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Legato NetWorker®

Module for Lotus®

Release 2.1
Windows® and UNIX® Version

Administrator's Guide

Legato NetWorker Module for Lotus Administrator's Guide

March 2001

01-8563-2.1

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Preface

The *Legato NetWorker® Module for Lotus® Administrator's Guide* contains information on how to configure and manage the Legato NetWorker Module for Lotus software.

You *must* install the NetWorker Module software on your server and clients to use the information presented in this guide. If you have not yet installed the software, refer to the *Legato NetWorker Module for Lotus Installation Guide* for installation instructions.

Audience

The information in this guide is intended for system administrators who are responsible for installing software and maintaining the servers and clients on a network. Operators who monitor the daily backups may also find this manual useful.

Product Documentation

Legato offers an extensive archive of product documentation at its web site *www.legato.com*. Most of the documents are in Adobe® Acrobat® Portable Document Format (PDF), and can be viewed by downloading and installing the Adobe Acrobat Reader. The Reader is available in the */viewers/acroread* directory on the Legato Documentation Suite CD-ROM, or directly from Adobe at *www.adobe.com*. To install and use the Reader on the platform of your choice, refer to the instructions in the CD-ROM's */viewers/acroread/readme.txt* file or at the Adobe web site.

Conventions

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

Convention	Indicates	Example
boldface	Names of DOS or UNIX line commands, daemons, options, programs, or scripts	The **nsradmin** command starts the command line version of the administration program.
italic in text	Pathnames, filenames, computer names, new terms defined in the Glossary or within the chapter, or emphasized words	Displayed messages are also written to */nsr/logs/daemon.log*.
italic in command line	A variable that you need to provide in the command line	**`nwadmin -s`** *server-name*
`fixed-width`	Examples and information displayed on the screen	`media waiting: recover waiting for 8mm 5GB tape volume name`
`fixed-width, boldface`	Commands and options that you must type exactly as shown	**`nsr_shutdown -a`**
Menu_Name> Command	A path or an order to follow for making selections in the GUI	Volume>Change Mode>Appendable
Important:	Information that you must read and follow to ensure successful backup and recovery of your data	 **Important:** You must install the NetWorker Module software in the same directory where you installed the NetWorker client binaries.

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Chapter 1: Introduction

This chapter provides information about Legato NetWorker software and the NetWorker Module for Lotus software. It includes the following topics:

- "Importance of Backing Up Mission-Critical Data" on page 15
- "NetWorker Software" on page 16
- "NetWorker Module for Lotus Software" on page 16

Importance of Backing Up Mission-Critical Data

Although the reliability of computer equipment has improved in recent years, hardware failures still occur, sometimes with catastrophic results.

You can lose data not only after hardware failures, but also because of user errors, software bugs, or procedural flaws. A viable backup strategy can help you recover from these potentially disastrous situations.

Many administrators do not recognize the jeopardy of failing to make regular backups of databases and transaction logs. If you lose all transaction logs, you can still recover a database to the time of its last full backup. Without backups or transaction logs, you cannot recover the database at all.

The NetWorker Module for Lotus software works with Lotus Notes®/Domino™ and NetWorker software to provide reliable, high-performance data protection for Notes databases. The NetWorker Module for Lotus software integrates backup and recovery procedures for your databases into the comprehensive network-wide data protection environment that NetWorker software provides.

1

NetWorker Software

NetWorker software is a network data storage management solution that protects and manages data across an entire network. NetWorker software reduces the administrative burden by automating and centralizing data storage.

NetWorker software provides the following features:

- Automated “lights out” backups during off-peak hours
- Remote administration
- Centralized and automated data storage administration
- Optimized performance using parallel save streams to storage devices

NetWorker server software and Notes/Domino software can exist on either the same or separate computers. The NetWorker Module for Lotus software and NetWorker client software must reside on each computer containing Notes data that you want to protect.

No matter where the computer running Notes/Domino software resides, that computer is considered a client of the NetWorker server.

NetWorker Module for Lotus Software

The NetWorker Module for Lotus software is an add-on module for NetWorker software. The NetWorker Module software allows you to protect and manage Lotus Notes databases using the cross-platform scheduling and media management services provided by NetWorker software.

The NetWorker Module software provides services that connect NetWorker software functionality to Notes/Domino servers and clients. NetWorker software provides backup schedules, volume labels, and client resources.

Files Backed Up by the NetWorker Module Software

The NetWorker Module software views .nsf, .ntf, and .box files as Notes databases and backs them up using Domino 5 Backup API for databases.

The NetWorker Module software views .ncf, .njf, .dic, .dsk, .id, and notes.ini files as text files and backs them up at the filesystem level.

Chapter 2: Configuring and Performing Scheduled Backups

This chapter provides information about configuring and performing scheduled backups with the NetWorker Module for Lotus software. It includes the following topics:

- "Configuration" on page 17
- "Using Backup Groups" on page 18
- "Using Volume Pools" on page 19
- "Using Backup Schedules" on page 20
- "Using Browse and Retention Policies" on page 20
- "Using NetWorker Backup Clients" on page 21
- "Customizing the Backup Script" on page 22
- "How to Customize the Backup Script for a Partitioned Domino Server" on page 25
- "Customizing Backups for Microsoft Cluster Servers" on page 27
- "Performing Backups" on page 28

Configuration

You can configure NetWorker performance and functionality using NetWorker features called *resources*. To configure a backup for Notes data, specify the resource settings in the NetWorker administration program.

If you do not configure custom resource settings before defining Lotus Notes/Domino servers or clients as NetWorker clients, NetWorker software will back up your data using its default resource settings.

Configuration Roadmap

The following tasks are a roadmap to follow when configuring the NetWorker Module for Lotus software for each Notes/Domino client or server that requires backup and recover services.

1. In the Groups resource, create a backup group specific for Notes backups. For more information, see "Using Backup Groups" on page 18.
2. In the Pools resource, create volume pools for Notes backups. For more information, see "Using Volume Pools" on page 19.
3. In the Schedules resource, create or choose a backup schedule. For more information, see "Using Backup Schedules" on page 20.
4. In the Policies resource, specify browse and retention polices. For more information, see "Using Browse and Retention Policies" on page 20.
5. In the Clients resource, configure a client for each Lotus Notes/Domino client and server that require backup and recover services. For more information, see "Using NetWorker Backup Clients" on page 21.
6. On the NetWorker client, customize the NetWorker Module backup script. For more information, see "Customizing the Backup Script" on page 22.

Using Backup Groups

You can assign one or more Lotus Notes/Domino clients or servers to a NetWorker *backup group*. NetWorker groups allow you to schedule backups to at a time of day when performance demands on your databases and NetWorker servers are lowest.

NetWorker software provides a preconfigured group named Default. To ensure that all data is backed up, NetWorker software adds all specified client resources to the Default group. The values of the Default group are:

- Start Time = 3:33
- Autostart = Disabled
- Client Retries=1
- Clones= No
- Clone Pool = Default Clone

To assign a Lotus Notes/Domino database system to another group with different attributes, you must create a new group using the NetWorker administration program.

Configuring Backup Groups

When a start time for each group is scheduled, it is important to schedule the groups far enough apart to ensure that one group completes its backup before the next group begins. Choose times when the traffic on the network is at its lowest, such as in the evening or on weekends.

Important: Be sure to enable the Autostart option for each group configured; otherwise, the group's scheduled backup will never take place.

For information on configuring backup groups, refer to the *Legato NetWorker Administrator's Guide*.

Using Volume Pools

NetWorker software provides a means of directing backups to groups of media called *pools*. Pools allow you to establish a logical and systematic method for tracking, organizing, and sorting backup data. The configuration settings for each pool act as a filter that informs NetWorker software of the type of data each volume should receive for storage.

Volume pools are always associated with a label template, which provides an automated method of identifying media assigned to a pool.

How to Configure Volume Pools

This section explains how to configure volume pools for the NetWorker Module software using the NetWorker administration program. For more information, refer to the *Legato NetWorker Administrator's Guide*.

To configure a volume pool:

1. Create a new pool in the NetWorker administration program.
2. Enter a name like NOTESdata as the entry for Name.
3. Select Backup for Pool Type.
4. Select a backup group for Groups; see "Using Backup Groups" on page 18.
5. Select a backup device for Devices.
6. Leave the Clients, Save Sets, and Levels fields blank.

7. Save the Pool configuration.

   A dialog box appears, asking you to select a label template or apply the configuration again to automatically create and select a label template.

8. Save the configuration again to automatically create a label template and assign it to the NOTESdata pool.

For instructions on creating and using NetWorker label templates, refer to the *Legato NetWorker Administrator's Guide*.

Using Backup Schedules

NetWorker software uses a backup schedule to determine what type of backup operation to perform on a given day for the specified save sets. The time of day the backup operation begins is determined by the start time assigned to the Groups resource associated with the client's save sets.

To create a backup schedule, use the information provided in the *Legato NetWorker Administrator's Guide*. When creating backup schedules for Lotus Notes databases, keep the following in mind:

- The NetWorker Module for Lotus software only supports full and incremental backups.
  - A *full backup* backs up all files, regardless of whether or not they have changed since the last backup operation.
  - An *incremental backup* backs up transaction logs and database files that are not logged and have changed since the last full backup.
- The NetWorker Module for Lotus software does not support level 1-9 backups; instead level backups are interpreted as incremental backups.

Using Browse and Retention Policies

To manage and reduce the size of online indexes, NetWorker software uses *browse polices* for client file index entries and *retention policies* for media database entries. You can choose one of the preconfigured polices provided with NetWorker software or create policies of your own. A policy can be used as either a browse or retention policy. However, NetWorker software does not allow a browse policy to exceed its retention policy.

For index policy concepts and information on creating browse and retention policies, refer to the *Legato NetWorker Administrator's Guide.*

Using NetWorker Backup Clients

NetWorker software uses a client/server model to provide storage management services. At least one computer on the network is designated as the NetWorker server. Computers with data to be backed up are configured as NetWorker clients.

A NetWorker client is a resource configured on the NetWorker server. The Client resource provides the server with information about the data to back up, how long to maintain the client file index entries, and how long to keep the media database entries.

