VERITAS™

VERITAS NetBackup™ 5.1 for Lotus Notes

System Administrator's Guide

for UNIX

N12345B

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Preface

This guide explains how to configure and use NetBackup for Lotus Notes® for UNIX to perform online backups and restores of Lotus® databases and Lotus transaction log extents.

This guide is intended for system administrators responsible for configuring and maintaining systems using Lotus databases. This guide assumes:

- A basic understanding of system administration.
- A working understanding of the NetBackup client and server software and familiarity with the information covered in the following NetBackup manuals:
  - *NetBackup Backup, Archive, and Restore Getting Started GuideNetBackup System Administrator's Guide for UNIX, Volume I* or *NetBackup System Administrator's Guide for Windows, Volume I*
  - *NetBackup Troubleshooting Guide for UNIX and Windows*
- A thorough understanding of the following Lotus topics:
  - Database file types and their relationships at recovery time
  - Data recovery scenarios

What Is In This Manual?

This guide is organized as follows:

Chapters in This Manual

Chapter	Description
"Introduction"	Describes the features of NetBackup for Lotus Notes for UNIX.
"Installation"	Provides details on installing NetBackup for Lotus Notes for UNIX.
"Configuration"	Provides details for configuring NetBackup for Lotus Notes for UNIX.
"Operating Instructions"	Contains a description of NetBackup backup and restore options for NetBackup for Lotus Notes for UNIX. It also contains troubleshooting tips.
"Lotus Domino Partitioned Servers"	How to use NetBackup with Domino partitioned servers.
"Lotus Domino Clustering"	How to use NetBackup with Domino clustering technology.
"Troubleshooting"	Offers a comprehensive set of debug logs for troubleshooting problems that may occur during NetBackup operations.

Getting Help

VERITAS offers you a variety of support options.

Accessing the VERITAS Technical Support Web Site

The VERITAS Support Web site allows you to:

- obtain updated information about NetBackup, including system requirements, supported platforms, and supported peripherals
- contact the VERITAS Technical Support staff and post questions to them
- get the latest patches, upgrades, and utilities

- view the NetBackup Frequently Asked Questions (FAQ) page
- search the knowledge base for answers to technical support questions
- receive automatic notice of product updates
- find out about NetBackup training
- read current white papers related to NetBackup

The address for the VERITAS Technical Support Web site follows:

- http://support.veritas.com

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Subscribe to the VERITAS Email notification service to be informed of software alerts, newly published documentation, Beta programs, and other services.

Go to http://support.veritas.com. Select a product and click “E-mail Notifications” on the right side of the page. Your customer profile ensures you receive the latest VERITAS technical information pertaining to your specific interests.

Accessing VERITAS Telephone Support

Telephone support for NetBackup is only available with a valid support contract. To contact VERITAS for technical support, dial the appropriate phone number listed on the Technical Support Guide included in the product box and have your product license information ready for quick navigation to the proper support group.

▼ To locate the telephone support directory on the VERITAS web site

1. Open http://support.veritas.com in your web browser.
2. Click the **Phone Support** icon. A page that contains VERITAS support numbers from around the world appears.

Accessing VERITAS E-mail Support

▼ **To contact support using E-mail on the VERITAS web site**

1. Open http://support.veritas.com in your web browser.
2. Click the **E-mail Support** icon. A brief electronic form will appear and prompt you to:
   - Select a language of your preference
   - Select a product and a platform
   - Associate your message to an existing technical support case
   - Provide additional contact and product information, and your message
3. Click **Send Message**.

Contacting VERITAS Licensing

For license information call 1-800-634-4747 option 3, fax 1-650-527-0952, or e-mail amercustomercare@veritas.com.

NetBackup Manuals

The following manuals, along with the online help, are included in the NetBackup documentation set. For a more detailed listing of NetBackup documents, refer to *NetBackup Release Notes for UNIX and Windows*.

If you have a UNIX server, refer to these documents:

- *VERITAS NetBackup System Administrator's Guide for UNIX, Volume I*

  NetBackup_AdminGuideI_UNIXServer.pdf

  Explains how to configure and manage NetBackup on a UNIX server, including managing storage units, backup policies, catalogs and host properties.

- *VERITAS NetBackup System Administrator's Guide for UNIX, Volume II*

  NetBackup_AdminGuideII_UNIXServer.pdf

  Explains additional NetBackup features such as notify scripts, enhanced authorization and authentication, and role-based security. The guide also discusses using NetBackup with AFS, Intelligent Disaster Recovery (IDR), and the BE Tape Reader.

- *NetBackup Media Manager System Administrator's Guide for UNIX*

Explains how to configure and manage the storage devices and media on UNIX NetBackup servers. Media Manager is part of NetBackup.

- *VERITAS NetBackup Troubleshooting Guide for UNIX and Windows*

  Provides troubleshooting information for UNIX- and Windows-based NetBackup products, including Media Manager.

If you have a Windows server, refer to these documents:

- *VERITAS NetBackup System Administrator's Guide for Windows, Volume I*

  NetBackup_AdminGuideI_WinServer.pdf

  Explains how to configure and manage NetBackup on a Windows server, including managing storage units, backup policies, catalogs and host properties.

- *VERITAS NetBackup System Administrator's Guide for Windows, Volume II*

  NetBackup_AdminGuideII_WinServer.pdf

  Explains additional NetBackup features such as notify scripts, enhanced authorization and authentication, and role-based security. The guide also discusses using NetBackup with AFS, Intelligent Disaster Recovery (IDR), and the BE Tape Reader.

- *NetBackup Media Manager System Administrator's Guide for Windows*

  Explains how to configure and manage the storage devices and media on Windows NetBackup servers. Media Manager is part of NetBackup.

- *VERITAS NetBackup Troubleshooting Guide for UNIX and Windows*

  Provides troubleshooting information for UNIX- and Windows-based NetBackup products, including Media Manager.

Glossary

If you encounter unfamiliar terminology, consult the NetBackup online glossary. The glossary contains terms and definitions for NetBackup and all additional NetBackup options and agents.

The NetBackup online glossary is included in the NetBackup help file.

▼ To access the NetBackup online glossary

1. In the NetBackup Administration Console, click **Help** > **Help Topics**.
2. Click the **Contents** tab.
3. Click **Glossary of NetBackup Terms**.

Use the scroll function to navigate through the glossary.

Accessibility Features

NetBackup contains features that make the user interface easier to use by people who are visually impaired and by people who have limited dexterity. Accessibility features include:

- Support for assistive technologies such as screen readers and voice input (Windows servers only)
- Support for keyboard (mouseless) navigation using accelerator keys and mnemonic keys

For more information, see the *NetBackup System Administrator's Guide for Windows, Volume I* or the *NetBackup System Administrator's Guide for UNIX, Volume I*.

Conventions

The following conventions apply throughout the documentation set.

Product-Specific Conventions

The following term is used in the NetBackup 5.1 documentation to increase readability while maintaining technical accuracy.

- Microsoft Windows, Windows

  Terms used to describe a specific product or operating system developed by Microsoft, Inc. Some examples you may encounter in NetBackup documentation are, Windows servers, Windows 2000, Windows Server 2003, Windows clients, Windows platforms, or Windows GUI.

  When Windows or Windows servers is used in the documentation, it refers to all of the currently supported Windows operating systems. When a specific Windows product is identified in the documentation, only that particular product is valid in that instance.

  For a complete list of Windows operating systems and platforms that NetBackup supports, refer to the *NetBackup Release Notes for UNIX and Windows* or go to the VERITAS support web site at `http://www.support.veritas.com`.

Typographical Conventions

Here are the typographical conventions used throughout the manuals:

Conventions

Convention	Description
GUI Font	Used to depict graphical user interface (GUI) objects, such as fields, listboxes, menu commands, and so on. For example: Enter your password in the **Password** field.
Italics	Used for placeholder text, book titles, new terms, or emphasis. Replace placeholder text with your specific text. For example: Replace *filename* with the name of your file. Do *not* use file names that contain spaces. This font is also used to highlight NetBackup server-specific or operating system-specific differences. For example: *This step is only applicable for NetBackup Enterprise Server.*
`Code`	Used to show what commands you need to type, to identify pathnames where files are located, and to distinguish system or application text that is displayed to you or that is part of a code example.
Key+Key	Used to show that you must hold down the first key while pressing the second key. For example: Ctrl+S means hold down the Ctrl key while you press S.

You should use the appropriate conventions for your platform. For example, when specifying a path, use backslashes on Microsoft Windows and slashes on UNIX. Significant differences between the platforms are noted in the text.

Tips, notes, and cautions are used to emphasize information. The following samples describe when each is used.

Tip Used for nice-to-know information, like a shortcut.

Note Used for important information that you should know, but that shouldn't cause any damage to your data or your system if you choose to ignore it.

Caution Used for information that will prevent a problem. Ignore a caution at your own risk.

Command Usage

The following conventions are frequently used in the synopsis of command usage.

brackets [ ]

The enclosed command line component is optional.

Vertical bar or pipe (|)

Separates optional arguments from which the user can choose. For example, when a command has the following format:

`command` *`arg1`*`|`*`arg2`*

In this example, the user can use either the *arg1* or *arg2* variable.

Navigating Multiple Menu Levels

When navigating multiple menu levels, a greater-than sign (>) is used to indicate a continued action.

The following example shows how the > is used to condense a series of menu selections into one step:

❖ Select **Start** > **Programs** > **VERITAS NetBackup** > **NetBackup Administration Console**.

The corresponding actions could be described in more steps as follows:

1. Click **Start** in the task bar.
2. Move your cursor to **Programs**.
3. Move your cursor to the right and highlight **VERITAS NetBackup**.
4. Move your cursor to the right. First highlight and then click **NetBackup Administration Console**.

Introduction 1

NetBackup for Lotus Notes for UNIX extends the capabilities of NetBackup to include online backups and restores of Lotus databases when Domino Server has been installed. This capability is provided as an add-on or extension to the NetBackup for UNIX client software. Because this product is tightly integrated with the Backup, Archive, and Restore interface for UNIX, this document only gives an overview of NetBackup functionality. In general, backup and restore operations for Lotus database files are identical to other NetBackup file operations, except where noted in this document.

At the time of this release NetBackup for Lotus Notes for UNIX supports the following versions of Domino Server:

- R5.0.3 or later
- R6.0.2 or later

When referring to Domino Server throughout this manual, it implies one of the supported versions.

Features

Online Backup	Lotus databases and transaction logs can be backed up without taking down the Domino Server. This ensures the availability of Lotus services and data during the Lotus backup.
Restore Operations	Using a few simple operations, an administrator using the NetBackup client can browse Lotus database backups and select the ones to be restored.
Transaction Logging	NetBackup for Lotus Notes for UNIX takes advantage of the ability of Lotus Domino to log transactions against one or more Lotus R5/R6 databases. Transaction Logging may be circular style, linear style, or archive style.
Point in Time Recovery	Transaction logging enables NetBackup for Lotus Notes for UNIX to perform a point-in-time recovery of a logged Lotus R5/R6 database(s).
Tight NetBackup Integration	Tight integration with NetBackup means two things: ◆ An administrator already familiar with NetBackup procedures and software will have no problems configuring and using NetBackup to perform backup and restore operations for Lotus databases and transaction log extents. ◆ All of the rich features and strengths of the NetBackup product suite are available to the Lotus database backup user.
Central Administration	Administrators can define Lotus Notes policies, back up and restore Lotus databases, and back up and restore archive style transaction log extents from a central location.
Media Management	Lotus database backups are saved directly to a wide variety of storage devices supported by the NetBackup master server.
Automated Backups	Administrators can set up schedules for automatic, unattended backups for local or remote clients across the network. These backups can be full or incremental and are managed entirely by the NetBackup server from a central location. The administrator can also manually back up clients.

Domino Partitioned Server Backup

Administrators can back up databases from Domino partitioned servers by specifying the `NOTES_INI_PATH=` directive in the Backup Selections list. Users can restore databases backed up from Domino partitioned servers by specifying the absolute path for the `notes.ini` file that is associated with the server instance to be used by the restore. This path can be specified in the Lotus Notes tab on the Restore Marked Files dialog box.

To back up multiple Lotus partitions from a single policy, each partition must be backed up using a separate data stream. This is accomplished by adding, to the Backup Selections list, the `NEW_STREAM` directive and the appropriate `NOTES_INI_PATH=` directive for each data stream.

Lotus Database

Lotus Database Configurations

NetBackup for Lotus Notes for UNIX supports the backup and restore of three database configurations that are supported by Lotus. These configurations can be divided into two categories: Domino Server databases and Local databases.

Domino Server Databases

Domino Server databases are managed by the Domino Server. Domino Server databases are located in a directory referred to as the Domino data directory, typically `/db/notesdata`. Domino Server databases may also be linked to this Domino data directory using Lotus Linked Directories or Databases. Domino Server databases can be Logged or Unlogged.

Logged Domino Server Databases

A feature of Domino Server is the ability to log transactions against one or more Lotus databases. If transaction logging is enabled on the server, all logged database transactions go into a single transaction log, consisting of one or more files or extents. Where archive style transaction logging is used, the archived log files serve as the incremental backup for the logged databases. Transaction logging must be enabled in order to initiate the recovery of logged databases using NetBackup for Lotus Notes for UNIX.

Unlogged Domino Server Databases

An unlogged database is one in which transaction logging is not enabled, or has been disabled for specific server database(s).

Unlogged Domino Server databases will be backed up when a full backup is performed. Unlogged Domino Server databases will also be backed up when a differential-incremental backup or cumulative-incremental backup is performed and the Unlogged Domino Server database has been recently updated. The database can be restored only to the point of the latest database backup.

Local Databases

Local databases are Lotus databases that are not located in the Domino data directory, cannot be shared, and cannot be logged. Local databases will be treated similarily to unlogged Domino Server databases when being backed up and restored.

Lotus Database Files

This section describes the set of files that may be backed up during a backup operation.

Database Files

NetBackup for Lotus Notes for UNIX will currently enumerate all Lotus databases with the following extentions:

`.NTF` Lotus Notes Template Files

`.NSF` Lotus Notes Server Files

`.BOX` Lotus Notes Mail Box Files

To allow Lotus databases with other extensions to be backed up (or to limit the default list of extensions), create the file `/usr/openv/netbackup/lotus.conf`. If the `lotus.conf` file exists, the default extensions will be overridden and only those databases with the extensions listed will be backed up. When creating the `lotus.conf` file, enter each extension on a separate line. Enter only the extension: no leading period or trailing characters are allowed.

Transaction Logs

Lotus Domino Server has the ability to log transactions against one or more Lotus R5/R6 databases. Because transactions cannot be logged against database versions earlier than Domino R5, these pre-R5 Lotus databases will be treated as unlogged databases.

All Lotus R5/R6 databases are logged by default when:

- Transaction logging is enabled by the administrator.
- The database is in the Domino data directory.

All logged database transactions go into a single transaction log, consisting of one or more files or extents.

Transaction logging may be of either circular, linear, or archive style. When archive style transaction logging is used, the archive log files may serve as the incremental backup for logged databases.

Note Transaction logging must be enabled in order to implement the recovery of logged Lotus databases.

Circular, Linear, and Archive Style Logging

When logging is enabled on the Domino Server, one of three styles of logging can be selected for all logged databases: circular, linear, or archive style logging.

