server.

   a. Hold down the Boot Reset (B RESET) and Alternate B (ALT B) buttons at the same time.

   b. Release the Boot Reset (B RESET) button.

   c. When the maintenance panel displays 0001, release the Alternate B (ALT B) button.

```
Normal startup? (Y/N):
```

6. Type **N** at the "Normal startup" prompt ⇐|.

   Y Normally starts and runs the service.

   N Starts the server, but requires user interaction for the non-normal startup options.

```
Enter interrupt point
1   Interrupt before opening primary volume
2   Interrupt before processing profile
3   Interrupt before running services
Enter one or more choices:
```

7. Type **3** for the "Interrupt before running services" option ⇐|.

8. Log on and enable.

If your Mail Service is coresident with the only Clearinghouse serving the domain, use the **Run Service** command to run the Clearinghouse Service. Select a normal startup, and log on after the Clearinghouse opens its database. If the Mail Service is coresident with the File Service that has the backup file drawer, run the File Service as well.

9. Type **Run Service** ⇐|.

```
Select choices
1   Mail Service
2   <service name>
3   <service name>
Enter one or more choices:
```

10. Type the number for the Mail Service ⇐|.

```
MS:  Normal startup? (Y/N):
```

11. Type **N** at the "Normal startup?" prompt ⇐|.

```
Running Mail Service.
Specify Mail Service startup option
1  Initialize new database
2  Restore old database
3  Repair existing database
4  Expand existing database
Enter choice number:
```

12. Type **2** for the "Restore old database" option ⇐|.

CAUTION: Do not cancel the operation after you select the "Restore old database" option. Doing so results in the loss of the local database, which the restore operation deletes to make room for the restored database.

```
Restoring Mail Service database
Name of this Mail Service:
```

13. Type the Mail Service name ⇐|.

```
File Service:
```

14. Type the name of the File Service containing the backup file drawer ⇐|.

```
File Drawer:
```

15. Type the name of the file drawer storing the backup database ⇐|.

If the name of the Mail Service backup file drawer includes the apostrophe, comma, exclamation point, parentheses, pound sign (#), or slash, type an apostrophe before that character. For example, specify the name **MS/backup** as **MS'/backup**.

```
Done.
MS!
```

16. Type **Proceed** and press RETURN to finish server initialization.
17. Log off.

Wrap-up

When you see the message "Done," you have restored the Mail Service database. To run any other services on the server, type **Proceed** and press RETURN. Otherwise, log off.

Example

This example shows the restoration of a Mail Service database.

```
MS! Stop Service
Select choices:
1   Mail Service
Enter one or more choices:  1
Stop immediately? (Y/N):  Y
Stopping Mail Service.
    Mail Service functions are now unavailable to the
    network.
Boot the server
MS:  Normal startup? (Y/N):  N
Enter interrupt point
1   Interrupt before opening primary volume
2   Interrupt before processing profile
3   Interrupt before running services
Enter one or more choices:  3
>Logon
    User name: Eliza Bentley
    Password: ****
>Enable
!Run Service
Select option:
1   Mail Service
Enter choice:  1
MS:  Normal startup? (Y/N):  N
Running Mail Service
Specify Mail Service startup option
1   Initialize new database
2   Restore old database
3   Repair existing database
4   Expand existing database
Enter choice number:  2
Restoring Mail Service database
Name of this Mail Service:  SpeedyMail
    File Service:  Everest:Detroit:GemSysCo
    File Drawer:  MSbackup
Done.
!Proceed
```

7. Server Monitor Service

This chapter helps you prepare to manage and perform the Server Monitor Service backup and restore procedures.

This information is based on services release version 11.0. The procedures are available using an 8000 or an 8090 server.

Overview

This section describes how Server Monitor Service backup and restore works and reviews your role as System Administrator.

The Server Monitor Service database contains:

- The names and locations of all the servers monitored by the Server Monitor Service
- The sampling rates at which each server is monitored
- The names of all the users who are notified when a server's status changes

Depending on the number of monitored servers on your network, the database may contain a great deal of information. Backing up the database saves you from reentering the information should the database be damaged or lost.

How backup works

When you backup up the Server Monitor Service, the operation creates a copy of the existing Server Monitor Service database and stores it in a backup file drawer. Then as you run regular File Service backup, the Server Monitor Service database is saved along with all other files on the File Service.