How to Create a NetWorker Client

To configure a system running Lotus Notes/Domino as a NetWorker client, you need two client resources; one to back up filesystem data and one to back up Notes data. To create a client resource to back up filesystem data, refer to the *Legato NetWorker Administrator's Guide.*

To create a client resource to back up Notes data:

1. Create a new client in the NetWorker administration program.
2. Enter the hostname of the computer running the Notes/Domino server or client software as the client name.
3. Specify NOTES as the save set in the Save Set field.
4. Select a backup group.
5. Select a schedule. For more information, see "Using Backup Schedules" on page 20.
6. Select a browse policy and a retention policy.
7. Specify all known aliases in the Aliases field for the system where the Notes/Domino server or client software is installed.
8. Enter the name of the backup script for the Backup Command.

   The default names are *nsrnote.bat* for Windows and *nsrnote* for UNIX. For more information, see "Customizing the Backup Script" on page 22.

Important: If the name of the backup script is not entered in the Backup Command field, a standard NetWorker **save** will be performed. If a NetWorker Module client attempts to recover a database file that was backed up with a standard NetWorker **save**, the recovery fails.

9. Leave the attributes for Directives, Remote User, and Archive Users blank.
10. Save the Client resource.

Customizing the Backup Script

A backup script is used to coordinate scheduled backup processes between NetWorker software and the NetWorker Module for Lotus software. You must configure the backup script, *nsrnote.bat* on Windows or *nsrnote* on UNIX, correctly for scheduled backups to run.

Once all the criteria for a backup script have been met and the server has been configured appropriately, perform a test backup before implementing the script into your regular backup schedule. For instructions on performing test backups, see "Testing Scheduled Backups" on page 28.

myArgs Options

To perform a scheduled backup, the appropriate **nsrnotesv** options must be specified in the "myArgs" line of the backup script. These options specify the type of backup to perform. The default value of the "myArgs" line is:

- For UNIX: `myArgs="-R"`
- For Windows: `SET myArgs=-R`

The **-R** specifies that the Notes database files to back up reside in the Notes default directory. The Notes default directory is the directory where the Notes/Domino server or client databases are located.

For information on the syntax and options of the **nsrnotesv** command, see "Appendix A: Commands and Command Options" on page 51.

Skipping Errors

To allow the NetWorker Module software to continue backing up database files after a noncritical error occurs, set the environment variable, NML_SKIPDBERRORS, to any value in the backup script.

- For UNIX: `NML_SKIPDBERRORS=Yes`
- For Windows: `SET NML_SKIPDBERRORS=Yes`

When this variable is set, the NetWorker Module software skips a database file if it encounters noncritical errors during a backup and proceeds to the next file. When this variable is set, remember to check the output log after a backup to see if any databases were skipped due to errors.

If this variable is not set, the NetWorker Module software aborts the backup if it encounters an error and fails to back up any database files.

Environment Variables

The following variables must be specified in *nsrnotes* or *nsrnotes.bat*.

AIX

Set the PATH environment variable in the script to the location of:

- NetWorker Module for Lotus - typically */usr/bin*
- Lotus Notes/Domino binaries - typically */opt/lotus/bin*
- Notes Exec Directory - typically */opt/lotus/notes/latest/ibmpow*
- Lotus Resource Directory - typically */opt/lotus/notes/latest/ibmpow/res/C*
- Lotus Notes/Domino data directory - defined by user during installation

Linux

Set the PATH environment variable in the script to the location of:

- NetWorker Module for Lotus - typically */usr/bin*
- Lotus Notes/Domino binaries - typically */opt/lotus/bin*
- Notes Exec Directory - typically */opt/lotus/notes/latest/linux*
- Lotus Resource Directory - typically */opt/lotus/notes/latest/linux/res/C*
- Lotus Notes/Domino data directory - defined by user during installation

Solaris

Set the PATH environment variable in the script to the location of:

- NetWorker Module for Lotus - typically */usr/sbin*
- Lotus Notes/Domino binaries - typically */opt/lotus/bin*
- Notes Exec Directory - typically */opt/lotus/notes/latest/sunspa*
- Lotus Resource Directory - typically */opt/lotus/notes/latest/sunspa/res/C*
- Lotus Notes/Domino data directory - defined by user during installation

Windows

Set the Path variable in the script to the location of the NetWorker Module for Lotus binaries, which is typically, *%SystemDrive%\Program Files\nsr\bin*.

Then, uncomment the Notes_ExecDirectory variable and set both the Notes_ExecDirectory and Path variables in the script to either of the following:

- For a Domino server, set both variables to the location of the server's *nnotes.dll* file, which is typically *%SystemDrive%\Lotus\Domino*.
- For a Lotus Notes client, set both variables to the location of the client's *nnotes.dll* file, which is typically *%SystemDrive%\Lotus\Notes*.

Naming

The filename of the backup script must begin with the prefix *nsr* or *save*:

- *nsrnote.bat*
- *savenotes*

The Backup Command that you enter in the client resource on the NetWorker server must be the same filename given to the backup script. For information on client resources, see "Using NetWorker Backup Clients" on page 21.

Location

The backup script must reside in the same directory as the **nsrnotesv** program. The default location of *nsrnotesv* is:

- For AIX - */usr/bin*
- For Linux - */usr/bin*
- For Solaris - */usr/sbin*
- For Windows - *%SystemDrive%\Program Files\nsr\bin*

How to Configure Manual Backups of a Partitioned Domino Server

To configure a manual back up a partitioned Lotus Domino server using the NetWorker User for Lotus program:

1. Set the Path variable to the Domino data directory that you want to back up.
2. Set the NOTESPARTITION variable to the value found in the *nclient.bat* file (Windows) or *.sgf.notespartition.* file (UNIX), located in the Domino data directory from step 1.

How to Customize the Backup Script for a Partitioned Domino Server

To customize the backup script of a partitioned Lotus Domino server:

1. Create a backup script for each partition.
2. Exclude the *cluster.ncf* file from the backup.
   a. Create a text file named *exclude.lst* with the text *cluster.ncf* in the file.
   b. In the **nsrnote** script, add the following line to the myArgs= statement:

      -E "*path*/**exclude.lst"**

Important: If you do not exclude the *cluster.ncf* file the backups will fail.

3. Set the following for a single partition in each backup script:
   - Set the myArgs and Path variables to the location of the Lotus data directory.
   - Set the NOTESPARTITION variable to the value found in the *nclient.bat* file (Windows) or *.sgf.notespartition* file (UNIX).

   For more information, see "Example: Creating Backup Scripts for a Partitioned Domino Server".
4. Create a NetWorker client resource for each partition.

   The NetWorker Module software does not allow two backups to run simultaneously on the same computer. Schedule the backups for each partition so that they do not run at the same time.
5. Add the name of the backup script to the Backup Command field of the appropriate NetWorker client resource.

Example: Creating Backup Scripts for a Partitioned Domino Server

In this example, the Lotus Domino data directories are */notes/data1* for partition one and */notes/data2* for partition two.

To configure the partition one backup script:

1. Set the myArgs variable to the partition one data directory:

   `SET myArgs=/notes/data1 -E exclude.lst`

2. Add the location of the partition one data directory to the PATH:

   `PATH=/notes/data1`

3. Set the environment variable, NOTESPARTITION, to the value found in the */notes/data1/.sgf.notespartition* file:

   `NOTESPARTITION=1`
   export **`NOTESPARTITION`**

To configure the partition two backup script, repeat steps 1 through 3 replacing the values for partition one with the values for partition two.

Customizing Backups for Microsoft Cluster Servers

In the following instructions, physical servers *clus_phys1* and *clus_phys2* are clustered together to form the virtual server *clus_vir1*.

How to Configure the NetWorker Module Software

To configure the NetWorker Module for Lotus software to back up a Domino server in a Microsoft Cluster Server (MSCS) environment:

1. Install Domino software on the cluster computers according to the instructions in Chapter 7 of the *Lotus Domino, Administering Domino Clusters, Release 5* manual.
2. Install NetWorker clients on computers *clus_phys1* and *clus_phys2*.
3. Add *-c clus_vir1* to the myArgs= statements in the *nsrnote.bat* file located on *clus_phys1* and *clus_phys2*.
4. On the NetWorker server, create three NetWorker client resources, one each for *clus_phys1*, *clus_phys2*, and *clus_vir1*.
5. Place the name of the *nsrnotes.bat* file in the Backup Command field of the *clus_vir1* client resource.
6. Place the Windows group names *Administrators@clus_phys1* and *Administrators@clus_phys2* in the Remote Access attribute of the NetWorker client resource *clus_vir1*.

After the NetWorker Module software has been configured correctly, you can perform scheduled backups of the Domino server.

Recovering Data in a Cluster

To recover data in a cluster, perform a directed recover from *clus_vir1* to the local machine. For instructions on performing a directed recover, see "Directed Recovery from the Command Line" on page 45.

To use the NetWorker User for Lotus program to recover data in a cluster, you must create the NSR_CLIENT environment variable and set it to the name of the virtual client, *clus_vir1*.

Performing Backups

Before using the NetWorker Module software, ensure that regular NetWorker filesystem backups are being completed successfully. Once the appropriate NetWorker server configuration is in place, the NetWorker Module software can be used to perform Notes backups.

- "Testing Scheduled Backups" on page 28
- "Monitoring Backups" on page 29
- "Backup Completion Notifications" on page 29

Once a successful backup has been performed, a recovery should then be attempted. For recovery instructions, see "Chapter 4: Recovering Data" on page 37.

Testing Scheduled Backups

The following sections describe how to test scheduled backups. For instructions on how to perform manual backups using the NetWorker Module for Lotus software, see "Chapter 3: Performing Manual Backups" on page 31.

How to Test a Scheduled Backup on Windows

Once the NetWorker server is correctly configured for scheduled backups, run a test of the scheduled backup as follows:

1. Log on as Administrator on the NetWorker server.
2. Start the NetWorker administration program on the NetWorker server.
3. Select the Configure tab of the Server window to make the Configure window active.
4. Select Manage Groups to open the Groups window.
5. Right-click the group you want to back up and select Start from the menu.
6. Click Yes to start the backup.

NetWorker software immediately backs up the clients in the group, displaying a clock icon. When the backup is complete, the clock icon will change to one of the following icons:

- ! - The backup completed with no errors.
- X - The backup completed with errors.
- Open hand - The backup was interrupted.