When circular-style logging is enabled, the transaction log extents are reused as the specified log file size is reached. By reusing the transaction log extents, you are saving resources, but limiting your recovery options. It is important to remember that transaction log extents are *not* backed up by NetBackup for Lotus Notes for UNIX when circular-style logging is enabled. Therefore, you will be able to recover logged Lotus databases only back to the point in time when the circular transaction log extents were overwritten.

When linear-style logging is enabled, the transaction log extents function the same as for circular-style logging, with one exception. Unlike circular-style logging, where the size of the transaction log extents are predefined and limited, for linear-style logging, the size of the transaction log exents are user-defined and limited in size only by the amount of mass storage available.

When archive style logging is enabled, transaction log extents are generated as needed and are limited in number only by the capacity of your mass storage. Unlike circular-style and linear-style transaction log extents, which cannot be backed up, archive-style transaction log extents must be backed up and may be used as the incremental backup for all logged databases. Backing up the archive-style transaction log extents is the only way to ensure that the transaction log extents are marked as available to be recycled and to prevent your mass storage from filling up. Unlike circular-style and linear-style logging, archive style logging does not limit the point in time to which a database may be recovered. With archive-style logging enabled, a logged database may be recovered to any point in time, from the time the database itself was last backed up to the current time.

Recycling Transaction Log Extents

Following either a full backup or differential-incremental backup, NetBackup for Lotus Notes for UNIX will mark the successfully backed up archive-style transaction log extents as ready to be recycled. The NetBackup for Lotus Notes for UNIX agent does not perform the actual deletion of the successfully backed up transaction log extents, since the Domino Server manages when a transaction log extent is actually recycled.

Backup Operations

This section presents overview information on NetBackup for Lotus Notes for UNIX backup operations.

Methods

NetBackup provides three methods to perform backups: automatic, manual, and user-directed. This section contains an overview of these methods. For more information on these backup methods and other administrator-directed activities, refer to the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I*.

Automatic Backups

The NetBackup administrator can schedule backups that occur automatically and unattended, under the control of the NetBackup master server. Automatic backups will meet most of your backup requirements.

Manual Backups

The manual backup allows the administrator to initiate a full backup, cumulative-incremental backup or differential-incremental backup that has been set up in the policy manager. The manual backup option can be useful for the following situations:

- Testing a configuration
- When workstations miss their regular backups
- Before installing new software (to preserve the old configuration)
- Preserving records before a special event such as when companies split or merge

In some cases, it may be useful to create a policy and schedule that you use only for manual backups. You can do this by creating a policy with a single schedule that has no backup window defined (and therefore never executes automatically).

User-Directed Backups

User-directed backups require a User Backup schedule type to be defined in the Lotus-Notes policy. Performing user-directed backups of Lotus databases is similar to using the Backup, Archive, and Restore interface to back up normal files. The example described in "Performing a Backup" on page 58 uses the Backup, Archive, and Restore interface to perform an online backup of a Lotus database.

Actions performed for a user backup of Lotus databases and transaction log extents are identical to a full backup except that the transaction log extents are not marked as ready to be recycled after they are successfully backed up. Because transaction log extents are not recycled, user backups are like taking a snapshot of the databases at a given point in time without impacting the content of ongoing full and incremental backups. A user backup is not automatically scheduled and must be initiated on the target client machine.

Restore and Recovery Operations

Using a few simple operations, an administrator using the NetBackup client can browse NetBackup for Lotus Notes backups and select the ones to be restored and recovered.

NetBackup for Lotus Notes for UNIX will support both restore and recovery operations. A restore operation will allow a user to restore any previously backed up Lotus databases. The operations performed during a database restore are:

- the existing database is taken offline and deleted
- the database is restored
- changed records recorded during the backup of the database are restored and applied to the database, and if the database is unlogged or local the database is brought back online

  If the database is a logged database, the database name is added to a list for recovery after all databases (unlogged/local and logged) have been restored.

Following the restore operation, the recovery operation will begin automatically and will attempt to recover all logged databases restored during the restore operation. The logged databases that have been restored will be rolled forward to a specific point in time using the appropriate transactions from the required transaction logs, before being brought back online. As part of the recovery operation, any required transaction logs that have been previously backed up and recycled will be restored automatically as part of the recovery operation. In general, it is recommended that required transaction log extents be restored automatically as part of the recovery operation rather than being restored manually by the user.

Methods

NetBackup provides three methods to perform restores:

- server-directed
- redirecting a restore to a different client
- redirecting a restore to a different path

These methods are supported in the Restore and Recovery Operations. An overview of these methods is given in the following sections. For more information on these restore methods and other administrator-directed activities, refer to the *NetBackup System Administrator's Guide for UNIX, Volume I*, or *NetBackup System Administrator's Guide for Windows, Volume I*.

Server-Directed Restore

An administrator can browse NetBackup for Lotus Notes databases and select the ones to be restored. When the administrator initiates the restore, the request is passed from the client to the NetBackup master server. Once the server validates the request, the restore operation becomes fully managed by the server, which identifies the storage device and the volume containing the Lotus databases by querying the NetBackup database. The server then transmits the data back to the client.

NetBackup restores Lotus databases and transaction log extents from a range of backups. By default, this range includes the last full backup and all cumulative incremental backups or differential incremental backups since that full backup.

NetBackup will allow you to select the NetBackup server from which files will be restored, to view the backup history, and to select items to restore for:

- a specific client
- other clients that were backed up by the selected NetBackup server

Redirecting a Restore to a Different Client

Databases or directories can be restored to a client other than the one from which they were backed up. This is possible only if the NetBackup administrator sets up the configuration to allow it and the NetBackup for Lotus Notes for UNIX agent has been installed on the alternate client. The administrator using the NetBackup Administration Console on the master server or using the Remote Administration Console can direct restores to any NetBackup client (regardless of which client the files came from). Please see the appropriate NetBackup manuals for the configuration needed for this type of redirected restore.

Redirecting a Restore to a Different Path

A user can restore Lotus database files to directories that are different from the directories from which the databases were backed up.

Installation 2

This chapter describes the requirements for using NetBackup for Lotus Notes for UNIX and how it is installed.

To determine which Lotus version levels are supported, refer to the Database Agent Matrix in the *NetBackup Release Notes for UNIX and Windows*.

Requirements

For backup operations, the following requirements must be met:

- Lotus Domino Server R5.0.3, or later, or R6.0.2 or later must be installed on the NetBackup client before a backup operation can be performed.
- Transaction logging must be enabled in order to initiate the recovery of logged databases.

For restore and recovery operations, the following requirement must be met:

- Transaction logging must be enabled in order to implement the recovery of logged databases.

Installation Prerequisites

Before installing NetBackup for Lotus Notes for UNIX, be sure you have completed the following procedures:

- Install the NetBackup server software on the server.

  The NetBackup server platform can be any of those that NetBackup supports.

  Refer to the *NetBackup Installation Guide for UNIX* or the *NetBackup Installation Guide for Windows*.

- Install the NetBackup client software on the client where you will be backing up the Lotus databases.

  Refer to the *NetBackup Installation Guide for UNIX* for installation instructions.

Now you are ready to install NetBackup for Lotus Notes for UNIX on the client where you will be backing up the Lotus databases. Refer to the next section for detailed instructions on installing NetBackup for Lotus Notes for UNIX.

Guidelines for Installing NetBackup for Lotus Notes for UNIX in a Cluster

- Prior to installing NetBackup for Lotus Notes for UNIX, the NetBackup server must be installed and configured to work in a cluster. (This is accomplished by following the instructions in the *NetBackup Installation Guide for UNIX*, including running the `cluster_config` script after the NetBackup server software has been installed.)
- Commands such as `bpplclients` and `update_dbclients` must be run from the active NetBackup node. If you are pushing the database agent software to clients located in a cluster, specify the individual node names (not virtual names) in the list of clients.
- If installing NetBackup for Lotus Notes for UNIX on a clustered NetBackup server, freeze the active NetBackup node before beginning the installation. Install on all the inactive nodes, then install on the active node. After you successfully install on the active node, unfreeze this node.
- The `cluster_config` script only needs to be run after the NetBackup server software has been installed. You do not need to run this script after installing NetBackup for Lotus Notes for UNIX on a NetBackup server or if you wish to install NetBackup for Lotus Notes for UNIX on a machine on which only the NetBackup client is installed.

Installing NetBackup for Lotus Notes for UNIX

There are two ways to install database agent software.

- Remote Installation - Loads the software on a master server. The user will then push the database software out to affected clients.

  Refer to the following section.

- Local Installation - Loads and installs the software only to the local machine.

  Refer to "Local Installation of NetBackup for Lotus Notes for UNIX" on page 19.

Remote Installation of NetBackup for Lotus Notes for UNIX

During a remote installation, NetBackup for Lotus Notes for UNIX files are loaded onto the current machine, which must be a UNIX master server. The software will then be distributed to the clients and installed.

Note In a clustered environment, the capability to push client software is only available from the active node.

Installation Requirements

- The version of the NetBackup client and the version of NetBackup for Lotus Notes for UNIX must be the same (e.g., 5.1).
- There must be adequate disk space on each client that will receive the software.

  Less than one megabyte of additional disk space is required in the client's `install_path/netbackup` directory. However, more disk space may be necessary at run time.

- NetBackup version 5.1 client software is installed and operational on each Lotus Domino Server or Lotus Notes client.

  This also means that the directory `install_path/netbackup` already exists on each Lotus Domino Server or Lotus Notes client.

- Lotus Domino has been installed on each client to which you will be pushing NetBackup for Lotus Notes for UNIX software.
- In a clustered environment, NetBackup server has been installed and configured to work in a cluster. (This is accomplished by following the instructions in the *NetBackup Installation Guide for UNIX*, including running the `cluster_config` script after the NetBackup server software is installed.)

Remote Installation Instructions

▼ To perform a remote installation

1. If installing NetBackup for Lotus Notes for UNIX on a clustered NetBackup server, first refer to the "Guidelines for Installing NetBackup for Lotus Notes for UNIX in a Cluster" earlier in this chapter.

2. Log in as the root user on the server.

   If you are already logged in, but are not the root user, execute the following command.

   `su - root`

3. Make sure a valid license key for NetBackup for Lotus Notes has been registered. To view or add license keys, perform one of the following:

   - Run the following command:

     `install_path``/netbackup/bin/admincmd/get_license_key`.

   - Open the NetBackup Administration Console and choose **Help** > **License Keys**.

4. Insert the CD-ROM into the drive.

5. Change the working directory to the CD-ROM directory.

   `cd /CD_mount_point`

6. Load the software on the server by executing the `install` script.

   `./install`

   a. Select the NetBackup Database Agent Software option.

      The following prompt will appear:

      `Do you want to do a local installation? (y/n) [n]`

   b. Answer **`n`**.

      You are presented with a menu of all database agents available on the CD-ROM.

   c. Select the NetBackup for Lotus Notes option.

   d. Enter **`q`** to quit selecting options.

      A prompt will appear asking if the list is correct.

   e. Answer **`y`**.

The `install` script identifies the types of client software loaded during the installation of the NetBackup server. By default, any matching NetBackup for Lotus Notes for UNIX software will automatically be loaded. If there are more platforms available, the script displays a menu giving you the opportunity to add more client types to the default list. Once the list is complete, database agent version files, compressed tar files and the `install_dbext` script are copied to directory *`install_path`*`/netbackup/dbext`.

f. Enter **q** to quit from the script.

7. Distribute and install the NetBackup for Lotus Notes for UNIX software on each client as described in the next sections.

Note In a clustered environment, the capability to distribute client software is only available from the active node.

There are two types of installs.

- *initial install* — Use an initial install if the clients you intend to update have not been added to policies of type Lotus-Notes.
- *upgrade install* — Use an upgrade install if all the clients you intend to update already have been added to policies of type Lotus-Notes.

Note The NetBackup version level (for example, 5.1) running on the clients you wish to update must be the same as the version level of the NetBackup for Lotus Notes for UNIX being installed.

Initial Installation on Clients

▼ To perform an initial install on the clients

1. Execute the following command to create a file containing a list of clients currently configured in the NetBackup database.

```
cd install_path/netbackup/bin
./admincmd/bpplclients -allunique -noheader > filename
```

where *`filename`* is the name of the file to contain the list of unique clients. If no clients have been configured in the NetBackup database, and therefore *`filename`* is empty, create *`filename`* using the same format as that generated by `bpplclients`.

`bpplclients` generates output in following format:

hardware operating_system client_name

where:

hardware is the hardware name. For example, execute the `ls` command in directory *`install_path`*`/netbackup/client`.

operating_system is the operating system name. For example, execute the `ls` command in directory *`install_path`*`/netbackup/client/`*`hardware`*.

client_name is the name of the client.

For example, the contents of *filename* might look like this:

```
Solaris Solaris8 curry
RS6000 AIX4.3.3 cypress
Linux RedHat2.4 bumper
```

2. Edit *filename*.

   This is an optional step. Use it if the contents of *filename* need to be changed. Edit *filename* to contain only those clients you wish to update with NetBackup for Lotus Notes for UNIX software.

3. Specify *filename* on the `update_dbclients` command.

   For example:

   `cd` ***`install_path`***`/netbackup/bin`
   `./update_dbclients Lotus_Notes -ClientList` *filename*

   Only clients listed in *filename* will be updated.

Upgrade Installation on Clients

▼ To perform an upgrade installation on the clients

1. Execute the following command.

   `cd` ***`install_path`***`/netbackup/bin`
   `./update_dbclients Lotus_Notes ALL ALL`

   This command will look at all possible clients and only update the ones currently in the Lotus-Notes policy type.

   Instead of `ALL ALL`, you may use `-ClientList` *filename* as explained in "Initial Installation on Clients" on page 16.

Note With an initial or upgrade install, some clients may be skipped and not updated. Possible reasons are:
- the client is a PC client (which cannot be updated from a UNIX server)
- NetBackup for Lotus Notes for UNIX does not support that client's platform type
- the NetBackup for Lotus Notes for UNIX software for that client type was not loaded onto the server in step 6 of the "Remote Installation Instructions" on page 15
- (if using the `ALL ALL` method) the client does not belong to the Lotus-Notes policy type

All skipped clients are available in a file whose name is displayed by `update_dbclients`.

The number of updates required to distribute the software to the clients is displayed.

If more than one update will occur, you will see the following prompt:

`Enter the number of simultaneous updates you wish to take place. 1 -` *max dflt*

(must be in the range of 1 to *max*; default: *dflt*).

where:

max is the maximum number of simultaneous updates that is allowed. The value displayed will be a number ranging from 1 to 30.

dflt is the default number the program will use if you press Enter. The value displayed will be a number ranging from 1 to 15.

For example, if three client updates will be performed, the *max* and *dflt* values shown would be 3. If 50 client updates will be performed, the *max* value shown would be 30 and the *dflt* value shown would be 15.

`update_dbclients` will start the number of updates that you specify. If this number is less than the total number of client updates to be performed, new updates will start as the previous updates finish until all of the updates have been completed.

Based on your answer, the time it will take to update the clients is displayed, followed by this question:

```
Do you want to upgrade the clients now? (y/n) [y]
```

2. Enter **y** or **n** for the prompt.

If you answer **n**, `update_dbclients` will quit and leave the list of clients it would have updated in a file. This file can later be used by the `-ClientList` parameter mentioned previously.

Answer **y** to continue the installation process.