The backup copy of the Server Monitor Service database is stored in a document named Config.database. This document is stored in a folder named SMSBackup, which the Server Monitor Service creates automatically.

The backup process for the Server Monitor Service is not automatic. You need to back up the Server Monitor Service after you perform the procedure "Configuring the Server Monitor Service database" in the Server Monitor Service chapter in the *Services Installation and Setup Guide*.

You also need to back up the Server Monitor Service whenever you make any changes to its database. Make sure you run backup after you perform any of the following procedures in the Server Monitor Service chapter in the *Services Maintenance Guide*:

- "Adding, listing, and verifying monitored servers"
- "Adding users for notification, and listing user notifications"
- "Changing sampling rates"
- "Removing monitored servers"
- "Removing users from a monitoring server notification list"

How restore works

You can recover from damage to or loss of the Server Monitor Service database by restoring the configuration from backup when you start the service. This moves the backup copy of the database from its file drawer back to the Server Monitor Service.

System Administrator duties

As System Administrator, your major duties and responsibilities include:

- Completing and maintaining the Server Monitor Service Backup and Restore Worksheet at the end of this chapter.
- Backing up the Server Monitor Service database whenever the information in changes.
- Restoring the Server Monitor Service database when it is damaged.
- Updating the Server Monitor Service Backup and Restore Activity Log whenever you back up or restore the Server Monitor Service.
- Troubleshooting the service as described in *Basic Network Troubleshooting*.

Server Monitor Service Backup and Restore Worksheet

Use the Server Monitor Service Backup and Restore Worksheet to record server-related and service-related information. This worksheet is at the end of this chapter.

Make a copy of the worksheet for each Server Monitor Service for which you have System Administrator responsibility. Retain the original worksheet for future use, and store the completed worksheets in your *Activities Guide*.

Using the worksheet

Before you perform any backup or restore procedure, complete the Server Monitor Service Worksheet. It is important that you fill out the worksheet accurately and update it whenever changes occur.

The completed worksheet saves you time as you perform the backup and restore procedures. It also serves as an information source for new System Administrators unfamiliar with your network configuration.

Filling out the worksheet

As you read this chapter, you are directed to make entries on the Server Monitor Service Backup and Restore Worksheet. The worksheet section number appears with these directions, so you know where to make each entry.

Use section ① for information about the server and the services installed on the server. Copy this information, including the name of the Server Monitor Service, from the Server Monitor Service Worksheet. If you need more information, see the Services Installation Worksheet and the Services System Software chapter in the *Guide to System Administration Activities*.

Use section ② to identify the Server Monitor Service backup location.

Server Monitor Service Backup and Restore Activity Log

Use the Server Monitor Service Backup and Restore Activity Log to keep track of the backup and restore operations you perform. The log is at the end of this chapter.

Make several copies of the log to keep by the server running the Server Monitor Service.

Whenever you back up or restore the Server Monitor Service, record your activity on the log. Store the completed logs in your *Activities Guide* for easy reference.

Planning for backup

Before you can back up the Server Monitor Service, you must create a file drawer to store the copy. The File Service that provides the file drawer for the backup copy of the Server Monitor Service database should not be on the same server as the Server Monitor Service. In this way, damage to the server disk will not damage both the Server Monitor Service database and its backup copy.

If you are backing up the Server Monitor Service for the first time, create a backup file drawer by performing the procedures "Creating private file drawers for users" and "Creating public file drawers for users" in the File Service chapter of the *Services Installation and Setup Guide*. Make yourself the owner of the file drawer, and give all Domain Administrators full access to it.

Know the full name of the File Service backup file drawer and folders. The backup location takes this format:

(File Service name:Domain:Organization) file drawer/file folder/config.database

Related procedures: Backing up a Server Monitor Service database, Creating private file drawers for users, Creating public file drawers for users (see the File Service chapter in the *Services Installation and Setup Guide*)

Filling out the worksheet

② **File Service name** - Record the name of the File Service containing the Server Monitor Service backup File Drawer.

File drawer name - Record the name of the Server Monitor Service backup file drawer. The name SMSbackup is recommended.

Owner - Record your name as owner of the drawer; this gives you full access rights.

Page limit - Specify a page limit of zero (0).