How to Test a Scheduled Backup on UNIX

Once the NetWorker server is correctly configured for scheduled backups, run a test of the scheduled backup as follows:

1. Log in as root on the NetWorker server.
2. Start the NetWorker administration program on the NetWorker server.

   For information on running the NetWorker administration program, refer to the *Legato NetWorker Administrator's Guide*.
3. In the main NetWorker Administrator window, open the Group Control window, either by choosing Group Control from the Server menu or by clicking the Group Control button.
4. In the Group Control window, highlight the correct Group name for the scheduled Notes backup and click Start.

When the status of the selected group in the Group Control window changes to Finished, the scheduled backup is complete. An e-mail Savegroup Completion message provides a report of the scheduled backup.

Monitoring Backups

To monitor the progress of a backup, NetWorker software displays messages in the NetWorker administration program for each database file backed up. After a backup is complete, a Backup Completed message appears.

If the backup is taking a long time and no new messages appear in the status window, this could mean that the database being backed up is very large, or that there is no backup volume mounted on the server. To see if a backup volume is mounted, check the pending box in the NetWorker administration program.

Backup Completion Notifications

NetWorker software provides several reports about the results of a backup:

- A series of error messages written to the NetWorker messages log files.

  For more information on NetWorker Module for Lotus and NetWorker error messages, see "Appendix C: Error Messages" on page 65.
- A scrolling list of messages displayed in the Group Control windows of the NetWorker administration program.

  These messages are displayed in three lists: pending save sets, completed save sets, and failed save sets.

- A printout of the NetWorker server's bootstrap file for the backup session, if the NetWorker server is part of the same save set group as the Notes/Domino server, or if the NetWorker server is not part of an enabled save set group.
- A "savegroup completion" notice upon completion of a backup.
- On a NetWorker server for UNIX, you can also send an e-mail notification of the results of a scheduled backup:
  1. Edit the NetWorker client resource
  2. Choose the View Details option
  3. Enter a notification command directed to a login ID in the Owner Notification attribute

For complete details on the reports generated by NetWorker software, refer to the *Legato NetWorker Administrator's Guide.*

Chapter 3: Performing Manual Backups

This chapter describes how to use the NetWorker Module for Lotus software to perform manual backups of Notes database and system files. It includes the following topics:

- "NetWorker Module Backup Programs" on page 31
- "Manual Backups from NetWorker User for Lotus" on page 32
- "Manual Backups from the Command Line" on page 34
- "Backing Up NetWorker Indexes for Disaster Recovery" on page 36

Before you can perform a manual database backup, NetWorker software must be configured to back up Lotus Notes/Domino data. For information on configuring NetWorker software and NetWorker Module software, see "Chapter 2: Configuring and Performing Scheduled Backups" on page 17.

NetWorker Module Backup Programs

A manual backup of Notes database files can be performed from either of the following NetWorker Module programs:

- **nwbml.exe -** NetWorker User for Lotus on Windows

  For backup instructions, see "Manual Backups from NetWorker User for Lotus" on page 32.
- **nsrnotesv** command-line program on AIX, Linux, Solaris, or Windows

  For backup instructions, see "Manual Backups from the Command Line" on page 34.

Important: The **nsrnotesv** command must be run as the Domino user specified when Lotus Notes/Domino was installed. Do not run this command as root.

Manual Backups from NetWorker User for Lotus

The following sections describe how to back up Lotus Notes/Domino database files.

How to Back Up Database Files

To perform a manual backup of database files from the NetWorker User for Lotus program:

1. In the NetWorker User for Lotus window, click Backup.

   To view a list of files available for backup, open a folder in the left pane. A file listing of the selected folder will appear in the right pane.

2. Select the database files to back up, and then click Mark.

   To unmark an item, select the item and click Unmark.

3. Optional: Select what backup options to use. The options are described in "NetWorker User for Lotus Backup Options" on page 32.

4. Click the Start button to begin the backup.

NetWorker User for Lotus Backup Options

Two backup options, data compression and data encryption, are available when using the NetWorker User for Lotus program. Their usage is detailed in the remainder of this section.

How to Select Data Compression

NetWorker client systems can compress data during backup before the data is moved over the network or written to tape. Compressing data may significantly increase the speed of the backup process.

To enable data compression during backup:

1. From the Options menu, select Backup Options.
2. In the Backup Options dialog box, select Compress.
3. Select OK.

How to Select Data Encryption

Encryption functions in a similar way as password protection. The encryption option encrypts data in such a way that data cannot be recovered without the password, even for administrators with full network access.

To enable data encryption during backup:

1. From the Options menu, select Backup Options.
2. In the Backup Options dialog box, select Encryption.
3. Select OK.

Connecting to a Different NetWorker Server

To connect to a different server with the NetWorker User for Lotus, enter the following command at the command prompt:

nwbml -s *server_name*

Where *server_name* is the name of the NetWorker server to which the files will be backed up.

If the server you have requested cannot be accessed, the following message appears:

```
Unable to connect to server ‘server_name’. Do you want to
connect to another server?
```

Select Yes to connect to the default NetWorker server or select No to return to the command prompt.

To permanently change which NetWorker server is used by the NetWorker User for Lotus, place the *-s server* option in the shortcut properties of the program icon.

Manual Backups from the Command Line

To perform a manual backup, enter the **nsrnotesv** command at the command line with the applicable options found in "Command-Line Backup Options" on page 34.

After this command is entered, the manual backup is performed.

How to Configure a Partitioned Domino Server for Backup

To configure a partitioned Domino server for backup from the command line:

1. Set the Path variable to the Domino data directory that you want to back up.
2. Set the NOTESPARTITION variable to the value found in the *nclient.bat* file (Windows) or *.sgf.notespartition.* file (UNIX), located in the Domino data directory from step 1.

Command-Line Backup Options

The backup command options may be applied to the **nsrnotesv** command at any DOS or UNIX command line shell. For a complete list of **nsrnotesv** options, see "Appendix A: Commands and Command Options" on page 51.

Selecting Databases for Backup

To back up specific Notes database files, specify the filenames and filepath in the **nsrnotesv** command. For example:

```
nsrnotesv -s server c:\Lotus\Domino\Data\accounting.nsf
nsrnotesv -s server /lotusdata/accounting.nsf
```

Using the *-s server* option to specify the NetWorker server speeds up the backup process.

Important: To back up database files whose filenames contain spaces, place double quotes around each filepath:

```
nsrnotesv "c:\Lotus\Domnio\Data\accounting 1998.nsf"
```

Wildcards

Use wildcards to specify which databases to back up.

```
nsrnotesv -s server c:\Lotus\Domino\data\*.nsf
nsrnotesv -s server /lotusdata/*.*
```

Backing Up Data that Traverses Mountpoints

To manually back up data that traverses mount points, use a wildcard as an argument in the **nsrnotesv** command. For example, to back up mounted filesystems under the */notes/data* directory, enter the backup command:

```
nsrnotesv -s server /notes/data/*
```


Exclude Lists

Use the **-E** option to specify an exclude list for the backup. This exclude list contains filenames to exclude or uses UNIX regular expressions to exclude certain file types.

```
nsrnotesv -E /tmp/excludelist -R
```

Comfort Span

Use the **-a** option to specify a comfort span in kilobytes. A comfort span determines whether the server will back up each database in full or perform an incremental backup of the database.

```
nsrnotesv -I -a comfort_span -R
```

Parallelism

Use the **-P** option to specify the parallelism level of a client. The client parallelism level controls the number of concurrent save streams that a client can send to a server. The **-P** option overrides the parallelism level set in the client resource.

```
nsrnotesv -P parallelism_level -R
```

Backing Up NetWorker Indexes for Disaster Recovery

When a manual backup of Lotus Notes/Domino databases are performed, the NetWorker client indexes and the NetWorker server's bootstrap are not backed up. If a scheduled backup is never performed, the client file indexes and bootstrap need to be backed up manually.

You can invoke a manual backup of the client file indexes and bootstrap with the **savegrp** command from the NetWorker server:

```
% savegrp -O -P printer_name -c client_name
```

For more information on the **savegrp** command, refer to the online help.

The client indexes and the server's bootstrap file are vital for recovering data to Lotus Notes/Domino database systems in the event of a disaster. For additional information on disaster recovery, see "Chapter 5: Lotus Notes/Domino Disaster Recovery" on page 49 or refer to the *Legato NetWorker Disaster Recovery Guide*.

Performing regular, scheduled backups of the NetWorker server provides maximum protection for critical data.

Chapter 4: Recovering Data

This chapter describes how to use the NetWorker Module for Lotus software to perform a recovery of Notes data. It includes the following topics:

- "NetWorker Module Recovery Programs" on page 37
- "Recovery from the NetWorker User for Lotus" on page 38
- "Recovery from the Command Line" on page 42
- "Document Level Recovery" on page 46

NetWorker Module Recovery Programs

You can recover Notes databases by using either of the following programs:

- **nwbml.exe -** NetWorker User for Lotus on Windows

  For recovery instructions, see "Recovery from the NetWorker User for Lotus" on page 38.
- **nsrnotesrc** command-line program on AIX, Linux, Solaris, and Windows

  For recovery instructions, see "Recovery from the Command Line" on page 42.

Important: The **nsrnotesrc** command must be run as the Domino user specified when Lotus Notes/Domino was installed. Do not run this command as root.

Recovery from the NetWorker User for Lotus

The following sections describe how to recover Notes database files.

How to Recover Notes Database Files

To perform a recovery using the NetWorker User for Lotus program:

1. Ensure that the NetWorker server services are running.
2. From the NetWorker User for Lotus window, click Recover to open the Recover window.

   To view a list of files available for recovery, open a folder in the left pane. A file listing of the selected folder will appear in the right pane.
3. Select the files to recover, and then click Mark.
4. Optional: Select what recover options to use. The options are described in "NetWorker User for Lotus Recovery Options" on page 39.
5. Click Start to begin the recovery process.

How to Recover Logged Database Files

Recovery in place of logged databases is not supported on a Domino server. To recover a logged database on a Domino server, either delete the database before recovery or:

1. Recover the logged database to a temporary directory and zap the DBIID during recovery.
2. Delete the old database from the Domino server.
3. Copy the recovered database from the temporary directory to the location of the old database.

How to Recover UNIX Databases from Windows

To use the NetWorker User for Lotus to browse and recover databases from UNIX Domino servers:

1. Start the NetWorker administrator program.
2. Customize the *nsrnml_remrecov* script on the UNIX computer you are recovering from.