If the `update_dbclients` command was successful in distributing the software to the client, it will automatically run the `install_dbext` script on the client. If `install_dbext` has successfully completed, there will be a version file in directory

install_path/share that contains the version of NetBackup for Lotus Notes for UNIX that was installed. The update_dbclients command displays a note on whether the update was successful for each client. When the update_dbclients command has completed, it displays a file name that contains a complete log of what happened for each client. If the update failed for any client, the log file should be examined to determine the problem.

Local Installation of NetBackup for Lotus Notes for UNIX

During a local installation, the NetBackup for Lotus Notes for UNIX files are extracted and installed. The local machine can be a client or a master server that also happens to be a client.

Installation Requirements

- The version of the NetBackup client and the version of NetBackup for Lotus Notes for UNIX are the same (e.g., 5.1).
- The local machine must have adequate disk space.

  Less than one megabyte of additional disk space is required in the *install_path*/netbackup directory. However, more disk space may be necessary at run time.
- NetBackup version 5.1 client software is installed and operational.

  This also means that the *install_path*/netbackup directory already exists.
- Lotus Domino has been installed on the local machine.

Local Install Instructions

▼ **To install NetBackup for Lotus Notes for UNIX to the local machine**

1. Log in as the root user on the machine.

   If you are already logged in, but are not the root user, execute the following command.

   ```
   su - root
   ```

   - If the local machine is a client, go to step 3.
   - If the local machine is a server, go to step 2.

2. Make sure a valid license key for NetBackup for Lotus Notes has been registered. In a NetBackup server clustered environment, the license key must be registered on each node. To view or add license keys, perform one of the following:
   - Run the command *install_path*`/netbackup/bin/admincmd/get_license_key`.
   - Open the NetBackup Administration Console and choose **Help** > **License Keys**.
3. Insert the CD-ROM into the drive.
4. Change the working directory to the CD-ROM directory.

   ```
   cd /CD_mount_point
   ```

5. Load and install the software by executing the `install` script.

Note It is expected that the NetBackup version level (for example, 5.1) running on the local machine matches the version level of the database agent being installed.

```
./install
```

a. Select the NetBackup Database Agent Software option.

   The following prompt will appear:

   ```
   Do you want to do a local installation? (y/n) [n]
   ```

b. Answer **y**.

   You are presented with a menu of all database agents available on the CD-ROM.

c. Select the NetBackup for Lotus Notes option.

d. Enter **q** to quit selecting options.

   A prompt will appear asking if the list is correct.

e. Answer **y**.

The following actions will occur:

- The version file, compressed tar file and `install_dbext` script will be loaded to directory *`install_path`*`/share`.
- The `install` script will automatically execute the `install_dbext` script.
- If `install_dbext` has successfully completed, there will be a version file in directory *`install_path`*`/share` that contains the version of NetBackup for Lotus Notes for UNIX that was installed.

f. Enter **q** to quit from the script.

Configuration 3

This section provides an overview of how to configure NetBackup to perform backup and restore operations for Lotus databases and transaction log extents.

To use NetBackup for Lotus Notes for UNIX, you must add at least one Lotus-Notes policy to NetBackup, then define the appropriate schedules for that policy. You must also configure NetBackup to perform backup and restore operations for individual mailboxes and folders.

This chapter contains information on the following topics:

- Defining the Client Properties for a Lotus Notes Client
- Configuration Using the NetBackup Administration Console for Windows
- Configuring a NetBackup Policy
- Testing NetBackup for Lotus Notes for Windows Configuration Settings
- Defining the Client Properties for a Lotus Notes Client
- Configuration Using the NetBackup Administration Console for UNIX
- Configuring a NetBackup Policy
- Testing NetBackup for Lotus Notes for UNIX Configuration Settings

Most requirements for Lotus-Notes policies are the same as for file system backups. Refer to the *NetBackup System Administrator's Guide for UNIX, Volume I* or *NetBackup System Administrator's Guide for Windows, Volume 1*, for detailed configuration instructions.

Defining the Client Properties for a Lotus Notes Client

NetBackup for Lotus Notes for UNIX needs to know:

- the path where the Lotus Domino data directory is located
- where the Lotus program files reside
- the location of the Lotus Domino resource files
- the path to the Lotus `notes.ini` file

NetBackup for Lotus Notes for UNIX will look for the above in the path defined in the **LOTUS_NOTES_PATH** variable. If the `notes.ini` file is located in a directory other than that defined in the **LOTUS_NOTES_PATH**, you can specify the path in the **LOTUS_NOTES_INI** variable. If the Lotus program files are located in a directory other than that defined in the **LOTUS_NOTES_PATH**, you can specify the path in the **LOTUS_NOTES_EXECDIR** variable.

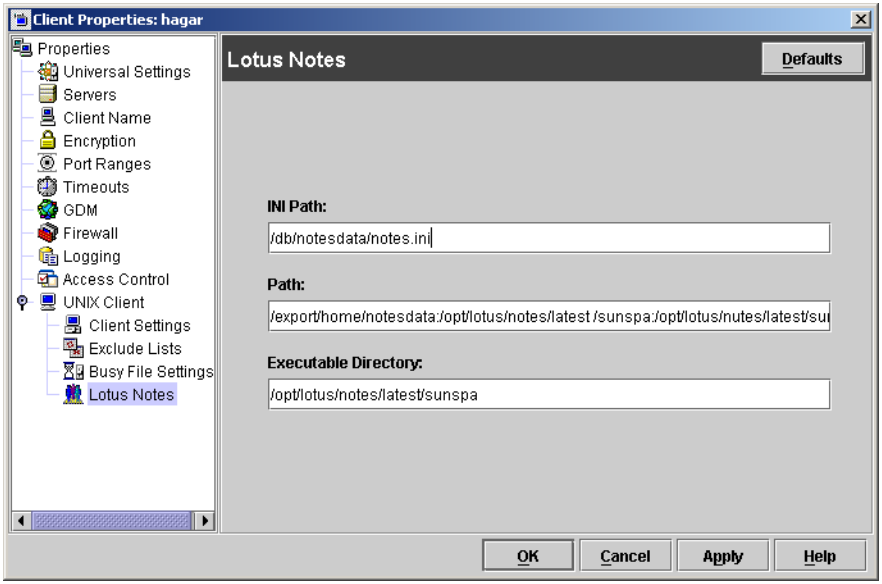
These variables can be set in the Client properties for the client or in the `bp.conf` file.

Defining the Lotus Notes Variables in the Client Properties

▼ **To define the Lotus Notes variables**

1. Open the NetBackup Administration Console.
2. Expand **Host Properties**.
3. Click on **Clients**.
4. In the right pane, right-click on the client and click **Properties**.

5. In the left pane, expand **Windows Client** or **UNIX Client** and click **Lotus Notes**.



6. In the **Path** box, specify a path made up of the Domino data directory, the Lotus program directory, and the Lotus resource directory. For example:

   ```
   /export/home/notesdata:/opt/lotus/notes/latest
   /sunspa:/opt/lotus/notes/latest/sunspa/res/C
   ```

7. To specify a Lotus `notes.ini` in an alternate directory than those specified in **Path**, specify the alternate Lotus `notes.ini` in the **INI Path** box. For example:

   ```
   /db/notesdata/notes.ini
   ```

8. To specify an alternate Lotus program files directory other than specified in the **Path** directory, specify the directory in the **Executable Directory** box. For example:

   ```
   /opt/lotus/notes/latest/sunspa
   ```

   NetBackup for Lotus Notes for UNIX will now look for the Lotus program files in the LOTUS_NOTES_EXECDIR directory, rather than in the LOTUS_NOTES_PATH directory.

9. Click **OK** to save your changes.

Defining the Lotus Notes Variables in the bp.conf File

The **LOTUS_NOTES_PATH**, **LOTUS_NOTES_INI** and **LOTUS_NOTES_EXECDIR** variables can also be defined in the `bp.conf` file.

▼ To define the Lotus Notes variables

1. Open the `bp.conf` file.

   This file is located in *`install_path`*`/netbackup/`.

2. To define the Lotus Notes path, add a `LOTUS_NOTES_PATH` entry, for example:

   ```
   LOTUS_NOTES_PATH = /export/home/notesdata:/opt/lotus/notes/latest
   /sunspa:/opt/lotus/notes/latest/sunspa/res/C
   ```

3. To specify a Lotus `notes.ini` in an alternate directory than those specified in LOTUS_NOTES_PATH, add a `LOTUS_NOTES_INI` entry that defines where the alternate Lotus `notes.ini` file resides. For example:

   ```
   LOTUS_NOTES_INI = /db/notesdata/notes.ini
   ```

4. To specify an alternate Lotus program files directory than the directory specified in LOTUS_NOTES_PATH, add a `LOTUS_NOTES_EXECDIR` entry that defines where the alternate Lotus program files reside. For example:

   ```
   LOTUS_NOTES_EXECDIR = /opt/lotus/notes/latest/sunspa
   ```

Configuration Using the NetBackup Administration Console for UNIX

Although the database agent is installed on the NetBackup client, some configuration procedures are performed using the NetBackup Administration Console on the server.

These procedures include:

- Configuring a NetBackup policy
- Testing NetBackup for Lotus Notes for UNIX configuration settings

See the next section for instructions on starting the NetBackup Administration Console.

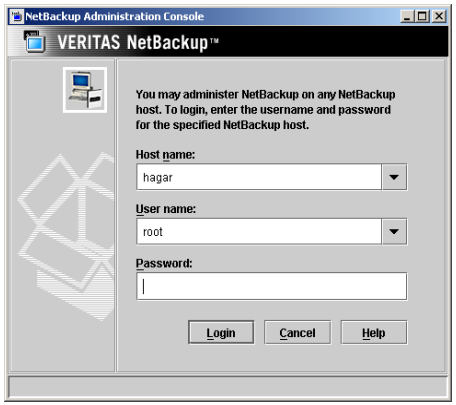
▼ To launch the NetBackup Administration Console for UNIX

1. Log onto the UNIX server as root.

2. Start the NetBackup Administration Console by executing:

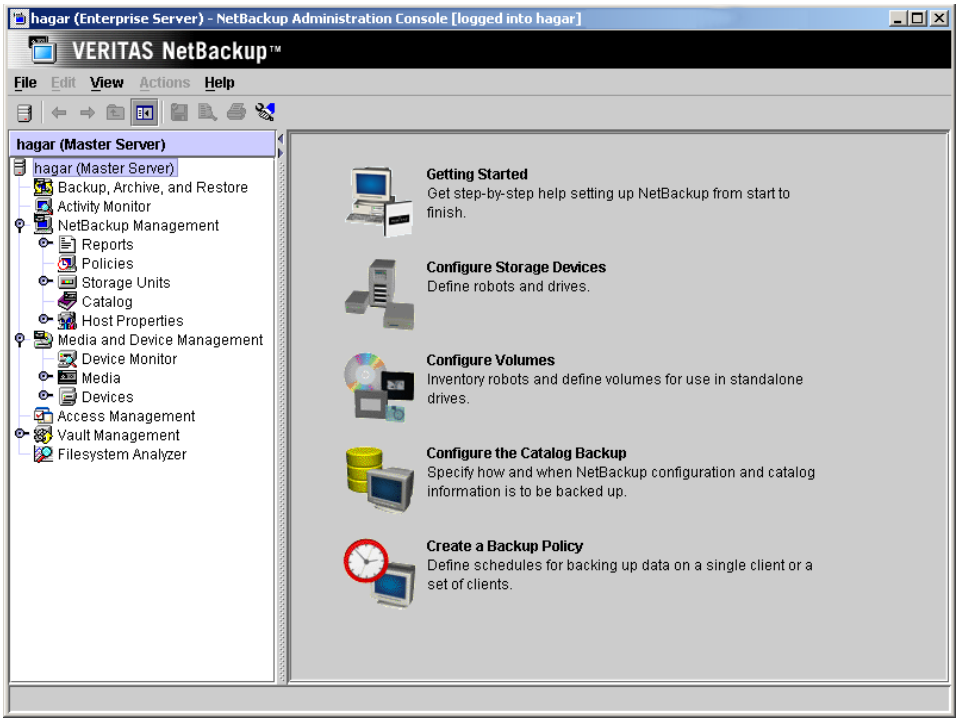
   install_path/**netbackup/bin/jnbSA &**

   The login dialog is displayed.



3. Type the name of the master server where you initially want to manage NetBackup. You can specify any NetBackup master server that has a valid license key for NetBackup for Lotus Notes registered. Indicate the User and Password.

4. Click **Login**. The NetBackup Administration Console is displayed.



Configuring a NetBackup Policy

A NetBackup policy defines the backup criteria for a specific group of one or more clients. These criteria include:

- policy attributes
- backup schedules
- items to be backed up, including a list of databases and directives
- clients to be backed up

To use NetBackup for Lotus Notes for UNIX, at least one Lotus-Notes policy with the appropriate schedules needs to be defined. A configuration can have a single policy that includes all clients or there can be many policies, some of which include only one client.

Most requirements for Lotus-Notes policies are the same as for file system backups. In addition to the attributes described here, there are other attributes for a policy to consider. Refer to the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed configuration instructions and information on all the attributes available.

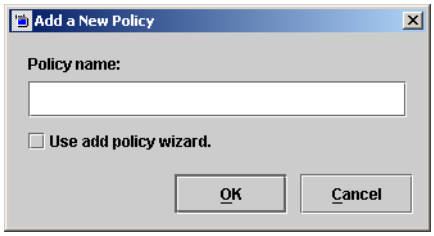
Adding New Policies

Use this procedure when configuring a policy from a UNIX server.

▼ To add a new policy

1. Log onto the server as root.
2. Start the NetBackup Administration Console.
3. If your site has more than one master server, choose the one to which you want to add the policy.
4. In the left pane, click on **Policies**. The right pane splits into an All Policies pane and a details pane.
5. In the All Policies pane, right-click on the Master Server, and click **New**.

   The Add a New Policy dialog is displayed.



   a. In the **Policy name** box, type a unique name for the new policy.

   b. Choose whether to use the wizard for configuring the policy. The wizard guides you through most of the setup process and simplifies it by automatically choosing default values that are good for most configurations. If necessary, you can change the defaults later by editing the policy. You will need to manually add entries to the Backup Selections list after completing the wizard.

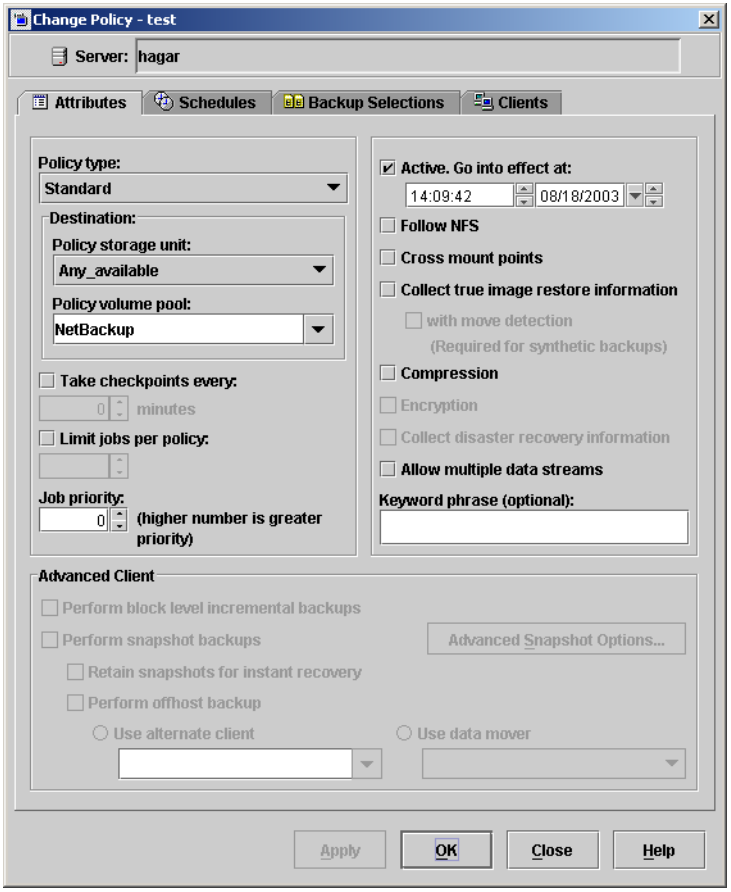
- To use the wizard, select the **Use add policy wizard** box and click **OK**. The wizard starts and you create the policy by following the prompts. When prompted, select the Lotus-Notes policy type.

