

VERITAS NetBackup™ 4.5 for MS-SQL Server

System Administrator's Guide

on Windows NT/Windows 2000

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VERITAS

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VERITAS Software Corporation
350 Ellis Street
Mountain View, CA 94043
USA
Phone 650-527-8000
Fax 650-527-8050
www.veritas.com



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Preface

This guide describes how to install, configure and use the NetBackup for Microsoft SQL Server extension on a Windows NT or Windows 2000 platform.

For specific information about the NetBackup Server software, refer to:

- ◆ *NetBackup System Administrator's Guide for UNIX*, if you have a UNIX server.

or

- ◆ *NetBackup System Administrator's Guide for Windows* if you have a Windows NT or a Windows 2000 server.

This document is the same as `NetBackup_AdminGuide_MS-SQL_NT.pdf` distributed with the NetBackup for SQL Server software.

In this manual, NetBackup for Microsoft SQL Server will be referred to as NetBackup for SQL Server. Microsoft SQL Server will be referred to as Microsoft SQL Server.



Audience

This guide is intended for the:

- ◆ Microsoft SQL Server system administrator responsible for configuring and using Microsoft SQL Server.
- ◆ NetBackup system administrator responsible for configuring NetBackup.

A system administrator is a person with system administrator privileges and responsibilities.

This guide assumes:

- ◆ A basic understanding of Windows NT or Windows 2000 system administration.
- ◆ A working understanding of the NetBackup for Windows NT or Windows 2000 client software.
- ◆ A working understanding of the NetBackup for UNIX server software.
- ◆ A familiarity with the information covered in the following NetBackup manuals:
 - *NetBackup System Administrator's Guide for UNIX* or *NetBackup System Administrator's Guide for Windows*.
 - *NetBackup Troubleshooting Guide for UNIX* or *NetBackup Troubleshooting Guide for Windows*.
- ◆ A thorough understanding of the Microsoft SQL Server administration.

Organization

This guide is organized as follows:

- ◆ *Introduction*, provides an overview of NetBackup for SQL Server and lists some features. Read this chapter to become familiar with NetBackup.
- ◆ *Installation*, describes the system configuration requirements and the installed components of NetBackup for SQL Server.
- ◆ *Configuration*, explains how to configure NetBackup for SQL Server.
- ◆ *Using NetBackup for SQL Server*, explains how to use NetBackup for SQL Server for installing and backing up transaction logs and databases.
- ◆ *Troubleshooting*, describes the various troubleshooting tools available with NetBackup for SQL Server.
- ◆ *Reference*, describes the various dialog boxes, screens, and menus associated with the NetBackup Database Extension Graphical User Interface.



In addition to these chapters, there is a glossary of terms that you will frequently encounter when using and discussing NetBackup for SQL Server.

Related Documents

The following documents provide related information. For a more detailed listing of NetBackup documents, refer to *NetBackup Release Notes*.

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

- ◆ *NetBackup System Administrator's Guide for UNIX*
Explains how to configure and manage NetBackup on a UNIX system.
- ◆ *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.
- ◆ *NetBackup Troubleshooting Guide for UNIX*
Provides troubleshooting information for UNIX-based NetBackup products. You can also refer to www.support.veritas.com, access the Knowledge Base Search option, and search for TechNotes.

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

- ◆ *NetBackup System Administrator's Guide for Windows*
Explains how to configure and manage NetBackup on a Windows server system.
- ◆ *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.
- ◆ *NetBackup Troubleshooting Guide for Windows*
Provides troubleshooting information for Windows-based NetBackup products. You can also refer to www.support.veritas.com, access the Knowledge Base Search option, and search for TechNotes.

Accessibility

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.

Conventions

The following explains typographical and other conventions used in this guide.

Type Style

Typographic Conventions

Typeface	Usage
Bold fixed width	Input. For example, type <code>cd</code> to change directories.
Fixed width	Paths, commands, filenames, or output. For example: The default installation directory is <code>/opt/VRTSxx</code> .
<i>Italics</i>	Book titles, new terms, or used for emphasis. For example: <i>Do not</i> ignore cautions.
<i>Sans serif</i> (italics)	Placeholder text or variables. For example: Replace <i>filename</i> with the name of your file.
Serif (no italics)	Graphical user interface (GUI) objects, such as fields, menu choices, etc. For example: Enter your password in the Password field.

Notes and Cautions

Note This is a Note. Notes are used to call attention to information that makes using the product easier or helps in avoiding problems.

Caution This is a Caution. Cautions are used to warn about situations that could cause data loss.



Key Combinations

Some keyboard command sequences use two or more keys at the same time. For example, holding down the **Ctrl** key while pressing another key. Keyboard command sequences are indicated by connecting the keys with a plus sign. For example:

Press Ctrl+t

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
```

the user can use either the *arg1* or *arg2* variable.

Terms

The terms listed in the table below are used in the VERITAS NetBackup documentation to increase readability while maintaining technical accuracy.

Term	Definition
Microsoft Windows, Windows	<p>Terms used as nouns to describe a line of operating systems developed by Microsoft, Inc.</p> <p>A term used as an adjective to describe a specific product or noun. Some examples are: Windows 95, Windows 98, Windows NT, Windows 2000, Windows servers, Windows clients, Windows platforms, Windows hosts, and Windows GUI.</p> <p>Where a specific Windows product is identified, then only that particular product is valid with regards to the instance in which it is being used.</p> <p>For more information on the Windows operating systems that NetBackup supports, refer to the VERITAS support web site at http://www.support.veritas.com.</p>



Term	Definition (continued)
Windows servers	A term that defines the Windows server platforms that NetBackup supports; those platforms are: Windows NT and Windows 2000.
Windows clients	A term that defines the Windows client platforms that NetBackup supports; those platforms are: Windows 95, 98, ME, NT, 2000, XP (for 32- and 64-bit versions), and LE.

Getting Help

For updated information about this product, including system requirements, supported platforms, supported peripherals, and a list of current patches available from Technical Support, visit our web site:

`http://www.support.veritas.com/`

VERITAS Customer Support has an extensive technical support structure that enables you to contact technical support teams that are trained to answer questions to specific products. You can contact Customer Support by sending an e-mail to `support@veritas.com`, or by finding a product-specific phone number from the VERITAS support web site. The following steps describe how to locate the proper phone number.

1. Open `http://www.support.veritas.com/` in your web browser.
2. Click **Contact Support**. The *Contacting Support Product List* page appears.
3. Select a product line and then a product from the lists that appear. The page will refresh with a list of technical support phone numbers that are specific to the product you just selected.



NetBackup for SQL Server extends the capabilities of NetBackup for Windows to include backing up and restoring Microsoft SQL Server databases. These capabilities are provided for a Windows client using either a UNIX or Windows NetBackup master server.

NetBackup for SQL Server includes a client-based graphical user interface (GUI) program to perform various activities on Microsoft SQL Server. These activities include:

- ◆ Setting options for NetBackup for SQL Server operations.
- ◆ Backing up, restoring and copying databases and database components, which include transaction logs, differentials, files and filegroups.
- ◆ Starting NetBackup for SQL Server operations from batch files which you have created.
- ◆ Monitoring NetBackup for SQL Server operations.



Features

This section describes the main features of NetBackup for SQL Server.

NetBackup Operations

- ◆ Full integration with the NetBackup master server and Media Manager.
- ◆ Support for Microsoft SQL Server 6.5, 7.0 and 2000 operations. NetBackup for SQL Server will detect which level of Microsoft SQL Server is installed.
- ◆ Backup and restore operations for Microsoft SQL Server 7.0 and 2000 use Microsoft's high-speed Virtual Device Interface.
- ◆ Backup and recovery of databases, differentials, files, filegroups, and transaction logs.
- ◆ Support for redirection of SQL Server restores to different locations.
- ◆ Support for multiple SQL Server instances.
- ◆ Client operation monitoring through the NetBackup Client Job Monitor. Server monitoring is also available through the NetBackup master.
- ◆ Performance tuning through user control of backup stripes, transfer size, and buffer usage.
- ◆ Job launch is supported through the following options:
 - Immediate launch through the NetBackup Database Extension GUI
 - Scheduled launch through the NetBackup scheduler
 - Command line launch
- ◆ Support for Microsoft Cluster Server
- ◆ Recovery of Microsoft SQL Server objects from VERITAS Backup Exec images.

Graphical User Interface

- ◆ GUI capability for browsing:
 - Microsoft SQL Server databases
 - Microsoft SQL Server database files and filegroups
 - Backup Exec images converted for NetBackup
- ◆ GUI assistance for staging a complete database restore from:
 - A database backup, a differential backup (optional), and a series of transaction logs



- File and filegroup backup, and a series of transaction logs
- ◆ GUI assistance for restoring database objects backed up on one Microsoft SQL Server client to another Microsoft SQL Server client.
- ◆ GUI assistance for creating and saving a backup script as an alternative to performing an immediate job launch.
- ◆ Online help provided through the NetBackup Database Extension GUI.

Note With this release, you cannot directly back up individual Microsoft SQL Server tables. However, if you place a single table in a file, then you can back up just that file without backing up the rest of the database.





This chapter covers installation of the NetBackup for SQL Server. It includes:

- ◆ System Configuration Requirements
- ◆ Installation Instructions



System Configuration Requirements

To use NetBackup for SQL Server, you need:

- ◆ Windows NT 4.0 with Service Pack 3 or higher, or Windows 2000
- ◆ NetBackup server for UNIX, Windows NT, or Windows 2000, version 4.5 or greater
- ◆ Microsoft SQL Server 6.5, 7.0 with Service Pack 1 or higher, or 2000

Users of NetBackup for SQL Server should have a working knowledge of the following topics:

- ◆ NetBackup client and server software
- ◆ Microsoft SQL Server



Installing NetBackup for SQL Server

The following is the procedure for installing NetBackup for SQL Server.

Installation Requirements

- ◆ A valid license key for NetBackup for SQL Server must be registered on the master or media server. License keys can be added from the NetBackup Administration Console. From the **Help** menu, choose **License Keys**.
- ◆ The version of the NetBackup Client and the version of NetBackup for SQL Server must be the same (e.g., 4.5).

▼ To install NetBackup for SQL Server:

1. Log on as Administrator.
2. Check that NetBackup for Windows and Microsoft SQL Server are installed on the Windows system.
3. Insert the NetBackup CD-ROM into the drive.
 - On systems with AutoPlay enabled for CD-ROM drives, the NetBackup install program starts automatically.
 - On Windows NT 4.0 or Windows 2000 systems that have AutoPlay disabled, run the `Launch.exe` program in the root directory on the CD-ROM.
4. Below the “Main Menu” on the left, click **Database Agents**.
5. Click **Database Agent Installation**.
6. Click **Microsoft SQL Server**.
7. Click **Next** and follow the prompts in the setup program.

Refer to the `readme.txt` file, found in the `MSSQL` install directory, for more details.





This chapter describes how to configure NetBackup for SQL Server. The following sections in this chapter describe each of these steps in detail.

1. Verifying Installed Components
2. Configuration Using the NetBackup Administration Console
3. Configuring the Media Manager
4. Setting the Maximum Jobs per Client Global Attribute
5. Configuring a NetBackup Policy
6. Configuring for Striped Backups and Restores
7. SQL Server Configuration

This chapter also contains “NetBackup Administration Console for Windows” on page 38 and “Performance Factors” on page 55.



Verifying Installed Components

Note *install_path* refers to the directory where you installed the NetBackup software. By default, this directory is `C:\Program Files\VERITAS\`.

When you installed NetBackup for SQL Server, the following actions were taken.

- ◆ An icon was added to the NetBackup Program Group

NetBackup - MSSQL Client

- ◆ The following new directories were created, if they did not already exist on your Windows NT/2000 host:

`install_path\NetBackup\DbExt\Mssql`

The default directory for batch files and miscellaneous items pertaining to installation.

`install_path\NetBackup\logs\user_ops\Mssql\jobs`

The directory containing NetBackup master server logging files for each operation that you perform.