Commands

This section lists the commands you use to perform backup and restore operations. You must be in the Server Monitor Service context to access these commands.

Table 7-1 shows the commands along with the logged on status and the service state (started or stopped) for accessing them.

Table 7-1. **Server Monitor Service backup and restore commands**

Command	Logged off		Logged on		Enabled	
	Started	Stopped	Started	Stopped	Started	Stopped
Backup Server Monitor					•	•
List Monitored Servers					•	•
Start						•
Stop					•	

Backup Server Monitor Available to the enabled user. Stores a copy of the Server Monitor Service database in a specified location.

Related procedure: Backing up a Server Monitor Service database

List Monitored Servers Available to the enabled user. Displays the list of servers this server is monitoring.

Related procedure: Restoring a Server Monitor Service database

Start Available to the enabled user when the Server Monitor Service is stopped. Starts the Server Monitor Service with the local or backup database.

The Services System Software **Start Service** command starts the Server Monitor Service with the local database only.

Related procedure: Restoring a Server Monitor Service database

Stop Available to the enabled user when the Server Monitor Service is started. Stops the Server Monitor Service.

Related procedure: Restoring a Server Monitor Service database

Procedures

This section contains these procedures for backing up and restoring your Server Monitor Service:

Backing up a Server Monitor Service database
Use this procedure to back up the Server Monitor Service database.

Restoring a Server Monitor Service database
Use this procedure to restore the Server Monitor Service database.

Backing up a Server Monitor Service database

Use this procedure to back up the Server Monitor Service database to a File Service.

Prerequisites

- Create the file drawer you want to use to store the backup copy. Perform the procedures "Creating private file drawers for users" and "Creating public file drawers for users" in the File Service chapter of the *Services Installation and Setup Guide*. Make yourself the owner, and give all Domain Administrators full access to the file drawer.
- See the Server Monitor Service Backup and Restore Worksheet for the pathname to the backup location.
- Update the Server Monitor Service Backup and Restore Activity Log with the date and time of this backup.

Step-by-step

1. Log on and enable in the Server Monitor Service context.
2. Type **Backup Server Monitor** ⇐|.

```
Backup location:
```

3. Type the pathname of the location you are using for backup and press RETURN.

   The format for the pathname is (File drawer name:domain: organization) file drawer name/SMSBackup/ config.database.

```
Confirm? (Y/N):
```

4. Type **Y** or **N** at the "Confirm" prompt ⇐|.

   Y Backs up the database.

   N Cancels the operation.

```
Done.
SMS!
```

5. Log off.

Wrap-up

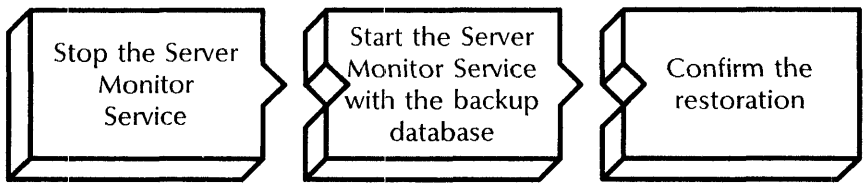
When you see the message "Done," you have backed up the Server Monitor Service database.

Example

This example shows a backup of the Server Monitor Service database.

```
SMS!Backup Server Monitor
    Backup location:
    (FS:OurDomain:OurOrg)SMSbackup/SMBackup/Config.database
    Confirm? (Y/N): Y
Done.
SMS!
```

Restoring a Server Monitor Service database



Use this procedure to move a copy of the Server Monitor Service database from its backup file drawer to the Server Monitor Service.

Step-by-step

1. Log on and enable in the Server Monitor Service context.

```
SMS!
```

2. Type **Stop** ⇐|.

```
SMS: This Server Monitor is now stopped.
SMS!
```

3. Type **Start** ⇐|.

```
Restore configuration from backup? (Y/N):
```

4. Type **Y** or **N** at the "Restore configuration from backup" prompt ⇐|.

   Y Continues the restore process.

   N Cancels the restore process.

```
Backup location: <default>
```

5. Press RETURN to accept the default (the last backup location). Otherwise, type the pathname of the backup location and press RETURN. The pathname must end with the folder name SMBackup and the document name Config.database.