3. In the Remote Access list of the Client Setup for the computer you are recovering from, enter a local username and the hostname of the Windows computer from which you will run NetWorker User for Lotus.

   username@hostname

4. Perform a directed recover of the database files. For instructions, see "How to Perform a Directed Recover" on page 39.

NetWorker User for Lotus Recovery Options

The NetWorker User for Lotus offers several recovery options. These options are described in the remainder of this section.

- "How to Perform a Directed Recover" on page 39
- "How to Change the Browse Time" on page 39
- "How to View the Database Versions to Recover" on page 40
- "How to Determine the Required Volumes for Recovery" on page 40
- "How to Relocate Recovered Data" on page 41
- "How to Zap Database and Replica IDs" on page 41
- "How to Recover Data Without Applying Transaction Logs" on page 42

How to Perform a Directed Recover

To recover a database file from a different client than where the file originated:

1. From the Operation menu, select Directed Recover.
2. In the Source Client dialog box, select the client to recover from.
3. In the Destination Client dialog box, select the client to recover to.
4. Select the files to recover, and then click Mark.

   If you are recovering logged database files, zap the database ID of the recovered files. For instructions, see "How to Zap Database and Replica IDs" on page 41

5. Click Start to begin the recovery process.

How to Change the Browse Time

From the Recover window, you can browse the entries for each backed-up file listed in the client file index from any time in the past. The Change Browse Time option in the View menu allows you to view the entries for your backed-up files from a specific point in time.

To change the Browse Time:

1. From the View menu, select Change Browse Time to open the Change Browse Time dialog box.
2. Select a day from the calendar to enter a new date.
3. Select Previous Month or Next Month to change from the current month.
4. Enter a time to browse, where:
   - **Time** is based on a 12-hour clock.
   - **a** represents a.m.
   - **p** represents p.m.

The browse time cannot be earlier than the first time a backup occurred, because the file index would not have any entries. For details on the browse and retention policies assigned to a specific Notes/Domino database system, refer to the NetWorker administration program on the NetWorker server.

How to View the Database Versions to Recover

To view the versions of a directory or file:

1. Select the database file or directory to recover.
2. From the View menu, select Versions.

The Versions dialog box displays the backup history of the currently selected database. Versions are sorted according to backup time, with the most recent backup displayed at the top of the list.

How to Determine the Required Volumes for Recovery

To determine the volumes required for a recovery:

1. Mark the database file(s) to recover.
2. From the View menu, select Required Volumes.

The backup volumes required for the recovery appear in the Required Volumes dialog box.

How to Relocate Recovered Data

When you recover Notes data from the NetWorker server, NetWorker software copies the data from the volume to a location on your system. Unless you relocate the recovered data, NetWorker software will attempt to place the data back in the original directory.

To designate a different directory:

1. From the Options menu, select Recover Options.
2. Make sure that the directory where you want to recover the files already exists, because the NetWorker Module software will not create the directory for you.
3. In the Relocate recovered data to field, enter the path where the files are to be recovered to.
4. Select OK.

If an existing data file has the same name as the one being recovered, NetWorker software will prompt you on how to recover the data file (rename, overwrite, or discard).

How to Zap Database and Replica IDs

To zap a database id (DBIID) for a recovered database:

1. From the Options menu, select Recover Options.
2. Check the Zap Database ID check box.
3. Select OK.

To zap both the database id and replica id for a recovered database:

1. From the Options menu, select Recover Options.
2. Check the Zap Database and Replica ID check box.
3. Select OK.

Important: After you the zap the DBIID of a recovered database file, you must perform a full backup of the database file. You will be unable to recover the database file until the full backup is performed.

How to Recover Data Without Applying Transaction Logs

To recover a database without applying transaction logs:

1. From the Options menu, select Recover Options.
2. Check the Do Not Apply Transaction Logs check box.
3. Select OK.

Connecting to a Different NetWorker Server

To connect to a different server with the NetWorker User for Lotus, enter the following command:

nwbml -s *server_name*

Where *server_name* is the name of the NetWorker server to recover files from.

If the server you have requested cannot be accessed, the following message appears:

```
Unable to connect to server 'server_name'. Do you want to
connect to another server?
```

Select Yes to connect to the default NetWorker server or select No to return to the command prompt.

To permanently change which NetWorker server is used by the NetWorker User for Lotus, place the *-s server* option in the shortcut properties of the program icon.

Recovery from the Command Line

The Notes/Domino server or client can remain up if you are recovering to a new directory, or the database you are recovering does not exist on the client.

Important: Notes databases are user-ID dependent. If you back up a file as superuser, you will only be able to recover it as superuser.

How to Recover from the Command Line

To perform a recovery using the **nsrnotesrc** command:

1. Ensure that the NetWorker server services are running. For instructions, refer to the *Legato NetWorker Administrator's Guide.*
2. From the command line, enter the **nsrnotesrc** command with applicable options found in "Command Line Recovery Options" on page 43.

   The **nsrnotesrc** command must be executed by the Lotus user (the user name specified while installing Lotus/Domino.) Recovery must not be performed by root.

Important: When you recover database files on Windows, you must be case-specific when you specify the filepath.

Command Line Recovery Options

The following command options may be applied to the **nsrnotesrc** command at any DOS or UNIX command line shell. For detailed information on the **nsrnotesrc** command options, see "Appendix A: Commands and Command Options" on page 51.

- "Selecting Databases to Recover" on page 43
- "Selecting the Database Version to Recover" on page 44
- "Recovering a Full Backup without Applying Incremental Logs" on page 45
- "Recovering All Notes Data" on page 45
- "Recovering All Notes Data in a Directory" on page 45

Selecting Databases to Recover

To select database files to recover, specify the NetWorker server to recover from and the filepath of each database file in the **nsrnotesrc** command.

nsrnotesrc -s *server* **-c** *client file_path*

To recover the database file *c:\Lotus\Domino\Data\account.nsf*, enter the command:

nsrnotesrc -s *server* **c:\Lotus\Domino\Data\account.nsf**

To recover the database file */lotusdata/account.nsf*, enter the command:

nsrnotesrc -s *server* **/lotusdata/account.nsf**

Important: To recover database files that have filenames with spaces, place double quotes around each filepath:

nsrnotesrc -s mars "c:\Lotus\account 1998.nsf"

Selecting a Directory to Recover

To select a directory containing database files to recover, specify the directory in the **nsrnotesrc** command.

nsrnotesrc -s *server* **-c** *client directory_path*

To recover the most recent backup of database files in the directory *c:\Lotus\Domino\Data*, enter the command:

nsrnotesrc -s *server* **-c** *client* **c:\Lotus\Domino\Data**

To recover the most recent backup of database files in the directory */space/notesdata/mail*, enter the command:

nsrnotesrc -s *server* **-c** *client* **/space/notesdata/mail**

Note: To recover directories that have path names with spaces, place double quotes around each directory path: **nsrnotesrc -s mars "c:\Lotus Notes\Data"**

Selecting the Database Version to Recover

To recover a database file from an earlier time, add the **-t** *time* option, in **nsr_getdate** format, to the **nsrnotesrc** command. The **-t** *time* option must be specified before the database filename**:**

nsrnotesrc -s *server* **-t** *time* **c:\Lotus\Domino\Data\account.nsf**

nsrnotesrc -s *server* **-t** *time* **/lotusdata/account.nsf**

The browse time cannot be earlier than the first time a backup occurred, because the file index would not have any entries. For details on the browse and retention policies assigned to a Notes/Domino client or server, refer to the NetWorker administration program on the NetWorker server.

Recovering a Full Backup without Applying Incremental Logs

To recover a full backup of a database file, without having the incremental logs applied, specify the **-X** option in the **nsrnotesrc** command. If you are recovering a point-in-time full backup of a database using the **-t** option and do not use the **-X** option, you may receive the error message:

```
Recovery Manager: Backup was later than recovery point in
time.
```

To avoid this error message, use the **-X** option in this scenario.

Recovering All Notes Data

To recover all Notes database files associated with a client, use the NOTES option in conjunction with the **-t** *time* option, where *time* indicates when a full backup performed on that client.

nsrnotesrc -s *server* **-t** *time* **NOTES**

Note: Using the NOTES option without the **-t** *time* option recovers data from the most recent backup.

Recovering All Notes Data in a Directory

To recover all Notes database files within a directory, use the NOTES option in conjunction with a directory path.

nsrnotesrc -s *server* **-c** *client* **NOTES:***directory_path*

To recover all database files within the path */space/notesdata/mail*, enter the command:

nsrnotesrc -s *server* **-c** *client* **NOTES:/space/notesdata/mail**

To recover all database files within the path *D:\Lotus\Domino\Data*, enter the command:

nsrnotesrc -s *server* **-c** *client* **NOTES:\D:\Lotus\Domino\Data**

Directed Recovery from the Command Line

The following sections describe how to perform a directed recovery from the command line. If you are recovering logged database files, add the -Z option to zap the database ID of the recovered files.

Altering Path Where Recovered Files Are Placed

The destination for recovered files, by default, is the filepath where the file originated on the client. To designate a different path, add the **-d** option followed by the file's destination path in the recover command, **nsrnotesrc**:

nsrnotesrc -s *server* **-d h:\recover c:\Lotus\Domino\Data\account.nsf**

nsrnotesrc -s *server* **-d /recover /lotusdata/account.nsf**

How to Recover Files from a Different Client

To recover a database file to a different client than where the files originated:

1. Ensure that the client has the same organization name, site name, domain name, and configuration as the original client.
2. Add the **-c** option to the recover command, **nsrnotesrc,** and specify the hostname of the system where the files originated:

   nsrnotesrc -s *server* **-c** *client* **c:\Lotus\Domino\Data\account.nsf**

   nsrnotesrc -s *server* **-c** *client* **/lotusdata/account.nsf**

Document Level Recovery

Document level recovery allows a user to recover individual Notes documents. However, it cannot recover design documents.In previous releases, recovering individual documents required recovering the full database and manually copying the needed documents. This section includes the following topics:

- "How to Perform Document Level Recovery from the Lotus Notes Client" on page 46
- "Performing Document Level Recovery from the Command-Line" on page 47

How to Perform Document Level Recovery from the Lotus Notes Client

To perform document level recovery from within the Lotus Notes client, you must be running a Windows version of the Lotus Notes client. In addition, the document level recovery feature must be added to the Lotus Notes client. For instructions on adding the document level recovery feature, refer to the *Legato NetWorker Module for Lotus Installation Guide.*

Document level recovery from the Lotus Notes client can be used to recover modified or deleted documents. The process for recovering modified documents is similar to the process for recovering deleted documents. The only difference is that when you recover modified documents, you can select which documents to recover.