`install_path\NetBackup\logs\user_ops\Mssql\logs`

The directory containing NetBackup client logging files for each operation that you perform.

- ◆ A readme file (`Readme.txt`) was placed in `install_path\NetBackup\DbExt\Mssql`.
- ◆ Two sample *batch* files were placed in `install_path\NetBackup\DbExt\Mssql`:

`bkup.bch`

`rest.bch`

Batch files are described in “Using Batch Files” on page 125.

- ◆ The following lists binaries created for NetBackup for SQL Server. The path for these components is `install_path\NetBackup\bin\`.

`DBbackmain.dll` NetBackup client DLL which backs up and restores SQL Server databases.

`dbbackup.exe` Graphical user interface to `dbbackmain`.



<code>dbbackex.exe</code>	A command-line interface to <code>dbbackmain</code> . It is also called internally by the NetBackup client (through <code>bphdb</code>), and by NetBackup for SQL Server for performing NetBackup scheduling operations.
<code>tdbackmain.dll</code>	Additional NetBackup client functions.

See *install_path*\NetBackup\DbExt\Mssql\Readme.txt for further information on the installation components.



Configuration Using the NetBackup Administration Console

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 the Media Manager
- ◆ Setting the Maximum Jobs per Client global attribute
- ◆ Configuring a NetBackup policy
- ◆ Testing NetBackup for SQL Server configuration settings

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

Starting the NetBackup Administration Console for Windows

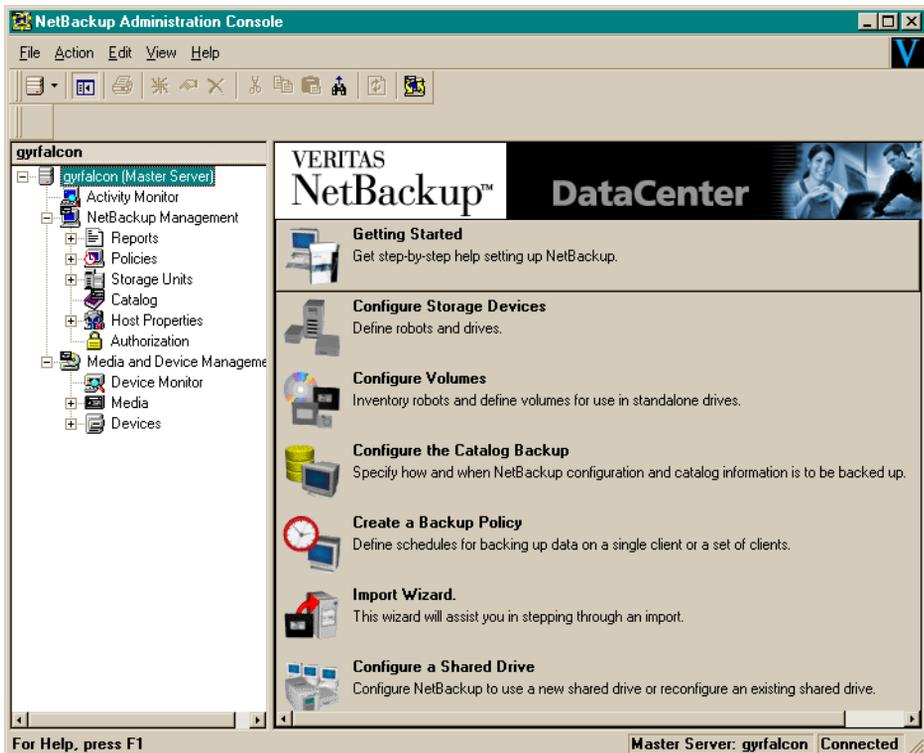
This section contains information on launching the Windows server version of the NetBackup Administration Console.

▼ To launch the NetBackup Administration Console for Windows

1. Log on to the server as administrator.
2. From the Windows **Start** menu, point to **Programs**, point to **VERITAS NetBackup** and click **NetBackup Administration Console**.



The NetBackup Administration Console appears.



Starting the NetBackup Administration Console for UNIX

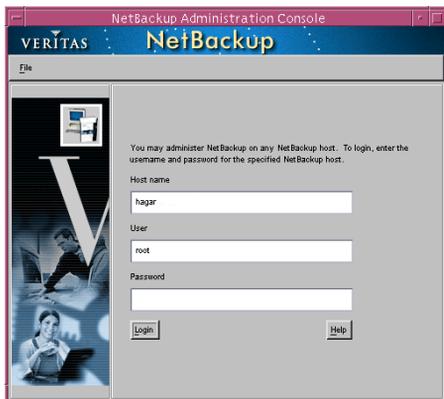
This section contains information on launching the Unix version of the NetBackup Administration Console.

▼ To launch the NetBackup Administration Console for UNIX

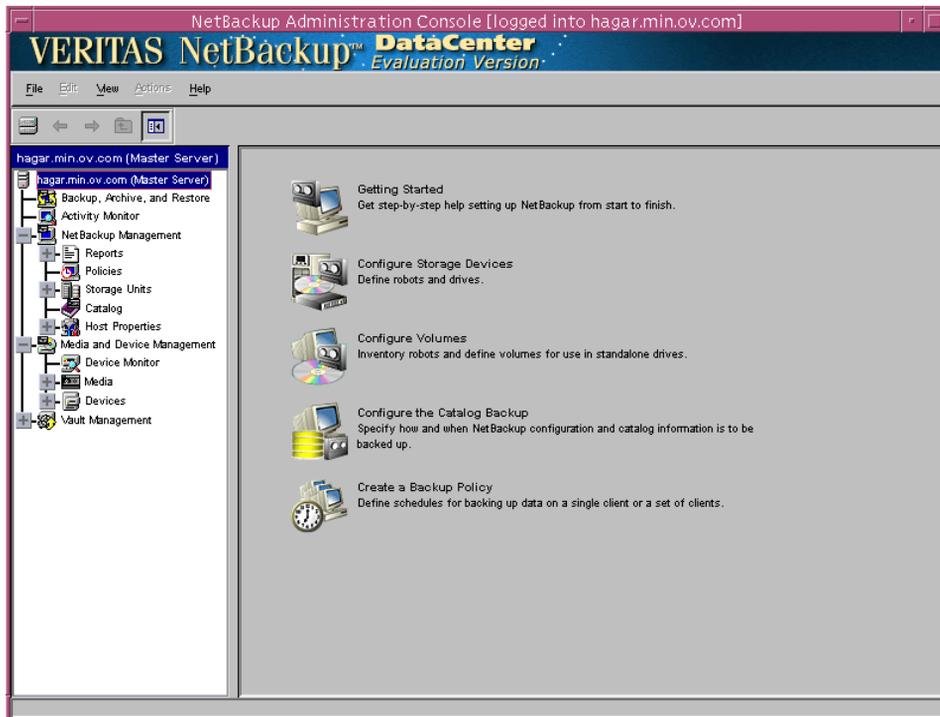
1. Log onto the UNIX server as root.
2. Start the NetBackup Administration Console by executing:
`install_path/netbackup/bin/jnbSA &`



The Login dialog box appears.



3. Type the name of the master server where you initially want to manage NetBackup. You can specify any NetBackup master server. Indicate the User and Password.
4. Click **Login**. The NetBackup Administration Console appears.



Configuring the Media Manager

Use the Media Manager to configure tapes or other storage units for a NetBackup for SQL Server configuration.

- ◆ Refer to the *Media Manager for NetBackup System Administrator's Guide for UNIX* if the NetBackup server is UNIX.
- ◆ Refer to the *Media Manager for NetBackup System Administrator's Guide for Windows* if the NetBackup server is Windows.

The number of volumes required will depend on the devices used, the size of the SQL Server databases that you are backing up, the size of your backups, and the frequency of backups.



Setting the Maximum Jobs per Client Global Attribute

The **Maximum jobs per client** attribute value is figured with the following formula.

$$\text{Max Jobs per Client} = \text{Number of Streams} \times \text{Number of Policies}$$

Where:

- ◆ *Number of Streams* is the number of backup streams between the database server and NetBackup. If striping is not used, then each separate stream starts a new backup job on the client. If striping is used, then each new job uses one stream per stripe.
- ◆ *Number of Policies* is the number of policies that may back up this client at the same time. This number can be greater than one. For example, a client may be in two policies in order to back up two different databases. These backup windows may overlap.

NetBackup Administration Console for Windows

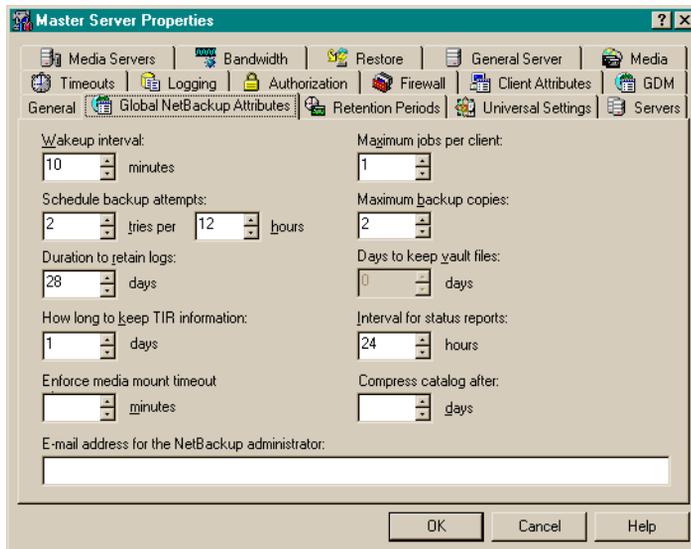
Use this procedure to set the **Maximum jobs per client** attribute on a Windows server or on a Remote Administration Console host.

▼ To set the Maximum jobs per client attribute on a Windows server

1. In the left pane of the NetBackup Administration Console, expand **Host Properties**. Select **Master Server**.
2. In the right pane, double-click on the server icon.
The Master Server Properties dialog box appears.



3. In the Master Server Properties dialog box, click the **Global NetBackup Attributes** tab.



The default value is 1 for **Maximum jobs per client**.

4. Change the **Maximum jobs per client** value to a value equal to the maximum number of backups allowed per client.

Tip To avoid any problems, we recommend that you enter a value of 99 for the **Maximum jobs per client** global attribute.

NetBackup Administration Console for UNIX

Use this procedure to set the **Maximum jobs per client** global attribute on a UNIX server.

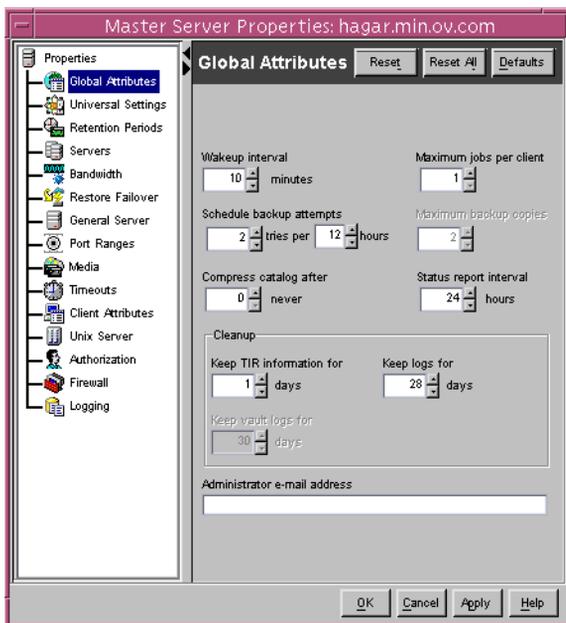
▼ To set the Maximum jobs per client attribute on a UNIX server

Use this procedure to set the **Maximum jobs per client** global attribute using the NetBackup Administration Console - Java interface on a Java-capable platform.

1. In the left pane of the NetBackup Administration Console, expand **Host Properties**. Select **Master Servers**.
2. In the right pane, double-click on the server icon. Click **Global Attributes**.



The Master Server Properties dialog box appears.



The default value is 1 for **Maximum jobs per client**.

3. Change the **Maximum jobs per client** value to a value equal to the maximum number of backups allowed per client.

Tip To avoid any problems, we recommend that you enter a value of 99 for the **Maximum jobs per client** global attribute.

Configuring a NetBackup Policy

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

- ◆ storage unit and media to use
- ◆ backup schedules
- ◆ batch file files to be executed on the clients
- ◆ clients to be backed up

To use NetBackup for SQL Server, at least one MS-SQL-Server 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 MS-SQL-Server 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 detailed configuration instructions and information on all the attributes available.

NetBackup Administration Console for Windows

Adding New Policies

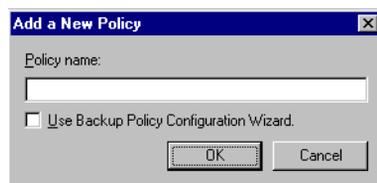
Use this procedure when configuring a policy from a Windows server or from a NetBackup Remote Administration Console host.

▼ To add a new policy

Note If you are going to perform striped dumps or loads, see “Configuring for Striped Backups and Restores.”

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**. From the menu, select **New Policy**.

The Add a New Policy dialog box appears.



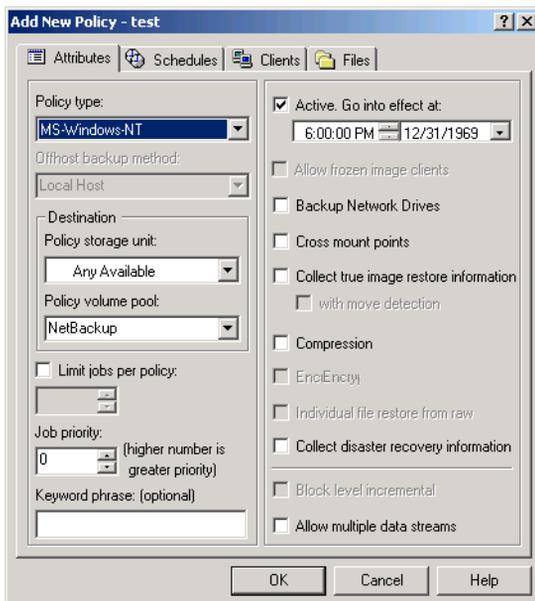
- a. In the **Policy name** box, type a unique name for the new policy.
- b. Choose whether to use the wizard for configuring the policy. The wizard guides you through the setup process and simplifies it by automatically choosing default values that are good for most configurations. If necessary, you can change the defaults later by editing the policy.



- 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 MS-SQL-Server policy type.
- 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 box appears in which you can specify the general attributes for the policy.



6. From the **Policy Type** box, select the MS-SQL-Server 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 scripts, see “Specifying the List of Scripts.”
 - To add clients, see “Adding Clients to a Policy.”
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 Microsoft SQL Server backups are explained below.

Your other policy attributes will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide* 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 SQL Server, you must have defined at least one MS-SQL-Server policy.
Keyword phrase	For NetBackup for SQL Server, the keyword phrase entry is ignored.

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.

A Microsoft SQL Server backup requires at least two specific schedule types: an Application Backup schedule and an Automatic Backup schedule. You can also create additional schedules.