The default backup location does not include a fully qualified File Service name, if the File Service resides on this server. If you specify a remote File Service, enclose the fully qualified File Service name in parentheses.

```
Confirm (Y/N):
```

6. Type **Y** or **N** at the "Confirm" prompt ⇐|.

   Y Restores the database from the specified backup location.

   N Return to step 3.

```
SMS: Starting Server Monitor with backup configuration.
SMS: This Server Monitor is now started.
SMS!
```

7. Log off.

Wrap-up

When you see the message "This Server Monitor is now started," you have restored the Server Monitor Service database.

Example

This example shows the restoration of a Server Monitor Service database from a backup location.

```
SMS!Stop
SMS: This Server Monitor is now stopped.
SMS!Start
    Restore configuration from backup? (Y/N): Y
    Backup location: (FS:Our Domain)SMSbackup/SMBackup/Config.database
    Confirm (Y/N): Y
SMS: Starting Server Monitor with backup configuration.
SMS: This Server Monitor is now started.
SMS!
```

8. Librarian Service

This chapter helps you prepare to manage and perform the Librarian Service backup and restore procedures.

The information is based on services release version 11.0. The procedures are available using an 8000 or an 8090 server.

Overview

This section describes how Librarian Service backup and restore works and reviews your role as System Administrator.

A Librarian Service database contains three files:

- The Records file, which contains the library objects
- The HashTable file, which contains an index of the Records file
- The Log file, which records the transactions made since the last backup

How backup works

The Librarian Service manages various types of information for applications, such as the ViewPoint Shared Books feature. Shared Books uses both the Librarian Service and the File Service to provide multi-part documents that can be shared by users. Shared Books uses the Librarian Service to manage some information about these documents.

The backup operation protects you from losing this information. Otherwise, you would have to recreate any Librarian Service database that was damaged or destroyed.

When you back up the Librarian Service manually, you force the copying of each Librarian Service database to the File Service, file drawer, and file folder you specified when you set the parameters for each database.

Librarian Service backups are done automatically once a day. Perform manual backups only under unusual circumstances, or when directed to do so by the Systems Customer Support Center.

If you are unable to back up the Librarian Service database manually, see *Basic Network Troubleshooting*.

How restore works

You can recover from damage to or loss of the Librarian Service database by recovering the most recent version of the database or by using an earlier version. Restore the database only when directed to do so in *Basic Network Troubleshooting*.

Using the most recent version

This operation copies to the Librarian Service the most recent version of the database saved on the specified File Service. The current version of the database is destroyed before the backup version is brought from the File Service.

Using an an earlier version

You can copy an earlier version of the Librarian Service database when you doubt that the most recent backup version is accurate. This may be the case when a File Service crashes while the Librarian Service was backing up.

This operation copies to the Librarian Service an earlier version of the database saved on the specified File Service. The current version of the database is destroyed before the backup version is brought from the File Service. All changes to the database since the time of the earlier backup are lost.

System Administrator duties

As System Administrator, your major duties and responsibilities include:

- Completing and maintaining the Librarian Service Backup and Restore Worksheet.
- Manually backing up the Librarian Service database as needed.
- Restoring the Librarian Service database when it is damaged.
- Updating the Librarian Service Backup and Restore Activity Log whenever you back up or restore the Librarian Service.
- Changing the Librarian Service backup parameters as needed.

Librarian Service Backup and Restore Worksheet

Use the Librarian Service Backup and Restore Worksheet to record server-related and service-related information. The worksheet is at the end of this chapter.

Fill out a separate copy of the worksheet for each Librarian Service for which you have System Administrator responsibility. Retain the original worksheet for future use, and store the completed worksheet in your *Activities Guide*.

Using the worksheet

Before you perform any backup or restore procedure, complete the Librarian Service Backup and Restore Worksheet. It is important that you fill out the worksheet accurately and update it whenever changes occur.

The completed worksheet saves you time as you perform the backup and restore procedures. It also serves as an information source for new System Administrators unfamiliar with your configuration.

Filling out the worksheet

As you read this chapter, you are directed to make entries on the Librarian Service Backup and Restore Worksheet. The worksheet section number appears with these directions, so you know where to make each entry.

Use section ① for information about the server and the services installed on the server. Copy this information, including the name and description of the Librarian Service, from the Librarian Service Worksheet in your *Activities Guide*. If you need more information, see the Services Installation Worksheet or *Guide to System Administration Activities*.