To perform a document level recovery:

1. Ensure that the NetWorker server services are running.
2. Start the Lotus Notes client.
3. Open a database that contains documents you want to recover.
4. Select the documents that you want to overwrite with previous versions. (Skip this step if you are recovering deleted files.)
5. From the Actions menu, choose either NML-Restore Selected Files or NML-Restore Deleted Files. (NML is an abbreviation for the NetWorker Module for Lotus software.)
6. Complete the fields in the Lotus Notes dialog box:
   a. Enter a temporary directory or use the default directory.
   b. Enter a NetWorker server name.
   c. Enter the number of days that have passed in which you want the backup to display.

      Entering 5 would display backups from the past five days.
   d. Click Refresh to display a list of backups.
   e. Select a backup from the list.
7. Click Restore to start the recovery process.
8. When the recovery is complete, click (F9) to refresh the Lotus Notes screen and to display your recovered files.

Performing Document Level Recovery from the Command-Line

The command-line version of document level recovery can only recover deleted documents. However, recovering deleted documents from one large database to another large database can take considerable time.

Important: The **nsrdocrc** command must be run as the Domino user specified when Lotus Notes/Domino was installed. Do not run this command as root.

To recover deleted documents from a database file, enter the command:

nsrdocrc -s *server* **-p** *database* **-t** *time*

- Use **-s** to specify the name of the NetWorker server to recover from.
- Use **-p** to specify the full pathname of the database file that has deleted documents to recover.
- Use **-t** to specify the save time, in **nsr_getdate** format, of the database file that has documents to recover.

  For logged databases, the **-t** option must specify the save time of the directory that contains the database file, instead of the database file itself.

  Note: If you do not specify the **-t** option and transaction logging is enabled, the **nsrdocrc** command will not recover any deleted documents, only existing documents.

Example: Recovering Deleted Documents from a Logged Database

To recover deleted documents in the *F:\Lotus\Domino\Data\account.nsf* database file backed up on March 13 from the client *saturn* to the server *mars*:

1. Run **nsrinfo** to get the save time of the directory that contains *account.nsf*:

   ```
   nsrinfo -s mars -n notes saturn | grep "Mar 13"
   NOTES:/F:/Lotus/Domino/Data/, date=984492446 Tue Mar 13
   08:07:26 2001
   ...
   NOTES:/F:/Lotus/Domino/Data/account.nsf, date=984492440
   Tue Mar 13 08:07:20 2001
   ```

2. Run **nsrdocrc** with the save time of the *F:\Lotus\Domino\Data* directory:

   ```
   nsrdocrc -s mars -p F:\Lotus\Domino\Data\account.nsf
   -t 984492446
   ```

For detailed information on the document level recovery command options, see "Appendix A: Commands and Command Options" on page 51.

Chapter 5: Lotus Notes/Domino Disaster Recovery

This chapter provides the basic instructions for disaster recovery in the event that the Notes server data, Notes server binaries, or the NetWorker Module for Lotus server binaries or Domino transaction logs are damaged or lost. It includes disaster recovery procedures for the following sections:

- "Domino Installation and Databases Are Lost" on page 49
- "Domino Installation, Databases, and Transaction Logs Are Lost" on page 50

For further information on using NetWorker software for disaster recovery, refer to the *Legato NetWorker Disaster Recovery Guide* and the Lotus Notes/Domino server documentation.

Domino Installation and Databases Are Lost

To recover a computer that has lost the Domino installation and databases:

1. Reinstall the Domino server at the same location as before, but do not configure it.
2. Recover the *notes.ini* file with the **-N** option.

   `nsrnotesrc -s` *server* **`-N /`***path***`/notes.ini`**
3. Recover all the databases using the **NOTES** option. Recover the databases to an alternate location using the **-d** option.
4. After the databases are recovered, copy them to the Domino data directory.
5. Start the Domino server.

Domino Installation, Databases, and Transaction Logs Are Lost

In the event of the loss of the active transaction log files, it is possible to recover database backups to the last committed transaction in the archived transaction logs. The following components must be available to achieve this:

- An up-to-date *notes.ini* file from the affected Domino server which has transactional logging enabled
- A set of recoverable database backup files
- The archived log extents

To recover a computer that has lost the Domino installation, databases, and transaction logs:

1. Reinstall the Domino server at the same location as before, but do not configure it.
2. Recover the *notes.ini* file with the **-N** option and place it in its original location:

   nsrnotesrc -s *server* **-N /***path***/notes.ini**
3. Prepare the log directory by making sure that the *logdir*, as it is defined in the *notes.ini* file, exists and that no old files are in the directory.
4. Recover the archived log extents into *logdir*:

   nsrnotesrc -s *server* **-N –l** *number_of_logs*

   Recovery of just the last archived extent will suffice but it is preferable to recover all the archived extents since the last full backup.
5. Allow the creation of the control file by setting the following parameter in the *notes.ini* file:

   ```
   TRANSLOG_Recreate_Logctrl=1
   ```
6. Prepare the data directory by first recovering all of the required database files into a temporary directory.

   nsrnotesrc -s *server* **-c** *client* **-d** *destination_path* **NOTES**
7. Overwrite the new data directory from the new Domino installation with the contents of this temporary directory.
8. Launch the Domino server.
9. When the disaster recovery process completes, perform a backup of the Domino server to avoid any future loss of data.

Appendix A: Commands and Command Options

This appendix provides syntax, notation, and related information for NetWorker Module for Lotus commands and command options. The NetWorker Module commands described in this appendix are for both Windows and UNIX.

NetWorker Module commands perform the following functions:

- **nsrnotesv** - Backs up the specified database objects.
- **nrsnotesrc** - Recovers the specified database objects.
- **nsrdocrc** - Recovers individual documents from a specified database.

Conventions

The conventions presented in the command line are as follows:

- The command option not residing in brackets must always be present in the command.
- The command option in square "[]" brackets is optional.
- For the command options in curly "{}" brackets, one of the items must exist in the command.

nsrnotesv

The **nsrnotesv** command is the NetWorker Module for Lotus command line backup utility. The command options may be applied to the **nsrnotesv** command at any DOS or UNIX command-line shell.

Following is the syntax for the **nsrnotesv** command:

nsrnotesv [**-CIZ**] [**-s** *server*] [**-a** *comfort_span*] [**-b** *pool*] [**-c** *client*] [**-d** *temporary_directory*] [**-D** *debug_level*] [**-E** *exclude_file*] [**-g** *group*] [**-P** *parallelism_level*] {**-R**|**-S**|**-T**| *filename* [*filename* [**...**]]}

C Sets data compression.

I Specifies an incremental manual backup.

Z Sets data encryption.

s Specifies the NetWorker server to back up to. If the server is not specified, the NetWorker Module software will back up to the default NetWorker server.

a Specifies a comfort span in kilobytes for an incremental backup.

b Specifies the destination pool for the save sets.

c Specifies a client name to be used for client indexing.

d Specifies a temporary directory other than the default for open file handling.

D Sets the debug level, 1-9 where 9 is the highest.

E Specifies the full path to a file containing a list of filenames or regular expressions to be excluded.

g Specifies the save group. Use this option to specify the pool to which save sets from the specified group should be written.

P Specifies the parallelism level of the client. The client parallelism level controls the number of concurrent save streams that a client can send to a server.

R Backs up Notes database files that reside in the default Notes directory, typically *c:\Lotus\Domino* or */notes.*

S Backs up Notes database files that reside outside the default Notes directory.

T Backs up Notes database files that reside inside or outside the default Notes directory.

nsrnotesrc

The **nsrnotesrc** command is the NetWorker Module for Lotus command-line recover utility. The command options may be applied to the **nsrnotesrc** command at any DOS or UNIX command-line shell.

Following is the syntax for the **nsrnotesrc** command:

nsrnotesrc [**-qNXZ**] [**-s** *server*] [**-c** *client*] [**-d** *destination_pathname*] [**-D** *debug_level*] [**-t** *time*] [**-T** *temporary_directory*] {**NOTES** | *filename* [*filename*[**...**]]}

nsrnotesrc [**-N**] [**-s** *server*] [**-l** *number_of_logs*] [**-d** *destination_pathname*] [**-c** *client*] [**-D** *debug_level*] [**-t** *time*]

q Sets verbosity to zero.

X Does not apply the transaction logs to the recovered file.

Z Assigns a new DBIID to the database being recovered. The -ZZ option assigns a new DBIID and new ReplicaID to the database being recovered.

N Skips initialization of Notes API during disaster recovery.

s Specifies the name of the NetWorker server to recover files from.

c Specifies the name of the client where the files originated.

d Specifies the destination path for recovered files.

D Sets the debug level, 1-9 where 9 is the highest.

t Specifies the time, in **nsr_getdate** format, from which database files should be recovered. When you specify a time, the **-t** option must precede the files to be recovered, or the recovery will fail.

T Specifies the temporary directory to be used.

l Specifies the number of transaction logs to be recovered. This option is used only during disaster recovery.

NOTES Specifies a recovery of all Notes data associated with a client. Specifying the **NOTES** option without the-t *time* option, only recovers the last directory or database backed up.

NotesName

Specifies the full pathname of the Notes database to recover.

NOTES:/*path***/**

Specifies the Notes directory to recover.

A

nsrdocrc

The **nsrdocrc** command is the NetWorker Module for Lotus command-line document level recovery utility. The command options may be applied to the **nsrdocrc** command at any DOS or UNIX command-line shell.

Following is the syntax for the **nsrdocrc** command:

nsrdocrc [**-c** *client*] [**-D** *debug_level*] **-p** *database* [**-s** *server*] **-t** *time* [**-T** *temporary_directory*]

c Specifies the name of the client to recover to.

D Sets the debug level, 1-9 where 9 is the highest.

s Specifies the name of the NetWorker server to recover from.

p Specifies the full pathname of the database whose deleted documents need to be recovered.

t Specifies the time, in **nsr_getdate** format, of the database file that contains documents to recover.

T Specifies a temporary directory to recover to. The default directory is */nsr/tmp*.