The following procedures explain how to configure the required schedule types, and how to add other new schedules.

▼ To configure an Application Backup schedule

1. Double-click on the schedule named **Default-Application-Backup**.

All Microsoft SQL Server database operations are performed through NetBackup for SQL Server using an Application Backup schedule. This includes those backups started automatically.

You must configure an Application Backup schedule for each MS-SQL-Server policy you create. If you do not do this, you will not be able to perform a backup. To help satisfy this requirement, an Application Backup schedule named **Default-Application-Backup** is automatically created when you configure a new MS-SQL-Server policy.



2. Specify the other properties for the schedule as explained in “Schedule Properties.”

The backup window for an Application Backup schedule must encompass the time period during which all NetBackup jobs, scheduled and unscheduled, will occur. This is necessary because the Application Backup schedule starts processes that are required for all NetBackup for SQL Server backups, including those started automatically.

For example, assume that you:

- expect users to perform NetBackup operations during business hours, 0800 to 1300.
- configured automatic backups to start between 1800 and 2200.

The Application Backup schedule must have a start time of 0800 and a duration of 14 hours.

Example Settings for an Application Backup schedule.

Type of Backup	Schedule settings	Description	Settings
Application Backup	Retention	The length of time backup images are stored.	2 weeks
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday through Saturday 00:00:01 - 23:59:59

Tip Set the time period for the Application Backup schedule for 24 hours per day, seven days per week. This will ensure that your NetBackup for SQL Server operations are never locked out due to the Application Backup schedule.

▼ **To configure an automatic backup schedule**

1. In the left pane, right-click on the name of the policy and select **New Schedule** from the menu.

The Add New Schedule dialog box appears. The title bar shows the name of the policy to which you are adding the schedules.

2. Specify a unique name for the schedule.
3. Select the **Type of Backup**.

For information on the types of backups available for this policy, see “Types of Backups.”



Refer to the following table for recommended settings for an Automatic Backup schedule.

Example Settings for an Automatic Backup Schedule.

Type of Backup	Schedule settings	Description	Settings
Automatic Backup	Retention	The length of time to store the record of a backup.	2 weeks
	Frequency	Frequency determines how often a backup should be performed	every week
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday, 18:00:00 - 22:00:00

Tip If you put multiple batch files in the same MS-SQL-Server policy, they will execute during each Automatic Backup session for that MS-SQL-Server policy. If you have a variety of SQL Server backup operations that you wish to have executed on different schedules, then consider creating multiple MS-SQL-Server policies with differing Automatic Backup schedules; and then assign each batch file to the policy that uses the desired Automatic Backup schedule.

- Specify the other properties for the schedule as explained in “Schedule Properties.”

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.

Other schedule properties will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide* 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 “Types of Backups.”



Description of Schedule Properties

Property	Description
Frequency	<p>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.</p>
Calendar	<p>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.</p>
Retention	<p>Frequency based scheduling</p> <p>The retention period for an Application Backup Policy schedule refers to the length of time that NetBackup keeps backup images.</p> <p>For example, if your database is backed up once every Sunday morning, you should select a retention period of at least 2 weeks. The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred.</p> <p>The NetBackup scheduler compares the latest record to the frequency to determine whether a backup is due. This means that if you set the retention period to expire the record too early, the scheduled backup frequency will be unpredictable. However, if you set the retention period to be longer than necessary, the NetBackup catalog will accumulate unnecessary records. <i>Therefore, set a retention period that is <u>longer</u> than the frequency setting for the schedule.</i></p> <p>For example, if the frequency setting is set to one week, set the retention period to be more than one week.</p> <p>Calendar based scheduling</p> <p>The retention period for an Application Backup Policy schedule refers to the length of time that NetBackup keeps backup images.</p> <p>The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred. However, this setting is not significant for calendar based scheduling.</p>
Multiple copies	<p>If you are licensed for the Inline Tape Copy feature and wish to specify multiple copies for your MS-SQL-Server policy, configure Multiple copies on the Application Backup schedule.</p>

Types of Backups

Description of Backup Types for Microsoft SQL Server

Application Backup	The Application Backup schedule enables user-controlled NetBackup operations performed on the client. At least one Application Backup schedule type must be configured for each MS-SQL-Server policy. The Default-Application-Backup schedule is automatically configured as an Application Backup schedule.
Automatic Backup	An Automatic Backup schedule specifies the dates and times when NetBackup will automatically start backups by running the batch files in the order that they appear in the file list. If there is more than one client in the MS-SQL-Server policy, the batch files are executed on each client.

Specifying the List of Scripts

The Scripts list in a database policy has a different meaning than the File list has for other policies. Normally, in a Standard policy, you would list files and folders to be backed up. But since you are now configuring a database policy, you will list scripts. NetBackup for SQL Server scripts are called batch files and are identified by the `.bch` extension.

Add batch files only if you are setting up a policy for automatic scheduling. All batch files listed in the Scripts list will be executed for the Automatic Backup schedules as specified under the **Schedules** tab.

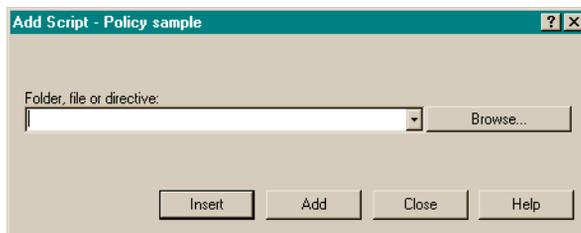
All batch files specified in the Scripts list are executed during manual or automatic backups. NetBackup will start backups by running the batch files in the order that they appear in the Scripts list.



▼ **To add batch files to the Scripts List**

1. In the left pane of the NetBackup Administration Console, right-click on the policy name and click **New Script**.

A dialog box appears. The title bar shows the name of the policy to which you are adding the batch files.



The optional file list in an MS-SQL-Server policy lists batch files that describe the backup and restore operations you wish to start through manual or scheduled operations initiated from the NetBackup server. Batch files reside on the client and direct the operation of NetBackup for SQL Server and SQL Server. Refer to “Create Batch Files” on page 125 for details on how to create a batch file.

2. Type the name of the batch file.

Specify the full pathname for the batch file in the file list. For example:

install_path\NetBackup\NetBackup\DbExt\Mssql\bkup.bch

could be the path name for a batch file to back up a database.

Note *install_path* refers to the directory where you installed the NetBackup software. By default, this directory is *C:\Program Files\Veritas*.

You can also specify just the simple file name. NetBackup for SQL Server resolves the simple name *filename* as *install_path\NetBackup\Dbext\Mssql\filename*.

3. Click **Add**.

Adding Clients to a Policy

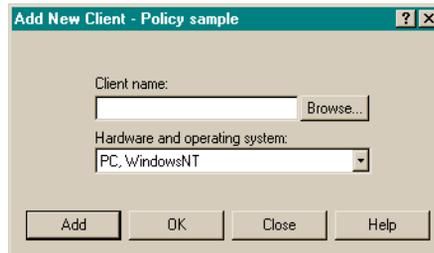
The client list is the list of hosts on which your batch files will be executed during an automatic backup. A NetBackup client must be in at least one policy but can be in more than one.

▼ To add clients to a policy

Note NetBackup for SQL Server must be installed on each client. Also, each batch file must be present on each client.