Note The Lotus-Notes policy type will not appear in the drop-down list unless your server has a license key for NetBackup for Lotus Notes.

- If you require more control over the settings than the wizard provides, do not select the **Use add policy wizard** box and proceed to step 6.

6. Click **OK**.

A dialog is displayed in which you can specify the general attributes for the policy.



7. From the **Policy type** box, select the Lotus-Notes policy type.

8. Complete the entries on the **Attributes** tab as explained in "Description of Attributes" and click **Apply** to save the attribute entries.

9. Add other policy information:
   - To add schedules, see "Adding New Schedules."
   - To add clients, see "Adding Clients to a Policy."
   - To add to the list of Backup Selections, see "Adding New Backup Selections" on page 36.

10. Click **Apply**. The new policy is created.

Description of Attributes

With a few exceptions, NetBackup manages a database backup like a file system backup. Policy attributes that are different for Lotus backups are explained below. This information is used when you are adding a new policy using either a Windows server (refer to "Adding New Policies" on page 41) or a UNIX server (refer to "Adding New Policies" on page 29).

Your other policy attributes will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed explanations of the policy attributes.

Description of Policy Attributes

Attribute	Description
Policy type	Determines the type of clients that can be in the policy and in some cases the types of backups that can be performed on those clients. To use NetBackup for Lotus Notes for UNIX, you must have defined at least one Lotus-Notes policy.
Keyword phrase to associate with the backup	A textual description of a backup. Useful for browsing backups and restores.
Allow multiple data streams	Specifies that, depending on directives in the list of backup selections, NetBackup can divide automatic backups for each client into multiple jobs, with each job backing up only a part of the list of backup selections. The jobs are in separate data streams and can occur concurrently. The number of available storage units, multiplex settings, and the maximum jobs parameters determines the total number of streams and how many can run concurrently.

Adding New Schedules

Each policy has its own set of schedules. These schedules control initiation of automatic backups and also specify when user operations can be initiated.

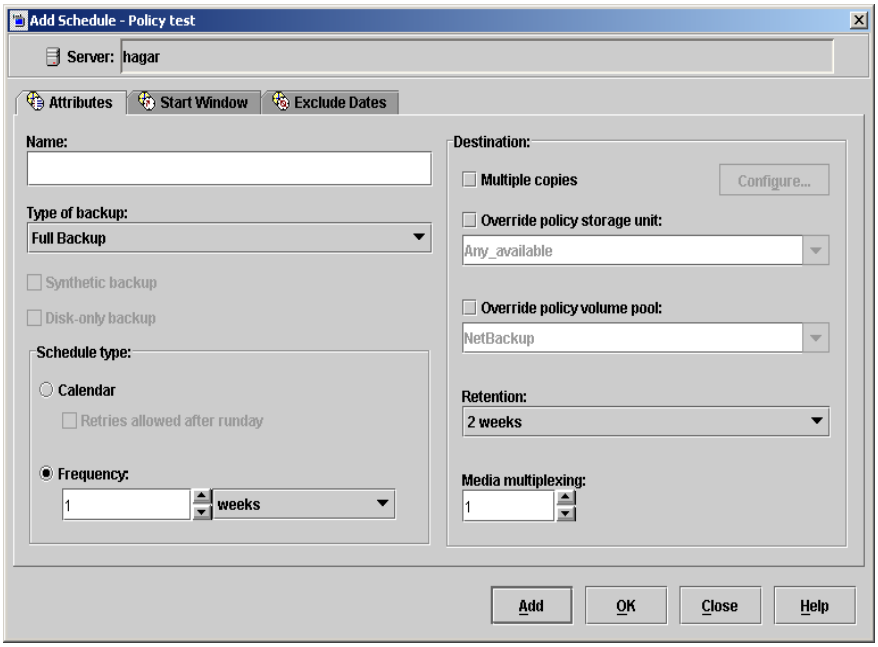
The following procedure starts from the Policy dialog. To see the Policy dialog, double click the policy name in the policy list in the left pane of the NetBackup Administration Console.

▼ To add a schedule

1. In the Policy dialog, click the **Schedules** tab.

2. Click **New**.

   A dialog is displayed. The title bar shows the name of the policy to which you are adding the schedules.



3. Specify a unique name for the schedule.

4. Select the **Type of backup**.

   For information on the types of backups available for this policy, see "Types of Backups" on page 34.

5. Specify the other properties for the schedule as explained in "Schedule Properties."

6. If this is the last schedule, click **OK**.

   To add more schedules, click **Add** and repeat step 2 through step 5. Click **Close** to cancel changes that you have not yet added and close the dialog.

Schedule Properties

Some of the schedule properties have a different meaning for database backups than for a regular file system backup. These properties are explained below. This information is used when you are adding a new schedule using either a Windows server (refer to "Adding New Schedules" on page 44) or a UNIX server (refer to "Adding New Schedules" on page 32).

Other schedule properties will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed explanations of the schedule properties.

Description of Schedule Properties

Property	Description
Type of backup	Specifies the type of backup that this schedule will control. The selection list shows only the backup types that apply to the policy you are configuring. For more information see the following section "Types of Backups."
Frequency	This setting is used only for scheduled backups, and not for user-directed backups. **Frequency** specifies the period of time that will elapse until the next backup operation can begin on this schedule. For example, if the frequency is seven days and a successful backup occurs on Wednesday, the next full backup will not occur until the following Wednesday. Normally, incremental backups will have a shorter frequency than full backups.
Calendar	This setting is used only for scheduled backups, and not for user-directed backups. The **Calendar** option allows you to schedule backup operations based on specific dates, recurring week days, or recurring days of the month.
Retention	Specifies a retention period for keeping backup copies of files before deleting them. Set the time period to retain at least two full backups of your database. In this way, if one full backup has been lost, you will have another full backup to fall back on. For example, if your database is backed up once every Sunday morning, you should select a retention period of at least 2 weeks.

Types of Backups

This information is used when you are adding a new schedule using either a Windows server (refer to "Adding New Schedules" on page 44) or a UNIX server (refer to "Adding New Schedules" on page 32).

The types of backups that can be performed are described in the following table:

Description of Types of Backups

Type of Backup	Description
Full backup	This backup type is used to back up all the Lotus databases identified in the Backup Selections list and/or the available transaction logs extents, if the `BACKUP_TRANSACTION_LOGS` directive is specified in the Backup Selections list. All transaction log extents, identified as available for backup by the Domino Server will be backed up. The inactive transaction log extents will be marked as ready to be recycled after they are successfully backed up. The Domino Server handles the actual recycling of transaction log extents.
Differential-incremental backup	A differential-incremental backup will perform differently depending on the type of Lotus database encountered. • unlogged databases or local databases A differential-incremental backup will back up all unlogged or local databases identified in the Backup Selections list that have been modified since the last full or incremental backup. The last modification date is determined by the time the database was last modified, not the time/date stamp of the database file. • logged databases (archival-style logging enabled) A differential-incremental backup will back up only those logged databases identified in the Backup Selections list that have been assigned a new DBIID since the last full or incremental backup. • logged databases (circular-style and linear- logging enabled) A differential-incremental backup will back up all logged databases identified in the Backup Selections list that have been modified since the last full or incremental backup. The last modification date is deterrmined by the time the database was last modified, not the time/date stamp of the database file. • transaction logs When the `BACKUP_TRANSACTION_LOGS` directive is encountered in the Backup Selections list, a differential-incremental backup will back up all transaction log extents identified as available for backup by the Domino Server. The inactive transaction log extents that are backed up will be marked as ready to be recycled upon successful completion of the backup.

Description of Types of Backups

Type of Backup	Description
Cumulative-Incremental backup	A cumulative-incremental backup will perform differently depending on the type of Lotus database encountered. ◆ unlogged databases or local databases A cumulative-incremental backup will backup all unlogged or local databases identified in the Backup Selections list that have been modified since the last full backup. The last modification date is determined by the time the database itself was modified, not the time/date stamp of the database file. ◆ logged databases (archival-style logging enabled) A cumulative-incremental backup will backup only those logged databases identified in the Backup Selections list that have been assigned a new DBIID since the last full backup. ◆ logged databases (circular- and linear-style logging enabled) A cumulative-incremental backup will back up all logged databases identified in the Backup Selections list that have been modified since the last full or incremental backup. The last modification date is deterrmined by the time the database was last modified, not the time/date stamp of the database file. ◆ transaction logs When the `BACKUP_TRANSACTION_LOGS` directive is specified in the Backup Selections list, a cumulative-incremental backup will back up all transaction log extents identified as available for backup by the Domino Server. The transaction log extents will not be marked as ready to be recycled upon successful completion of the backup.
User backup	Actions performed for a user backup are identical to a full backup except that the transaction log extents are not marked as ready to be recycled after they are successfully backed up. Because transaction log extents are not recycled, user backups are like taking a snapshot of the databases and transaction log extents at a given point in time without impacting the content of ongoing full and incremental backups. A user backup is not automatically scheduled and must be initiated on the target client machine. You may want to consider creating a separate policy for User Backup schedule types. This will allow you to easily separate user-directed and scheduled backups when restoring files. If you decide to create separate policies for User Backup schedule types, the considerations are similar to those for automatic backups. One difference is that you do not need a to indicate any backup selections because users select the files before starting the operation.

Adding New Backup Selections

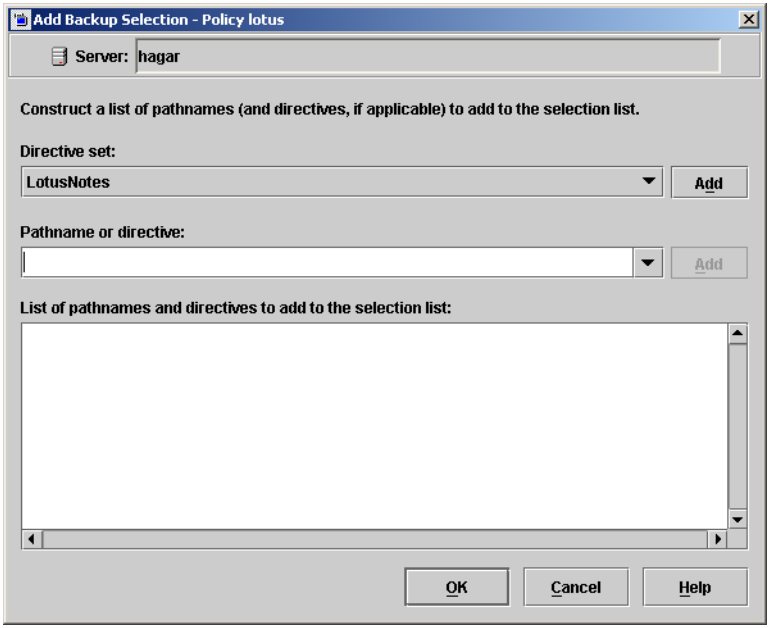
The following procedures explain how to add databases or directives to the Backup Selections list. Only the databases and/or directives specified will be backed up. The procedure assumes you have the Policy dialog open. To see the Policy dialog, double-click the policy name in the Policies list in the NetBackup Administration Console.

▼ To add databases or directives to the Backup Selections List

1. In the Policy dialog, click **Backup Selections**.

2. Click **New**.

   A dialog is displayed. The title bar shows the name of the policy to which you are adding backup selections.



3. Indicate what you wish to back up.

   - To specify a directory or database in the Backup Selections list, type the name of the directory or database in the **Pathname or directive** text box and click **Add**.
   - To specify a directive, click the arrow button to the right of the **Pathname or directive** box, select a directive, and click **Add**.

     For information about the directives, refer to the "Directives in the Backup Selections List" section.

4. If there are no more items to add, click **OK**.

   Any pathnames or directives you specified are appended to the end of the Backup Selections list.

Directives in the Backup Selections List

This information is used when you are adding Lotus Notes directives to the Backup Selections list using either a Windows server (refer to "Adding New Backup Selections" on page 49) or a UNIX server (refer to "Adding New Backup Selections" on page 36).

The types of directives that can be added to the Backup Selections list are described in the following table:

Directives in the Backup Selections List

Directive	Description
ALL_LOTUS_DATABASES	This directive is supported only on UNIX clients. Performs the backup on all Lotus databases on each of the selected clients. ALL_LOTUS_DATABASES means both local databases and Domino Server databases. **Note** Using the ALL_LOTUS_DATABASES Backup Selections list directive can have tremendous performance issues on clients with large or multiple local drives. In this case, it is suggested that more specific folders or databases be added to the Backup Selections list, for example, the Domino data directory.
BACKUP_TRANSACTION_LOGS	Backs up all transaction log extents identified by the Domino Server as available for backup.
NOTES_INI_PATH=	If you are configuring a backup for a Domino partitioned server, use this directive, where: NOTES_INI_PATH= the *absolute path for the notes.ini file associated with the server instance to be used* This directive identifies the location of the `notes.ini` file associated with the particular server partition that will be used to perform the backup. The server partition specified will have an impact on the how a database is backed up (logged or unlogged) and which set of transaction log extents will be backed up.

Directives in the Backup Selections List

Directive	Description
NEW_STREAM	To perform a scheduled backup of more than one partition for Domino partitioned server from a single policy, you must back up each Domino partition with a separate data stream. Use the NEW_STREAM directive and the appropriate NOTES_INI_PATH= directive for each data stream. The NEW_STREAM directive is used to define a single stream for a particular partition of a Domino partitioned server, and multiple streams for a single partition on a non-partitioned Domino Server. To use the NEW_STREAM directive, the **Allow multiple data streams** attribute must be enabled for the policy on the **Attributes** tab. For more information on the NEW_STREAM directive, see the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I*.

ALL_LOTUS_DATABASES Directive

The ALL_LOTUS_DATABASES directive is not supported for Windows clients. If this directive is encountered when performing a Lotus-Notes backup on a Windows client, the backup will fail with a `status 69: The file list string is invalid`.

On your NetBackup master server(s), review each Lotus-Notes policy.

- If the ALL_LOTUS_DATABASES directive does not appear in any Lotus-Notes policy, no action is necessary.
- If only UNIX clients are specified in the client list for the Lotus-Notes policy containing the ALL_LOTUS_DATABASES directive, no action is necessary.
- If only Windows clients are specified in the client list for the Lotus-Notes policy containing the ALL_LOTUS_DATABASES directive, remove the directive from the Backup Selections list and add entries for the folder(s) containing the actual Lotus database(s).
- If both UNIX and Windows clients are specified in the client list for the Lotus-Notes policy containing the ALL_LOTUS_DATABASES directive, separate the policy into two policies: one exclusively for UNIX clients and another exclusively for Windows clients. Remove the ALL_LOTUS_DATABASES directive from the policy for the Windows clients and add entries for the folder(s) containing the actual Lotus database(s).

