

Legato NetWorker® ClientPak and Storage Node User's Guide

Release 6.0, MPE/iX Version



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Legato NetWorker User's Guide, MPE/iX Version, Release 6.0

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Preface

About This Guide

The *Legato NetWorker® User's Guide, MPE/iX, Version, Release 5.5* contains instructions on how to use the NetWorker backup, recover, and archive software from an MPE/iX client workstation. MPE/iX is the operating system for Hewlett-Packard® HP 3000 business servers.

This guide explains how to:

- Back up data on an MPE/iX client computer to a NetWorker server
- Back up and recover data using the NetWorker MPE/iX **NSRSAVE** and **NSRRECOV** programs
- Back up and recover data using the **NSRARCH** and **NSRRETRV** programs
- Browse the online file index to recover data
- Use the optional Legato NetWorker Archive Application

Audience

Users and system administrators who perform client-initiated backups, recovers, and archives from an HP 3000 MPE NetWorker client will benefit from this guide. This guide assumes that you are an experienced MPE/iX user.

Legato Product Manuals and Documentation

Legato offers an extensive archive of product documentation at its web site (<http://www.legato.com>). Most of the documents are in Adobe Acrobat® Portable Document Format (PDF) that you can easily view by downloading Adobe Acrobat Reader, which is also available from Legato's web site.

To access the archive:

1. Select *Documents Library* from the home page (<http://www.legato.com>).
2. Make your selection from the *Legato Product Manuals and Documentation* search choices. You can search the archive by part number, title, publication date, version, or OS/platform.

How to Navigate Through This Guide

The guide is organized into chapters and sections to help you locate the kind of information you need, such as step procedures with examples:

- The Preface [on page 7](#) describes the typographic conventions and symbols used in this guide, as well as customer and technical support information.
- Chapter 1 [on page 11](#) provides an overview of NetWorker and MPE volume sets.
- Chapter 2 [on page 13](#) describes how to back up your data.
- Chapter 3 [on page 23](#) describes how to recover any lost or damaged data.
- Chapter 4 [on page 45](#) describes how to archive and retrieve data.

For information on server configuration and administration, refer to the *Legato NetWorker Administrator's Guide* that is distributed with Legato NetWorker server software. The *Legato NetWorker Administrator's Guide* includes detailed information on the functionality of the NetWorker software.

Information and Services

Legato offers a variety of services, including electronic, telephone, and fax support that provide company, product, and technical information.

Legato Service or Resource	Technical Bulletins	Binary Patches	Company & Product Information	Training Programs
http://www.legato.com	Yes	Yes	Yes	Yes
ftp.legato.com , Internet address 137.69.200.1 (log in as <i>anonymous</i>)	Yes	Yes		
Legato Inside Sales, (650) 812-6000 or sales@legato.com			Yes	
Legato Education Services, (650) 812-6096 or training@legato.com				Yes
<i>Note:</i> For detailed information about our services, support policies, and software subscriptions, please refer to the booklet <i>LegatoCare Service, Support and Training Programs</i> included in the NetWorker package.				

Technical Support

If you purchased technical support from HP, please refer to your HP Support Contract. You must register Legato NetWorker for MPE/iX with Legato Systems, Inc. before you can purchase Legato technical support. Please complete the registration form found on the last page of this guide.

Legato also provides several sources to fulfill your technical support needs.

Technical Support Service	Address
Hotline	(650) 812-6100
E-mail	<i>support@legato.com</i>
Tech Dialog (requires password)	<i>http://www.legato.com/tech_dialog</i>

Customer Service

Contact Legato Customer Service if you have questions about licensing, registering, or authorizing your Legato products. Customer Service also supplies instructions for transferring licenses to a different server (rehosting) and provides status on product orders.

Customer Service	Address
Telephone number	(650) 812-6000 (option 3)
Fax number	(650) 812-6220
E-mail	<i>service@legato.com</i>
E-mail for order status	<i>orderadmin@legato.com</i>

Customer Feedback

The Legato NetWorker for MPE/iX team welcomes your comments and suggestions about software features, the installation procedure, and documentation. Please send any suggestions and comments to *feedback@legato.com*. You will receive a notice confirming receipt of your e-mail. Although we cannot respond personally to every request, we consider all your comments and suggestions during product design.

Conventions

This guide uses the following typographic conventions and symbols to make information easier to access and understand.

- **boldface, lowercase or UPPERCASE** – Indicates references to NetWorker programs or commands within paragraphs as in the following example:

You can start the NetWorker **NSRSAVE** program either from the MPE/iX Command Interpreter (CI) or from the POSIX shell if you prefer.

- *italic* – Indicates directory pathnames, files, computer names, new terms defined in the Glossary or within the chapter, and emphasizing words or ideas as in the following example:

With the NetWorker ClientPak for MPE/iX, you can manually perform *client-initiated backups*.

- `fixed-width` – Used for examples and information displayed on the screen as in the following example:

```
NSRSAVE: /reports/ 389 KB 00:00:30 5 files.
```

- `fixed-width, boldface lowercase or UPPERCASE` – Used for commands and text you type exactly as shown as the *recover* command or the *RUN NSRRECOV;INFO=* command as in the following examples:

```
recover> recover
: RUN NSRRECOV;INFO="-s server -c client"
```

- `fixed-width, boldface italic lowercase` – Used for commands and text you type for which you need to substitute a variable, as used for *reports*, *server*, and *client* in the following examples:

```
recover> add reports
: RUN NSRRECOV;INFO="-s server -c client"
```

-  **Important:** Indicates important information and cautionary notes that prevent you from making a mistake.
-

MPE Versus MPE/iX POSIX Filepath Naming Conventions

The HP documentation discusses naming conventions for defining filepaths in MPE and MPE/iX POSIX. We have included a comparison here for your convenience.

MPE	MPE/iX POSIX
FILENAME.GROUP.ACCOUNT (Must be uppercase.)	/ACCOUNT/GROUP/filename (The filename is case-sensitive.)

Chapter 1: Introduction to NetWorker

Overview

Legato NetWorker for MPE/iX is tightly integrated with HP's TurboSTORE software to provide enterprise storage management capability. HP's TurboSTORE/iX products provide high-performance backup solutions.

NetWorker ClientPak for MPE/iX

If you have used NetWorker software on a UNIX or NT server, then you know that NetWorker normally has a graphical user interface (GUI).

The NetWorker ClientPak for MPE/iX does not have a GUI. Instead, you must enter commands from either an MPE/iX Command Interpreter (CI) shell or from a POSIX shell.

MPE Client

From the MPE client, you can enter commands to perform client-initiated backups, recovers, and archives of your data.

To configure your MPE client to be included in the automatic server-initiated backups, use the **nwadmin** GUI on the NetWorker server for your HP 3000 MPE client.

About Legato NetWorker for MPE/iX

Legato NetWorker is a software product for network storage management. A NetWorker client is a computer on the network configured to have its files automatically backed up by the NetWorker *server*.

The NetWorker server is the computer on your network that runs the NetWorker server software, stores the client indexes and media database, and provides backup and recovery services to the clients on the network. Once your system administrator installs NetWorker on your HP 3000 and configures a NetWorker server to recognize your HP 3000 as a NetWorker *client*, then NetWorker can do a *server-initiated backup* of your HP 3000 automatically. Refer to the *Legato NetWorker Administrator's Guide* for information on configuring your HP 3000 as a NetWorker client on a NetWorker server.

With Legato NetWorker for MPE/iX, you can also perform *client-initiated backups*. Once you back up your data from either the server or the client, you can use NetWorker to recover any lost or damaged data. NetWorker for MPE/iX backs up and recovers your entire MPE file system with permissions and the hierarchical file systems (HFS) intact.

Archiving involves long-term storage of data on media called *archive volumes*. Archive volumes are similar to backup volumes, but are stored for long periods of time and are not automatically recycled. They are also not browsable if you want to recover them.

To conserve space, you can groom files from your system after archiving. Mission-critical data remains safely preserved for as long as you need it.

The optional Legato NetWorker Archive Application provides the ability to take a snapshot of finished project files, directories, or MPE *volume sets* residing on primary *media*. To conserve media space, you can choose to have archived data automatically removed from the media after NetWorker verifies that the snapshot is safely stored on removable media.

Unlike backed-up data, the media used for storing archived data is never recycled. Archived data is preserved for as long as you need it. Archiving data associated with a finished project frees up space for current projects, while assuring future access to mission-critical data.

To use the Archive Application, your system administrator simply enables the software on the NetWorker server. No additional installation procedures are required.

MPE Volume Set Support

Legato NetWorker for MPE/iX, Release 5.5 provides MPE volume set support. “Volume set” is an MPE/iX term used to denote one or more MPE volumes that are logically grouped together for some system or business reason. For example, all the disks that are used by the accounting department can be put in an exclusive volume set.

As with other non-volume set saves, such as files and directories, the system administrator can configure the NetWorker server for your HP 3000 MPE client to perform server-initiated backups. Refer to the *Legato NetWorker Installation Guide, MPE/iX Version, Release 5.5* for information on how to configure the MPE client on a NetWorker server.

You can also perform client-initiated backups and recovers of the MPE volumes sets. The procedure is similar to performing client-initiated backups and recovers of files and directories. The only difference is that you need to append a special `_VOLUME_SET` tag to the names of nonsystem volume sets and explicitly reference the directory accounting information file (DAF) of a volume set by appending another special `_VOLUME_SET_DAF` tag. See [“Chapter 2: Backing Up Files” on page 13](#) and [“Chapter 3: Recovering Files” on page 23](#) for information on backing up and recovering data.

If you have system administrator permissions, you can also archive MPE volume sets. Although you can groom volume sets, be warned that you cannot remove the directory information pseudo files. You should *never* groom the system volume set. See [“Chapter 4: Archiving and Retrieving Files” on page 45](#) for information on archiving.

Only system administrators should back up, recover, or archive volume sets. The primary purpose of the MPE volume set function is for backing up entire MPE volume sets as part of a disaster recovery plan. Should a disaster occur, you can recover the NetWorker save sets for the MPE volume sets and restore them.

Chapter 2: Backing Up Files

You can perform two types of backups with Legato NetWorker for MPE/iX: server-initiated backups and client-initiated backups. This chapter describes how to perform client-initiated backups and briefly discusses server-initiated backups of an MPE client. However, for comprehensive information on how to configure your MPE client to perform server-initiated backups, refer to the *Legato NetWorker Administrator's Guide, UNIX Version* that is distributed with the NetWorker server software.

Server-Initiated Backups

Once your system administrator installs NetWorker on your HP 3000 and configures a NetWorker server to recognize your HP 3000 as a NetWorker client, then NetWorker performs server-initiated backups of your HP 3000.

Ideally, the system administrator should configure your HP 3000 as two MPE clients on the NetWorker server: one for performing server-initiated backups of specific files and directories, and one for performing server-initiated backups of MPE volume sets. Refer to “Configuring the MPE Client on the NetWorker Server” in the *Legato NetWorker Installation Guide, MPE/iX Version, Release 5.5* for more information on configuring a NetWorker MPE client on a NetWorker server. The process for configuring an MPE client to receive server-initiated backups of MPE files and directories is standard. Refer to the *Legato NetWorker Administrator's Guide, UNIX Version* for information on the default configuration for a client on a NetWorker server.

For server-initiated backups, NetWorker creates index entries and a media database that track the media location of each client file. NetWorker maintains two types of indexes on the server: a *file index* and a *media index*. The file index stores information about the files backed up by NetWorker. The media index stores information about NetWorker media and the save sets stored on the media.