Use section ② for the Librarian Service backup parameters.

Librarian Service Backup and Restore Activity Log

Use the Librarian Service Backup and Restore Activity Log to keep track of the backup and restore procedures you perform. The log is at the end of this chapter.

Make several copies of the log to keep by the server running the Librarian Service.

Whenever you manually back up or restore the Librarian Service, record your activity on the log. Store the completed logs in the *Activities Guide* for easy reference.

Planning for backup

The File Service that provides the file drawer for the backup copies of the Librarian Service database should not be on the same server as the Librarian Service, if possible.

If you are setting Librarian Service backup parameters for the first time, create a backup file drawer by performing the procedures "Creating private file drawers for users" and "Creating public file drawers for users" in the File Service chapter of the *Services Installation and Setup Guide*. The file drawer must exist before you can specify its name in the backup pathname. The backup path names the backup file drawer and backup file folder for a Librarian Service database.

Specify yourself as the owner of the file drawer. Specify a page limit of zero (0). Give yourself and the administrative user group (if you have one on your network) full access to the file drawer.

The Librarian Service can keep up to 100 backup versions of each database. Keeping more than one backup version allows you to restore the Librarian Service from an earlier version.

Related procedures: Changing the Librarian Service backup parameters, Creating private file drawers for users, Creating public file drawers for users (see the File Service chapter in the *Services Installation and Setup Guide*)

Filling out the Worksheet

② **File Service name** - Record the name of the File Service containing the Librarian Service backup file drawer.

File drawer name - Record the name of the backup file drawer. Use a name that easily identifies the purpose of the drawer, such as LSbackup.

Database name - Record the name of the database to be backed up.

Backup path - Record the pathname for the remote backup location of the database. The pathname includes the fully qualified name of the File Service.

Number of backup versions - Record the number of backup versions you want to store for the database.

Commands

This section lists the commands you use to perform backup and restore operations and change backup parameters.

Table 8-1 shows the commands, along with the logged on status and the service state (started or stopped) for accessing them.

Table 8-1. **Librarian Service backup and restore commands**

Command	Logged off		Logged on		Enabled	
	Started	Stopped	Started	Stopped	Started	Stopped
Backup Databases					•	
Create Databases					•	
Destroy Database						•
List Databases	•		•		•	
Recover Database					•	
Set Backup Path					•	
Start Service					•	•
Stop Service					•	•

Backup Databases Available to the enabled user when the Librarian Service is started. Backs up a copy of the current version of every database to the location specified by the database parameters.

Related procedure: Backing up the Librarian Service databases manually

Create Database Available to the enabled user when the Librarian Service is started. Names the database. Creates the three files of the Librarian Service database.

Related procedure: Restoring a Librarian Service database from an earlier version

Destroy Database Available to the enabled user when the Librarian Service is stopped. Deletes a database.

Related procedure: Restoring a Librarian Service database from an earlier version

List Databases Available to any user when the Librarian Service is started. Lists the size and creation dates of the Librarian Service database files and lists the database parameters. Loads the most recent version of a database, if verbose mode is selected.

Related procedure: Backing up the Librarian Service databases manually

Recover Database Available to the enabled user when the Librarian Service is started. Deletes the current version of the database and restores the most recent backup version.

Related procedure: Restoring the Librarian Service database, Restoring the Librarian Service database from an earlier version

Set Backup Path Available to the enabled user when the Librarian Service is started. Specifies the pathname to a remote backup location and the number of backup versions to store.

Related procedure: Changing the Librarian Service backup parameters

Start Service Available to the enabled user when the service is started or stopped. Starts the currently loaded and stopped services you select.

Related procedure: Restoring a Librarian Service database from an earlier version

Stop Service Available to the enabled user when the service is started or stopped. Stops the currently loaded and started services you select.

Related procedure: Restoring a Librarian Service database from an earlier version

Procedures

This section contains the procedures for backing up and restoring the Librarian Service and changing its backup parameters.

Backing up the Librarian Service manually
Use this procedure to back up the Librarian Service manually whenever appropriate.

Restoring a Librarian Service database
Use this procedure to restore the most recent backup version of a Librarian Service database.

Restoring a Librarian Service database from an earlier version
Use this procedure to restore a Librarian Service database when you want an earlier version to become the current version.