Appendix B: Troubleshooting

The first half of this appendix contains troubleshooting tips that can help you configure and use NetWorker Module for Lotus software. The second half of this appendix contains information on message logs that can help in troubleshooting problems.

This chapter includes the following topics:

- "Displaying NetWorker Module for Lotus Versions" on page 56
- "Backing Up a Large Number of Database Files" on page 56
- "Backing Up Linked Database Files" on page 57
- "Incomplete Backups in NetWorker User for Lotus" on page 57
- "Multiple Arguments in Backup Script" on page 58
- "Specifying Filenames with Spaces" on page 58
- "Specifying a Group Name with Spaces in nsrnote.bat" on page 58
- "Invalid Time Specified Error" on page 58
- "Norton AntiVirus for Lotus Notes" on page 59
- "Message Logs" on page 60

Displaying NetWorker Module for Lotus Versions

The following sections describe how to display version information for NetWorker Module for Lotus binaries.

How to Display Version Information on Windows NT

To display version information for the NetWorker Module for Lotus on Windows NT:

1. Open Windows NT Explorer and locate a NetWorker Module for Lotus binary.
2. Right-click the file and select Properties.
3. Select the Version tab to display the version information.

How to Display Version Information on UNIX

To display version information for the NetWorker Module for Lotus on UNIX, use the **what** command.

```
# what nsrnotesv

Module Name: Networker Module for Lotus
Module Version: <Module version>
Product: NetWorker
Release: <NetWorker version>
Build number: <build number>
Build date: <build date>
Build arch.: <build architecture>
Build info: <build info>
```

Troubleshooting the NetWorker Module for Lotus

The following section discusses troubleshooting tips for issues regarding NetWorker Module for Lotus software.

Backing Up a Large Number of Database Files

The NetWorker Module for Lotus software may crash when it tries to back up a large number of databases files (500 or more files).

To allow the NetWorker Module software to back up a large number of database files, configure the maximum shared memory to be at least 100 MB. The amount of memory needed will depend on what applications are running on the computer.

Reboot the computer after making these changes.

Example: Increasing Shared Memory Segments

On a Solaris computer, add the following lines to the */etc/system* file to increase shared memory segments. The following lines set the maximum size of the shared memory identifier to 100 MB, with 100 possible shared memory identifiers.

```
set shmsys:shminfo_shmmax=104857600
set shmsys:shminfo_shmmin=1
set shmsys:shminfo_shmmni=100
set shmsys:shminfo_shmseg=10
```

For additional instructions on configuring shared memory, refer to the computer's operating system documentation.

Backing Up Linked Database Files

The NetWorker Module for Lotus software can not back up linked database files or directories. This is because the **nsrnotesv** program skips database files and directory links.

To back up linked database files or directories, specify the full path to the database files that are linked.

Incomplete Backups in NetWorker User for Lotus

A problem occurs if a backup is performed from the NetWorker User for Lotus, but the Lotus Notes/Domino binaries are not in the search path. The backup will fail, but no error message is generated. Instead, the NetWorker User for Lotus shows that the backup was successful.

To avoid this problem, make sure that the Lotus Notes/Domino binaries are in the search path.

Multiple Arguments in Backup Script

This problem affects the UNIX version of the NetWorker Module for Lotus software. If multiple arguments are used in the **nsrnotes** script, the script fails because UNIX cannot parse the spaces between the arguments.

To allow multiple arguments in the **nsrnotes** script, place single or double quotes around the arguments in the myArgs= statement.

```
# Here are my backup options:
myArgs='-C -R'
```

Specifying Filenames with Spaces

To back up or recover database files whose filenames contain spaces, place double quotes around each filepath.

nsrnotesv "c:\notes\ accounting 1998.nsf"

nsrnotesrc -s *server_name* **"c:\notes\ accounting 1998.nsf"**

Specifying a Group Name with Spaces in nsrnote.bat

Specifying the **-g group_name** option with a group whose name contains spaces will cause the save set to fail.

myArgs=**-g** *group name* **-R**

To work around this problem:

1. Find the following line in the *nsrnote.bat* file:

   IF "%1"== "" GOTO Backup

2. Replace the double quotes in this line with single quotes.

   IF '%1' == '' GOTO Backup

Modifying the above line will allow the save set to be successful.

Invalid Time Specified Error

When recovering files using the European date format (dd/mm/yy), an "Invalid Time Specified" error appears.

The **nsrnotesrc** command is unable to interpret European date formats. When restoring files using the **nsrnotesrc -t** command, the date specified for the **-t** option must be in US/Canada format (mm/dd/yy).

For example, to recover files from a save set that is date- and time-stamped 08/26/98 15:08:34, enter the following command:

nsrnotesrc -s *spain* **-t "***08/26/98 15:08:34***"** */notes/names.nsf*

nsrnotesrc -s *spain* **-t "***08/26/98 15:08:34***"** *c:\notes\data\names.nsf*

Norton AntiVirus for Lotus Notes

The NetWorker Module for Lotus software fails to back up databases if Norton AntiVirus 2.0 for Lotus Notes is running on a Notes/Domino server. To fix this problem, the *Exclusive Directories* option must be activated in Norton AntiVirus. Activating this option allows the NetWorker Module software to back up a Notes/Domino server while Norton AntiVirus is running.

To activate the *Exclusive Directories* option:

1. Start the Domino Administrator program.
2. Choose to list all the files for the Domino Server.
3. In the list, find the *nav.ntf* file and double-click it to open it.
4. Select the Auto-Protect option.
5. Click the Global Options button.
6. In the Databases And Directories To Exclude From Scans field, enter the temporary directory used by NetWorker Module software. The default directory is *c:\Program Files\nsr\tmp*. If the **-d** option is used in the myArgs line of the *nsrnote.bat* file, the temporary directory is the one specified by the **-d** option.
7. Click Save and click Close.
8. Uncheck the box for Document Writes and click Save.
9. Check the box for Document Writes.
10. Click Save and click Close to exit the Norton AntiVirus for Lotus Notes configuration.

Message Logs

Collecting the following message logs can be help troubleshoot problems.

- "NetWorker Log Files" on page 60
- "Lotus Notes/Domino Log Files" on page 60
- "NetWorker Module for Lotus Backup Report" on page 61

NetWorker Log Files

The following log files are created by NetWorker Module for Lotus and NetWorker software:

- *notes_<systemname>.cat*—For further details, see "NetWorker Module for Lotus Backup Report" on page 61.
- *xbsa.messages*—For further details, see "XBSA Error Messages" on page 73.
- *nsrnote(.bat)*—For further details, see "Customizing the Backup Script" on page 22.
- *daemon.log*—For further details, see "NetWorker Messages" on page 67.
- *messages*—For further details, see "NetWorker Messages" on page 67.
- *nsr.res*
- *savegroup.log* (Windows NT)

Lotus Notes/Domino Log Files

Several log files are available from the Lotus Notes/Domino workstation. To access these log files:

1. Start the Lotus Notes workstation.
2. From the File menu, select Database, and then select Open.
3. Open the Notes Log database.
4. From this database you can select various log files. Two common log files to select are Miscellaneous Events and Database>Size.
5. To export a log file to a text file, select the desired log file and choose Export from the File menu.

NetWorker Module for Lotus Backup Report

When a backup session is completed and the debug level is set to 3 or higher, the NetWorker Module for Lotus software creates a backup session report on each Notes/Domino server or client where the NetWorker Module for Lotus software resides. This backup report is typically created in the *%SystemDrive%\win32app\nsr\tmp* for Windows or */nsr/tmp* directory on UNIX and can be viewed in any text editor. The syntax for the backup report's catalog filename is as follows:

`notes_`*systemname*`.cat`

Note: The catalog file resulting from a backup session will be overwritten when the following backup session is completed. You will need to create an index and a catalog file for storage if you want to maintain these reports for a longer period of time.

The backup session report consists of two sections.

- The first section, indicated by the header Backup Handle, shows the client's backup options as indicated in the backup script.
- The second section of the report, indicated by the header Save set, contains details on each save stream that was backed up from the Notes/Domino server or client to the NetWorker server. The number of streams within the report depends on the parallelism attribute setting indicated in the Server resource on the NetWorker server.

For information on changing the parallelism setting, refer to the *Legato NetWorker Administrator's Guide*.

The first section of the backup session report has the following attributes:

Table 1. Backup Handle (Part 1 of 2)

Attribute	Meaning
Server	Indicates the NetWorker server to which the Notes database files were backed up.
Client	Indicates the Notes/Domino server or client associated with this report.
Saveset	Indicates the save set label.

Table 1. Backup Handle (Part 2 of 2)

Attribute	Meaning
Status	Indicates whether the overall backup of the Notes/Domino server or client was successful or not. A value of zero (0) indicates that the backup was successful. A nonzero value indicates the backup failed. The numeric value is an associated error that occurred during backup. Descriptions of the error numbers can be found in Table 3 on page 65.
EndTime	Specifies the time that the backup on the Notes/Domino server or client was completed, in **nsr_getdate(3)** format.
Group	Specifies the group being used by the Notes/Domino server or client for backups. If this attribute is blank, it indicates that the default NetWorker group is being used.
Compression	Indicates whether compression was used during the backup, where 0 indicates no compression and 1 indicates compression.
Encryption	Indicates whether encryption was used during the backup, where 0 indicates no encryption and 1 indicates encryption.

The second section of the backup session report gives the following details on each save stream within a Notes/Domino server or client backup session:

Table 2. Save Stream Report (Part 1 of 2)

Attribute	Meaning
Saveset	Specifies the label given to the save stream by NetWorker Module for Lotus software, typically: `notes_`*`systemname`*`_save_stream#`
StartTime	Specifies the time the backup began on the specific save stream in nsr_getdate(3) format.
Bytes	Specifies the total size of the save stream in bytes. If the total size is zero, the NetWorker Module for Lotus software will not back up the save stream.
NumTry	Specifies the number of attempts made to back up the save stream.
NumFiles	Specifies the total number of files contained within the save stream.