Backing up files is short-term insurance against data loss. The NetWorker server to which your HP 3000 is a client automatically backs up your files according to a backup schedule determined by your system administrator.

For an overview of how to perform manual backups of directories, files, or volume sets on an as-needed basis from your HP 3000, see “[Client-Initiated Backups](#)” on page 14.

NetWorker saves directories, files, or MPE volume sets in groups called *save sets*. The save sets are saved to *backup volumes* on a NetWorker backup device. A NetWorker backup volume is a unit of media used for backup, such as a magnetic tape, a disk, or an optical disk. NetWorker stores and tracks your data on backup volumes on a regular basis. MPE volumes are disks on an MPE client; MPE volume sets are sets of disks.

A NetWorker *volume pool* contains a collection of backup volumes to which specific data has been backed up. Volume pools allow you to sort backup data to selected volumes. For more information on managing media and backup devices, refer to the *Legato NetWorker Administrator's Guide, UNIX Version*.

Client-Initiated Backups

You can back up directories, files, groups of files, or MPE volume sets on an MPE client from the MPE Command Interpreter (CI) or from the POSIX shell.

You enter the **NSRSAVE** command to start the NetWorker **NSRSAVE** program. The **NSRSAVE** program is a client-side program that runs manual backups. Manual backups are intended for quick backups of a few files or directories. They do not generate bootstrap files or back up indexes, so they do *not* serve as replacements for server-initiated backups.

For details on entering the **NSRSAVE** command to back up directories, files, groups of files, or volume sets, see the following sections:

- [“Backing Up a Directory” on page 17](#)
- [“Backing Up a File” on page 19](#)
- [“Backing Up a Group of Files” on page 19](#)
- [“Backing Up MPE Volume Sets” on page 20](#)

Once you have backed up your data using either a server-initiated backup or a client-initiated backup, you can recover any lost or damaged data by using the NetWorker **NSRRECOV** program. See [“Chapter 3: Recovering Files” on page 23](#) for information.

Setting System Variables for Client-Initiated Backups

You can set system variables in a CI session to affect client-initiated backups that you perform from that specific session. Once you have set a system variable in a CI session, then the setting affects all manual backups done during that session until you turn the setting off in that CI session. You can perform backups from a CI session where the system variables have not been set if you do not want them applied to specific backups.

Note that the system variables that you set do not affect server-initiated backups. The system administrator can set these same variables for the scheduled backups done from the NetWorker server. Similarly, system variables that are set for the server-initiated backups do not affect your client-initiated backups.

The types of system variables that you can set for client-initiated backups include:

- Setting the NetWorker time zone to match the HP STORE program
- Creating logs of your NetWorker backups
- Storing temporary shadow logs of TurboSTORE online backups on a separate MPE volume set
- Specifying a notification at the start or end of online backup
- Specifying the frequency for displaying the progress of backups

Setting the NetWorker Time Zone to Match the HP STORE Program

The HP STORE program runs in the Command Interpreter, which uses the local time zone for your MPE client. NetWorker runs in POSIX, which by default uses Greenwich Mean Time. To correct the potential discrepancy between time zones, you can set the TZ variable.



Important: You should always have the TZ variable set when performing server-initiated or client-initiated backups, or recovering files and directories with NetWorker. For example, when you are recovering your files, you need to set the time zone variable; otherwise the backup times in the recover browser could be Greenwich Mean Time.

To set the time zone for client-initiated backups, add the following system variable when you start a CI session:

```
: SETVAR TZ "EST5daylight"
```

Note that the value EST5daylight is only an example; it might not be appropriate for your time zone.

For information about the value to use to set the TZ variable, display the **timezone** man page from the POSIX prompt only:

```
$ man timezone
```

Creating Logs of Your NetWorker Manual Backups

You can set the NSR_MPE_LOGNAME system variable to save information on client-initiated backups in a log file.

To create logs of your manual backups, enter the following system variable when you start a CI session:

```
: SETVAR NSR_MPE_LOGNAME "/TMP/LOG"
```

You can also set this system variable from the POSIX shell if you prefer:

```
$ export NSR_MPE_LOGNAME="/TMP/LOG"
```

The name *log* is the required name of the log file. Note that the name of the directory and file are in POSIX format. The actual name of the file will have the date and time stamp appended to it. You can name this directory anything you want and put it wherever you want.

Storing Temporary Shadow Logs for Online Backups

You can set the `NSR_MPE_ONLINE_SAVE_LOGVOLSET` system variable to specify the MPE volume set on which the 7x24 TurboSTORE will store the temporary *shadow logs* for online backups. Shadow logs contain the before-backup images of any files that are changed during the backup. If you don't set this system variable, the shadow logs are saved to the MPE volume set of the file that NetWorker and TurboSTORE are backing up currently. If you decide not to save the shadow log to a different volume set, make sure that you have enough space on the volume set to which you are backing up files.



Important: You must not include the NetWorker-expected tag “_VOLUME-SET” on non-system volume sets.

Specifying the Frequency for Displaying the Progress of Backups

You can set the `NSR_MPE_PROGRESS` variable to set the frequency for displaying a message on the progress of backups.

To report on the progress of backups, for example, enter the following system when you start a CI session:

```
: SETVAR NSR_MPE_PROGRESS "5"
```

Note that the value given represents a time in minutes.

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_PROGRESS=5
```

Specifying a Notification at the Start of Online Backups

The following variable allows your backups to stream a user-specified job file either at the end of its scanning phase (using `ONLINE`), at the end of a store operation (normal backup), or at the end of a synchronization point (`ONLINE=START`).

Use the following command to set the notification system variable to on or off (the default is off).

To specify a notification, enter the following system variable at the CI prompt:

```
: SETVAR NSR_MPE_NOTIFY_ON ""
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_NOTIFY_ON=""
```

Refer to the *900 Series HP 3000 Computer Systems STORE and TurboSTORE/iX Products Manual* for more information on this feature.

Controlling the 7x24 True Online Backup

You can set three different controls for the 7x24 True Online Backup:

- The `ONLINE=START` option allows you to perform file, database application, and system backups without closing the files or disks. This setting is the default.
- The `ONLINE` option allows you to specify `ONLINE` without `START` or `END`.
- The `OFF` option allows you to turn the `ONLINE` option off if changes are being made to files.

To control the 7x24 True Online Backup, add one of the following system variables when you start a CI session:

```
: SETVAR NSR_MPE_7X24_ONLINE "ONLINE=START"
: SETVAR NSR_MPE_7X24_ONLINE "ONLINE"
: SETVAR NSR_MPE_7X24_ONLINE "OFF"
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_7X24_ONLINE="ONLINE=START"
```

Refer to the *900 Series HP3000 Computer Systems STORE and TurboSTORE/iX Products Manual* for more information on this feature.

Backing Up a Directory

You can back up directories or files from the MPE Command Interpreter (CI) or from the POSIX shell.

The `NSRSAVE` command to back up a directory includes the following parameters:

- `-s`, the parameter for the server
- The name of the server to which you are backing up your directory
- The *pathname* of the directory that you are backing up

Using the Command Interpreter

From the CI, enter the following command to back up a directory:

```
: RUN NSRSAVE;INFO="-s server /directory_pathname"
```

For example:

```
: RUN NSRSAVE;INFO="-s jupiter /projects/project1/reports"
```

In the example, *jupiter* is the name of the server and */projects/project1/reports* is the directory pathname.

Backing up your files can take a fair amount of time. NetWorker displays the following message while the backup is in progress:

```
>> TURBO-STORE/RESTORE  VERSION  C.55.29  B5152AA  <<
                        (C) 1986 HEWLETT-PACKARD CO.

STORE /projects/project1/reports;;ONLINE=START;TREE;SHOW;NW3K
WED, DEC 17, 1997,  4:49 PM

VOLUME RESTRICTIONS          SECTORS CODE   MEDIA FILENAME
DISC                          :C        32 HFSDIR    1
/projects/project1/reports/
DISC                          :C         0           1
/projects/project1/reports*
/rep1
DISC                          :C         0           1
/projects/project1/reports*
/rep2
DISC                          :C         0           1
/projects/project1/reports*
/rep3
DISC                          :C         0           1
/projects/project1/reports*
/rep4
DISC                          :C         0           1
/projects/project1/reports*
/rep5

ONLINE BACKUP UTILIZED DISC SPACE FOR LOG ON THE FOLLOWING
VOLSETS:
MPEXL_SYSTEM_VOLUME_SET :                               0 KB
HFS DIRECTORIES STORED :                               1
FILES STORED :                                           5
TOTAL MEDIA WRITTEN :                                     0
NSRSAVE: /projects/project1/reports 15 KB 00:00:04      9 files
```

The last four items in the message are TurboSTORE information items that are not interpreted by NetWorker.

Using the POSIX Shell

From the POSIX shell, enter the following command to back up a directory:

```
$ NSRSAVE -s server /directory_pathname
```

Backing Up a File

Backing up files is very similar to backing up directories. You can back up files from the CI or from the POSIX shell.

The **NSRSAVE** command to back up a file includes the following parameters:

- **-s**, the parameter for the server
- The name of the server to which you are backing up your directory
- The pathname of the file that you are backing up

Using the Command Interpreter

From the CI, enter the following command to back up a file:

```
: RUN NSRSAVE;INFO="-s server /file_pathname"
```

For example:

```
: RUN NSRSAVE;INFO="-s jupiter /projects/project1/reports/rep1"
```

Using the POSIX Shell

From the POSIX shell, enter the following command to back up a file:

```
$ NSRSAVE -s server /file_pathname
```

Backing Up a Group of Files

You can back up a group of files with common character patterns in their filename, but only from the POSIX shell. For example, if you have a directory with five files starting with the letter *r*, then you can back up all those files at once by entering the minimum number of characters that form a pattern and substituting an asterisk for characters that are different.

The **NSRSAVE** command to back up a group of files includes the following parameters:

- **-s**, the parameter for the server
- The name of the server to which you are backing up your directory
- The pathname of the file that you are backing up
- The characters that create a common pattern in the filename
- An asterisk for the different characters in the filename

For example, from the POSIX shell, back up all the files in the */projects/project1/reports* directory starting with the letter *r* as follows:

```
$ NSRSAVE -s jupiter /projects/project1/reports/r*
```

Backing Up MPE Volume Sets

Only system administrators should back up volume sets. A backup of an MPE volume set takes a snapshot of the volume sets, including the directory information. Having this information backed-up prepares you for a disaster recovery.

The system administrator should have configured your HP 3000 NetWorker MPE client to do server-initiated backups of volume sets. Refer to “Configuring the MPE Client on the NetWorker Server” in the *Legato NetWorker ClientPak for MPE/iX Installation Guide* for information on configuring your HP 3000 on a NetWorker server.

In addition to server-initiated backups of MPE volume sets from the NetWorker server, you can perform manual backups of MPE volume sets from the HP 3000 NetWorker MPE client.

Naming Conventions for Backing Up MPE Volume Sets

MPE supports two types of volume sets: system volume sets and non-system volume sets. MPE systems are shipped with a single preconfigured system volume set called *MPEXL_SYSTEM_VOLUME_SET*. You can add as many non-system volume sets as you need.

The naming conventions for each type of volume set are different:

- For both system and non-system volume sets, add a slash (/) before the volume set name, for example: */MPEXL_SYSTEM_VOLUME_SET*.
- For an MPE non-system volume set, append the tag *_VOLUME_SET* to the end of the volume set name. For example, if you were backing up or recovering all project files that reside exclusively on an MPE volume set, *PROJECTS*, you would name the volume set */PROJECTS_VOLUME_SET*.

Do not append *_VOLUME_SET* to the end of an MPE system volume set. When an HP system is installed, it automatically creates the MPE system volume, *MPEXL_SYSTEM_VOLUME_SET*.

To perform sever-initiated backups of MPE volume sets, add the correct save set names for the MPE volume sets to the Client resource on the NetWorker server.

When NetWorker saves an MPE volume set, it saves the directory accounting information file in the pseudo file, */PROJECTS_VOLUME_SET_DAF*.

To recover all the files and directories on an MPE volume set, you use the *save set identification* (ssid) for the volume set. See [“Recovering Volume Sets” on page 41](#) for more information on recovering MPE volume sets.

If the default keyword “All” appears in the Save Set attribute in the Clients resource on the NetWorker server, all currently mounted MPE volume sets for the MPE client are backed up according to the group and schedule listed in the Clients resource.

How to Manually Back Up MPE Volume Sets

You can save MPE volume sets manually from the MPE Command Interpreter (CI) or from the POSIX shell.

Using the Command Interpreter

From the CI, enter the following command to save an MPE volume set:

```
: RUN NSRSAVE;INFO="-s jupiter /PROJECTS_VOLUME_SET"
```

Backing up a volume set can take a fair amount of time. NetWorker displays the following message while the backup is in progress:

```
>> TURBO-STORE/RESTORE  VERSION  C.55.29  B5152AA  <<
(C) 1986 HEWLETT-PACKARD CO.
STORE /; ;ONLINE=START;TREE;ONVS=PROJECTS;DIRECTORY;SHOW;NW3K
THU, DEC 18, 1997, 3:33 PM
VOLUME RESTRICTIONS          SECTORS CODE  MEDIA FILENAM
PROJECTS                      :S      32  ROOT      1  //
                                PROJECTS VOLUMESET MPE DIRECTORY ACCOUNTING FILE
/PROJECTS_VOLUME_SET_DAF     :S      32  ACCT      1  /DOCTOR
                                :S      32  ACCT      1  /DOCTOR PUB/
                                :S      32  GROUP     1  /DOCTOR/SURGEON/
DISC                          :C       0  HFSDIR    1  /DOCTOR/SURGEON/
                                pcadir
                                :S      32  ACCT      1  /SYS/
                                :S      32  GROUP     1  /SYS/PUB/
                                :S      32  GROUP     1  /SYS/PROJG001/
DISC                          :C      32  HFSDIR    1  /SYS/PUBKG001/
                                tempreloc/
DISC                          :C      16          1  /SYS/PROJG001/
                                testfile.txt

ONLINE BACKUP UTILIZED DISK SPACE FOR LOG ON THE FOLLOWING VOLSETS
SRSAVE: /PUCK_VOLUME_SET  27 KB 00:00:03      11 files
MPEXL_SYSTEM_VOLUME_SET :                               0 KB
PROJECTS:                                                  0 KB
MPE DIRECTORIES STORED:                                   1
HFS DIRECTORIES STORED :                                  9
HFS DIRECTORIES NOT STORED :                             1
FILES STORED :                                           1
TOTAL MEDIA WRITTEN :                                     0
```

Note that in the sample display, the line entry "PROJECTS VOLUMESET MPE DIRECTORY ACCOUNTING FILE" corresponds to the directory accounting information file, which is identified in the **NSRRECOV** program as */PROJECTS_VOLUME_SET_DAF*. In the previous version of NetWorker, the file was displayed as */PROJECTS_VOLUME_SET*.

Using the POSIX Shell

From the POSIX shell, enter the following command to back up a volume set:

```
$ NSRSAVE -s jupiter /PROJECTS_VOLUME_SET
```

Listing Groups in an MPE Volume Set

You can receive a list of all accounts and groups in an MPE volume set that NetWorker backs up in a server-initiated backup.

Enter the following MPE command at the CI prompt to display a list of groups in a MPE volume set, as in the following example:

```
: REPORT ;ONVS= PROJECTS
```

You can also display a list of groups in an MPE volume set from the POSIX shell:

```
$ CALLCI "REPORT ;ONVS= PROJECTS"
```

Chapter 3: Recovering Files

This chapter describes how to:

- Recover entire directories, individual files, groups of files, or MPE volume sets
- Browse the NetWorker save sets for available recovery files and view the backup history of files
- Recover files with earlier backup dates
- Recover and relocate a file into a different client directory

The NetWorker NSRRECOV Program

The NetWorker **NSRRECOV** program replaces lost or damaged files from a copy stored on a NetWorker backup volume. When NetWorker backs up files to media, it creates an entry for the files in an online file index. NetWorker uses this index to map the backed-up files to backup volumes.

Recovery operations are the highest priority operations in NetWorker. For example, if an *autochanger* inventory occurs at the same time that a client starts a recovery, and a tape affected by the inventory is needed for recovery, the inventory is suspended until the recovery is completed.

When you back up files, NetWorker saves the files as a save set that you can browse if you need to recover a file, a directory, or a volume set. Each time you back up files, NetWorker saves a new backup version of the files. If more than one version of backed-up files exists, by default NetWorker recovers the files with the most recent backup dates.

When you start the **NSRRECOV** program from a directory that has been backed up, NetWorker searches the saved file index for the save set that corresponds with the current client directory.

Types of Recoveries

You can perform two types of recoveries:

- Interactive-browse recoveries
- Non-interactive recoveries

With interactive recoveries, you browse the save sets and mark specific files that you want to recover. With non-interactive recoveries, you do *not* browse the save sets or mark specific files; you enter the **NSRRECOV** command, the command parameters, and the file path of the files that you want to recover.

You can perform both non-interactive and interactive recoveries during a Command Interpreter (CI) session or from a POSIX prompt. You can also set system variables for both interactive and non-interactive recoveries.

Setting System Variables for a Recovery Session

You can set system variables during a CI session to affect the recoveries that you perform during that specific CI session. Once you have set a system variable during a CI session, then the setting affects all recoveries performed during that session unless you turn the setting off. You can perform recoveries from a different CI session and *not* set the system variables if you do not want system variables applied to specific backups.

The types of system variables that you can set for recovery includes:

- Preserving the backup date for recovered files and directories
- Setting the NetWorker time zone to match the HP STORE process
- Turning the parallelism attribute on and off
- Changing the name of the creator of the files
- Relocating files from one group or account to another
- Recovering files to your local logon group or account

Preserving the Original Backup Date

You can set the NSR_MPE_OLDDATE system variable to preserve the original backup date of files and directories.

To preserve the original backup date on the recovered file, directory, or MPE volume set directory accounting information file, enter the following system variable during the current CI session:

```
: SETVAR NSR_MPE_OLDDATE_ON ""
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_OLDDATE_ON=""
```

Setting the NetWorker Time Zone to Match the HP STORE Process

The HPSTORE runs in the Command Interpreter, which uses the time zone set for your MPE client. NetWorker runs in POSIX, which by default uses Greenwich Mean time. To correct a potential discrepancy between time zones, you must set the TZ variable.



Important: You should always have the TZ variable set when performing server-initiated or client-initiated backups, or recovering files and directories with NetWorker. For example, when you are recovering your files, you need to set the time zone variable; otherwise the recover browse time will be in Greenwich Mean Time.

To set the time zone for recovery sessions, add the following system variable when you start a CI session:

```
: SETVAR TZ "EST5daylight"
```

Note that the value EST5daylight is only an example; it might not be appropriate for your time zone.

You can also set the TZ variable from the POSIX shell:

```
$ export T=EST5daylight
```

For information about the value used to set the TZ variable, display the **timezone** man page from the POSIX prompt only:

```
$ man timezone
```

Turning Off Parallel Backups

If you turned on parallelism, then you can turn it off with the **NSR_MPE_RECOV_PARALLELISM_OFF** system variable.

To turn parallelism off, enter the following command during a CI session:

```
: SETVAR NSR_MPE_RECOV_PARALLELISM_OFF ""
```

To turn parallelism off from a POSIX prompt, enter the following command:

```
$ export NSR_MPE_RECOV_PARALLELISM_OFF=""
```

Changing the Name of the Creator/Owner of Files

To change the name of the creator/owner of files to a new name, use the **NSR_MPE_RECOVER_CREATOR** system variable.

Note that only an account manager (AM) has the capability to create a group and change the creator under the logged-on account.

To change the name of the creator, enter the following system variable during the current CI session:

```
: SETVAR NSR_MPE_RECOV_CREATOR "<new creator name>"
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_RECOV_CREATOR="<new creator name>"
```

Relocating Files from One Group or Account to Another

You can relocate files from one group or account to another with the **NSR_MPE_RECOV_GROUP** and **NSR_MPE_RECOV_ACCOUNT** system variables.

The following rules apply to these system variables:

- You must be a system manager (SM) or a system supervisor (OP) to create an account, group, creator, and path. Only an account manager (AM) has the capability to create a group and change the creator under the logged-on account.
- You can only relocate files to an existing group or account. If the group or account does not exist, the **NSRRECOV** program will create an hierarchical file system (HFS) pathname and will preserve the original creator. You can use the **NSR_MPE_RECOV_CREATOR** system variable to change the creator. See [“Changing the Name of the Creator/Owner of Files” on page 25](#).
- If you set the **NSR_MPE_RECOV_GROUP** or the **NSR_MPE_RECOV_ACCOUNT** system variable, the file will be automatically relocated to that group or account. The creator name will automatically reflect the new group or account.
- If you set the **NSR_MPE_RECOV_ACCOUNT** system variable and then use the NetWorker **NSRRECOV** program **relocate** command to relocate files, the **relocate** command overrides the **GROUP** or **ACCOUNT** system variables. See [“Recovering and Relocating Files” on page 39](#).

To relocate files from one group to another, enter the following system variable during the current CI session:

```
: SETVAR NSR_MPE_RECOV_GROUP "<new group>"
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_RECOV_GROUP="<new group>"
```

To relocate files from one account to another, enter the following system variable during the current CI session:

```
: SETVAR NSR_MPE_RECOV_ACCOUNT "<new account>"
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_RECOV_ACCOUNT="<new account>"
```

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Recovering Files to Local Groups or Accounts

You can recover files to your logon group or account with the `NSR_MPE_RECOV_LOCAL_ON` system variable. This system variable is mutually exclusive; it overrides the `NSR_MPE_RECOV_CREATOR`, `NSR_MPE_RECOV_GROUP`, and `NSR_MPE_RECOV_ACCOUNT` system variables.

This system variable overrides the `relocate` command in the `NSRRECOV` program. The default for the `NSR_MPE_RECOV_LOCAL_ON` system variable is off.

To change the destination of recovered files, enter the following system variable during the current CI session:

```
: SETVAR NSR_MPE_RECOV_LOCAL_ON ""
```

You can also set this system variable from the POSIX shell:

```
$ export NSR_MPE_RECOV_LOCAL_ON=""
```

The NSRRECOV Program

You can start the `NSRRECOV` program from the MPE/iX Command Interpreter (CI) or from the POSIX shell.

You can only recover files that you have previously backed up. You can start the `NSRRECOV` program from any directory; however, if you start it from a directory that has not been previously backed up by NetWorker, then NetWorker prompts you to enter the name of the save set that you want to browse. The `NSRRECOV` program is an interactive, browse recovery procedure.

During both an interactive and non-interactive recovery, if you try to recover a file, directory, NetWorker prompts you with the options of discarding the recovered file, overwriting the existing file with the recovered file, or renaming the recovered file.

You can turn the overwrite prompt off and set the `NSRRECOV` program to consistently overwrite existing files or consistently *not* overwrite existing files. Setting this system variable also turns on the parallelism attribute. The parallelism attribute allows any one recovery session to be executed faster by having two or more recovery subprocesses work concurrently.

To turn the prompts off and recover the files in parallel, enter the `NSRRECOV` command, the regular `NSRRECOV` program parameters, and either `-iY` or `-iN`.

- If you enter **-iY**, the **i** turns on parallelism and the **Y** overwrites any existing files.
- If you enter **-iN**, the **i** turns on the parallelism and the **N** instructs the **NSRRECOV** program *not* to overwrite any existing files or directories.
- If you turn on parallelism, you can set a system variable to turn it off again. See [“Turning Off Parallel Backups” on page 25](#).

The **NSRRECOV** command includes the following parameters:

- **-s**, the server parameter
The name of the server from which you are recovering the files
- **-c**, the client parameter
The name of the client to which you are locating the recovered files
- **-iY**, turns overwrite prompt off; overwrites existing files, directories and turns parallelism on
- **-iN**, turns overwrite prompt off; does *not* overwrite existing files, directories and turns parallelism on
- **-a**, the automatic parameter for non-interactive recoveries
The file path of the file, directory, or MPE volume set that you want to recover

Entering the client parameter and client name are optional; for example, if you are recovering files from the client where the files were originally backed up, then you do *not* have to enter the client name.



Important: The naming convention for *recovering* MPE volume sets differs from the naming convention for *saving* MPE volume sets. See [“Naming Conventions for Recovering MPE Volume Sets” on page 41](#).

Non-interactive Recovery

With non-interactive recoveries you do not browse the save sets or mark the files for recovery. Enter the **NSRRECOV** command and the parameters for the file path of the file, directory, or MPE volume set that you want to recover. Perform non-interactive recoveries when you want to recover files, directories, or MPE volume sets quickly.

To perform a non-interactive recovery file *rep1*, enter the **NSRRECOV** command and all the parameters from the CI, as in the following example:

```
: RUN NSRRECOV;INFO="-s jupiter -iN -a
/projects/project1/reports/rep1"
```

Interactive Browse Recovery

To browse save sets and recover specific files, groups of files, directories, or MPE volume sets, start the **NSRRECOV** program and enter only the server and client parameters. You can also turn the overwrite prompt off and turn parallelism on during interactive browse recoveries.

Using the Command Interpreter

From the CI, enter the following command to start the **NSRRECOV** program:

```
: RUN NSRRECOV;INFO="-s server -c client -iN"
```

For example:

```
: RUN NSRRECOV;INFO="-s jupiter "
```

The following prompt is displayed:

```
NSRRECOV: Current working directory is /projects
```

Using the POSIX Shell

From the POSIX shell, enter the following command to start the **NSRRECOV** program:

```
$ NSRRECOV -s server -c client
```

Note that the client name is optional.

Once you have started the **NSRRECOV** program, you can browse save sets for individual files, groups of files, directories, or volume sets.

Browsing Save Sets that are Available for Recovery

You can browse save sets for files that are available for recovery from the NetWorker **recover** prompt. See [Table 1 on page 29](#) for the list of **NSRRECOV** program commands.



Important: You must have write permissions for the save sets that you want to browse.

To browse save sets, follow these steps:

1. Start the **NSRRECOV** program and display the name of the current save set:

```
recover> pwd
```

The name of the save set is displayed, for example:

```
/projects
```

2. Change to the save set where the directory to be recovered resides:

```
recover> cd project1
```

3. List the directories or files in the current save set in one of the following ways:

- To list the directories or files without details, enter the list command:

```
recover> ls  
documents reports
```

- To list the files with details, enter the long format listing command:

```
recover> ls -l  
total 1614420  
drwxrwxrwx 0 MANAGER.SYS 992 Nov 21 13:38 documents  
drwxrwxrwx 0 MANAGER.SYS 896 Nov 21 14:19 reports
```

NSRRECOV Program Commands

Table 1 provides NSRRECOV program commands to enter at the **recover** prompt. You can run the NSRRECOV commands with arguments.

Table 1. NSRRECOV Commands

Command	Description
add <i>filename</i>	Add a filename to the recovery list
cd <i>dir</i>	Change to a specified directory (<i>dir</i>)
changetime	Change the browse time of the online index
delete <i>filename</i>	Delete a filename from the recovery list
dest	Verify the destination directory for recovered files
force	Overwrite existing files
help or '?'	Display this list of NSRRECOV commands
list	List the files in the recovery list
ls -f (or lf) <i>filename</i>	List filenames with file type information
ls -l (or ll) <i>filename</i>	List filenames using long format
ls <i>filename</i>	List filenames
noforce	Do not overwrite existing files
pwd	Display the name of the current directory
quit	Exit from the NSRRECOV program
recover	Start the recovery process from the recover prompt
relocate <i>dir</i>	Specify a new directory location for recovered files
verbose	Toggle verbose or quiet mode for recovery status messages
versions <i>filename</i>	Display the backup history of a filename (filename can be either a file or a directory)
volumes <i>filename</i>	List the volumes needed to recover marked files (filename can be either a file or a directory)

Refer to the man pages for more information on NetWorker commands. See [“Displaying the Man Pages”](#) on page 60.

Recovering a Directory

Once you have started the **NSRRECOV** program, you can recover an entire directory. This section assumes that you have started the **NSRRECOV** program and have changed to the save set where the recovery directory resides.

To recover an entire directory, follow these steps:

1. Mark the directory that you want to recover by entering the NetWorker **add** command and the name of the directory:

```
recover> add reports
```

The following message is displayed:

```
6 file(s) marked for recovery
```

2. (Optional) Verify the marked files in the recovery list as follows:

```
recover> list
```

```
/projects/project1/reports/ @ Fri Nov 21 19:00:00 1997
/projects/project1/reports/rep1 @ Fri Nov 21 19:00:00 1997
/projects/project1/reports/rep2 @ Fri Nov 21 19:00:00 1997
/projects/project1/reports/rep3 @ Fri Nov 21 19:00:00 1997
/projects/project1/reports/rep4 @ Fri Nov 21 19:00:00 1997
/projects/project1/reports/rep5 @ Fri Nov 21 19:00:00 1997
6 file(s) marked for recovery
```

3. Start the recovery process by entering the **recover** command at the NetWorker **recover** prompt:

```
recover> recover
```

NetWorker displays the following message:

```
Recovering 6 files into their original locations
```

```
FILES RESTORED : 5
```

```
Volumes needed (all on-line):
```

```
jupiter.012 at /source/rmt/data
```

```
Requesting 6 file(s), this may take a while...
```

```
>> TURBO-STORE/RESTORE VERSION C.55.29 B5152AA
```

```
(C) 1986 HEWLETT-PACKARD CO.
```

```
RESTORE ; ;SHOW;NW3K;CREATE
```

```
WED, DEC 17, 1997, 4:58 PM
```

```
'CREATE' OPTION DEFAULTING TO
```

```
'CREATE=ACCOUNT, GROUP, CREATOR, PATH'
```

```
BASED ON YOUR CAPABILITIES (S/R 502)
```

```
WARNING: YOUR DEFAULT FILESET BECOMES '@.@.' SINCE YOU HAVE OP
OR SM CAPABILITY (S/R 1911)
```

```

VOLUME RESTRICTIONS          SECTORS CODE   MEDIA FILENAME
          DISC                C           0           1
/projects/project1/reports*
/rep1
/projects/project1/reports*
/rep2
DISC                          :C           0           1
/projects/project1/reports*
/rep3
DISC                          :C           0           1
/projects/project1/reports*
/rep4
DISC                          :C           0           1
/projects/project1/reports*
/rep5
DISC                          :C           0 HFSDIR   1
/projects/project1/reports*
//
Received 6 file(s) from NSR server `jupiter'
Recover completion time: Wed Dec 17 16:58:31 1997
recover>

```

Recovering a File

If more than one version of a backed-up file exists, NetWorker automatically recovers the file with the most recent backup date. This section describes how to recover a file or files with the most recent backup date.

This section assumes that you have started the **NSRRECOV** program.

To recover files with the most recent backup date, follow these steps:

1. Change to the save set where the file resides, for example:

```
recover> cd reports
```

2. (Optional) List the files in the current save set as follows:

```
recover> ls
```

The following message is displayed:

```
rep1  rep2  rep3  rep4  rep5
```

3. Mark the file that you want to recover as follows:

```
recover> add repl
```

The following message is displayed:

```
1 file(s) marked for recovery
```

To add other files to the recovery list, repeat the **add** command.

4. (Optional) Verify the marked files in the recover list as follows:

```
recover> list
```

```
/projects/project1/reports/repl @ Wed Dec 4 10:36:07 1996
```

```
1 file(s) marked for recovery
```

5. Start the recovery process as follows:

```
recover> recover
```

NetWorker displays the following message:

```
Recovering 1 file into its original location
```

```
Volumes needed (all on-line):
```

```
    jupiter.012 at /source/rmt/data
```

```
Requesting 1 file(s), this may take a while...
```

```
>> TURBO-STORE/RESTORE  VERSION  C.55.29  B5152AA  <<
```

```
          (C) 1986 HEWLETT-PACKARD CO.
```

```
RESTORE ; ;SHOW;NW3K;CREATE
```

```
WED, DEC 17, 1997,  5:00 PM
```

```
'CREATE' OPTION DEFAULTING TO
```

```
'CREATE=ACCOUNT,GROUP,CREATOR,PATH'
```

```
BASED ON YOUR CAPABILITIES  (S/R 502)
```

```
WARNING: YOUR DEFAULT FILESET BECOMES '@.@.' SINCE YOU HAVE OP  
OR SM CAPABILITY  (S/R 1911)
```

```
VOLUME RESTRICTIONS          SECTORS CODE    MEDIA FILENAME
```

```
          DISC                C            0            1
```

```
/projects/project1/reports*
```

```
/repl
```

```
Received 1 file(s) from NSR server 'jupiter'
```

```
Recover completion time: Wed Dec 17 17:00:48 1997
```

Recovering a Group of Files

You can recover a group of files with common character patterns in their filenames. For example, if you have a directory with five files starting with the letter *r*, you can recover those files by entering the minimum number of characters that form a pattern and substituting an asterisk for the different characters. NetWorker searches for the files with the matching patterns.

Table 2 shows some sample search patterns.

Table 2. Search Patterns

Search Pattern	Search for
<code>r*</code>	Files starting with the letter "r"
<code>*.tmp</code>	Files with the suffix ".tmp"
<code>*rep*</code>	Files containing the letters "rep"

This section assumes that you have started the **NSRRECOV** program, changed to the save set where the saved files reside, and listed the files.

To recover a group of files, follow these steps:

1. Mark the files that you want to recover by entering the NetWorker **add** command, then enter the characters that create a common pattern in the filename and substitute an asterisk for the different characters in the filename, as in the following example:

```
recover> add r*
```

The following message is displayed:

```
5 file(s) marked for recovery
```

2. Start the recovery process as follows:

```
recover> recover
```

NetWorker displays the following message:

```
Recovering 5 files into their original locations
```

```
Volumes needed (all on-line):
```

```
jupiter.012 at /source/rmt/data
```

```
Requesting 5 file(s), this may take a while...
```

```
>> TURBO-STORE/RESTORE VERSION C.55.29 B5152AA <<
```

```
(C) 1986 HEWLETT-PACKARD CO.
```

```
RESTORE ; ;SHOW;NW3K;CREATE
```

```
WED, DEC 17, 1997, 5:02 PM
```

```
'CREATE' OPTION DEFAULTING TO
```

```
'CREATE=ACCOUNT, GROUP, CREATOR, PATH'
```

```
BASED ON YOUR CAPABILITIES (S/R 502)
```

```
WARNING: YOUR DEFAULT FILESET BECOMES '@.@.@' SINCE YOU HAVE OP  
OR SM CAPABILITY (S/R 1911)
```

Viewing the Backup History

```
VOLUME RESTRICTIONS          SECTORS CODE  MEDIA FILENAME
DISC                          :C           0           1
/projects/project1/reports*
/rep1
DISC                          :C           0           1
/projects/project1/reports*
/rep2
DISC                          :C           0           1
/projects/project1/reports*
/rep3
DISC                          :C           0           1
/projects/project1/reports*
/rep4
DISC                          :C           0           1
/projects/project1/reports*
/rep5
Received 5 file(s) from NSR server `jupiter'
Recover completion time: Wed Dec 17 17:02:39 1997
```

3

Viewing the Backup History

If you have several backups of the same directory or file, you can view the different versions by displaying the backup history. If you are not sure where a directory or file resides, you can use the backup history to locate it.

If more than one version of a backed-up directory, file, or MPE volume set directory accounting information file exists, NetWorker automatically recovers the directory, file, or MPE volume set with the most recent backup date. The most recent backup date is always the one immediately before the browse time. Browse time is always set to midnight of the current date to ensure that you automatically recover the most recent backup. For example, a current browse time of *Fri Nov 21 10:51:37 1997* displays files backed up at midnight of *Thu Nov 20 1997*.

To view the backup history of a file, at the NetWorker **recover** prompt, enter the **versions** command and the name of the file, directory, or MPE volume set directory accounting information file:

```
recover> versions rep1
```

NetWorker displays the different versions of the backup files that you can recover:

```
491520 -rw-rw-rw-  0 MANAGER.SYS 211 Jan 31 14:06  rep1
      save time:  Fri Nov 21 15:48:11 1997
      location:   projects.001 at /dev/rmt/0mbn
491520 -rw-rw-rw-  0 MANAGER.SYS 211 Nov 21 14:06  rep1
      save time:   Fri Oct 31 15:46:28 1997
      location:   projects.001 at /dev/rmt/0mbn
```

```
491520 -rw-rw-rw- 0 MANAGER.SYS 211 Jan 31 14:06 repl
      save time: Tues Sep 30 14:08:10 1997
      location: projects.001 at /dev/rmt/0mbn
Display more versions of `projects/project1/reports/repl' [y]?
```

[Table 3](#) explains the information in the previous example of a backup history.

Table 3. Information in the Backup History of a File

Information	Example
Block Count	491520 Does not apply in MPE environment
File mode permissions	-rw-rw-rw
Link count	0 Does not apply in MPE environment
Owner of the file	MANAGER.SYS
File size	211
Last date file modified	Oct 31 14:06
filename	repl
Save times	Fri Nov 28 15:45:11 1997 Fri Oct 31 15:46:28 1997 Tues Sep 30 14:08:46 1997
Location	projects.001 (the backup volume) /dev/rmt/0mbn (the backup device)

Recovering a File with an Earlier Backup Date

If more than one version of a backed-up file exists, NetWorker automatically recovers the file with the backup date immediately before the browse time. The default browse time is midnight (23:59:59) of the current day.

For example, if you have three versions of a file with save times of 14:08:10, 14:08:55, and 14:21:44, NetWorker recovers the file with the browse time of 14:21:44 because it is closest to the default browse time of 23:59:59.

You can recover an earlier version of a file by changing the browse time. The browse time must be later than the save time of the file you want to recover, but before the next backup. For example, to recover the file with the save time of 14:08:10, you could change the browse time to 14:08:50. If you change the browse time to 14:09:00, then the file with the save time of 14:08:55 is recovered.

This section assumes that you have started the **NSRRECOV** program and have displayed the backup history of the file.

To recover files with an earlier backup date, follow these steps:

1. To recover an earlier backup, enter the **changetime** command and the new browse time. Continuing with the previous example, to recover the version of the file with the save time of *Tues Sep 30 14:08:46 1997*, change the browse time as follows:

```
recover> changetime 9/31/97 23:59:59
```

The following message is displayed:

```
time changed to Tues Sep 30 23:59:59 1997
```

The following formats are valid browse time entries:

- hh:mm:ss (24 hour clock) or hh:mm:ss (am or pm)
- mm/dd(/yy) or monthname dd (yy) (yy is optional)
- Last Friday, next Friday, or third Friday
- + or -x seconds, minutes, hours, weeks, months, or years
- Now (the current date and time)

2. Mark the file, as follows:

```
recover> add repl
```

3. Start the recovery process as follows:

```
recover> recover
```

NetWorker recovers the file dated *Tues Sep 30 14:08:46 1997*, the file that is closest to and earlier than the changed browse time of 11:59:59 pm Tuesday, September 30th.

Recovering a File That Already Exists

If you try to recover a file that already exists in the client directory, NetWorker tells you that the file exists and gives you the options of discarding the recovered file, overwriting the existing file with the recovered file, or renaming the recovered file.

This section assumes that you have started the **NSRRECOV** program, changed to the save set where the saved file resides, marked the file, and started the file recovery.

If a file that you mark for recovery already exists, NetWorker displays the following message:

```
/projects/project1/repl file exists, overwrite (n,y,N,Y, or  
rename (r, R) [n]?
```

You can respond to this message in lowercase or uppercase:

- A response in uppercase means that you do not want NetWorker to display the above message if the file already exists; meaning you want your response to apply to the recovery of each existing file during the current recovery session.
- Lowercase means that you want NetWorker to display the above message each time that you try to recover an existing file. The default response to the above warning prompt is a lowercase "n"; you do not want to overwrite the current existing file and you want to be prompted each time you try to recover an existing file.

Enter one of the following responses to the message:

- **n** – NetWorker does *not* overwrite the existing file and displays the following message:


```

skipping recover of /projects/project1/reports/rep1
Received 1 file(s) from NSR server `jupiter`
      
```
- **y** – NetWorker overwrites the original file and displays the following message:


```

overwriting /projects/project1/reports/rep1
VOLUME RESTRICTIONS          SECTORS CODE    MEDIA FILENAME
DISC                          :C           16           1
/projects/project1/reports/rep1
Received 1 file(s) from NSR server `jupiter`
      
```
- **r** – NetWorker does *not* overwrite the existing file, but recovers and renames the file with a *.R* extension, for example, *rep1.R*. NetWorker displays the following message:


```

renaming /projects/project1/reports/rep1 to
/projects/project1/reports/rep1.R
DISC                          :C           16           1
/projects/project1/reports/rep*
1.R
Received 1 file(s) from NSR server `jupiter`
      
```
- **N** – NetWorker does not overwrite the existing file and displays the following message:


```

skipping recover of /projects/project1/reports/rep1
Received 1 file(s) from NSR server `jupiter`
      
```

The second time that you try to recover an existing file in the same recovery session, NetWorker displays the following message:

```

/projects/project1/reports/rep2
/projects/project1/reports/rep2: file exists, skipping
Received 1 file(s) from NSR server `jupiter`
      
```
- **Y** – NetWorker overwrites the existing file and displays the following message:


```

overwriting /projects/project1/reports/rep1
VOLUME RESTRICTIONS          SECTORS CODE    MEDIA FILENAME
DISC                          :C           16           1
/projects/project1/reports/rep1
Received 1 file(s) from NSR server `jupiter`
      
```

The second time that you recover an existing file in the same recovery session, NetWorker automatically overwrites the existing file without displaying a warning prompt. When the recovery is complete, NetWorker displays the following message:

```
Recovering 1 file into its original location
Volumes needed (all on-line):
    jupiter.012 at /source/rmt/data
Requesting 1 file(s), this may take a while...
/projects/project1/reports/rep2
/projects/project1/reports/rep2: file exists, overwriting
DISC                :C          16          1
/projects/project1/reports/rep2
Received 1 file(s) from NSR server `jupiter`
```

- **R** – NetWorker recovers and renames the file with a *.R* extension and displays the following message:

```
Recovering 1 file into its original location
renaming /projects/project1/reports/rep3 to
/projects/project1/reports/rep3.R
VOLUME RESTRICTIONS          SECTORS CODE    MEDIA FILENAME
DISC                :C          16          1
/projects/project1/reports/rep*
3.R
Received 1 file(s) from NSR server `jupiter`
```

The second time that you recover an existing file in the same recovery session, NetWorker automatically renames the recovered file without displaying a warning prompt. When the recovery is complete, NetWorker displays the following message:

```
/projects/project1/reports/rep4
/projects/project1/reports/rep4: file exists, renaming to
/projects/project1/reports/rep4.R
DISC                :C          16          1
/projects/project1/reports/rep*
4.R
Received 1 file(s) from NSR server `jupiter`
```

Recovering and Relocating Files

You can recover files to a different directory, group, or account from the one where they were originally stored by using the **NRSRECOV** program **relocate** command. The **relocate** command overrides the `NSR_MPE_RECOVER_GROUP` and the `NSR_MPE_RECOVER_ACCOUNT` system variables if you set them for the current recovery session. See [“Relocating Files from One Group or Account to Another” on page 25](#).

When you relocate files, they will retain the same name and file attributes. Marking a group of files to relocate to another directory is the same as recovering a group of files. For example, if you want to relocate three files starting with the letter *r*, you can mark the three files at once by entering the minimum number of characters that form a pattern and substituting an asterisk for the different characters.

The following rules apply to relocating files in groups and accounts.

- If a file or directory is not in a group or account, you can relocate it to any directory, group, or account.
- If a file or directory is in an account, you can relocate it to any other account.
- If a file or directory is in a group, you can relocate it to any group in any account.
- If a file is in a directory in an account, you can relocate that file to any directory in any account.
- If a file is in a directory in a group, you can relocate to a directory in any group.

This section assumes that you have started the **NSRRECOV** program.

File Recovery and Relocation Procedure

To recover and relocate files, follow these steps:

1. Change to the save set directory where the files are currently located, for example:

```
recover> cd documents
```

2. List the files in the save set directory as follows:

```
recover> ls
```

```
doc1 doc2 doc3 doc4 doc5 doc6 rep6 rep7
```

3. Mark the files in the directory by entering the NetWorker **add** command, enter the characters that create a common pattern in the filenames of the files you want to relocate, and substitute an asterisk for the different characters in the filenames. For example, mark the files that start with the letter *r* as follows:

```
recover> add r*
```

```
2 file(s) marked for recovery
```

4. Enter the **relocate** command and the client directory pathname to which you want to relocate the files, for example:

```
recover> relocate /projects/project1/reports
```

5. Start the recovery process:

```
recover> recover
```

The following message is displayed:

```
Recovering 2 files within /projects/project1/documents/ into
/projects/project1/
```