Changing the Librarian Service backup parameters
Use this procedure to change the database parameters that control Librarian Service backup.

Backing up the Librarian Service manually

This procedure forces a manual backup of the Librarian Service databases. Use this procedure as necessary to supplement automatic backups. Perform this procedure when the Librarian Service workload is lowest.

CAUTION: Do not manually backup a database while it is in use. Doing so could adversely affect an aplication such as the Shared Books feature. Notify all the users who have access to the database that you must back it up, and ask them to stop using Shared Books until further notice. Use your Librarian Service Worksheet to determine which users have access to the database.

Prerequisites

- Perform the procedure "Setting the database parameters" in the Librarian Service chapter of the *Services Installation and Setup Guide*.
- If you need to change the backup location or the number of backup versions stored, perform the procedure "Changing the Librarian Service backup parameters" later in this chapter.
- The Librarian Service must be started.
- Know the remote backup location of the Librarian Service. This information is on the Librarian Service Backup and Restore Worksheet (see your *Activities Guide*).
- Update the Librarian Service Backup and Restore Activity Log with the date and time of the backup.

Step-by-step

1. Log on and enable in the Librarian Service context.
2. To load the most recent version of the databases, type **List Databases** ⇐|.

```
Database name: *
```

3. Press RETURN to list all the Librarian Service databases.

```
Verbose feedback? (Y/N):
```

4. Type **Y** to display verbose feedback ⇐|.

   Y Displays complete information about the databases and loads them.

   N Lists only the names of the databases.

```
<database name>
LS: <database name>: being loaded.
  .Records                <bytes>    <date> <time>
  .HashTable              <bytes>    <date> <time>
  .Log                    <bytes>    <date> <time>
  Readers: *
  Writers: *
  Authentication level: strong
  Backup path: (<File
Service>:<domain>:<organization>)<file
drawer>/<optional folder>
<database name>
LS: <database name>: being loaded.
  .Records                <bytes>    <date> <time>
  .HashTable              <bytes>    <date> <time>
  .Log                    <bytes>    <date> <time>
  Readers: *
  Writers: *
  Authentication level: strong
  Backup path: (<File
Service>:<domain>:<organization>)<file
drawer>/<optional folder>
LS!
```

5. Type **Backup Databases** ⇐|.

```
LS: <database name>: backup started.
LS!
LS: <database name>: backup completed.
```

Wrap-up

When you see the message "backup completed," the backup is complete; the "LS!" prompt does not appear. Then log off.

You may want to make a record of this information. If you are using Remote System Administration, use the Make Document or Make Screen option.

Notify all users who have access to the Librarian Service databases that the backup is complete.

Example

This example shows a manual backup of the Librarian Service databases. Note that snapshot2 was not backed up because it had not changed since the last backup.

```
LS!List Databases
      Database name: *
      Verbose feedback? (Y/N): Y
snapshot2
LS:snapshot2: being loaded.
  .Records                    12141      8-Dec-87 16:22:06 PST
  .HashTable                  31140      8-Dec-87 16:22:06 PST
  .Log                        0          8-Dec-87 16:22:35 PST
  Readers: *
  Writers: *
  Authentication level: simple
  Backup path: (bermuda triangle:alphaservices-es:gemsysco)abc
snapshot3
LS:snapshot3: being loaded.
  .Records                    10240      9-Dec-87 12:16:11 PST
  .HashTable                  35840      9-Dec-87 12:16:11 PST
  .Log                        927        9-Dec-87  18:32:44 PST
  Readers: *
  Writers: *
  Authentication level: simple
  Backup path: (bermuda:alphaservices-es:gemsysco)abc
LS!Backup Databases
LS: snapshot3: backup started.
LS!
LS: snapshot3: backup completed
```

Restoring a Librarian Service database

Use this procedure to restore the most recent backup version of a Librarian Service database. The operation first destroys the current version of the database.

CAUTION: Do not restore a database while it is in use. Doing so could adversely affect the Shared Books feature. Notify all the users who have access to the database that you must back it up, and ask them to stop using Shared Books until further notice.

Prerequisites

- Know the location of the backup versions. See the Librarian Service Backup and Restore Worksheet in your *Activities Guide*.
- Update the Librarian Service Backup and Restore Activity Log with the date and time of the restore.