Table 2. Save Stream Report (Part 2 of 2)

Attribute	Meaning
Item	Specifies a file or directory contained within the specific save stream. When multiple files make up a save stream, the Item attribute will be indicated multiple times followed by its associated: StartTime, BackupTime, ModTime, Status, Bytes, and Level.
StartTime	Specifies the time the backup began on the specific item, in **nsr_getdate(3)** format.
BackupTime	Specifies the total amount of time it took to back up the item, in **nsr_getdate(3)** format.
ModTime	Specifies the last time the file or item was modified, in **nsr_getdate(3)** format.
Status	Indicates whether the backup of the item was successful or not. A value of zero (0) indicates that the backup was successful. If the value is not zero, then the backup on the save stream failed and the value indicates the error number. Descriptions of the error numbers can be found in Table 3 on page 65.
Bytes	Specifies the total number of bytes from the item that was backed up.
Level	Specifies the level of backup performed on the item, where 0 indicates a full backup and 1 indicates an incremental.

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Appendix C: Error Messages

This appendix lists error messages you may encounter while using NetWorker Module for Lotus software.

- Table 3, "NetWorker Module Error Messages," on page 65
- Table 4, "Error Messages Generated While Backing Up Data," on page 68
- Table 5, "Error Messages Generated While Recovering Data," on page 72
- Table 6, "XBSA Error Messages," on page 73

NetWorker Module Messages

Table 3 lists errors messages produced by the NetWorker Module for Lotus software.

Table 3. NetWorker Module Error Messages (Part 1 of 3)

Error Number	Description	Error Type
0	The backup was successfully completed.	system
1	The backup failed.	system
100	Not enough memory to complete the backup.	system
101	The set environment variable failed.	system
102	The secondary process failed.	system
103	The NetWorker server specified does not exist.	system
104	Process received an exceptional signal.	system

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Table 3. NetWorker Module Error Messages (Part 2 of 3)

Error Number	Description	Error Type
200	There are no files available for backup.	file
201	Unable to open file for backup.	file
202	Filename specified for backup does not exist.	file
203	The requested file is inconsistent.	file
204	Copying the Notes database file failed.	file
205	Not enough space to copy the Notes database file.	file
206	NetWorker Module for Lotus software will attempt to back up the file again.	file
207	File cannot be removed.	file
208	Creation of the file directory failed.	file
209	Not a valid filename.	file
210	The file is empty.	file
211	File was skipped during backup as there were no changes in the file.	file
212	The temporary directory specified does not exist.	file
213	The file has changed since the last backup.	file
214	The file has no read permissions.	file
300	Save set failed.	save set
301	Backup of the database file failed.	save set
302	Attempt to create an index entry failed.	save set
303	Attempt to create a directory failed.	save set
401	A single parallelism stream failed and the backup session has aborted.	parallelism
500	The shared memory location is invalid.	shared memory

Table 3. NetWorker Module Error Messages (Part 3 of 3)

Error Number	Description	Error Type
501	The creation of a shared memory location failed.	shared memory
502	The mapped memory location failed.	shared memory
503	The mapped memory location of the file failed.	shared memory
504	The mapped memory location of the files failed.	shared memory
600	Exceeded number of retries to perform backup of a file.	file handling
700	Default file failed.	file awareness
701	The file search failed.	file awareness
702	Backup of all files failed.	file awareness
800	Creation of the client file index on the server failed.	index

NetWorker Messages

NetWorker error messages are displayed in the NetWorker Administrator windows. The display lists the messages generated during the past 24 hours. The messages are also written to the default messages directory for NetWorker software, *%SystemDrive%\Program Files\nsr\logs* for Windows, */nsr/logs* for UNIX.

Backup Error Messages

Table 4 on page 68 lists the error messages generated during a backup session. NetWorker error messages appear in the format:

```
day hh:mm:ss service_or_program_name: message
```

C

Table 4. Error Messages Generated While Backing Up Data (Part 1 of 5)

Error Message	Description	Service
cannot lock flag file for client name: reason	The flag file signifying the end of the first part of index compression is already in use by another instance of the **nsrck** program or by the **nsrindexd** service.	nsrck
checking index for clientname	Files associated with the named client are being inspected.	nsrck
completed checking count clients	Displayed when some form of checking was performed successfully.	nsrck
compressing index for clientname	Displayed when the **-C** option has taken effect.	nsrck
cross-checking index for clientname	Displayed when the **-X** option is in effect.	nsrck
more space needed to compress clientname index, size required	The **nsrck** program is unable to find enough disk space to hold the temporary file *db.CMP*.	nsrck
rolling forward index compression for clientname	Index compression completed its first copy and the compression was rolled forward.	nsrck
Warning no valid savetimes - cross-check not performed for clientname	During a cross-check, no save sets were found for this client.	nsrck
lock on filename acquired	Follows the “waiting for lock” message.	nsrindexd
waiting for lock on filename	Indicates another program is accessing the same file required by the **nsrindexd** service.	nsrindexd
A copy of this process is already running!	Another copy of **nsrmmdbd** is currently running and has exclusive access to the media database.	nsrmmdbd
Cannot open lock file	Indicates an internal error.	nsrmmdbd

Table 4. Error Messages Generated While Backing Up Data (Part 2 of 5)

Error Message	Description	Service
media db is saving its data	The service is dumping its records to a temporary file while the database is being backed up.	nsrmmdbd
media db is recovering, this may take a while	The **nsrmmdbd** service is reloading its database.	nsrmmdbd
media db is cross checking the save sets	Printed each time the service is restarted.	nsrmmdbd
media dbb is open for business	Indicates the service is available.	nsrmmdbd
RPC error, details...Cannot open save session with 'server'	The **save** command is unable to back up data to the NetWorker server.	nsrnotesv savefs
save: client.xxx.com is not on client's access list	Occurs when the named client has more than one name.	nsrnotesv savefs
save: path length of n too long, directory not saved	Occurs if there is a directory tree that is very deep, or directory names are very long.	nsrnotesv savefs
/path/savefs: Command not found /path/save: Not found	The **save** or **savefs** command could not be found in the specified path.	nsrnotesv savefs
savefs: error starting save of filesystem	The **savefs** command has detected the failed save and has marked the save set as failed.	nsrnotesv savefs
save: unknown host name: server savefs: unknown host name: server	The host table on the specified client does not include the server's name.	nsrnotesv savefs
unknown host	The specified client is not listed in the host table on the server.	nsrnotesv savefs
Warning: client is not in the hosts table!	The client's hostname is not listed in the host table on the client.	nsrnotesv savefs

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Table 4. Error Messages Generated While Backing Up Data (Part 3 of 5)

Error Message	Description	Service
Warning - file 'path' changed during save	Generated when **save** notices that the file's modification time changed while the file was being backed up.	nsrnotesv savefs
save: path file size changed!	Generated when NetWorker software backs up the message log files.	nsrnotesv savefs
save: network error, server may be down	The backup of the named filesystem began, but the connection to the NetWorker server closed part way through.	nsrnotesv savefs
Aborted	The **savegrp** that was running was stopped.	savegrp
Access violation - unknown host: client	The client's hostname and IP address are not correctly listed in one or more of */etc/host*, NIS, or DNS on the server.	savegrp
asm: cannot open /path: I/O error	There may be bad blocks on the disk(s) containing the specified file or directory.	savegrp
asm: cannot stat /path: Stale NFS file handle asm: cannot stat /path: Missing file or filesystem	The **save** attempted to test the named directory to determine if it was a different filesystem then the one currently being saved. The filesystem was NFS-mounted, but the mount failed.	savegrp
asm: external ASM 'asm2' exited with code 1	The backup will attempt to continue and save other data.	savegrp
asm: missing hard links not found	The files were either created or removed while the backup was running.	savegrp
asm: /path was not successfully saved	The specified path within the current save set was not saved successfully.	savegrp
asm: xdr_op failed for /path	Either ASM unexpectedly exited due to a bad block on the disk or due to a bug, or the network connection to the NetWorker server was lost.	savegrp

Table 4. Error Messages Generated While Backing Up Data (Part 4 of 5)

Error Message	Description	Service
connect to address AA.BB.CC.DD: message Trying AA.BB.CC.DD	The connection to the client failed on the address specified.	savegrp
Connection refused	The client machine is not accepting any new network connections.	savegrp
Connection timed out	The client has crashed.	savegrp
group groupname aborted, savegrp is already running	Occurs when the named group has already started or restarted.	savegrp
has been inactive for n minutes since time. client: save set is being abandoned by savegrp	A backup of the specified save set started, but after *n* minutes of no activity, **savegrp** gave up on the save set.	savegrp
Host is unreachable	The NetWorker server is unable to make TCP/IP connections to the client.	savegrp
no cycles found in media db; doing full save	A message that is added to any save set that is saved at the level full instead of the level found in the client's schedule.	savegrp
No 'NSR client' resource for client clienthostname savefs: cannot retrieve client resources	The client's host name changed.	savegrp
no output	The save set was completed, but returned no status output.	savegrp
filesystem: No such file or directory	An explicit save set was named in the Client resource for the specified client, but that save set does not exist on the client.	savegrp
n retries attempted	The specified number of retries was performed before the backup of the save set succeeded or was finally marked as failed.	savegrp
printer: unknown printer /path savegrp: printing bootstrap information failed	**savegrp** was unable to print the bootstrap to the printer.	savegrp

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Table 4. Error Messages Generated While Backing Up Data (Part 5 of 5)

Error Message	Description	Service
reading log file failed	The specified save set was completed, but **savegrp** was unable to read the log file of the output status from the save set.	savegrp
savegrp: client rcmd (3) problem for command	The attempt to run the specified command failed on the specified save set.	savegrp
Saving server index because server is not in an active group	**savegrp** has noticed that the NetWorker server is not listed in any automatically started, enabled group.	savegrp
socket: All ports in use	The NetWorker server has run out of socket descriptions.	savegrp

Recovery Error Messages

Table 5 lists the error messages generated by NetWorker software during a recovery session.

Table 5. Error Messages Generated While Recovering Data

Error Message	Description
Browsing machine's on-line file index	States which NetWorker client's index is being browsed for interactive recovers.
Cannot open recover session with server	Indicates that some problem was encountered connecting the NetWorker server on the named system.
error, name is not on client list	Indicates that the client invoking the **recover** command is not in the server's client list.
Message from server: Other clones exist for failed save set	The **recover** command will be automatically resubmitted to the server, if any files remain to be recovered, because the request failed on a save set that had multiple clones.
Path name is within machine:export-point	The given pathname is mounted from a file server and the recovery will use the index for the named file server.
/path:Permission denied	The file cannot be recovered because it is not being accessed by root or by the group operator, and the user does not have read permissions for the file.