```
reports
```

```
Volumes needed (all on-line):
```

```
    jupiter.012 at /source/rmt/data
```

```
Requesting 2 file(s), this may take a while...
```

```
>> TURBO-STORE/RESTORE  VERSION  C.55.29  B5152AA  <<
```

```
          (C) 1986 HEWLETT-PACKARD CO.
```

```
RESTORE ; ;SHOW;NW3K;CREATE
```

```
WED, DEC 17, 1997,  5:13 PM
```

```
'CREATE' OPTION DEFAULTING TO
```

```
'CREATE=ACCOUNT,GROUP,CREATOR,PATH'
```

```
BASED ON YOUR CAPABILITIES  (S/R 502)
```

```
WARNING: YOUR DEFAULT FILESET BECOMES '@.@.@' SINCE YOU HAVE OP
```

```
OR SM CAPABILITY  (S/R 1911)
```

```
VOLUME RESTRICTIONS          SECTORS CODE    MEDIA FILENAME
```

```
DISC                          :C          0          1
```

```
/projects/project1/reports*
```

```
/rep6
```

```
DISC                          :C          0          1
```

```
/projects/project1/reports*
```

```
/rep7
```

```
Received 2 file(s) from NSR server 'jupiter'
```

```
Recover completion time: Wed Dec 17 17:13:32 1997
```

6. (Optional) Verify that the files have been recovered:

a. Quit the **NSRRECOV** program as follows:

```
recover> quit
```

b. Change to the relocation client directory, for example:

```
$ cd ../
```

```
$ pwd
```

```
/projects/project1
```

```
$ cd reports
```

c. List the files in the relocation directory, for example:

```
$ ls
```

```
rep1 rep2 rep3 rep4 rep5 rep6 rep7
```

The two files, *rep6* and *rep7*, are relocated from the *documents* directory to the *reports* directory, which already contains 5 *rep* files.

Recovering Volume Sets

Only system administrators should recover volume sets.

You can perform three types of recoveries of MPE volume sets:

1. Non-interactive recovery of the *directory accounting information file* (DAF) for an MPE volume set. A directory accounting information file contains the group and account information for the MPE volume set and any other file or directory on that volume set.
2. Interactive-browse recovery of the directory accounting information file, and of any file or directory on a volume set.
3. Save set-based recovery of an entire MPE volume set.

Note that you can recover an entire MPE volume set interactively, but we recommend that you use the save set-based recovery method to recover an entire MPE volume set.



Important: Performing a full restoration of a system volume save set is *not* advised because you could overwrite crucial files.

The **NSRRECOV** program for recovering MPE volume sets includes the special directory accounting information file that allows you to rebuild the accounts and groups of the volume set.

For information on recovering an entire MPE volume set in case of a disaster, see [“Disaster Recovery: Restoring an Entire MPE Volume Set” on page 43](#).

Browsing MPE Volume Sets for Recovery

You can browse files, directories, MPE/iX accounts, and groups derived from either client-initiated backups or server-initiated backups of volume sets. If you are unable to browse, it might be because the system administrator turned the browse feature off.



Important: Purged MPE/iX accounts and groups will be restored with only the default attributes, which includes permissions.

Naming Conventions for Recovering MPE Volume Sets

MPE supports two types of volume sets: system volume sets and non-system volume sets. MPE systems are shipped with a single preconfigured system volume set called *MPEXL_SYSTEM_VOLUME_SET*. You can add as many non-system volume sets as you need.

The naming conventions for each type of volume set are different:

- For both system and non-system volume sets, add a slash (/) before the volume set name, for example: */MPEXL_SYSTEM_VOLUME_SET*.
- For an MPE non-system volume set, append the tag *_VOLUME_SET* to the end of the volume set name. For example, if you are backing up or recovering all project files that reside exclusively on an MPE volume set, *PROJECTS*, name the volume set */PROJECTS_VOLUME_SET*.



Important: Do not append `_VOLUME_SET` to the end of an MPE system volume set. When an HP system is installed, it automatically creates the MPE system volume, `MPEXL_SYSTEM_VOLUME_SET`.

The name of the directory accounting information file for an MPE volume set is the same as the name of the MPE volume set for previously saved data. The new name has an extra tag, `_DAF`. Therefore, if you enter the name of or mark an MPE volume set during the recovery process, you recover the directory accounting information file *only*.

You can recover an entire MPE volume set by using the save set-based recovery method, which uses the save set recovery identification (ssid) for the MPE volume set. When NetWorker saves an MPE volume set, it saves the file directory accounting information in the file `/PROJECTS_VOLUME_SET_DAF`. Using the example above, when you recover this specific file, it will contain only the file directory accounting information. To recover all the files and directories on an MPE volume set, you use the *save set identification* (ssid) for the volume set.

3

Non-interactive Recovery of a Directory Accounting Information File

Use the non-interactive recovery method to recover the directory accounting information file of an MPE volume set.

With a non-interactive recovery you do *not* browse the save sets or mark the files for recovery. Enter the `NSRRECOV` command and the parameters for the file path of the MPE volume set for which you want to recover the directory accounting information file. Perform non-interactive recoveries when you want to recover the directory accounting information file for an MPE volume set quickly.

To perform a non-interactive recovery of the directory accounting information file *only*, enter the `NSRRECOV` command at the CI prompt:

```
: RUN NSRRECOV;INFO="-s jupiter -a /PROJECTS_VOLUME_SET_DAF"
```

Interactive Browse Recovery of Directory Accounting Information File

Although you can recover an entire MPE volume set using the interactive browse recovery method, Legato recommends that you use the save set recovery method instead. Use the interactive browse recovery method to recover the directory accounting information file *only*.

The interactive browse process for recovering the directory accounting information file for an MPE volume set is the same procedure that you follow for recovering files, groups of files, or directories. Once you have started the `NSRRECOV` program, as with files, you can browse the save sets for available recovery MPE volume sets.



Important: You can only restore one directory accounting information file at a time.

To recover MPE volume sets with the most recent backup date, follow these steps:

1. Change to the save set where the MPE volume set resides, for example:

```
recover> cd /
```

2. (Optional) List the files in the current save set as follows:

```
recover> ls /PROJECTS_VOLUME_SET_DAF
```

NetWorker displays the following information:

```
PROJECTS_VOLUME_SET_DAF SYS PROJGRP1
```

3. Mark the directory accounting information file that you want to recover as follows:

```
recover> add PROJECTS_VOLUME_SET_DAF
```

The following message is displayed:

```
1 file(s) marked for recovery
```

To add other files to the recovery list, repeat the **add** command.

4. Start the recovery process as follows:

```
recover> recover
```

Disaster Recovery: Restoring an Entire MPE Volume Set

The save set-based recovery is ideal for the quick recovery of entire MPE volume sets, especially after a disaster.



Important: Performing a full restoration of the system volume save set is *not* advised because you could overwrite crucial files.

To perform a disaster recovery, perform the following steps:

1. For the system volume set, use *only* MPE/iX tools to set up the MPE system volume set and the operating system. Note that you can restore required subsets of any saves of the system volume set, including the directory accounting information pseudo file.
2. For the system volume set, properly restore and configure all the prerequisite system software needed for NetWorker to work and reinstall NetWorker. Refer to the *Legato NetWorker ClientPak for MPE/iX Installation Guide* for software requirements.
3. Use the MPE/iX tools to recreate and mount each non-system volume set.
4. Obtain the save set identification (ssid) with the following server command:

```
$ mminfo -s jupiter -aV -t /PROJECTS_VOLUME_SET
```

or

```
$ mminfo -s tempest -aV -t "nov10"
```

Note that you can also obtain this information through the **nwadmin** Graphical User Interface (GUI).

Recovering Volume Sets

5. Once you have recreated and mounted a non-system volume set, perform a save set recovery.

To perform a save set-based recovery from the CI prompt, enter the **NSRRECOV** command:

```
: RUN NSRRECOV;INFO="-s jupiter -s ssid_for_volume_set"
```

To perform a save set-based recovery from the POSIX shell, enter the following command:

```
$ NSRRECOV -s jupiter -s ssid_for_volume_set
```

Chapter 4: Archiving and Retrieving Files

This chapter describes how to archive and retrieve files using the optional NetWorker Archive Application.

Archiving Data

The backup and archive processes serve very different purposes. Backup is short-term insurance against data loss. NetWorker keeps track of backups in the online file index to enable you to recover lost or corrupted files quickly. This online file index requires considerable disk space. Because archives are kept forever theoretically, NetWorker does not track them in the online file index; NetWorker only tracks archives in the online media index.

Archiving is the process by which NetWorker backs up data to an *archive volume*. Archive volumes are similar to backup volumes, except they do not have an expiration date, which means that NetWorker will keep track of them indefinitely. Archiving is a long-term strategy for preserving data.

Once files are safely stored on archive volumes, the archived files can be removed from the local disk, freeing up space on your system. If you ever need to restore archived files to your system, you can do so at any time.

If you have system administrator permissions, you can also archive MPE volume sets. Although you can groom volume sets, be warned that you cannot remove the accounts, groups, or pseudo files.

The best way to remember what an archive contains is to create a meaningful *annotation*. An annotation is a comment that you associate with your archive to help you identify data should you want to retrieve it. Annotations are stored in the media index to make searching for archives easier. Annotations are limited to 1024 characters.

You can archive directories or individual files. You can start the **NSRARCH** program during an MPE/iX CI session or from the POSIX shell.

When you archive, you have the options of verifying the archive, cloning the archive, and grooming directories once the archive is complete. Cloning and grooming are discussed under separate sections (see [“Cloning an Archive” on page 47](#) and [“Grooming Your Directories” on page 48](#)).

You can archive a directory and verify the archive in one step. NetWorker verifies the archive by comparing the data on the archive volume with the data on the local disk, byte for byte, attribute for attribute. If there are any discrepancies, NetWorker lets you know.

The **NSRARCH** command for archiving and verifying the archive includes the following parameters:

- **-s**, the parameter for the server.
The name of the server to which you are archiving the directory.
- (Optional) **-b**, the parameter for the volume pool.
(Optional) The name of the volume pool, which must be enclosed in quotes if the name is more than one word. *Archive* is the name of the default volume pool.
- **-V**, the verify parameter.
- **-T**, the parameter for the annotation text.
The annotation text, which must be enclosed in quotes if the text is more than one word. Annotation text must be alphanumeric; avoid using characters. Keep the annotation text simple. When NetWorker searches for an annotation, the search is case-sensitive.
- The pathname of the directory that you are archiving.

4

Using the Command Interpreter

From the CI, enter the following command to archive and verify the archive:

```
: RUN NSRARCH;INFO="-s server -b volume pool -V -T "annotation
text" directory_pathname"
```

For example:

```
: RUN NSRARCH;INFO="-s jupiter -b "Project Archive" -V -T
"project1" /projects/project1"
```

When you start the **NSRARCH** program, keep the following points in mind:

- If you have a multiserver network and do not specify a server name, NetWorker chooses an archive server for you.
- If you do not specify a *volume pool* for your archive, the volume pool becomes *Archive* by default.
- If you do not know which volume pool to choose, contact the system administrator.
- If you do not include the **-T** (annotation text) parameter and an annotation when you archive files, NetWorker displays the following prompt:

```
Please enter annotation for this archive (type <Return> when
finished): [Return] or [Enter]
```

NetWorker displays the list of directories and files while archiving and verifying. When archiving and verifying is complete, NetWorker displays the following information:

```
NSRARCH: /projects/project1 97 KB 00:00:10      39 files
ONLINE BACKUP UTILIZED DISC SPACE FOR LOG ON THE FOLLOWING
VOLSETS:
MPEXL_SYSTEM_VOLUME_SET :                      0 KB
```

```

HFS DIRECTORIES STORED :           10
FILES STORED :                     29
TOTAL MEDIA WRITTEN :              0

```

Archive Completion Information