Adding Clients to a Policy

The client list is the list of clients that will be backed up during an automatic backup. A NetBackup client must be in at least one policy but can be in more than one.

This procedure starts from the Policy dialog. To see the Policy dialog, double-click the policy in the policy list in the left pane of the NetBackup Administration Console.

Requirements for clients

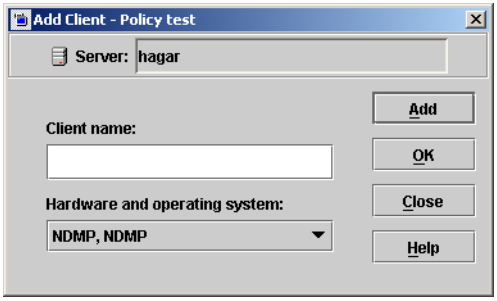
On the client the following must be installed:

- the Lotus Domino Server or Lotus Notes client
- NetBackup client or server
- NetBackup for Lotus Notes for UNIX

▼ To add clients to a policy

1. In the Policy dialog, click the **Clients** tab.
2. On the **Clients** tab, click **New**.

   The Add Client dialog is displayed. The title bar shows the name of the policy where you are adding clients.



3. In the **Client name** text box, type the name of the client that you are adding.
4. Choose the **Hardware and operating system** type and click **Add**.
5. If this is the last client, click **OK**. If you are going to add more clients, repeat step 3 and step 4.

Configuration Using the NetBackup Administration Console for Windows

Although the database agent is installed on the NetBackup client, some configuration procedures are performed using the NetBackup Administration Console on the server.

These procedures include:

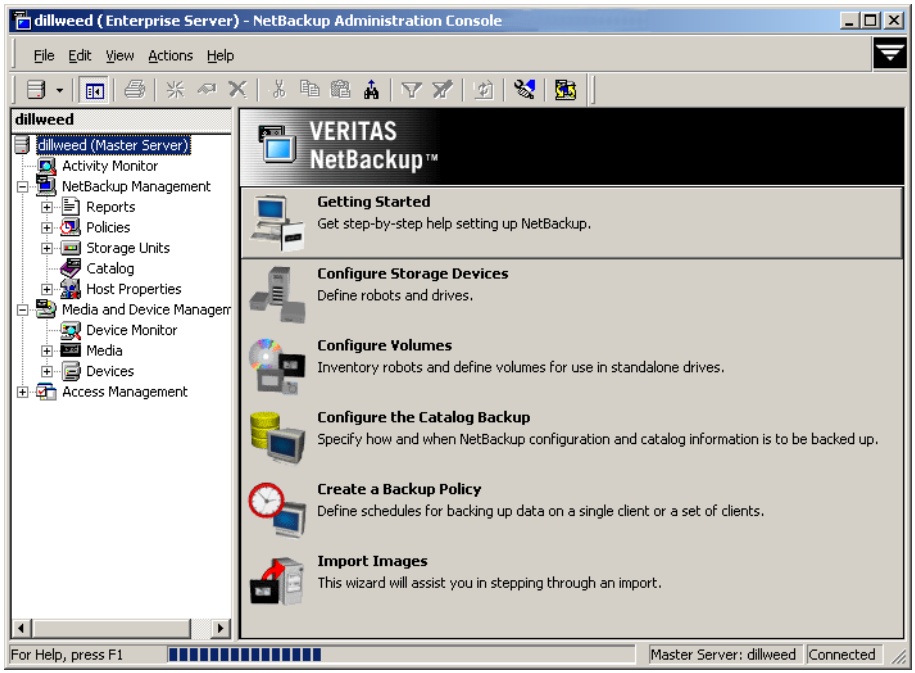
- Configuring a NetBackup policy
- Testing NetBackup for Lotus Notes for UNIX configuration settings

See the next section for instructions on starting the NetBackup Administration Console.

▼ To launch the NetBackup Administration Console for Windows

1. Log on to the server as administrator.
2. Choose **Start** > **Programs** > **VERITAS NetBackup** > **NetBackup Administration Console**.

   The NetBackup Administration Console is displayed.



Configuring a NetBackup Policy

A NetBackup policy defines the backup criteria for a specific group of one or more clients. These criteria include:

- policy attributes
- backup schedules
- items to be backed up, including a list of databases and directives
- clients to be backed up

To use NetBackup for Lotus Notes for UNIX, at least one Lotus-Notes policy with the appropriate schedules needs to be defined. A configuration can have a single policy that includes all clients or there can be many policies, some of which include only one client.

Most requirements for Lotus-Notes policies are the same as for file system backups. In addition to the attributes described here, there are other attributes for a policy to consider. Refer to the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed configuration instructions and information on all the attributes available.

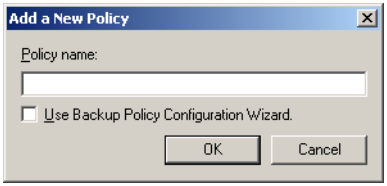
Adding New Policies

Use this procedure when configuring a policy from a Windows server or from a NetBackup Remote Administration Console host.

▼ To add a new policy

1. Log on to the server as administrator.
2. Start the NetBackup Administration Console.
3. If your site has more than one master server, choose the one where you want to add the policy.
4. In the left pane, right-click **Policies** and choose **New Policy**.

   The Add a New Policy dialog is displayed.



a. In the **Policy name** box, type a unique name for the new policy.

b. Choose whether to use the wizard for configuring the policy. The wizard guides you through most of the setup process and simplifies it by automatically choosing default values that are good for most configurations. If necessary, you can change the defaults later by editing the policy. You will need to manually add entries to the Backup Selections list after completing the wizard.

- To use the wizard, select the **Use Backup Policy Configuration Wizard** box and click **OK**. The wizard starts and you create the policy by following the prompts. When prompted, select the Lotus-Notes policy type.

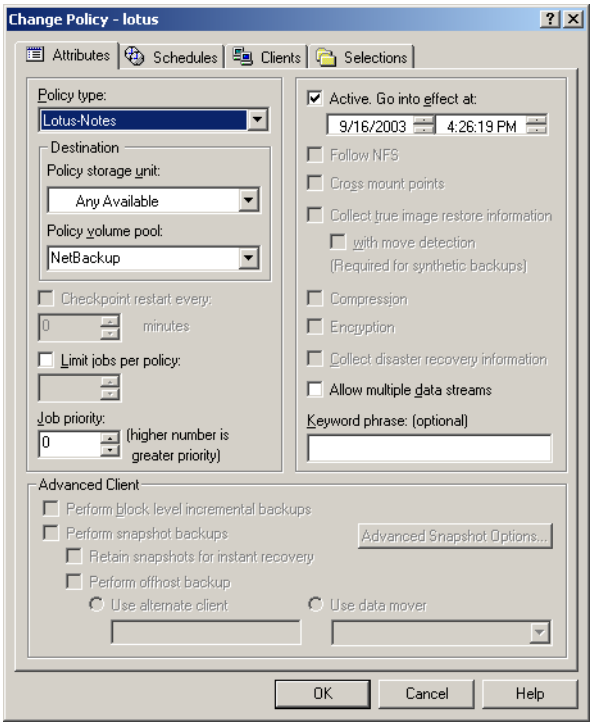
Note The Lotus-Notes policy type will not appear in the drop-down list unless your server has a license key for NetBackup for Lotus Notes.

- If you require more control over the settings than the wizard provides, then do not select the **Use Backup Policy Configuration Wizard** box and proceed to step 5.

5. Click **OK**.

A dialog is displayed in which you can specify the general attributes for the policy.

6. From the **Policy Type** box, select the Lotus-Notes policy type.



7. Complete the entries on the **Attributes** tab as explained in "Description of Attributes."

8. Add other policy information:

   - To add schedules, see "Adding New Schedules."
   - To add clients, see "Adding Clients to a Policy."
   - To add Lotus objects to the Backup Selections list, see "Adding New Backup Selections" on page 49.

9. Click **OK**. The new policy will be created.

Description of Attributes

With a few exceptions, NetBackup manages a database backup like a file system backup. Policy attributes that are different for Lotus backups are explained below. This information is used when you are adding a new policy using either a Windows server (refer to "Adding New Policies" on page 41) or a UNIX server (refer to "Adding New Policies" on page 29).

Your other policy attributes will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed explanations of the policy attributes.

Description of Policy Attributes

Attribute	Description
Policy type	Determines the type of clients that can be in the policy and in some cases the types of backups that can be performed on those clients. To use NetBackup for Lotus Notes for UNIX, you must have defined at least one Lotus-Notes policy.
Keyword phrase to associate with the backup	A textual description of a backup. Useful for browsing backups and restores.
Allow multiple data streams	Specifies that, depending on directives in the list of backup selections, NetBackup can divide automatic backups for each client into multiple jobs, with each job backing up only a part of the list of backup selections. The jobs are in separate data streams and can occur concurrently. The number of available storage units, multiplex settings, and the maximum jobs parameters determines the total number of streams and how many can run concurrently.

Adding New Schedules

Each policy has its own set of schedules. These schedules control initiation of automatic backups and also specify when user operations can be initiated.

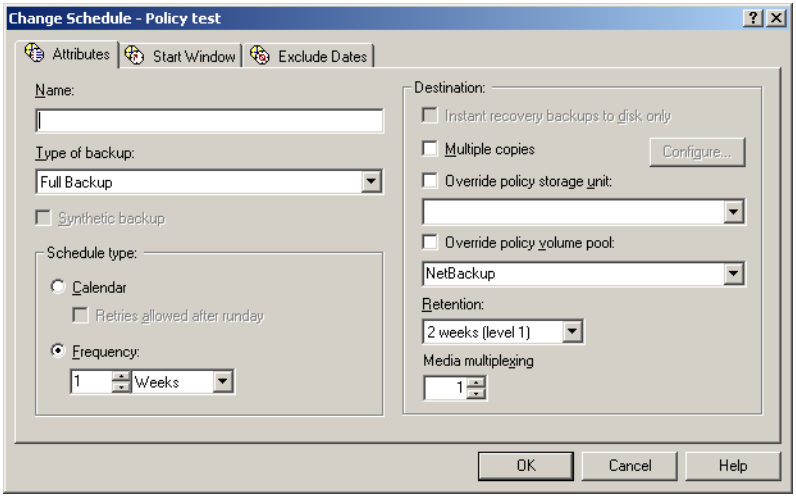
The following procedures start on the Policy dialog. To see the Policy dialog, double-click the policy name in the Policies list of the NetBackup Administration Console.

▼ To add a schedule

1. On the Policy dialog, click the **Schedules** tab.

2. Click **New**.

   A dialog is displayed. The title bar shows the name of the policy to which you are adding the schedules.



3. Specify a unique name for the schedule.

4. Select the **Type of backup**.

   For information on the types of backups available for this policy, see "Types of Backups" on page 34.

5. Specify the other properties for the schedule as explained in "Schedule Properties."

6. Click **OK**.

   To add other schedules, repeat step 1 through step 6.

Schedule Properties

Some of the schedule properties have a different meaning for database backups than for a regular file system backup. These properties are explained below. This information is used when you are adding a new schedule using either a Windows server (refer to "Adding New Schedules" on page 44) or a UNIX server (refer to "Adding New Schedules" on page 32).

Other schedule properties will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed explanations of the schedule properties.

Description of Schedule Properties

Property	Description
Type of backup	Specifies the type of backup that this schedule will control. The selection list shows only the backup types that apply to the policy you are configuring. For more information see the following section "Types of Backups."
Frequency	This setting is used only for scheduled backups, and not for user-directed backups. **Frequency** specifies the period of time that will elapse until the next backup operation can begin on this schedule. For example, if the frequency is seven days and a successful backup occurs on Wednesday, the next full backup will not occur until the following Wednesday. Normally, incremental backups will have a shorter frequency than full backups.
Calendar	This setting is used only for scheduled backups, and not for user-directed backups. The **Calendar** option allows you to schedule backup operations based on specific dates, recurring week days, or recurring days of the month.
Retention	Specifies a retention period for keeping backup copies of files before deleting them. Set the time period to retain at least two full backups of your database. In this way, if one full backup has been lost, you will have another full backup to fall back on. For example, if your database is backed up once every Sunday morning, you should select a retention period of at least 2 weeks.

Types of Backups

This information is used when you are adding a new schedule using either a Windows server (refer to "Adding New Schedules" on page 44) or a UNIX server (refer to "Adding New Schedules" on page 32).

The types of backups that can be performed are described in the following table:

Description of Types of Backups

Type of Backup	Description
Full backup	This backup type is used to back up all the Lotus databases identified in the Backup Selections list and/or the available transaction logs extents, if the `BACKUP_TRANSACTION_LOGS` directive is specified in the Backup Selections list. All transaction log extents, identified as available for backup by the Domino Server will be backed up. The inactive transaction log extents will be marked as ready to be recycled after they are successfully backed up. The Domino Server handles the actual recycling of transaction log extents.
Differential-incremental backup	A differential-incremental backup will perform differently depending on the type of Lotus database encountered. • unlogged databases or local databases A differential-incremental backup will back up all unlogged or local databases identified in the Backup Selections list that have been modified since the last full or incremental backup. The last modification date is determined by the time the database was last modified, not the time/date stamp of the database file. • logged databases (archival-style logging enabled) A differential-incremental backup will back up only those logged databases identified in the Backup Selections list that have been assigned a new DBIID since the last full or incremental backup. • logged databases (circular-style and linear- logging enabled) A differential-incremental backup will back up all logged databases identified in the Backup Selections list that have been modified since the last full or incremental backup. The last modification date is deterrmined by the time the database was last modified, not the time/date stamp of the database file. • transaction logs When the `BACKUP_TRANSACTION_LOGS` directive is encountered in the Backup Selections list, a differential-incremental backup will back up all transaction log extents identified as available for backup by the Domino Server. The inactive transaction log extents that are backed up will be marked as ready to be recycled upon successful completion of the backup.

Description of Types of Backups

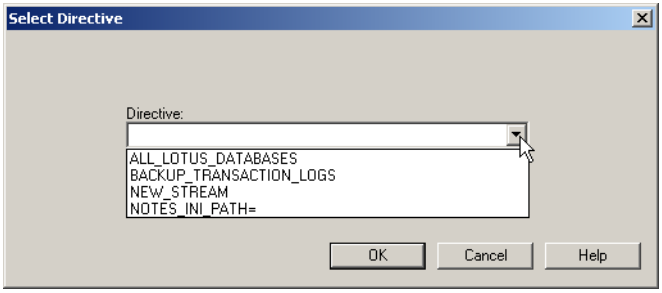
Type of Backup	Description
Cumulative-Incremental backup	A cumulative-incremental backup will perform differently depending on the type of Lotus database encountered. ◆ unlogged databases or local databases A cumulative-incremental backup will backup all unlogged or local databases identified in the Backup Selections list that have been modified since the last full backup. The last modification date is determined by the time the database itself was modified, not the time/date stamp of the database file. ◆ logged databases (archival-style logging enabled) A cumulative-incremental backup will backup only those logged databases identified in the Backup Selections list that have been assigned a new DBIID since the last full backup. ◆ logged databases (circular- and linear-style logging enabled) A cumulative-incremental backup will back up all logged databases identified in the Backup Selections list that have been modified since the last full or incremental backup. The last modification date is deterrmined by the time the database was last modified, not the time/date stamp of the database file. ◆ transaction logs When the `BACKUP_TRANSACTION_LOGS` directive is specified in the Backup Selections list, a cumulative-incremental backup will back up all transaction log extents identified as available for backup by the Domino Server. The transaction log extents will not be marked as ready to be recycled upon successful completion of the backup.
User backup	Actions performed for a user backup are identical to a full backup except that the transaction log extents are not marked as ready to be recycled after they are successfully backed up. Because transaction log extents are not recycled, user backups are like taking a snapshot of the databases and transaction log extents at a given point in time without impacting the content of ongoing full and incremental backups. A user backup is not automatically scheduled and must be initiated on the target client machine. You may want to consider creating a separate policy for User Backup schedule types. This will allow you to easily separate user-directed and scheduled backups when restoring files. If you decide to create separate policies for User Backup schedule types, the considerations are similar to those for automatic backups. One difference is that you do not need a to indicate any backup selections because users select the files before starting the operation.