1. In the left pane of the NetBackup Administration Console, right-click on the policy name and click **New Client**.

The Add New Client dialog box appears. The title bar shows the name of the policy to which you are adding the clients.



2. In the **Client name** text box, type the name of the client that you are adding.

On the client the following should be installed:

- Microsoft SQL Server
- NetBackup client or server
- NetBackup for SQL Server
- the backup or restore script(s)

3. Choose the hardware and operating system type.
4. Click **Add**.
5. To add another client, repeat step 2 through step 4. If this is the last client, click **Close** to close the dialog box.

NetBackup Administration Console for UNIX

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



▼ **To add a new policy**

Note If you are going to perform striped dumps or loads, see “Configuring for Striped Backups and Restores.”

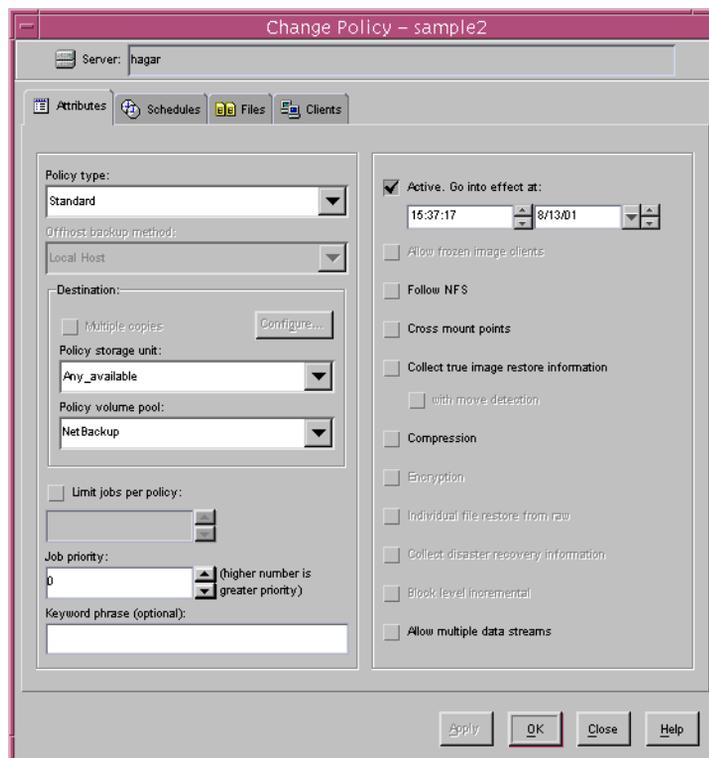
1. Log onto the server as root.
2. Start the NetBackup Administration Console.
3. If your site has more than one master server, choose the one to which you want to add the policy.
4. In the left pane, click on **Policies**. The right pane splits into a All Policies pane and a details pane.
5. In the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

The Add a New Policy dialog box appears.



- 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 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.
 - 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 MS-SQL-Server policy type.
 - 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 box appears in which you can specify the general attributes for the policy.



7. From the **Policy type** box, select the MS-SQL-Server 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 scripts, see “Specifying the List of Scripts.”
 - To add clients, see “Adding Clients to a Policy.”

Description of Attributes

With a few exceptions, NetBackup manages a database backup like a file system backup. Policy attributes that are different for Microsoft SQL Server backups are explained below.



Your other policy attributes will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide* 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 SQL Server, you must have defined at least one MS-SQL-Server policy.
Keyword phrase	For NetBackup for SQL Server, the keyword phrase entry is ignored.

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.

A Microsoft SQL Server backup requires at least two specific schedule types: an Application Backup schedule and an Automatic Backup schedule. You can also create additional schedules.

The following procedures explain how to configure the required schedule types, and how to add other new schedules.

▼ To configure an Application Backup schedule

1. Under the policy name, select **Schedules**.
2. In the right pane, double-click on the schedule named **Default-Application-Backup**.

A dialog box appears. The title bar shows the name of the policy to which you are adding the schedule.

All Microsoft SQL Server database operations are performed through NetBackup for SQL Server using an Application Backup schedule. This includes those backups started automatically.

You must configure an Application Backup schedule for each MS-SQL-Server policy you create. If you do not do this, you will not be able to perform a backup. To help satisfy this requirement, an Application Backup schedule named **Default-Application-Backup** is automatically created when you configure a new MS-SQL-Server policy.



3. Specify the other properties for the schedule as explained in “Schedule Properties.”

The backup window for an Application Backup schedule must encompass the time period during which all NetBackup jobs, scheduled and unscheduled, will occur. This is necessary because the Application Backup schedule starts processes that are required for all NetBackup for SQL Server backups, including those started automatically.

For example, assume that you:

- expect users to perform NetBackup operations during business hours, 0800 to 1300.
- configured automatic backups to start between 1800 and 2200.

The Application Backup schedule must have a start time of 0800 and a duration of 14 hours.

Tip Set the time period for the Application Backup schedule for 24 hours per day, seven days per week. This will ensure that your NetBackup for SQL Server operations are never locked out due to the Application Backup schedule.

Example Settings for an Application Backup schedule.

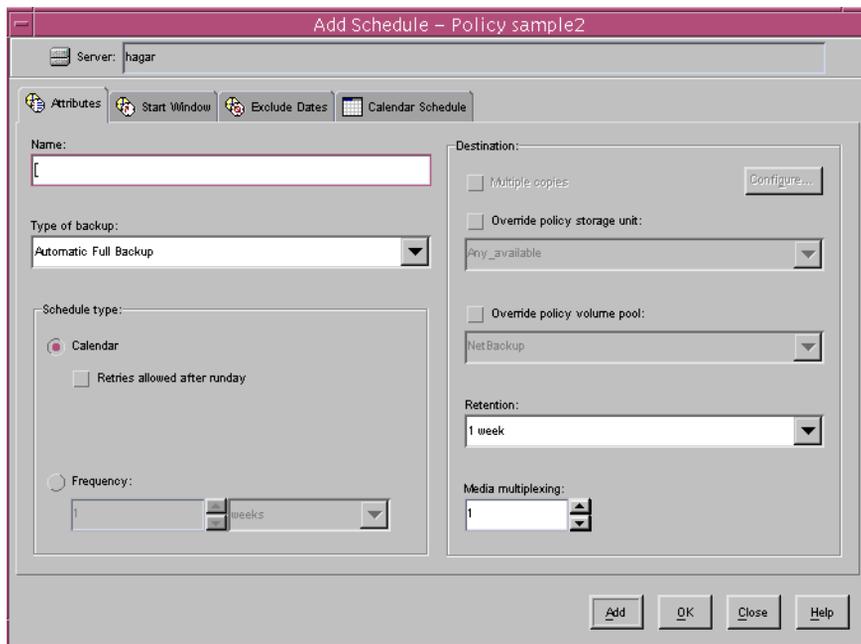
Type of Backup	Schedule settings	Description	Settings
Application Backup	Retention	The length of time backup images are stored.	2 weeks
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday through Saturday 00:00:01 - 23:59:59



▼ **To configure an automatic backup schedule**

1. In the All Policies pane, expand the policy you wish to configure. Right-click **Schedules** and choose **New**.

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



2. Specify a unique name for the schedule.

3. Select the **Type of Backup**.

For information on the types of backups available for this policy, see “Types of Backups.”

Refer to the following table for recommended settings for an Automatic Backup schedule.

Example Settings for a Automatic Backup Schedule.

Type of Backup	Schedule settings	Description	Settings
Automatic Backup	Retention	The length of time to store the record of a backup.	2 weeks
	Frequency	Frequency determines how often a backup should be performed	every week
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday, 18:00:00 - 22:00:00

Tip If you put multiple batch files in the same MS-SQL-Server policy, they will execute during each *Automatic Backup* session for that MS-SQL-Server policy. If you have a variety of SQL Server backup operations that you wish to have executed on different schedules, then consider creating multiple MS-SQL-Server policies with differing *Automatic Backup* schedules; and then assign each batch file to the policy that uses the desired *Automatic Backup* schedule.

Note For Automatic Backup schedules, the batch files must be installed on each machine in the client list.

4. Specify the other properties for the schedule as explained in “Schedule Properties.”

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.

Other schedule properties will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator’s Guide* 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 “Types of Backups.”



Description of Schedule Properties

Property	Description
Frequency	<p>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.</p>
Calendar	<p>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.</p>
Retention	<p>Frequency based scheduling</p> <p>The retention period for an Application Backup Policy schedule refers to the length of time that NetBackup keeps backup images.</p> <p>For example, if your database is backed up once every Sunday morning, you should select a retention period of at least 2 weeks. The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred.</p> <p>The NetBackup scheduler compares the latest record to the frequency to determine whether a backup is due. This means that if you set the retention period to expire the record too early, the scheduled backup frequency will be unpredictable. However, if you set the retention period to be longer than necessary, the NetBackup catalog will accumulate unnecessary records. <i>Therefore, set a retention period that is <u>longer</u> than the frequency setting for the schedule.</i></p> <p>For example, if the frequency setting is set to one week, set the retention period to be more than one week.</p> <p>Calendar based scheduling</p> <p>The retention period for an Application Backup Policy schedule refers to the length of time that NetBackup keeps backup images.</p> <p>The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred. However, this setting is not significant for calendar based scheduling.</p>
Multiple copies	<p>If you are licensed for the Inline Tape Copy feature and wish to specify multiple copies for your MS-SQL-Server policy, configure Multiple copies on the Application Backup schedule.</p>

Types of Backups

Description of Backup Types for Microsoft SQL Server