```

Completed:   Mon Dec 15 14:45:26 1997
Save set(s): /projects/project1
Verified:    Yes
Volume(s):   projects.archive.001

```

Annotation:

Project1

Using the POSIX Shell

From the POSIX shell, enter the following command to archive data and verify the archive:

```

$ NSRARCH -s server -b volume pool -V -T "annotation text"
directory_pathname

```

Cloning an Archive

NetWorker clones an archive by making a duplicate copy of the archive. Usually system administrators clone archives. Before making a clone of your archive, you might want to check with your system administrator.

Two backup devices are required to make a clone: one for the original archive volume and the other for the archive clone volume. Each backup device must have a valid, writable archive volume mounted.

The **NSRARCH** command for cloning an archive includes the following parameters:

- **-s**, the parameter for the server.
The name of the server to which you are cloning the files.
- **-b**, the parameter for the volume pool.
(Optional) The name of the archive volume pool, which must be enclosed in quotes if the name is more than one word. *Archive* is the name of the default archive volume pool.
- **-V**, the verify parameter.
- **-C**, the clone parameter.
The name of the volume pool to which you are cloning, which must be enclosed in quotes if the text is more than one word. *Archive clone* is the name of the default clone volume pool.
- **-T**, the parameter for the annotation text.
The annotation text, which must be enclosed in quotes if the text is more than one word. Annotation text must be alphanumeric.
- The pathname of the directory that you are cloning.

Cloning an Archive from the Command Interpreter

From the CI, enter the following command to archive and clone the archive:

```
: RUN NSRARCH;INFO="--s server -b volume pool -V -C "clone volume pool" -T "annotation text" directory_pathname"
```

For example:

```
: RUN NSRARCH;INFO="--s jupiter -b "Project Archive" -V -C "Projects Clone" -T "project1" /projects/project1"
```

Archiving and cloning an archive might take a long time. NetWorker displays the list of directories and files while archiving and cloning.

When archiving and cloning is complete, NetWorker displays the following information:

```
Archive Completion Information
Completed:   Mon Dec 15 14:55:12 1997
Save set(s): /projects/project1
Cloned:      Yes
Volume(s):   projects.archive.001
```

Cloning an Archive from the POSIX Shell

From the POSIX shell, enter the following command to archive and clone the archive:

```
$ NSRARCH -s server -b volume pool -V -C "clone volume pool" -T "annotation text" directory_pathname
```

Grooming Your Directories

NetWorker grooms directories on the client by removing all the files in the directory. Grooming helps conserve disk space once the archive is finished and has been verified. You should verify the archive to avoid deleting the directory accounting information file.

The **NSRARCH** command for archiving, verifying, and grooming includes the following parameters:

- **-s**, the parameter for the server.
The name of the server where the client is registered.
- (Optional) **-b**, the parameter for the volume pool.
(Optional) The name of the volume pool, which must be enclosed in quotes if the name is more than one word. *Archive* is the default.
- **-V**, the verify parameter.
- **-G remove**, the remove parameter.
- **-T**, the parameter for the annotation text.
The annotation text, which must be enclosed in quotes if the text is more than one word. Annotation text must be alphanumeric.
- The pathname of the directory to be removed.

To archive and groom a directory, follow these steps:

1. From the CI, archive and groom a directory as follows:

```
: RUN NSRARCH;INFO="-s server -G remove -T "annotation text"
directory_pathname"
```

For example:

```
: RUN NSRARCH;INFO="-s jupiter -G remove -T "project1"
/projects/project1"
```

NetWorker displays the list of directories and files and prompts you to confirm the removal of the directory.

```
NSRARCH:/rene/projectx/documents 23 KB 00:00:08 9 files
```

```
ONLINE BACKUP UTILIZED DISC SPACE FOR LOG ON THE FOLLOWING
VOLSETS:
```

```
remove all files and directories archived (y/n)? [n]
```

2. Cancel or confirm the removal of all files as follows:

- To cancel, press **[Enter]** to accept the default **n**.

If you ignore the prompt, NetWorker assumes that you do *not* want to remove the files and cancels the grooming process.

- Type **y** and press **[Enter]** to confirm the removal.

NetWorker continues with the grooming and displays the following information when the grooming is complete:

```
MPEXL_SYSTEM_VOLUME_SET : 0 KB
HFS DIRECTORIES STORED : 10
FILES STORED : 29 TOTAL
MEDIA WRITTEN : 0
```

Archive Completion Information

```
Completed: Mon Dec 15 15:23:28 1997
```

```
Save set(s): /projects/project1
```

```
Groomed: Yes
```

```
Volume(s): projects.archive.001
```

```
Annotation:
```

```
project1
```

Retrieving Archived Files

NetWorker retrieves archived files by copying files from an archive volume to a local disk. Unless you are `manager.sys`, you must own the directories or files to retrieve them.

You need to know the save set ID (identification) number and the name of the archive pool. If you are not sure, ask your system administrator to check the information with the NetWorker software on the server of which you are a client.

The `NSRRETRV` command to retrieve an archive includes the following parameters:

- `-S`, the parameter for the save set identification.
`ssid`, specifies the save set identification for the save set to be retrieved.
- `-s`, the parameter for the server.
The name of the server from which you are retrieving the files.
- (Optional) `-b`, the parameter for the volume pool.
(Optional) The name of the volume pool, which must be enclosed in quotes if the name is more than one word. *Archive* is the name of the default volume pool.
- The original pathname of the directory to be retrieved.

From the CI, retrieve the archive as follows:

```
: RUN NSRRETRV;INFO="-S ssid -s server directory_pathname"
```

For example:

```
: RUN NSRRETRV;INFO="-S 14321 -s jupiter /projects/project1"
```

From the POSIX shell, enter the following command to retrieve the archive:

```
$ NSRRETRV -S ssid -s server directory_pathname
```

Appendix A: Error Messages

NetWorker provides error messages to help you solve backup, recovery, and archive problems that you might encounter. This section contains a list of error messages for the NSRSAVE, NSRARCH, NSRRECOV, NSRRETRV, and SAVEFS programs for the NetWorker ClientPak for MPE/iX.

Error Messages

The error messages, listed in [Table 4](#), are listed in alphabetical order. The tables also provides the cause of each error message and a solution.

Table 4. Error Messages

<p>Error Message '09/30/12:00' not valid, time not changed</p> <p>Displayed in the following NetWorker program: NSRRECOV</p> <p>Cause You asked NetWorker to change the browse time to a browse time that was earlier than the save time for the file.</p> <p>Solution Enter the time using one of the following valid time formats:</p> <ul style="list-style-type: none">• hh:mm:ss (24 hour clock) or hh:mm:ss am/pm• mm/dd(/yy) or monthname dd (yy) (/yy is optional)• Last Friday, next Friday, <i>or</i> third Friday• + or -x seconds, minutes, hours, weeks, months, <i>or</i> years• Now (the current date and time)
--

Table 4. Error Messages (Continued)

<p>Error Message '12:20:14:00' not valid, time not changed</p> <p>Displayed in the following NetWorker program: NSRRECOV</p> <p>Cause The change time you entered while trying to recover was an invalid time format.</p> <p>Solution Enter the time using a valid time format.</p>
<p>Error Message: Annotation must contain only alphanumeric characters on MPE/iX systems.</p> <p>Displayed in the following NetWorker program: NSRARCH</p> <p>Cause: You entered one or more non-alphanumeric characters, such as ! # * ? & ~, in your -T annotation text or in response to the annotation prompt.</p> <p>Solution: Reenter your annotation text using only alphanumeric characters from a-z, A-Z, and 0-9.</p>

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Table 4. Error Messages (Continued)

<p>Error Message: Cannot build recover list - volume set violation</p> <p>Displayed in the following NetWorker programs: NSRRECOV, NSRRETRV</p> <p>Cause: You tried to recover a directory accounting information file for a volume set along with a version of some other file or directory from another save set or save time. NetWorker does not allow you to mix save times to ensure data integrity.</p> <p>For a related issue see the next error message, Conflict: at most one dir info file can be marked/recovered at a time.</p> <p>Solution:</p> <ul style="list-style-type: none"> • For interactive recovery, use the ls -l (list), delete, and versions commands, and unmark the files or directories so all remaining marked objects have the same save time. • Or better, recover the directory accounting information file by itself, for example: <code>"-s ssid /XXX_VOLUME_SET"</code> or <code>"-s ssid"</code>. <p>See “Non-interactive Recovery of a Directory Accounting Information File” page 42 and “Disaster Recovery: Restoring an Entire MPE Volume Set” page 43.</p>
<p>Error Message: Conflict: at most one dir info file can be marked/recovered at a time</p> <p>Displayed in the following NetWorker programs: NSRRECOV, NSRRETRV</p> <p>Cause: You marked more than one directory accounting information file for volume sets for recovery in a single recovery session.</p> <p>Solution:</p> <ul style="list-style-type: none"> • For an interactive recovery, mark and recover the directory accounting information file one at a time. See “Non-interactive Recovery of a Directory Accounting Information File” page 42. • For saveset-based recovery of part or all of a volume set, or only the directory accounting information file itself, use exactly one <code>-s ssid_for_volume set</code> option or argument at a time. See “Disaster Recovery: Restoring an Entire MPE Volume Set” page 43.

Table 4. Error Messages (Continued)

<p>Error Message: <code>filter_mpe_volsets failed</code></p> <p>Displayed in the following NetWorker programs: NSRSAVE, NSRARCH</p> <p>Cause: NetWorker found a temporary memory problem.</p> <p>Solution: Try one of the following solutions:</p> <ul style="list-style-type: none"> • Retry the command. • Reboot the host system.
<p>Error Message: <code>/<invalid_mpe_volset_id>_VOLUME_SET: invalid NetWorker volume set identifier or /<invalid_system_volume_set_id></code></p> <p>Displayed in the following NetWorker programs: NSRSAVE, NSRARCH</p> <p>Cause: You specified an invalid MPE/iX volume set name after the required leading slash (/) and, in the case of nonsystem volume sets, before the required suffix tag (<code>_VOLUME_SET</code>).</p> <p>Solution: Insert the valid MPE/iX volume set name in the expected NetWorker format: <code>/MPEXL_SYSTEM_VOLUME_SET</code> or <code>/<valid_mpe_volset_id>_VOLUME_SET</code> for example, <code>/PROD_VOLUME_SET</code> for an MPE/ix volume set named "PROD".</p>
<p>Error Message: <code>mpevs_init failed</code></p> <p>Displayed in the following NetWorker programs: NSRSAVE, NSRARCH, NSRRECOV, NSRRETRV, SAVEFS</p> <p>Cause: NetWorker found a memory or volume set management problem.</p> <p>Solution: Try the following in descending order of preference:</p> <ul style="list-style-type: none"> • Retry the command. • Remount the non-system volume sets, ensure they are usable, and reboot the host system. • If all volume sets seem to be usable using test MPE/iX commands and the problem persists, contact Legato Technical Support.

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Table 4. Error Messages (Continued)

<p>Error Message Nothing marked for backup</p> <p>Displayed in the following NetWorker programs: NSRSAVE, NSRARCH</p> <p>Cause You started a backup or archive without marking files.</p> <p>Solution Start the backup or archive again; mark at least one file.</p>
<p>Error Message NSRSAVE: invalid time specification: '20d1978'</p> <p>Displayed in the following NetWorker program: NSRSAVE</p> <p>Cause You entered the time with an invalid time format.</p> <p>Solution Enter the time using one of the following valid time formats:</p> <ul style="list-style-type: none"> • hh:mm:ss (24 hour clock) or hh:mm:ss am/pm • mm/dd(/yy) or monthname dd (yy) (/yy is optional) • Last Friday, next Friday, <i>or</i> third Friday • + or -x seconds, minutes, hours, weeks, months, <i>or</i> years • Now (the current date and time)
<p>Error Message: TurboSTORE fails with error code n</p> <p>Displayed in the following NetWorker programs: NSRSAVE, NSRARCH, NSRRECOV, NSRRETRV</p> <p>Cause: A request from NetWorker to start TurboSTORE failed for a backup or recovery session.</p> <p>Solution: Ensure that your TurboSTORE product is operational. Test it by saving a small test file to disk or to tape at the MPE prompt outside of NetWorker.</p>

Table 4. Error Messages (Continued)

<p>Error Message Unable to relocate to /directory</p> <p>Displayed in the following NetWorker program: NSRRECOV</p> <p>Cause NetWorker was unable to relocate the recovered file to the path you specified.</p> <p>Solution Start the recovery again and enter a valid <i>pathname</i>. Note that you must have write permissions for the directory you specify.</p>
<p>Error Message Unable to start backup</p> <p>Displayed in following NetWorker program: NSRSAVE</p> <p>Cause NetWorker was unable to execute the NSRSAVE program.</p> <p>Solution Contact the system administrator. There could be a problem with the NetWorker software or MPE client configuration.</p>
<p>Error Message: usage: NSRARCH [<options>] [path ...] options: [-BiLqvxVy] [-b pool] [-f directive file] [-N name] [-s server] [-W width] [-T annotation] [-C clone pool] [-I input file] [-G remove] [-R name]</p> <p>Displayed in following NetWorker program: NSRARCH</p> <p>Cause: An invalid option was entered. Note that the -E and -n NSRSAVE options have been temporarily disabled for the NSRARCH program in NetWorker ClientPak for MPE/iX.</p> <p>Solution: Reenter the option using only the valid options as shown in the error message.</p>

A

Table 4. Error Messages (Continued)

<p>Error Message: Volume set save path argument must be by itself</p> <p>Displayed in the following NetWorker programs: NSRSAVE & NSRARCH</p> <p>Cause: An extra save path argument was used with a volume set save path, as in the following example: : RUN NSRSAVE;INFO="-s <i>nwrksrvr</i> /PROD_VOLUME_SET /SYS/PUB"</p> <p>Solution: Specify the volume set path name by itself in a separate NSRSAVE or NSRARCH command, as in the following example: : RUN NSRSAVE;INFO="-s <i>nwrksrvr</i> /PROD_VOLUME_SET"</p>
<p>Error Message Your system is not a registered client.</p> <p>Displayed in the following NetWorker program: NSRSAVE</p> <p>Cause The server you selected does not have your system listed as a NetWorker client.</p> <p>Solution Contact the system administrator. Your MPE client needs to be added to the list of recognized clients for the selected server.</p>

Appendix B: Common NetWorker Commands

This appendix contains a table of common NetWorker commands and instructions on how to display the man pages.

Common NetWorker Commands

[Table 5](#) lists some commonly used NetWorker client commands, the command used to display the man page, and a brief description of the command.

Table 5. Common NetWorker Commands

MPE/iX Command	UNIX Manual Page	Description
JBCONFIG	jbconfig	Configures a jukebox (Media Changer Device) for a NetWorker server.
JBEXER	jbexercise	Tests the functionality of a jukebox.
JBINFO	jbinfo	Tests a jukebox for SJI compliance using a standard inquiry. It also performs medium transfers between tape drives and slots.
man page only	nsr	Guide to using NetWorker
MMINFO	mminfo	Provides information about the backup volumes and save sets
MMLOCATE	mmlocate	Accesses and manages the volume location information contained in the media database
NSRADMIN	nsradmin	NetWorker character-based program for system administration
NSRARCH	nsrarchive	Archives files to long-term storage
NSRCLONE	nsrclone	Used by system administrators to make new copies of existing save sets
NSRDOWN	nsr_shutdown	Stops a NetWorker server's process
NSREXECD	nsrexecd	NetWorker client execution daemon

Table 5. Common NetWorker Commands (Continued)

MPE/iX Command	UNIX Manual Page	Description
NSRIZE	nsr_ize	Installs and removes NetWorker
NSRJB	nsrjb	Manages jukeboxes for NetWorker servers.
NSRMM	nsrmm	Labels, mounts, unmounts, deletes, and purges volumes
NSRMMD	nsrmmd	The nsrmmd daemon provides RPC-based media multiplexing and demultiplexing service.
NSRRECOV	NSRRECOV recover	Browses the online indexes and recovers files from the NetWorker server
NSRRETRV	NSRRETRV nsrretrieve	Retrieves NetWorker archived save sets
NSRSAVE	NSRSAVE save	Saves files to the NetWorker server
SAVEFS	SAVEFS savefs	Saves file systems to the NetWorker server
SCANNER	scanner	Directly reads NetWorker media, such as backup tapes or disks, to confirm the contents of a volume, extract a save set from a volume, or rebuild the NetWorker on-line indexes.
TAPEEXER	tapeexercise	Writes sample data to a tape, and tests to see if positioning and read operations perform as expected to the NetWorker server.

B

Displaying the Man Pages

You must display the man pages from the `/SYS/NETWRKR` directory.

To display a man page, follow these steps:

1. Change to the NetWorker directory:
 - : `CHDIR /SYS/NETWRKR`
2. Enter the command to display the man page:
 - : `NSRHELP man-page`

For example, display the NetWorker man page for **nsr** as follows:

- : `NSRHELP nsr`

Glossary

This glossary contains terms and definitions found in this manual. Most of the terms are specific to NetWorker products.

annotation	A comment that you associate with an archive save set to help identify that data. Annotations are stored in the media index for ease of searching and are limited to 1024 characters.
Application-Specific Module (ASM)	A program that, when used in a directive, specifies the way a set of files or directories is to be backed up and recovered.
archiving	The process by which NetWorker backs up directories or files to an archive volume and then optionally deletes them from the disk to free up disk space.
archive clone pool	A volume pool composed exclusively of archive clone save sets.
archive pool	A volume pool composed exclusively of archive save sets.
archive volume	A tape or other storage medium used for NetWorker archives, as opposed to a backup volume.
autochanger/ jukebox	A mechanism that uses a robotic arm to move media among various components—including slots, media drives, media access ports, and transports—located in a device. Autochangers automate media loading and mounting functions during backups and recoveries. The term can refer to a variety of backup devices: autoloader, carousel, library, near-line storage, datawheel, and jukebox.

back up	The process of saving a copy of your files or directories onto a separate medium.
backup volume	Backup media, such as magnetic tape or optical disk.
bootstrap	Information that includes the server index, media index, and configuration files needed for recovering NetWorker after a disk crash.
browse policy	The policy that determines how long entries for your files remain in the online file index.
browse time	The viewing specification for files backed up at a specific time.
client	A machine that accesses the NetWorker server to back up or recover files. Clients may be workstations, PCs, or file servers.
client-initiated backup	Manual backups that you perform from the MPE client.
clone	The process by which NetWorker makes an exact copy of saved data (save sets). NetWorker can clone individual save sets or the entire contents of a backup volume.
clone volume	A duplicated volume. NetWorker can track four types of volumes: backup, archive, backup clone, and archive clone. Save sets of different types may not be intermixed on one volume.
command line	The shell prompt, where you enter commands.
compressasm	A NetWorker directive used for compressing and decompressing files.
device	The backup device (tape drive, optical drive, or autochanger) connected to the NetWorker server, used for backing up and recovering client files.
directive	An instruction that directs NetWorker to take special actions on a given set of files.
enabler codes	Special codes provided by Legato that allow you to run your NetWorker software product.
file index	A database of information maintained by NetWorker that tracks every file or filesystem backed up.
fileserver	A machine with disks that provides services to other machines on the network.

filesystem	1. A file tree on a specific disk partition or other mount point. 2. The entire set of all files. 3. A method of storing files.
full (f)	A backup level in which all files are backed up, regardless of when they last changed.
grooming	The process of removing files after a successful archive.
group	A client or group of clients that starts backing up their files at a designated time.
heterogeneous networks	Networks that contain systems of different platforms that interact meaningfully across the network.
incremental (i)	A backup level in which only files that have changed since the last backup are backed up.
interoperability	The ability of software and hardware on multiple machines from multiple vendors to communicate meaningfully.
level [1-9]	A backup level that backs up files that have changed since the last backup of any lower level.
media	Magnetic tape or optical disks used to back up files.
media index	A database of information maintained by NetWorker that tracks every backup volume.
media manager	The NetWorker component that tracks save sets to backup volumes.
NetWorker	Legato's network-based software product to back up and recover filesystems.
NetWorker client	A computer that can access the backup and recovery services from a NetWorker server.
NetWorker server	The computer on a network running the NetWorker software, containing the online indexes, and providing backup and recover services to the clients on the same network.
nsrhost	The logical <i>hostname</i> of the computer that is the NetWorker server.
online indexes	The databases, located on the NetWorker server, that contain all the information pertaining to the client backups and backup volumes.

operator	The person who monitors the server status, loads backup volumes into the server devices, and otherwise executes day-to-day tasks using NetWorker.
override	An interim backup level that takes place instead of the scheduled one.
pathname	Instructions for accessing a file. An <i>absolute pathname</i> tells you how to find a file beginning at the root directory and working down the directory tree. A <i>relative pathname</i> tells you how to find the file starting from your current location.
preconfigured	Existing selections or configurations for different NetWorker features.
print	Instruction to send data to a printer.
recover	The NetWorker command used to browse the server index and recover files from a backup volume to a client's disk.
recycle	A volume whose data has passed both its browse and retention policies and is available for relabeling.
retention policy	Policy that determines how long entries will be retained in the media index and thus be recoverable.
retrieval	The process of locating and copying back files and directories that NetWorker has archived.
save	The process by which NetWorker backs up client files to backup volumes and makes data entries in the online file index.
save set	A set of files or a filesystem backed up onto backup media using NetWorker.
save set ID	An internal identification number that NetWorker assigns to a save set.
scanner	The NetWorker command used to read a backup volume when the online indexes are no longer available.
server	The computer on a network running the NetWorker software, containing the online indexes and providing backup and recovery services to the clients on a network.

server-initiated backup	Client backups scheduled on a server to occur automatically.
shell prompt	A cue for input in a shell window where you enter a command.
skip (s)	A backup level in which files are skipped and not backed up.
stand-alone device	A backup device that contains a single drive for backing up data. Stand-alone devices cannot store or automatically load backup volumes.
storage node	Manages the media that contains backed-up data, while the NetWorker server manages the information required to administer the clients and to track and recover data.
system administrator	The person normally responsible for installing, configuring, and maintaining NetWorker.
user	The person who can use NetWorker from his or her workstation to back up and recover files.
volume	Backup media, such as magnetic tape or optical disk.
volume ID	The internal identification assigned to a backup volume by NetWorker.
volume name	The name you assign to a backup volume when it is labeled.
volume pool	A feature that allows you to sort backup data to selected volumes. A volume pool contains a collection of backup volumes to which specific data has been backed up.
volume set (MPE client)	A source of saved data. An MPE volume is an MPE client disk. A volume set is a set of disks; each disk belongs to exactly one volume set. "Volume set" is an MPE operating system term used to denote one or more volumes that are logically grouped together for system or business reasons. For example, all disks that are used by the accounting department may be put on an exclusive volume set.

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