Adding New Backup Selections

The following procedures explain how to add databases or directives to the Backup Selections list. Only the databases and/or directives specified will be backed up. The procedures assume you have the Policy dialog open. To see the Policy dialog, double-click the policy name in the Policies list in the NetBackup Administration Console.

▼ To add directives to the Backup Selections List

1. In the Policy dialog, click **Backup Selections**.
2. Click **New**.
3. Click the **Directives** button.
4. From the **Directive** list, select a directive. For a description of each of the directives, refer to "Directives in the Backup Selections List" on page 30.

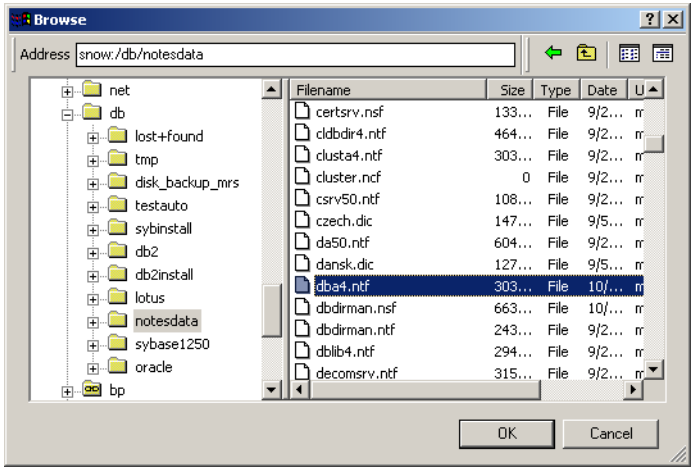


5. Click **OK**.
6. If this is the last entry you wish to add click **OK**.

▼ To add databases or folders to the Backup Selections List

1. In the Policy dialog, click **Backup Selections**.
2. Click **New**.
3. Click the **Remote Folder** button.
4. Browse to the database or folder you wish to add and select it.

5. Click **OK**.



6. If this is the last entry you wish to add click **OK**.

Directives in the Backup Selections List

This information is used when you are adding Lotus Notes directives to the Backup Selections list using either a Windows server (refer to "Adding New Backup Selections" on page 49) or a UNIX server (refer to "Adding New Backup Selections" on page 36).

The types of directives that can be added to the Backup Selections list are described in the following table:

Directives in the Backup Selections List

Directive	Description
ALL_LOTUS_DATABASES	This directive is supported only on UNIX clients. Performs the backup on all Lotus databases on each of the selected clients. ALL_LOTUS_DATABASES means both local databases and Domino Server databases. **Note** Using the ALL_LOTUS_DATABASES Backup Selections list directive can have tremendous performance issues on clients with large or multiple local drives. In this case, it is suggested that more specific folders or databases be added to the Backup Selections list, for example, the Domino data directory.

Directives in the Backup Selections List

Directive	Description
BACKUP_TRANSACTION_LOGS	Backs up all transaction log extents identified by the Domino Server as available for backup.
NOTES_INI_PATH=	If you are configuring a backup for a Domino partitioned server, use this directive, where: NOTES_INI_PATH= the *absolute path for the notes.ini file associated with the server instance to be used* This directive identifies the location of the `notes.ini` file associated with the particular server partition that will be used to perform the backup. The server partition specified will have an impact on the how a database is backed up (logged or unlogged) and which set of transaction log extents will be backed up.
NEW_STREAM	To perform a scheduled backup of more than one partition for Domino partitioned server from a single policy, you must back up each Domino partition with a separate data stream. Use the NEW_STREAM directive and the appropriate NOTES_INI_PATH= directive for each data stream. The NEW_STREAM directive is used to define a single stream for a particular partition of a Domino partitioned server, and multiple streams for a single partition on a non-partitioned Domino Server. To use the NEW_STREAM directive, the **Allow multiple data streams** attribute must be enabled for the policy on the **Attributes** tab. For more information on the NEW_STREAM directive, see the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I*.

ALL_LOTUS_DATABASES Directive

The ALL_LOTUS_DATABASES directive is not supported for Windows clients. If this directive is encountered when performing a Lotus-Notes backup on a Windows client, the backup will fail with a `status 69: The file list string is invalid`.

On your NetBackup master server(s), review each Lotus-Notes policy.

- If the ALL_LOTUS_DATABASES directive does not appear in any Lotus-Notes policy, no action is necessary.
- If only UNIX clients are specified in the client list for the Lotus-Notes policy containing the ALL_LOTUS_DATABASES directive, no action is necessary.

- If only Windows clients are specified in the client list for the Lotus-Notes policy containing the ALL_LOTUS_DATABASES directive, remove the directive from the Backup Selections list and add entries for the folder(s) containing the actual Lotus database(s).
- If both UNIX and Windows clients are specified in the client list for the Lotus-Notes policy containing the ALL_LOTUS_DATABASES directive, separate the policy into two policies: one exclusively for UNIX clients and another exclusively for Windows clients. Remove the ALL_LOTUS_DATABASES directive from the policy for the Windows clients and add entries for the folder(s) containing the actual Lotus database(s).

Adding Clients to a Policy

The client list is the list of clients that will be backed up during an automatic backup. A NetBackup client must be in at least one policy but can be in more than one.

This procedure starts in the Policy dialog. To see the Policy dialog, double-click the policy name in the Policies list in the NetBackup Administration Console.

Requirements for clients

On the client the following must be installed:

- the Lotus Domino Server or Lotus Lotus client
- NetBackup client or server
- NetBackup for Lotus Notes for UNIX

▼ To add clients to a policy

1. In the Policy dialog, click the **Clients** tab.
2. Click **New**.

3. Enter the name of the client you want to add.
   - Type the name into the client list and click **OK**.

     If NetBackup cannot detect the hardware and operating system, a dialog will be displayed so you can specify this information.

     OR

   - Click the **Browse for Computer** button to choose the client from the network:

4. To add another client, repeat step 2 and step 3. If this is the last client, click **OK** to close the dialog.

Testing NetBackup for Lotus Notes for UNIX Configuration Settings

After you have configured the master server for NetBackup for Lotus Notes for UNIX, you should test the configuration settings. For a description of status codes, refer to the *NetBackup Troubleshooting Guide for UNIX and Windows*.

NetBackup Administration Console for UNIX

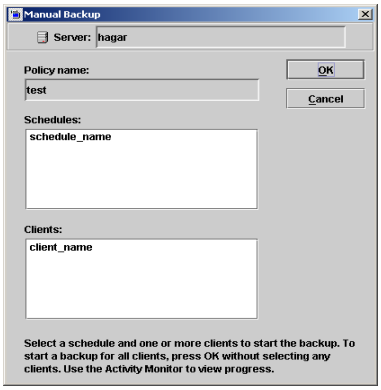
Use this procedure to test a policy configuration on the NetBackup Administration Console for UNIX.

▼ To test the configuration settings on a UNIX server

1. Log onto the server as root.
2. Start the NetBackup Administration Console.
3. In the left pane, click **Policies**.

   The right pane splits into an All Policies pane and a details pane.
4. In the All Policies pane, click the policy you wish to test.
5. Choose **Actions** > **Manual Backup**.

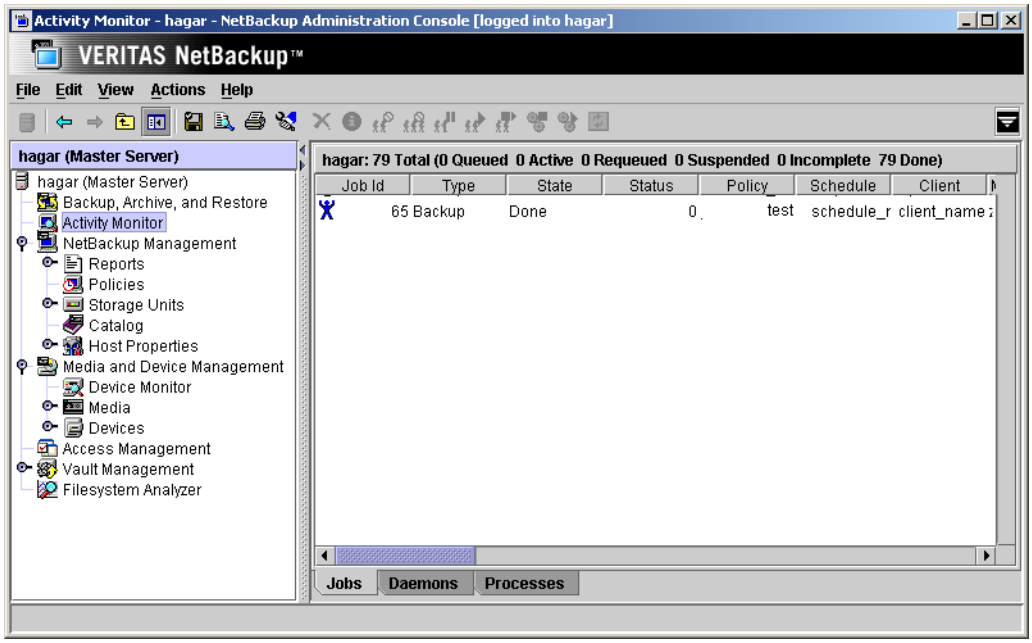
   The Manual Backup dialog is displayed.



The Schedules pane contains the name of a schedule (or schedules) configured for the policy you are going to test. The Clients pane contains the name of the client(s) listed in the policy you are going to test.

6. Follow the instructions on the dialog.

7. Click **Activity Monitor** on the NetBackup Administration Console.



If the manual backup does not exit with a successful status, refer to the Troubleshooting chapter.

NetBackup Administration Console for Windows

Use this procedure to test a policy configuration from a Windows server or from the Remote Administration Console.

▼ To test the configuration settings on a Windows server

1. Log onto the server as administrator.

2. Start the NetBackup Administration Console.

3. In the left pane, click **Policies**. The policy list appears in the right pane.

4. Click on the policy you wish to test.

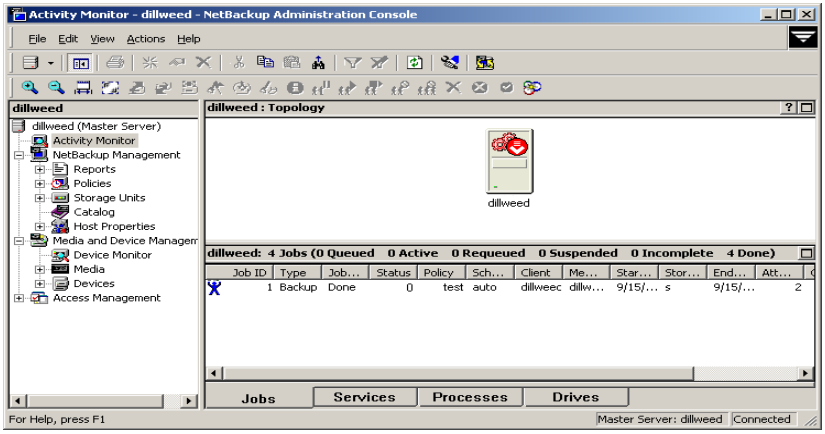
5. Choose **Actions** > **Manual Backup**.

   The Manual Backup dialog is displayed.

   The Schedules pane contains the name of a schedule (or schedules) configured for the policy you are going to test. The Clients pane contains the name of the client(s) listed in the policy you are going to test.

6. Follow the instructions on the dialog.

7. Click **Activity Monitor** on the NetBackup Administration Console.



If the manual backup does not exit with a successful status, refer to the Troubleshooting chapter.

Operating Instructions 4

After completing the configuration, you can use the Backup, Archive, and Restore interface to back up Lotus databases, mailboxes, transaction log extents, or folders.

Performing a Backup

This section describes a user-directed backup of a Lotus database using NetBackup for Lotus Notes for UNIX. These instructions supplement the operating instructions in the *NetBackup Backup, Archive, and Restore Getting Started Guide*. Refer to that guide for detailed backup instructions.

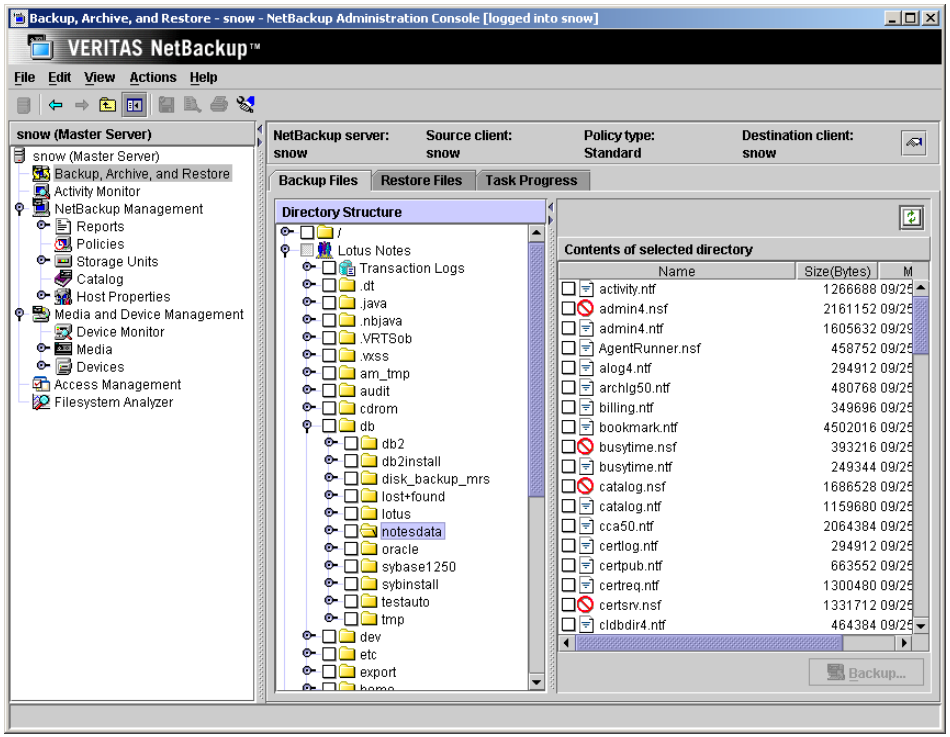
Note User-directed backups will not mark backed up transaction log extents as ready to be recycled upon successful completion of the backup. Therefore, user-directed backups should be used for special situations and should not replace regularily scheduled full or incremental backups.