Table 5. Error Messages Generated While Recovering Data

Error Message	Description
Using server as server for client	Tells which NetWorker server was selected for the client's index.

XBSA Error Messages

During a backup or recovery, NetWorker software attempts to record messages generated by the NetWorker XBSA library to the file assigned to the NSR_DEBUG_FILE environment variable. For descriptions of the NetWorker variables and values, see "Appendix D: Environment Variables" on page 77.

If the assigned location is invalid or unreachable, the message is written to one of the following locations:

- The alternate messages directory created during installation, *%SystemDrive%\win32app\nsr\applogs* for Windows, */nsr/applogs* for UNIX
- The temporary directory

NetWorker XBSA error messages appear in the format:

```
function_name:BSA_RC_message_code:message
```

Table 6 lists the error messages produced by the NetWorker XBSA.

Table 6. XBSA Error Messages (Part 1 of 3)

Error Message	Description
BSA_RC_ABORT_ACTIVE_NOT_FOUND No active object matched the name that was specified for a BSAMarkObjectInactive	Indicates that no active object matching the given search parameters was found on the NetWorker server being used by the NetWorker Module session.
BSA_RC_ABORT_SYSTEM_ERROR System detected error due to explanation. Operation aborted	Indicates that a general system error has occurred within a NetWorker Module function call.
BSA_RC_APP_OBJECTOWNER_TOO_LONG The appObjectOwner field contained too many characters (n>=n)	Indicates that the appObjectOwner parameter contains too many characters and may be corrupt.

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Table 6. XBSA Error Messages (Part 2 of 3)

Error Message	Description
BSA_RC_AUTHENTICATION_ERROR There was an authentication failure for ObjectOwner ownername	Indicates that the routine failed to authenticate a BSAObjectOwner with the NetWorker server used by the NetWorker Module session.
BSA_RC_BAD_CALL_SEQUENCE The sequence of API calls is incorrect. Must call item1 before item2	Indicates that an API call sequence was made that does not conform to the NetWorker Module Data Movement API State Diagram document.
BSA_RC_BAD_HANDLE The handle used to associate this call with a previous BSAInit() call is invalid because explanation	Indicates that the value passed into the function for bsaHandle contained a NULL pointer.
BSA_RC_BAD_PARAMETER received parameter parm with value, which is invalid	Indicates that an invalid parameter was received.
BSA_RC_BSA_OBJECTOWNER_TOO_LONG The bsaObjectOwner parameter contains too many characters and may be corrupt	Indicates that the appObjectOwner parameter contains too many characters and may be corrupt.
BSA_RC_BUFFER_TOO_SMALL Buffer is too small to hold the object entry to be returned. n bytes required for the object entry	Indicates the buffer is too small to hold the object entry to be returned.
BSA_RC_COPYGPNAME_TOO_LONG The copyGpName Field contained too many characters (n>=n)	Indicates the copyGpName parameter contains more than BSA_MAX_COPYGNAME characters and the structure could not be used for the requested operation.
BSA_RC_DESCRIPTION_TOO_LONG The description field contained too many characters (n>=n)	Indicates the Description field in one of the supplied structures contained more than the BSA_MAX_DESC characters and the structure could not be used for the requested operation.
BSA_RC_INVALID_COPYTYPE The copyTypes parameter contained an unrecognized value of n	Indicates the copyType parameter contains a structure with values not contained within the NetWorker Module libraries.

Table 6. XBSA Error Messages (Part 3 of 3)

Error Message	Description
BSA_RC_INVALID_DATABLOCK The dataBlock parameter contained inconsistent values: bufferLength: n, bufferPtr:n, numBytes: n	Indicates that the fields of a supplied dataBlock parameter are not consistent.
BSA_RC_INVALID_KEYWORD an entry in the environment structure is invalid (variable=value)	Indicates that one of the environment strings passed into the function did not have a valid structure.

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Appendix D: Environment Variables

This appendix lists environment variables, their default values, and valid options. It includes the following topics:

- "NetWorker XBSA" on page 77
- "Adding NetWorker XBSA Variables to Backup Scripts" on page 77
- "Default Values and Valid Options" on page 78

NetWorker XBSA

NetWorker XBSA allows for configuration of environment options to activate NetWorker software features not directly supported by X/Open specifications. NetWorker XBSA enables NetWorker Module for Lotus software and NetWorker software to interact during backups and recoveries to:

- Ensure recovery of database files to their proper sequence in a database.
- Compile a history of files backed up for Lotus Notes/Domino databases.

Adding NetWorker XBSA Variables to Backup Scripts

To add a NetWorker XBSA variable to a backup script:

1. Copy the backup script to a new file and give it a new name. The new filename must begin with **nsr** or **save**. For details, see "Customizing the Backup Script" on page 22.
2. Add the NetWorker XBSA environment variable to the new backup script and assign a valid value to the variable.

   new_NSR_variable=*value*

3. Save the edited backup script.
4. From the NetWorker administration program, edit the NetWorker client resource configured for a Notes/Domino server or client and enter the filename of the customized backup script in the Backup command field. For details, see "Using NetWorker Backup Clients" on page 21.

D

Default Values and Valid Options

This section contains descriptions and valid settings for each of the NetWorker XBSA environment variables that can be added to a customized backup script. The environment variables listed in Table 7 appear in the NetWorker XBSA libraries included with the NetWorker Module for Lotus software.

Table 7. NetWorker Module Environment Variables (Part 1 of 3)

NetWorker Module Variable	Definition	Possible Values
NML_SKIPDBERRORS	Allows the NetWorker Module software to continue backing up database files after a noncritical error occurs.	Any value. If no value is given, this feature is turned off.
NSR_BACKUP_LEVEL	Indicates the NetWorker backup level to use for the backup session.	• **full** - full backup • **incr** - incremental backup • **skip** - skip backup
NSR_CLIENT	Indicates the NetWorker client resource to use for the backup session.	NetWorker software will use the name of the NetWorker client where the client software is installed.
NSR_COMPRESSION	Indicates whether to compress the data as it is being backed up.	• **FALSE**, no compression • **TRUE**, compression
NSR_DATA_VOLUME_POOL	Indicates the volume pool to which data files should be backed up.	Any valid NetWorker pool name.

Table 7. NetWorker Module Environment Variables (Part 2 of 3)

NetWorker Module Variable	Definition	Possible Values
NSR_DEBUG_FILE	Indicates the full pathname and filename where NetWorker XBSA messages should be written to.	Any valid pathname or filename.
NSR_DEBUG_LEVEL	Indicates the level of debugging that should be used during the NetWorker Module backup and recover sessions.	• **0**, no debugging information • **1**, only errors causing fatal system errors • **2**, all network related errors • **3**, messages concerning the operation taking place • **4**, all starting and ending of sessions • **5**, parameters for all entries and exits from NetWorker Module software • **6**, all entries and exits from internal NetWorker Module functions • **7**, all NetWorker Module internal errors • **8**, all NetWorker Module parameters
NSR_ENCRYPTION	Indicates whether encryption of the data to be backed up should take place.	• **NONE**, no encryption • **TRUE**, standard Legato encryption
NSR_ENCRYPTION_KEY	Indicates the key to use for the selected method of encryption.	Any string that conforms to the key values for the encryption method defined by NSR_ENCRYPTION.
NSR_GROUP	Indicates the group to use for a backup session.	Any valid NetWorker group name.
NSR_LOG_VOLUME_ POOL	Indicates the volume pool to which logical logs should be backed up.	Any valid NetWorker pool name.

Table 7. NetWorker Module Environment Variables (Part 3 of 3)

NetWorker Module Variable	Definition	Possible Values
NSR_NO_BUSY_ERRORS	Indicates whether the NetWorker Module for Lotus libraries will wait for a busy NetWorker server or fail immediately upon receiving a busy notification.	• **TRUE**, NetWorker Module software will wait for the selected server to become available. • **FALSE**, NetWorker Module software will fail immediately if the server is not ready for a request.
NSR_PROCESS_ENVIRON	Indicates whether the process that called the NetWorker Module library should be processed along with the explicit NetWorker Module environment variable.	• **TRUE** • **FALSE**
NSR_SAVESET_NAME	Indicates the save set name NetWorker Module software should use for a save session.	Any valid NetWorker save set name.
NSR_SERVER	Indicates the hostname of the server NetWorker Module software should use for a save session.	Variable that can be checked by using gethostbyname().

Glossary

This glossary contains terms and definitions found in this manual. Most of the terms are specific to the Legato NetWorker Module for Lotus software.

Administrators group	Windows NT user group whose members have all the rights and abilities of users in other groups, plus the ability to create and manage all the users and groups in the domain. Only members of the Administrators group can modify Windows NT OS files, maintain the built-in groups, and grant additional rights to groups.
autochanger	A mechanism that uses a robotic arm to move media among various components located in a device including slots, media drives, media access ports, and transports. Autochangers automate media loading and mounting functions during backups and recovers.
browse policy	The policy that determines how long entries for your files remain in the online file index.
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.
client	A computer that accesses the NetWorker server to back up or recover files. Clients may be workstations, PCs, or fileservers.
command line	The shell prompt, where you enter commands.

device	The backup device (tape drive, optical drive, or autochanger) connected to the NetWorker server; used for backing up and recovering client 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.
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.
group	A client or group of clients that starts backing up its files at a designated time.
heterogeneous networks	Networks with 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.
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	A Legato network-based software product to back up and recover filesystems.
NetWorker client	A computer that can access the backup and recover 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 *hostname* of the computer that is the NetWorker server.

online indexes	The databases located on the 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.
pathname	Instructions for accessing a file. An *absolute pathname* tells you how to find a file beginning at the root directory and working down the directory tree. A *relative pathname* tells you how to find the file starting where you are now.
preconfigured	Existing selections or configurations for different NetWorker features.
print	Send data to a printer.
recover	The NetWorker command used to browse the server index and to 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	A NetWorker policy that determines how long entries will be retained in the media database and thus be recoverable.
save	The NetWorker command that backs up client files to backup volumes and makes data entries in the online index.
save set	A set of files or a filesystem backed up onto backup media using NetWorker.
save set ID	An internal identification number assigned to a save set by NetWorker.
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 recover services to the clients on a network.
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.
system administrator	The person normally responsible for installing, configuring, and maintaining NetWorker.
user	A 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.

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