Step-by-step

1. Log on and enable in the Librarian Service context.
2. Type **Recover Database** ⇐|.

```
Which database?
1    <database name>
Enter choice number:
```

3. Type the number for the database you want to restore ⇐|.

```
Recovery path:  (<File Service
name>:<domain>:<organization>)<backup file drawer
name> <optional folder>
```

4. Type the pathname to the remote backup location ⇐|.

```
Recover will delete existing database. Confirm (Y/N):
```

5. Type **Y** at the "Confirm" prompt ⇐|.

   Y Deletes the current database and begins the restore operation.

   N Cancels the restore operation.

```
LS: <database name>: recovery started.
LS: <database name>: being loaded.
LS: <database name>: recovery completed.
LS!
```

6. Log off.

Wrap-up

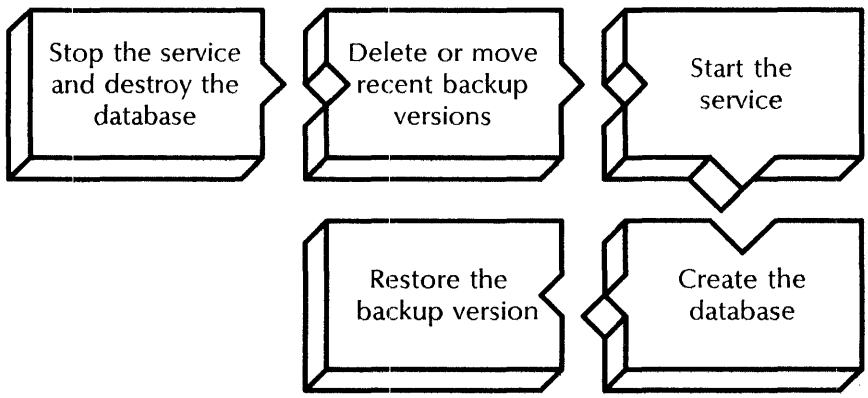
When you see the "Recovery completed" message, you have successfully restored the database.

Example

This example shows the restoration of the most recent backup copy of a Librarian Service database.

```
LS! Recover Database
    Which database?
    1   snapshot
    Enter choice number:  1
Recovery path: (Hawaii:Alpha:Gemsysco)abc
Recover will delete existing database. Confirm (Y/N): Y
LS: snapshot: recovery started.
LS: snapshot: being loaded.
LS: snapshot: recovery completed.
LS!
```

Restoring a Librarian Service database from an earlier version



Use this procedure to replace the current version of a Librarian Service database a version earlier than the most recent backup version.

CAUTION: Do not restore a database while it is in use. Doing so could adversely affect the Shared Books feature. Notify all the users who have access to the database that you must recover it, and ask them to stop using Shared Books until further notice.

Prerequisites

- Have access to the file drawer storing the backup versions.
- Know the location of the backup versions. This information is on the Librarian Service Backup and Restore Worksheet (see your *Activities Guide*).

- Update the Librarian Service Backup and Restore Activity Log with the date and time of this restore.

Step-by-step

1. Log on and enable in the Librarian Service context.
2. Type **Stop Service** ⇐|.

```
Select choices
1   <service name>
2   Librarian Service
Enter one or more choices:
```

3. Type the number for the Librarian Service ⇐|.

```
LS: Stop immediately? (Y/N):
```

4. Type **Y** or **N** at the "Stop immediately" prompt ⇐|.
   - **Y** Stops the Librarian Service immediately
   - **N** Stops the Librarian Service after all user activity ends.

```
Stopping Librarian Service.
LS!
```

5. Type **Destroy Database** ⇐|.

```
Database name
1   <database name>
2   <database name>
Enter choice number:
```

6. Type the number for the database you want to restore ⇐|.

```
Destroy <database name>. Confirm (Y/N):
```

7. Type **Y** at the "Confirm" prompt ⇐|.
   - **Y** Destroys the database.
   - **N** Cancels the destroy operation.

```
Destroying '<database name>' ... done.
LS!
```

8. Delete or save all database backup versions more recent than the version you want to retrieve ⇐|.
   - To delete versions, access the Librarian Service backup file drawer from your workstation. Delete all more recent backup versions of the database.

- To save versions, access the backup file drawer from your workstation, then use the MOVE key to transfer the database files to another location.