▼ To perform a backup

1. Open the Backup, Archive, and Restore interface.

2. Click the **Backup Files** tab.

   The Lotus Notes object is displayed in the left pane. Items within this object can be selected in order to perform backups of the logged and unlogged Domino Server databases, local databases, and archive style transaction log extents.



3. If necessary, change the NetBackup master server that will perform the backup.

   If there is more than one master server to which you can send your backups, ensure that you are connected to the correct one. Ask your NetBackup administrator if you have questions about which master server to use.

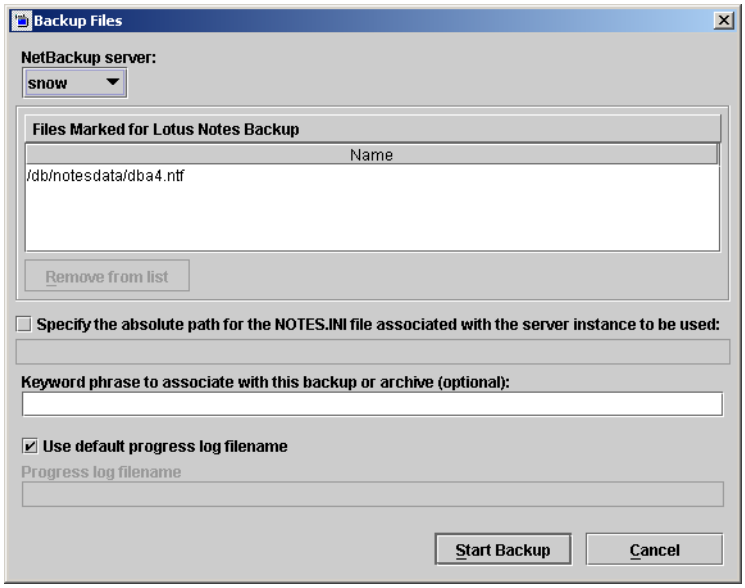
   Normally, you will not have to switch master servers unless, for some reason, the administrator has temporarily moved the NetBackup backups (for example, because of a problem on the original master server). If the change becomes permanent, the administrator should change your default to reflect the other server.

4. To specify what you want to back up, expand the Lotus Notes object, navigate the directories, and select the desired databases, the Transaction Logs node, or both.

Note It is not possible to select individual transaction log extents to be backed up. Instead, to backup transaction log extents, select the Transaction Log node of the tree. NetBackup will then query the Domino server for the list of transaction log extents that are available to be backed up.

5. Click **Backup**.

The Backup Files dialog box is displayed.



When backing up from a Domino partition server, you can specify the absolute path for the `notes.ini` file associated with the particular server partition that will be used to perform the backup. The server partition specified will have an impact on how a database is backed up (if logged) and which set of transaction logs will be backed up.

6. Click **Start Backup**.

Note The NetBackup operation may take a few minutes to complete.

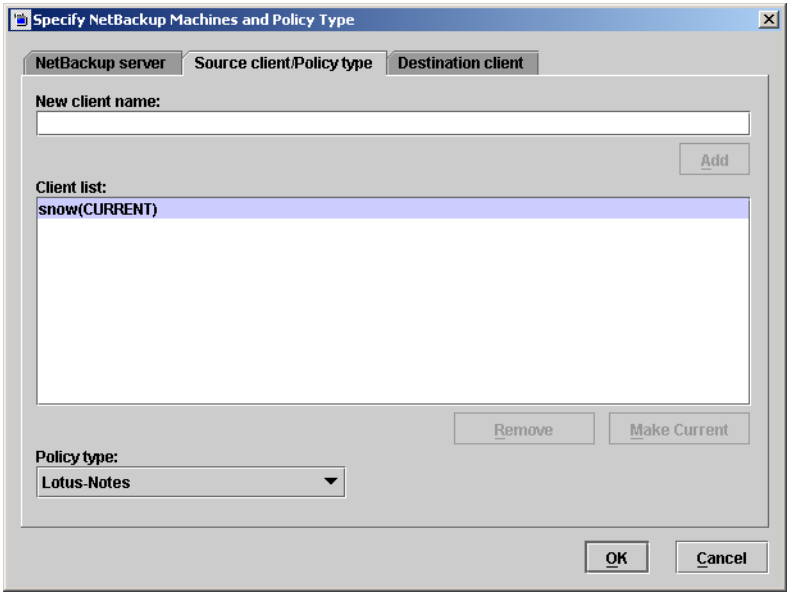
Performing a Restore

This section describes a user-directed restore of a Lotus database using NetBackup for Lotus Notes for UNIX. These instructions supplement the operating instructions in the *NetBackup Backup, Archive, and Restore Getting Started Guide*, to which you can refer for detailed restore instructions.

▼ To perform a restore

1. Open the Backup, Archive, and Restore interface.
2. Log in as Domino Server administrative user. Performing a restore as the root user is not allowed.
3. Click the **Restore Files** tab.
4. Select the appropriate server, source client ,and policy type.
   a. On the **Actions** menu, click **Specify NetBackup Machines and Policy Type**.
   b. Verify that the appropriate server is marked as CURRENT.

      To change the server, select the desired server and click the **Make Current**.
   c. Click on the **Source client/Policy type** tab.



d. Verify that the appropriate client is marked as CURRENT.

The source client is the client on which the backup was performed. To change the source client, select the desired client and click the **Make Current**.

e. From the **Policy type** list, select **Lotus-Notes**.

f. Click **OK**.

5. On the **View** menu, click **Show Most Recent Backup**.

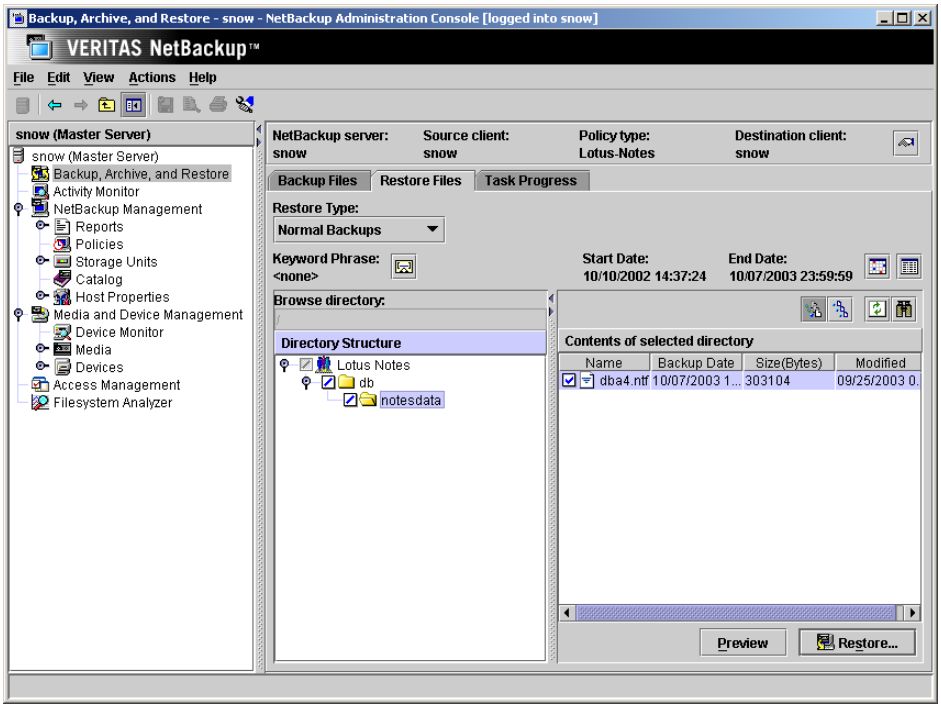
6. On the **View** menu, click **Refresh**.

NetBackup browses for Lotus database backup images.

7. Select the database files you want to restore.

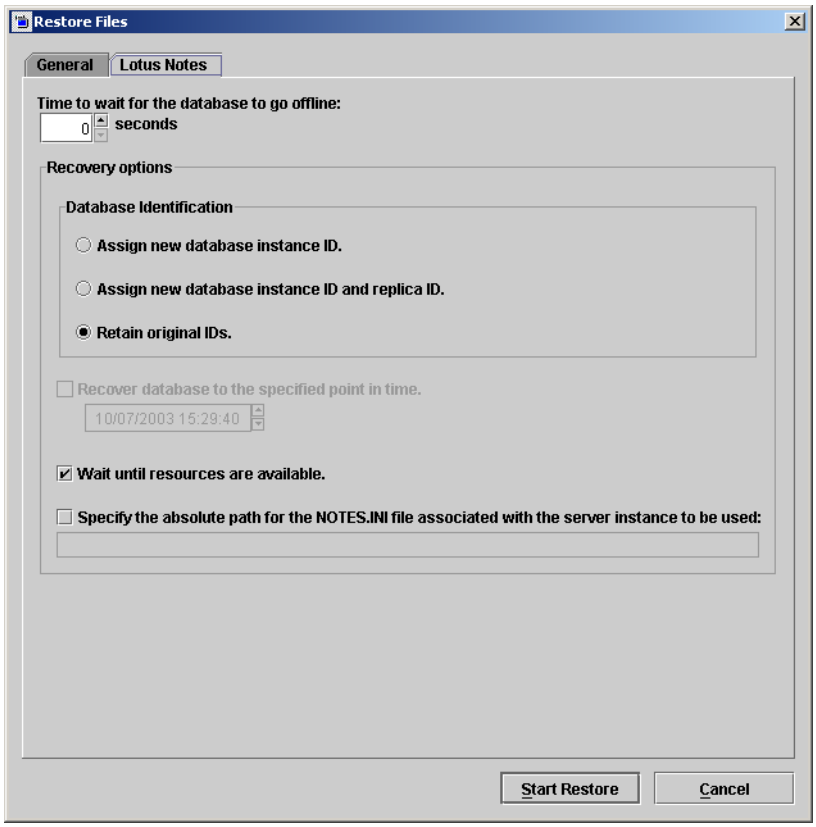
Note While it is possible to select transaction log extents to restore, in general, it is not recommended to do so. If a transaction log extent is required to recover a database, the transaction log extent will be restored automatically as part of the database recovery and recycled automatically by the Domino server when the transaction log extent is no longer required.

Note The **Browse Directory** box is not available when browsing for Lotus-Notes backups on a NetBackup client.



8. Click **Restore**.

The **Restore Files** dialog box is displayed, with the **Lotus Notes** tab displayed.



9. Enter the following information as described below:

- **Time to wait for the database to go offline**: This field allows the user to specify the number of seconds that the restore process will wait for a busy database. When a Lotus database is to be restored it needs to be taken offline. This will ensure that the database is not being accessed, close the database, and delete the database. If the database is being accessed it cannot be taken offline. If the database is still busy and not able to be taken offline after the specified wait time, the restore of that database will fail.
- **Database Identification**: The user can assign a new database instance ID (DBIID), assign a new database instance ID (DBIID) and a new replica ID, or retain the original database instance ID (DBIID) and replica ID during the restore.

The replica ID is used to synchronize two or more databases that are being replicated in the Lotus Domino environment. The user may select to assign a new replica ID during a restore to prevent the other database(s) under replication from replicating over the restored database files.

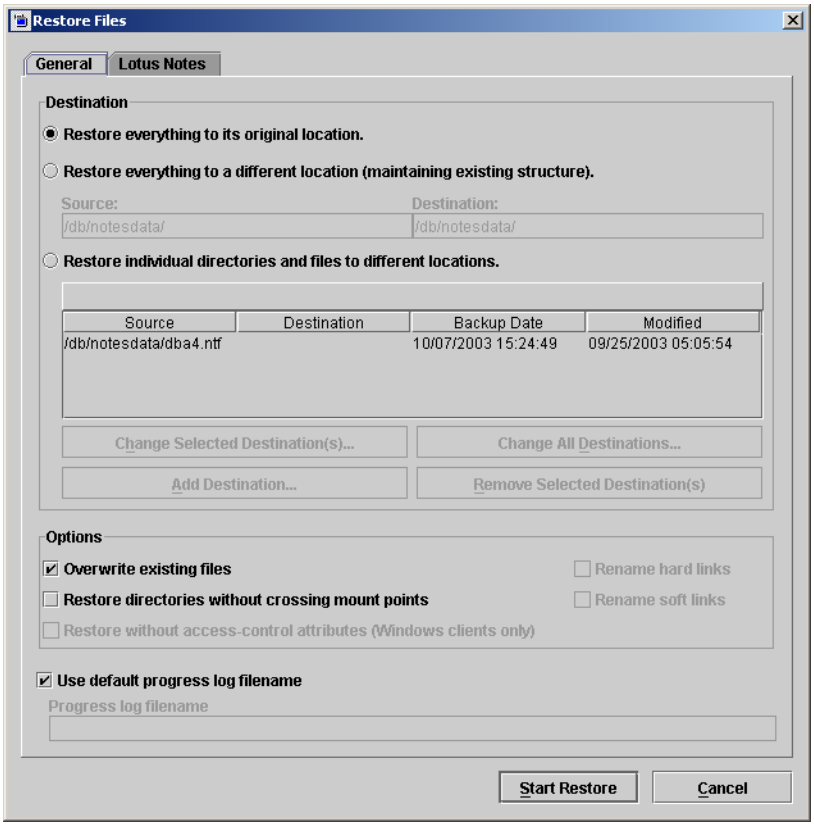
- **Recover database to the specified point in time**: If the user selects to assign a new database instance ID (DBIID), or assign a new database instance ID (DBIID) and a new replica ID, the user will have the option to recover the selected database(s) to a specific point in time.

  The user will click the **Recover database to the specified point in time** checkbox to enable the date and time controls. The date and time can now be set for the restore process.

- **Wait until resources are available**: Click this checkbox to wait for Lotus Domino Server Resources to become available before starting the restore process.

- **Specify the absolute path for the NOTES.INI file associated with the server instance to be used**: When restoring on a Domino partition server, the user can specify the absolute path for the `notes.ini` file associated with the particular server partition that will be used to perform the restore. The server partition specified will have an impact on how a database is restored (if logged) and which set of transaction logs will be used for recovery.

10. Click on the **General** tab.



11. Click **Start Restore**.

Redirecting a Restore to a Different Client

This section describes how to redirect a restore to a different client. A restore redirected to a different client is performed just like a regular restore, except that a different destination client, and, possibly, a different source client is selected. For complete information on performing restores, see "Performing a Restore" on page 62.

▼ **To select a different destination (and source) client**

1. Open a Restore window.
2. Choose **Actions** > **Specify NetBackup Machines**.

   The Specify NetBackup Machines dialog box is displayed.
3. Click on the **Source client** tab.

   a. Select the source client in the **Client list** box and click **Make Current**.

      The source client is the machine name whose backup images you would like to browse.

   b. From the **Policy type** drop-down list, select **Lotus-Notes**.
4. Click on the **Destination client** tab.

   a. In the **Client list** box, enter the client to which to redirect the restore. The NetBackup for Lotus Notes agent must be installed on the destination client.
5. Click **OK**.

   NetBackup will browse the NetBackup Catalog for Lotus Notes backup images.

Lotus Domino Clustering 5

Domino clustering technology can provide high availability, load balancing, and scalability for your Lotus Domino Server environment. Domino clustering uses event-driven replication to keep data in all Domino Servers in the cluster in sync. Domino clustering is a type of "software" clustering. As such, Domino clustering provides failover of databases to an available Domino Server. Domino clustering does not provide failover of the Domino Server itself, as would be expected in a "hardware" clustering environment.