Application Backup	The Application Backup schedule enables user-controlled NetBackup operations performed on the client. At least one Application Backup schedule type must be configured for each MS-SQL-Server policy. The Default-Application-Backup schedule is automatically configured as an Application Backup schedule.
Automatic Backup	An Automatic Backup schedule specifies the dates and times when NetBackup will automatically start backups by running the batch files in the order that they appear in the file list. If there is more than one client in the MS-SQL-Server policy, the batch files are executed on each client.

Specifying the List of Scripts

The File list in a database policy has a different meaning than the File list has for other policies. Normally, in a Standard policy, you would list files and folders to be backed up. But since you are now configuring a database policy, you will list scripts. NetBackup for SQL Server scripts are called batch files and are identified by the `.bch` extension.

Add batch files only if you are setting up a policy for automatic scheduling. All batch files listed in the Files list will be executed for the Automatic Backup schedules as specified under the **Schedules** tab.

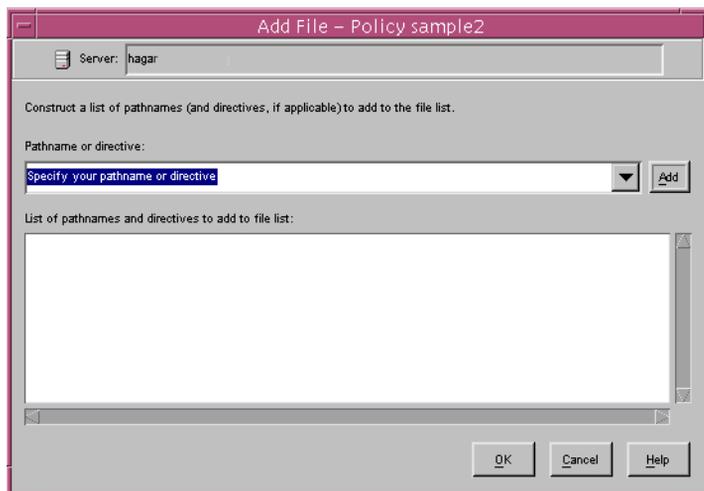
All batch files specified in the Files list are executed during manual or automatic backups. NetBackup will start backups by running the batch files in the order that they appear in the Files list.

▼ To add batch files to the Scripts List

1. In the left pane, click **Policies**.
2. In the All Policies pane, expand the policy you want to add the scripts.
3. Right-click on **Files** and choose **New**.



The Add File dialog box appears. The title bar shows the name of the policy to which you are adding the batch files.



The optional file list in an MS-SQL-Server policy lists batch files that describe the backup and restore operations you wish to start through manual or scheduled operations initiated from the NetBackup server. Batch files reside on the client and direct the operation of NetBackup for SQL Server and SQL Server. Refer to “Create Batch Files” on page 125 for details on how to create a batch file.

4. Type the name of the batch file.

Specify the full pathname for the batch file in the file list. For example:

`install_path\NetBackup\DbExt\Mssql\bkup.bch`

could be the path name for a batch file to back up a database.

Note `install_path` refers to the directory where you installed the NetBackup software. By default, this directory is `C:\Program Files\Veritas\`.

You can also specify just the simple file name. NetBackup for SQL Server resolves the simple name *filename* as `install_path\NetBackup\Dbext\Mssql\filename`.

5. Click **Add**.

6. To add more scripts, repeat step 4 and step 5.

Adding Clients to a Policy

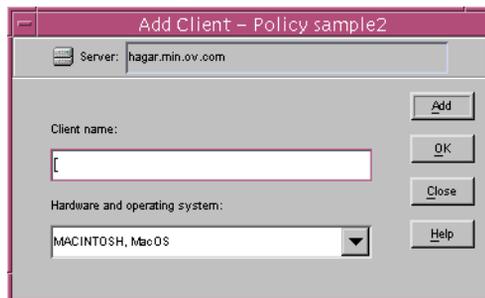
The client list is the list of hosts on which your NetBackup for SQL Server backups will be performed. A NetBackup client must be in at least one policy but can be in more than one.

▼ To add clients to a policy

Note NetBackup for SQL Server must be installed on each client. Also, each batch file must be present on each client.

1. In the left pane, expand **Policies**.
2. In the All Policies pane, expand the policy you wish to configure.
3. Right-click on **Clients** and choose **New**.

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



4. In the **Client name** text box, type the name of the client that you are adding.
On the client the following should be installed:
 - Microsoft SQL Server
 - NetBackup client or server
 - NetBackup for SQL Server
 - the backup or restore script(s)
5. Choose the hardware and operating system type and click **Add**.
6. If this is the last client, click **OK**. If you are going to add more clients, repeat step 4 and step 5.



Testing NetBackup for SQL Server Configuration Settings

After you have configured the master server for NetBackup for SQL Server, you should test the configuration settings. For a description of status codes, refer to the *NetBackup Troubleshooting Guide for Windows* if you are using a Windows server or the *NetBackup Troubleshooting Guide for UNIX* if you are using a UNIX server.

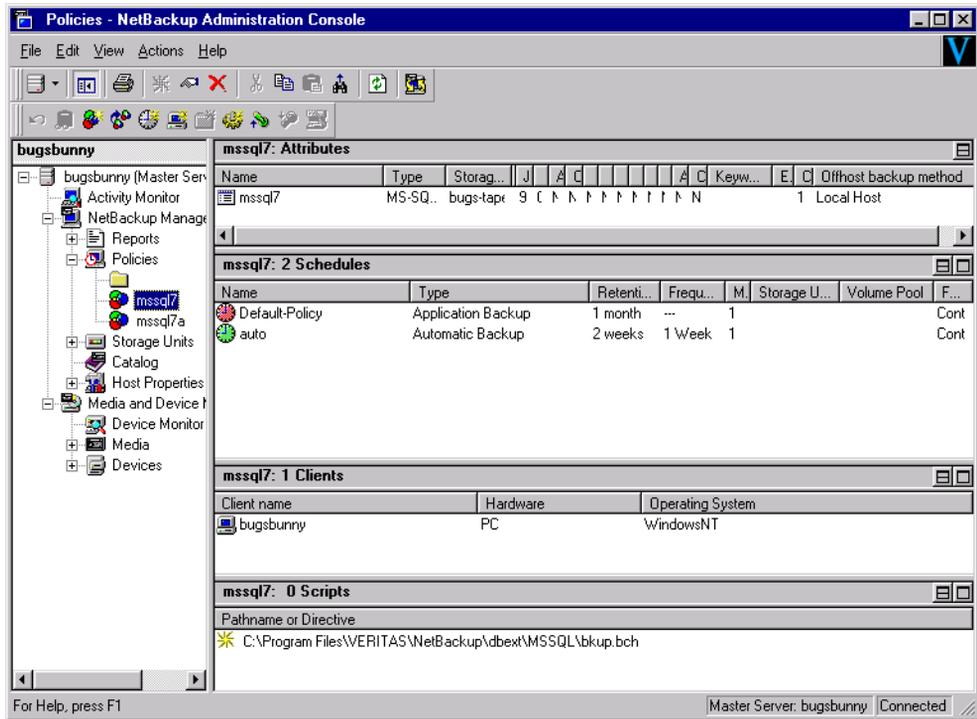
NetBackup Administration Console for Windows

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.

- Click on the policy you wish to test.



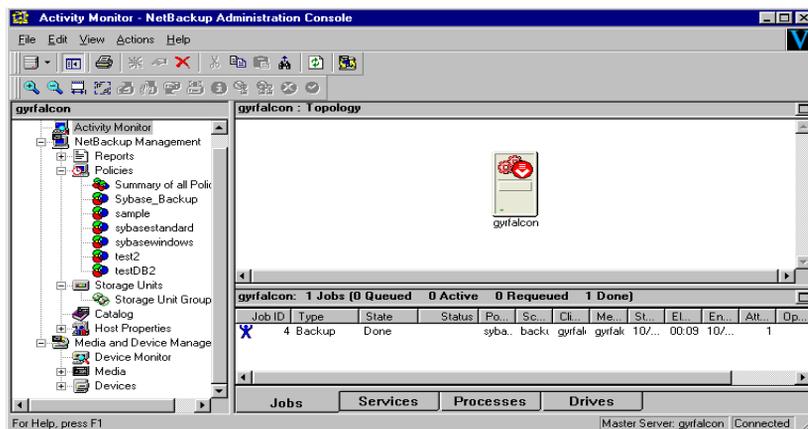
- From the **Actions** menu, click **Manual Backup**.

The Manual Backup dialog box appears.



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 box.
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 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

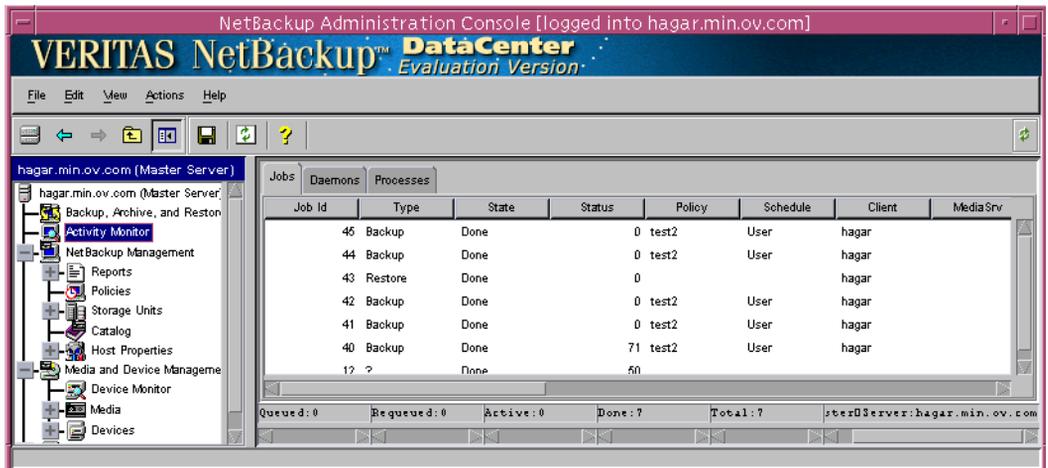
1. Log onto the server as root.
2. Start the NetBackup Administration Console.
3. In the left pane, click **Policies**.
The right pane splits into an All Policies pane and a details pane.
4. In the All Policies pane, click the policy you wish to test.
5. From the **Actions** menu, click **Manual Backup**.

The Manual Backup dialog box appears.



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 box.
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.

Configuring for Striped Backups and Restores

SQL Server supports backing up and restoring databases through multiple data streams, which are called stripes. This feature is also supported by NetBackup for SQL Server. You can archive the streams to separate devices or you can multiplex them to the same device. Multiplexing means that you use just one storage device as the target for all of the data streams.

Caution Usage of backup striping for SQL Server 6.5, either with or without multiplexing, is not generally recommended and may actually slow down your operations. See “Performance Factors” on page 55 for more information.

The following sections describe how to configure for non-multiplexed and multiplexed backups. In addition, see the section “Browsing Objects on Remote SQL Server Installations” on page 147 for information on how to start striped backups and restores after you have configured NetBackup.

Configuring for Non-Multiplexed Backup Stripes

When backup striping is used, all streams must be available before the backup or restore can proceed. Also, the number of stripes specified in the restore must match the number specified during the backup. Therefore, if you wish to use backup striping without multiplexing you must:

- ◆ Disable multiplexing on the *Application Backup Policy* schedules that you will use for striped backups or restores. This is necessary because all the streams must be simultaneously available before a restore can proceed. You can do this by setting the Media Multiplexing property in your *Application Backup Policy* schedule to 1.
- ◆ Ensure that the storage unit has as many drives as you will have stripes.

In addition, you must ensure that backups and restores are scheduled so that enough drives are available at the time you will be performing striped backups or restores.

Configuring for Multiplexed Backup Stripes

If you use backup stripes and you want the data streams to be stored to a single device, you must do the following.

- ◆ Set the Media Multiplexing property in your *Application Backup Policy* schedule to the number of backup stripes that you plan to use.

- ◆ Set the Maximum Multiplexing per Drive property for the storage units which you associate with your *Application Backup Policy* schedule to the number of stripes that you plan to use.

SQL Server Configuration

This section contains information on configuring the SQL Server for NetBackup operations.

Create ODBC Data Source Names

Although specialized, high-speed interfaces are used for transferring data streams to and from SQL Server, NetBackup also accesses SQL Server via ODBC to initiate backups and restores and to query system tables. You must create ODBC Data Source Names (DSNs) for NetBackup to use. In particular, you must create a distinct DSN for each SQL Server instance which you plan to access. Data source names are required for accessing both the default SQL Server instance (if one exists) as well as all of the named instances.

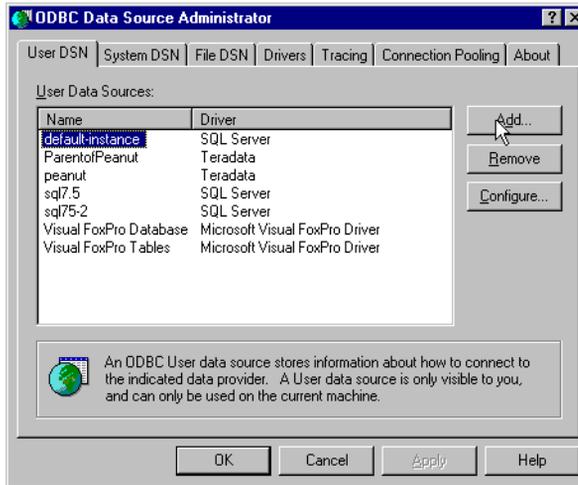
Since SQL Server 6.5 cannot be active when 7.0 or 2000 are active, you must use the Microsoft SQL Server Switch in order to activate the version that you want before attempting to create a DSN for that version.