9. Type **Start Service** ⇐|.

```
Select choices
    1   Librarian Service
    Enter one or more choices:
```

10. Type **1** to start the Librarian Service ⇐|.

```
Starting Librarian Service.
Starting Librarian Service
LS!
```

11. Type **Create Database** ⇐|.

```
Database name:
```

12. Type the name of the database you want to restore ⇐|.

```
Creating '<database name>' ... done.
LS!
```

13. Type **Recover Database** ⇐|.

```
    Which database?
    1   <database name>
    2   <database name>
    Enter choice number:
```

14. Type the number for the database you want to restore ⇐|.

```
Recovery path: (<File Service
name>:<domain>:<organization>)<backup file drawer
name> <optional folder>
```

15. Press RETURN to confirm the default recovery path, which is the pathname of the backup location. If this location is not correct, type the correct pathname ⇐|.

```
Recover will delete existing data base.  Confirm (Y/N):
```

16. Type **Y** at the "Confirm" prompt ⇐|.

    Y Deletes the current database and begins the restore operation.

    N Cancels the restore operation.

```
LS: <database name>: recovery started.
LS: <database name>: being loaded.
LS: <database name>: recovery completed.
LS!
```

17. Log off.

Wrap-up

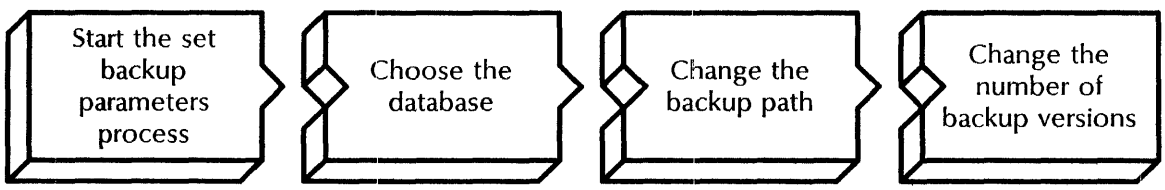
When you see the "Recovery completed" message, you have successfully restored the database.

Example

This example shows the restoration of a Librarian Service database from an earlier backup version.

```
LS!Stop Service
        Select choices
        1   Mail Service
        2   Gateway Service
        3   Remote Batch Service
        4   Librarian Service
        Enter one or more choices: 4
        LS: Stop immediately? (Y/N):  N
Stopping Librarian Service.
LS!Destroy Database
        Database name
        1   snaps1
        2   snaps2
        3   snaps3
        Enter choice number: 1
        Destroy snaps1.  Confirm (Y/N):  Y
Destroying 'snaps1' ... done.
Delete or move, from the backup location, database backup versions more recent
than the one to be restored.
LS!Start Service
        Select choices
        1   Librarian Service
        Enter one or more choices: 1
Starting Librarian Service.
LS!Create Database
        Database name:  snaps1
Creating 'snaps1' ... done.
LS!Recover Database
        Which database?
        1   snaps2
        2   snaps3
        3   snaps1
        Enter choice number: 3
        Recovery path:  (bermuda triangle:alphaservices-es:xerox)abc
        Recover will delete existing data base.  Confirm (Y/N):  Y
LS: snaps1: Recovery started.
LS: snaps1: being loaded.
LS: snaps1: Recovery completed.
LS!
```

Changing the Librarian Service backup parameters



Use this procedure to change the backup parameters for the Librarian Service.

Prerequisites

See the Librarian Service Backup and Restore Worksheet for the pathname to the backup location and the number of backup versions to keep.

Step-by-step

1. Log on and enable in the Librarian Service context.
2. Type **Set Backup Path** ⇐|.

```
Which database?
1    <database name>
Enter choice number:
```

3. Type the number for the database ⇐|.

```
Path to back up files for this data base:
```

4. Type the pathname to the remote backup location ⇐|.

```
Number of backup versions to keep (1..100):
```

5. Type the number of backup versions you want to store ⇐|.

```
LS!
```

6. Log off.

Wrap-up

When you see the "LS!" prompt, you have successfully changed the backup parameters.

Example

This example shows changing the values for the backup path and number of backup versions parameters.

```
LS!Set Backup Path
    Which database?
    1   ProdSpecs
    Enter choice number: 1
    Path to back up files for this data base: (FS1)Vol1/January
    Number of backup versions to keep (1..100): 2
LS!
```

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