Up to six Domino Servers within the same Notes domain may exist in a Domino cluster. A Domino Server may be a member of a single Domino cluster; however, a Notes domain may have more than one Domino cluster.

Lotus Domino Clustering Components

Several components work together to control a Domino cluster. These include the Cluster Manager, the Cluster Database Directory, the Cluster Database Directory Manager, and the Cluster Replicator.

The *Cluster Manager* runs on each server in a Domino cluster and monitors the state of the other Domino Servers in the Domino cluster. The Cluster Manager performs the following tasks: 1) determines which Domino Servers belong to the Domino cluster, 2) monitors for server availability and workload, 3) fails over database requests due to unavailability of a Domino clustered server, and 4) performs workload balancing.

The *Cluster Database Directory* (CLDBDIR.NSF) is replicated on every server in a Domino cluster. The Cluster Database Directory contains information such as file name, server, replica ID, cluster replication status, and out of service information for each database on each Domino Server in the Domino cluster. The different cluster components use this information to perform their tasks.

The *Cluster Database Directory Manager* (CLDBDIR) task on each Domino Server manages the Cluster Database Directory and keeps it up-to-date. The Cluster Database Directory Manager also monitors the status of each database to determine if they are out of service or pending delete.

The *Cluster Replicator* (CLREPL) task constantly synchronizes the database replicas in a Domino cluster. Because the Cluster Replicator is event-driven, rather than schedule-driven, as in traditional replication, changes that occur to a database in the Domino Cluster are immediately pushed to the other replicas in the Domino cluster. This ensures that each time a database is accessed they contain the most up-to-date data. The Cluster Replicator task will push changes only to those Domino Servers in a Domino cluster. The traditional scheduled replication is used to replicate changes to and from Domino Servers outside a Domino cluster.

Because Domino stores replication events in memory only, both the source and destination servers must be available for the replication to complete successfully. If a destination server is not available, the Cluster Replicator task on the source server will continue to store the replication events in memory until the destination server becomes available. If the source server shuts down before the replication completes, the replication events in memory will be lost. To prevent this loss of data, standard replication should be configured to perform immediate replication with all members of the Domino cluster whenever a Domino cluster server is restarted. It is also recommende-styled that scheduled replication between Domino clustered servers be performed on a regular basis to help maintain database consistency for all members of the Domino cluster.

Backing up a Lotus Domino Replicated or Clustered Environment

If using transaction logging, it is recommended that when configuring your Domino cluster environment:

- Archive-style logging be enabled on the Domino Server that will function as your backup server.
- Circular- or linear-style logging be enabled on all other Domino Servers in the Domino cluster.

  By running circular-style or linear-style logging on the non-backup Domino Servers, all the advantages of transaction logging such as data reliability and integrity and improved Domino Server performance can be attained without having to manage (recycle) the archival-style transaction logs.

It is also recommended that such non-database Domino files as the `notes.ini`, user and server certificates ids, the `CLUSTER.NCF` file also be backed up as part of the standard backup.

Restore/Recovery in a Lotus Domino Replicated or Clustered Environment

Because Domino clustering is a “software” clustering solution that relies on software replication to provide consistency of the databases across all members of the Domino cluster, the replica ID plays an important role in achieving the expected results when attempting to restore a Domino database from backup. Understanding how replication functions is vital to achieving the expected result. The following examples illustrate two possible restore/recovery scenarios.

Example 1

The environment is a Lotus Domino Clustered environment with four Lotus Domino Servers as members of the Domino cluster. Server A is identified as your backup server and is running archive-style transaction logging. Servers B, C, and D are running circular- or linear-style logging. To provide load balancing across all the Domino Servers, replicas of all databases exist on all four servers in your Domino cluster. A successful full backup of all databases was completed earlier in the week. Successful incremental backups of the archival-style transaction logs are completed every four hours, with the last one completing 2 hours ago. At 2:30 pm, a user complains that the database `ACME.NSF` has become corrupted, while modifying the database on server C over the last 30 minutes. Unfortunately, because the environment is a Domino cluster environment, the corruption has been replicated to all four member servers. The user states that the database was in a consistent state when he began modifying the database.

▼ **To restore the database to a consistent state:**

1. On server A, perform a point-in-time recovery of the database `ACME.NSF`. Select the database `ACME.NSF` from the last successful backup of the database (eg. the full backup completed successfully earlier in the week). Begin the restore.

2. On the **Lotus Notes** tab of the Restore Marked Files dialog box, select the **Assign new database ID and replica ID** option, select the **Restore database(s) to date and time** option, and specify today's date at 2:00 pm (the time the user started modifying the database) as the point-in-time for recovery.

3. After the restore/recovery is successful, a version of `ACME.NSF` recovered to today at 2:00 pm should exist on server. Verify the consistency of `ACME.NSF` on server A. If all is as expected, from server A create new replicas of `ACME.NSF` on servers B, C, and D. Cluster replication on a consistent version of `ACME.NSF` should now be functional on servers A, B, C, and D.

Example 2

The environment is a Lotus Domino Clustered environment with three Lotus Domino Servers as members of the Domino cluster. Server C is identified as your backup server and is running archive-style transaction logging. Servers A and B are running circular-style or linear-style logging. To provide high availability and load balancing of mail, replicas of all mail databases between A-L exist on servers A and C and replicas of all mail databases between M-Z exist on servers B and C. A successful full backup of all databases was completed earlier in the week. Successful incremental backups of the archive-style transaction logs are completed every four hours, with the last one completing 2 hours ago. A user complains that he has just realized that yesterday afternoon about 3:30 pm he deleted 30 mail messages from his mail database mander.nsf that should not have been deleted.

▼ **To recover the accidentally deleted mail:**

1. On server C, perform a point-in-time recovery of the database /mail/mander.nsf. Select the database /mail/mander.nsf from the last successful backup of the database (e.g., the full backup completed successfully earlier in the week). Begin the restore.

2. On the **Lotus Notes** tab of the Restore Marked Files dialog box, select the **Assign new database ID and replica ID** option, select the **Restore database(s) to date and time** option, and specify yesterday's date at 3:25 pm (the time just prior to when the user deleted the mail messages) as the point-in-time for recovery.

3. After the restore/recovery is successful, a version of /mail/mander.nsf recovered to yesterday at 3:25 pm and containing the deleted messages should exist on server C. Verify the existence of messages in /mail/mander.nsf on server C. If all is as expected, copy the accidentally deleted messages from /mail/mander.nsf on server C to the database on server B.

4. After the copy, verify the existence of the messages in /mail/mander.nsf on server B. If all is as expected, from server B create a new replica of /mail/mander.nsf on server C. Cluster replication should now be functional for /mail/mander.nsf on servers B and C.

It is important to note in the example above that the **Assign new database ID and replica ID** option was chosen. If the **Assign new database ID** option had been chosen instead, the final results of the recovery would have been very different. As in the example above, the restore of the database /mail/mander.nsf functions the same, except the replica ID is not changed. The database would have then been recovered to the specified point-in-time. However, because the replica ID of the database /mail/mander.nsf on server C had not been changed as part of the restore, the replica ID of the database on server C still matches the replica ID of the database on server B. Therefore, all the changes to the database between the point-in-time the database was recovered to and the current time, including the deletion of the 30 mail messages, will eventually be replicated from the database on

server B to the database on server C. The final result will be two identical copies of the database /mail/mander.nsf, one on server B and the other on server C, that are the same as when we started restoring the database /mail/mander.nsf on server C.

Lotus Domino Partitioned Servers 6

Domino partitioned servers allow multiple Domino Servers to run on a single computer. The advantages of using Domino partitioned servers are to reduce hardware expenses and minimize the number of computers that need to be administered. Each Domino partitioned server has its own Domino data directory and `notes.ini` file, but all Domino partitioned servers on a single computer share the same Domino program directory.

Lotus recommends using different user accounts for each Domino partitioned server to allow easier use of such commands as `nsd` to clean up orphaned processes after a Domino Server crash. To accommodate this recommendation, the NetBackup for Lotus Notes for UNIX agent will easily support backups and restores of multiple Domino Server partitions each using a different UNIX user account. It is possible to backup multiple Lotus partitions from a single NetBackup policy, however, each partition must be backed up using a separate data stream.

Backups in a Domino Partitioned Server Environment

The following examples illustrate two possible configurations of the Backup Selections list that could be used to backup a Lotus partitioned server environment.

Example 1

The environment is a Domino partitioned server environment running with two partitions. The Domino data directory for partition 1 is located at `/db/notesdata1` and the Domino data directory for partition 2 is located at `/db/notesdata2`. To backup this environment with two separate NetBackup policies, the following would be added to the Backup Selections list:

Policy 1

```
NOTES_INI_PATH=/db/notesdata1/notes.ini
/db/notesdata1
```

Policy 2

```
NOTES_INI_PATH=/db/notesdata2/notes.ini
/db/notesdata2
```

Example 2

The environment is a Domino partitioned server environment running with three partitions. The Domino data directory for partition1 is located at `/db/notesdata1`, the Domino data directory for partition 2 is located at `/db/notesdata2`, and the Domino data directory is located at `/db/notesdata3`. Each partition is configured to use archive-style transaction logging. To back up this environment using a single NetBackup policy, the following would be added to the Backup Selections list:

Policy 1

```
NEW_STREAM
NOTES_INI_PATH=/db/notesdata1/notes.ini
/db/notesdata1
BACKUP_TRANSACTION_LOGS
NEW_STREAM
NOTES_INI_PATH=/db/notesdata2/notes.ini
/db/notesdata2
BACKUP_TRANSACTION_LOGS
NEW_STREAM
NOTES_INI_PATH=/db/notesdata3/notes.ini
/db/notesdata3
BACKUP_TRANSACTION_LOGS
```

Restoring a Domino Partitioned Server Environment

As with restores of a non-partitioned Domino Server environment, restores of a partitioned server environment must be performed as the user that owns the Domino data directory for the partition being restored. For Lotus Domino Server, the `notes.ini` file determines how a database to be restored is accessed and which Lotus transaction log extents to use for recovery. Because each partition in a Domino partitioned server environment has its own `notes.ini`, it is required that Lotus databases from different partitions must be restored in separate restore operations.

Troubleshooting 7

The NetBackup master server and client software offers a comprehensive set of debug logs for troubleshooting problems that may occur during NetBackup operations. Debug logs are covered in detail in the *NetBackup Troubleshooting Guide for UNIX and Windows*.

If you are experiencing problems backing up or restoring databases or transaction log extents, and the cause of the problem cannot be determined from standard NetBackup progress reports, you may enable NetBackup debug logs to aid in determining the cause of the problem. Debug logging is enabled by creating certain directories under the NetBackup `Logs` directory.

The following topics cover troubleshooting of NetBackup:

- Backup Operation Debug Logging
- Restore Operation Debug Logging
- Changing the Debug Level
- Viewing the Status of a NetBackup Operation

Backup Operation Debug Logging

To turn on debug logging for backup operations, create the following directory:

```
/usr/openv/netbackup/logs/bpbkar
```

After creating this directory and performing a backup, debug logging information will be placed in the following file:

```
/usr/openv/netbackup/logs/bpbkar/mmddyy.log
```

Restore Operation Debug Logging

To turn on debug logging for restore operations, create the following directory:

`/usr/openv/netbackup/logs/tar`

After creating this directory and performing a restore, debug logging information will be placed in the following file:

`/usr/openv/netbackup/logs/tar/mmddyy.log`

For details on the contents of these debug logs, refer to the *NetBackup Troubleshooting Guide for UNIX and Windows*. After the cause of the problem has been determined, debug logging can be disabled by removing the previously created debug logging directories.

Note When debug logging is enabled, the files can become large. The same files are used by normal file backups.

Changing the Debug Level

You can control the amount of information written to the debug log in the *install_path*/NetBackup/logs/bpbkar directory by changing the General debug level. The higher the value, the more information is logged. In everyday normal operations, the default value of 0 is sufficient. However, VERITAS technical support may ask you to set the value higher when a problem is being analyzed.

▼ **To change the Debug Level**

1. Enter the following line in the bp.conf file.

```
VERBOSE = 2
```

Viewing the Status of a NetBackup Operation

NetBackup provides many standard status reports to verify the completion of backup and restore operations. In addition, users and the administrator can set up additional reports if a site requires them.

Operational Reports

The administrator has access to operational progress reports through the NetBackup Administration Console. Reports may be generated for Status of Backups, Client Backups, Problems, All Log Entries, Media Lists, Media Contents, Images on Media, Media Logs, Media Summary, and Media Written. These reports may be generated for a specific time frame, client, or master server. Refer to *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for details.

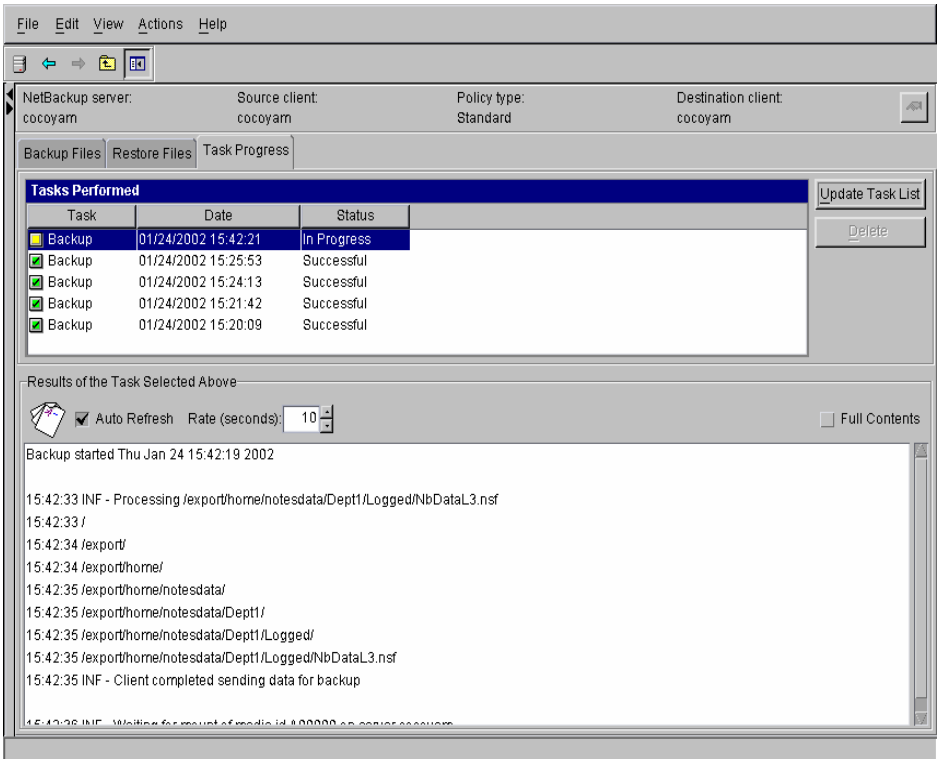
Progress Reports

Progress reports on the client allow easy monitoring of user operations. When reports are created by the NetBackup client for each user-directed backup or restore operation, administrators can monitor these operations and detect any problems that may occur.

▼ **To view the status of an operation**

1. Click the **Task Progress** tab.
2. Click **Update Task List**.
3. Click on the task for which you want to check the progress.

The status of the operation is displayed in the lower pane.



When `the requested operation was successfully completed` message appears, the NetBackup operation is finished. (See your *NetBackup Backup, Archive, and Restore Getting Started Guide* for further information on the progress report and the meanings of the messages.)

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