Note If SQL Server 6.5 is active, NetBackup for SQL Server will reference it as a default instance. SQL Server 6.5 does not support multiple instances. If SQL Server 7.0 is active, it will be the default instance. However, SQL Server 7.0 is also compatible with one or more named 2000 instances. If only SQL Server 2000 instances exist, there may be zero or 1 default instance and zero or more named instances.



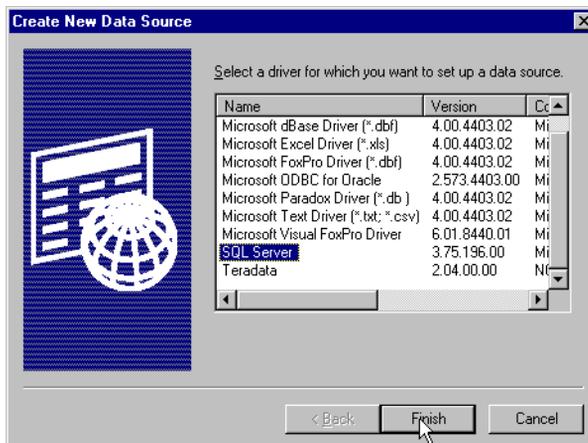
▼ To create a DSN for usage by NetBackup for SQL Server

1. Open the ODBC Data Source Administrator. The ODBC Data Source Administrator can usually be accessed through either the **Start** menu or the **Control Panel**.



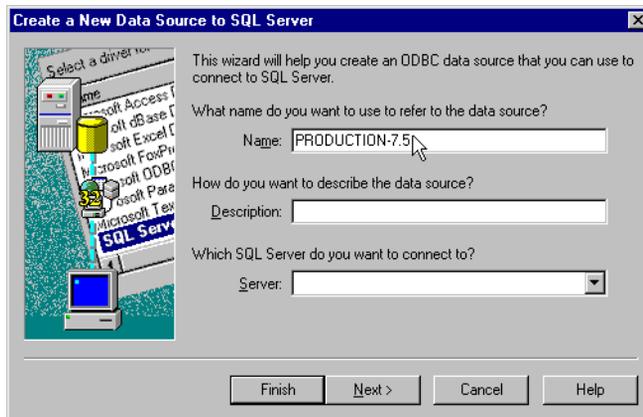
Note Be sure to position the ODBC Data Source Administrator on the **User DSN** tab. NetBackup for SQL Server accesses SQL Server through user DSNs.

2. Click **Add**. The **Create New Data Source** dialog box will appear.
3. Select **SQL Server** in the **edit** selection box.

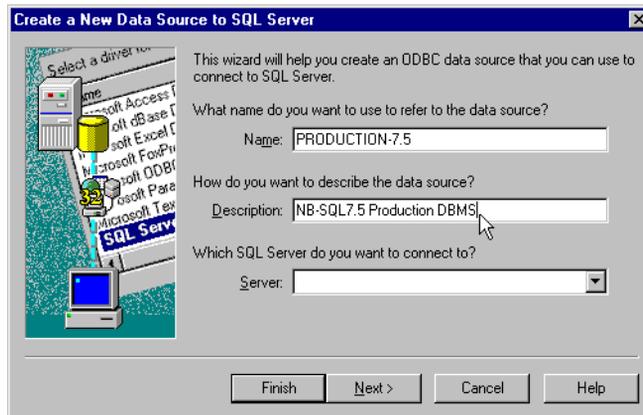


4. Click **Finish**.

5. Enter a new DSN name into the **Name** edit box.



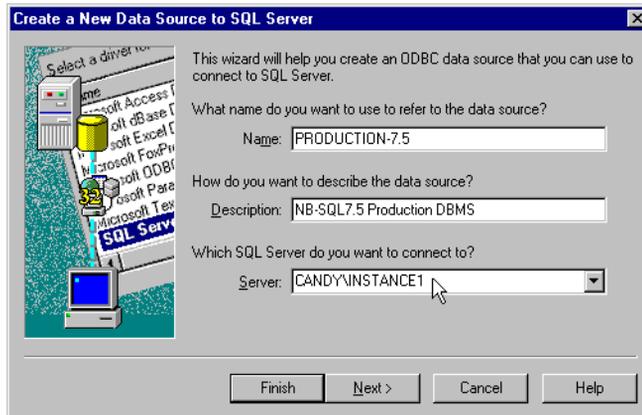
6. Enter a DSN description into the **Description** edit box.



7. Enter the SQL Server instance name into the **Server** edit box.



Note Do not select (local) as your Server. NetBackup for SQL Server does not use DSNs in which you have chosen (local).

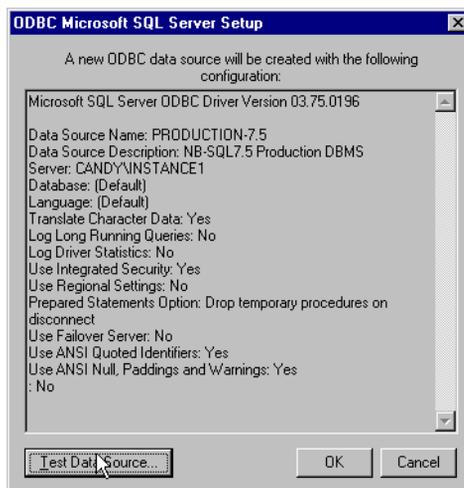


8. To specify the default instance, enter the host name. To specify a named instance, use the format *hostname\instance-name*.

9. Click **Finish**.

A dialog box showing the ODBC configuration for this DSN will appear.

10. Click **Test Data Source**.

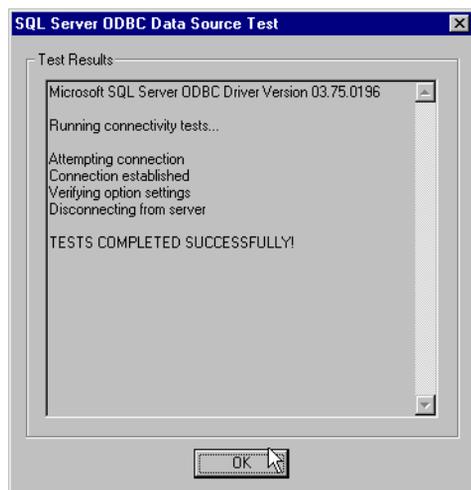


The test results in the final panel should indicate TESTS COMPLETED SUCCESSFULLY.

11. Click **OK**.



After you have created an ODBC data source name, you should be able to select it from the **Set database login parameters** dialog box of the NetBackup Database Extension GUI.



DBMS (Database Management System) Privileges

When you install SQL Server, you can elect to use either integrated or standard security. Integrated security refers to the usage of Windows authentication in lieu of standard SQL Server-based logins.

Note Microsoft recommends that you use integrated security because Windows logins, unlike SQL Server-based logins, can be traced using standard Windows security tools. NetBackup for SQL Server supports both integrated and standard security for any level of SQL Server.

If you choose integrated security, then SQL Server ignores the userid and password that you provide in the **Set DBMS Login Parameters** dialog box of the NetBackup Database Extension GUI. Instead, security validation to perform backup and restore operations and for querying the master database will be based upon the SQL Server privileges that have been granted to the Windows NT/2000 account. The batch file userid and password keywords are also ignored. When integrated security is used SQL Server operations generated by NetBackup for SQL Server will always be validated against the Windows NT/2000 userid.

If you choose standard security, then you must supply NetBackup for SQL Server with a SQL Server-based userid and password through the **Set database options** dialog box. This userid and password combination is encrypted and stored in the `install_path\NetBackup\dbext\MSSQL\logins\` folder in a file that is named from



your Windows userid. In order to perform an SQL Server operation, NetBackup for SQL Server determines the current Windows userid and then looks up the SQL Server userid/password from the corresponding encrypted login file.

Note Since NetBackup for SQL Server does backup and restore commands and issues select statements against the master database, you should review SQL Server user documentation in order to determine exactly what privileges are required by the user accounts that you establish for NetBackup for SQL Server.

Set SQL Server Login for Scheduled Operations

When you use the NetBackup Database Extension GUI, SQL Server security is satisfied based upon either your current Windows login, if you are using integrated security, or upon the settings displayed in the Set Database Login Parameters dialog box. See “DBMS (Database Management System) Privileges” on page 47.

When the NetBackup scheduler is used, backup and restore operations are launched from a daemon process called the NetBackup Client Service. You must ensure that this Client Service is sufficiently endowed with SQL Server privileges to perform backup and restore operations. If you are using integrated security, then you must ensure that the startup option for the NetBackup Client Server specifies a Windows userid that has been granted SQL Server administrative privileges.

Authorization for Scheduled Operations

If you will be using NetBackup to perform automatic SQL Server backups, then use the following steps to set up an account for NetBackup to use for logging into SQL Server.

1. Open **Services** applet from the Windows Control Panel.
2. Double-click on **NetBackup Client Service** from the Service panel to bring up the Service dialog box for the NetBackup Client Service.

3. Select **This Account** in the **Log On As** grouping of the Services dialog box.



4. Click the button next to the edit box. The **Add User** dialog box will display.
5. Select a user account. The **Add** button will become enabled when a user account is selected.

Note If you are using integrated security, then the user account that you choose must have sufficient SQL Server privileges to perform a SQL Server backup. If you are using standard SQL Server security, then the Windows user account must be mapped to a SQL Server userid which has sufficient privileges to perform a backup. See *How To Use Standard SQL Server Security* for information on how to map the Windows account to a standard SQL Server userid.

6. Click **Add**. The Service dialog box appears with the user account in the **This Account** text box.
7. Type the password and the password confirmation.
8. Click **OK**.

Note If you later change the password associated with the account name entered in step 7, then you must reopen the NetBackup Client Service dialog box, enter the new password, and restart the NetBackup Client Service. Failing to perform this procedure will result in your NetBackup scheduled backup operations to fail.

9. Log onto Windows with the Windows account selected in step 5. Then perform the procedure described in “Set Database Login Parameters” on page 63 The database login parameters that you choose will be selected for SQL Server backups launched from the NetBackup Scheduler.



10. Stop and restart the NetBackup Client Service from the service dialog box.

How to Use Standard SQL Server Security

If you are using standard SQL Server security, then you must ensure that the NetBackup Client Service is started with a Windows userid that is associated with a standard SQL Server userid that has sufficient administrative privileges to perform backup and restore.

To make this association, perform the following steps:

1. Log on to your Windows host using the Windows userid which you intend to use for the NetBackup Client Service.
2. Start the NetBackup Database Extension GUI and go to the DBMS login parameters window. Type the standard SQL Server login name and password into the edit boxes provided. The values that you supply will be encrypted to a login file that is associated with the current Windows userid.
3. Finally, perform the procedure above for setting the startup userid for the NetBackup Client Service.



Preparation for Backing Up Files and Filegroups

If you plan to back up database files or filegroups, then you will be responsible for creating the files and filegroups for your databases and for placing individual database components into them. NetBackup places a restriction on the layout of your database in order to successfully perform backup and restores of database files and filegroups.

Before attempting a file and filegroup backup, you must ensure no table is placed into a filegroup which is different than any one of its indices.

For example, the layout as indicated by the following Transact SQL statements should not be used:

```
use master
CREATE DATABASE MultiFileDB
ON
PRIMARY ( NAME = FileX,
          FILENAME = 'd:\mssql\data\FileX.mdf' ),
FILEGROUP AltGroup
( NAME = AltGroupFil,
  FILENAME = 'd:\mssql\data\AltGroupFil.ndf' )
GO
use MultiFileDB
CREATE TABLE Table1 (col1 char(10),col2 char(10), col3 char(10)) on AltGroup
go
create unique clustered index index4 on Table1 (col2)
go
```

Notice in this example, Table1 has been placed in filegroup AltGroup but its index is placed (by default) in the primary filegroup.

If you do place a table into a different filegroup than one of its indices and use NetBackup for SQL Server to back it up, you may fail with ODBC error message, Database file %s is subject to logical recovery and must be among the files to be backed up as part of the file or filegroup backup.

Recovery Factors for SQL Server 7.0 and 2000

This section is provided to assist you in defining a recovery plan which is suitable to your application environment. Much of this information is based on Microsoft's *SQL Server Books Online*. Refer to that resource for a more inclusive discussion.

Transaction Logs

SQL Server maintains a write-ahead transaction log for each database. This log helps to maintain database updates in cache memory to ensure that data is not written to disk before it has been committed. Database writes occur as a part of the checkpoint procedure. Checkpoint frequency is determined by SQL Server based upon the "recovery interval"



which is a configuration parameter indicating the maximum time interval that can be tolerated during a system restart. When checkpoint occurs the portion of the transaction log that is no longer needed for system restart becomes inactive and is optionally truncated, depending upon the the recovery strategy in place, as described in the next section.

If the transaction log is not truncated by the checkpoint procedure, then it can be backed up and used for point-in-time recovery, failure from disk crash, or move and copy operations.

Recovery Strategies

SQL Server 2000 provides three basic levels for database recovery which have different implications for both backup performance and for the granularity of recovery. These levels are:

- ◆ *Simple.* With this method the inactive portion of the transaction log is not retained beyond the database checkpoint, this method provides for minimal usage of log space. However, the database can only be restored to the last full backup. Transaction log restores, including point in time recovery and named transaction recovery are not supported. In addition, maximum performance is provided for bulk operations, such as (Create Index, Select Into, and Bulk Copy) because they are not logged.
- ◆ *Full.* Using this method, the inactive portion of the transaction log is retained until it is truncated, which normally occurs when it is backed up. The transaction log can then be used to stage a recovery either to a point in time or to a named transaction. The Full Recovery model provides maximum recoverability but it uses the most log space and does not provide maximum performance for bulk operations.
- ◆ *Bulk-Logged.* This method is identical to the Full Recovery model except that bulk operations are not logged and thus cannot be recovered.

SQL Server 7 provides similar recovery as SQL Server 2000 except that functionality is defined by two attributes that are provided via the database options menu. These are:

- ◆ *Truncate log on checkpoint.* Enables “simple” logging, i.e., the inactive portion of the transaction log is truncated on checkpoint.
- ◆ *Select Into/Bulk Copy.* Bulk operations are not logged.

Backing up the Transaction Log

Transaction logs can be backed up in SQL Server 2000 for databases which are set in either full or bulk-logged mode. In SQL Server 7, transaction logs can be backed up unless “truncate log on checkpoint” has been checked. By default a transaction log is truncated after it has been backed up. However, it is not truncated following a full database or differential backup.

The main factors in deciding how frequently to backup a transaction log would be

- ◆ Conservation of log space.
- ◆ How close to the failure point you must be able to recover in case of a disk crash.

During peak periods in a high transaction environment, it may not be unusual to back up the transaction log on an hourly basis.

Differential Backup

Unlike the transaction log backup, the differential backup is a backup of the database. The differential includes all of the changes made to the database since the last full backup. If you have made several differential backups since the last full backup, then to accomplish a full restore to the end of the last differential backup, you would only need to restore the last full database, followed by the last differential. You would not need to restore any of the intermediate differentials.

Although differential backups are supported with both SQL Server 7 and 2000, the performance of SQL Server 2000 differential backups are especially high in performance because SQL Server maintains the list of changed data pages in a bit map, thereby avoiding the need to read unchanged pages.

A typical backup procedure may use full database, differential, and transaction log backups in ascending order of frequency. For example the full database backup may be taken bi-weekly, the differential may be taken nightly, and the transaction log backup may be made as frequently as every hour for either mission critical or high volume applications.

File and Filegroup Backups

In addition to full, differential, and transaction log backups, SQL Server also supports backing up database filegroups and files. Since a filegroup is composed of one or more database files, backing up the constituent files of a filegroup is logically equivalent to backing up the filegroup itself.

Filegroup/file backups would commonly be used in a tightly architected application in which physical disk locations were mapped to logical objects, such as tables and indexes. There are two types of factors which may lead to the choice to use file/filegroup backups in this type of environment.

- ◆ Some portions of the database, which may be distinguished by such factors as volatility or mission criticality, may be recognized as having to be backed up more frequently than other portions.
- ◆ The database may be so large that the time required for a full database backup could not fit in the allocated time window. Thus it may be more viable to do a full backup of one or more files or filegroups on a rotating basis.



The filegroup/file backup also carries the advantage on restore that, in case of disk failure, it would be possible to recover just the failed unit without restoring the entire database.

In order to use filegroup/file backups you must maintain backups of the transaction log. For example, to perform a full database restore using filegroups and files, you would be required to restore all of the constituent filegroups and files in addition to all of the transaction log segments starting from the point at which the first component backup was taken up until a point in time following the last component backup.

Database Recovery

During the restore process, a database goes into “loading mode” until the restore command is executed against the database with the "recovery" option. Prior to placing the database into recovery mode all of the restore commands would be executed using the “WITH NORECOVERY” clause. By specifying NORECOVERY, it is possible to continue to stage additional restore statements to bring the database up to the desired state. The database becomes usable again after the last restore statement has been applied with recovery.

Staging Recovery

NetBackup for SQL Server keeps track of the backups you have performed and when. Two different restore histories are provided for identifying the complete set of backups that can be used for staging a complete recovery.

The first such history is contained in the “Restore Database, Differentials, and Transaction Logs” dialog. Use this window if you have been performing database and differential backups. This window displays a hierarchy consisting of full, differential, and transaction log images. By clicking on any logical image, NetBackup automatically highlights the full set of objects required to accomplish a recovery, up to and including the object that you selected. If you select a transaction log image, then NetBackup automatically highlights all of the transaction log images prior to the last differential image. In addition, it highlights the last differential image plus the last full database backup image. Then, by clicking **OK**, a batch file can be created that directs the full recovery process, or the process can be launched immediately.

The second restore history is provided through the “Restore Filegroups and files” dialog. Use this window if you have been performing filegroup and/or file backups. In generating this window, NetBackup looks for the last full set of file and filegroup images which constitute a full database. If such a set exists and if there also exists a full set of transaction log images that span the time during which the file and filegroup backups were taken, then the full recovery set will automatically be marked with checks. A full recovery script can then be generated by selecting the “Save for later Execution” Restore Script, and then clicking on the **OK** button.

Performance Factors

Backup performance can be influenced by your hardware environment as well as settings in SQL Server, the NetBackup master server, and NetBackup for SQL Server. This section discusses the most prominent factors in SQL Server and NetBackup for SQL Server. The availability of buffer space has a definite influence on how fast backups run.

Buffer Space Parameters for SQL Server 6.5

There are two parameters you can use to increase buffer space in SQL Server 6.5.

BACKUP BUFFER SIZE

It is an integer value between 1 and 10. It represents the size of the backup buffers multiplied by 64 kilobytes. You can increase backup speed by increasing backup buffer size. Use the Microsoft SQL 6.5 Enterprise Manager configuration/options dialog box to modify the BACKUP BUFFER SIZE. Online help is available.

NUMBER OF BUFFERS PER STRIPE

The second factor which affects buffer space availability is the NUMBER OF BUFFERS PER STRIPE parameter which you can set in the NetBackup for SQL Server administration GUI for each operation. NetBackup for SQL Server uses this parameter to decide how many buffers to allocate for reading or writing each data stream during a backup or restore operation. By allocating a greater number of buffers, you can affect how quickly NetBackup for SQL Server can send data to the NetBackup master server.

The default value for the NUMBER OF BUFFERS PER STRIPE is 1. For operations that you start from NetBackup Database Extension GUI, you can change this value through the Client Options dialog box. See “Client Options” on page 190. Otherwise, you can use the BUFFERS parameter to set this parameter when you create a batch file manually. For more details on the BUFFERS parameter, see “Create Batch Files” on page 125.



Buffer Space Parameters for SQL Server 7.0 and 2000

There are three parameters you can use to increase buffer space in SQL Server 7.0 and 2000.

MAXTRANSFERSIZE

The MAXTRANSFERSIZE parameter can be set for each backup or restore operation. It ranges in size from 64 kilobytes to 4 M bytes. The default is 64 kilobytes. MAXTRANSFERSIZE is the buffer size used by SQL Server 7.0 and 2000 for reading and writing backup images. Generally, you can get better SQL Server 7.0 and 2000 performance by using a larger value.

Set the MAXTRANSFERSIZE for your NetBackup for SQL Server session using the Client Options dialog box. Otherwise, you can use the MAXTRANSFERSIZE parameter to set this value when you create a batch file manually. For more details on the MAXTRANSFERSIZE parameter, see “Create Batch Files” on page 125.

BLOCKSIZE

The BLOCKSIZE parameter can be set for each backup operation. For restores, NetBackup for SQL Server automatically chooses the same size that you backed up with. BLOCKSIZE ranges from 512 bytes to 64 kilobytes. The default is 512 bytes. BLOCKSIZE is the incremental size that SQL Server 7.0 and 2000 uses for reading and writing backup images.

Set the BLOCKSIZE for your NetBackup for SQL Server session using the Client Options dialog box. Otherwise, you can use the BLOCKSIZE parameter to set this value when you create a batch file manually. For more details on the BLOCKSIZE parameter, see “Create Batch Files” on page 125.

NUMBER OF BUFFERS PER STRIPE

The NUMBER OF BUFFERS PER STRIPE parameter affects buffer space availability. This parameter is set in the NetBackup for SQL Server administration GUI for each operation. NetBackup for SQL Server uses this parameter to decide how many buffers to allocate for reading or writing each data stream during a backup or restore operation. By allocating a greater number of buffers, you can affect how quickly NetBackup for SQL Server can send data to the NetBackup master server.

The default value for the NUMBER OF BUFFERS PER STRIPE is 1. For operations that you start from the NetBackup Database Extension GUI, you can change this value through the Client Options dialog box. See “Client Options” on page 190. Otherwise, you can use the BUFFERS parameter to set this value when you create a batch file manually. For more details on the BUFFERS parameter, see “Create Batch Files” on page 125.

Backup Threads for SQL Server 6.5

Another factor that impacts performance is the BACKUP THREADS parameter in SQL Server 6.5. By increasing the number of backup threads, you can improve the ability of SQL Server 6.5 to read and write backup data streams. BACKUP THREADS is a configuration parameter which you can set through the Microsoft SQL Enterprise Manager configuration/options dialog box.

Backup Stripes

You can divide your backup operation into multiple concurrent streams in any situation in which SQL Server dumps data faster than your tape drive is capable of writing. Although NetBackup supports multiplexing many stripes to the same drive, you generally will realize performance gains only if you use the same number of tape drives as streams.

To divide a backup operation into multiple stripes, use the **How Many MS SQL Server Stripes?** edit box, which appears in each of the backup dialog boxes of the NetBackup Database Extension GUI.

Shared Memory Usage

If NetBackup Server is installed on the same host as NetBackup for SQL Server, then you will obtain optimal performance by using shared memory for data transfer instead of sockets. Shared memory is the default for this configuration and will be used unless you create a *install_path*\NetBackup\NOSH.M file.



Alternate Buffer Method for SQL Server 7.0 and 2000

NetBackup for SQL Server supports an alternate buffer method which optimizes CPU usage by allowing NetBackup and SQL Server to share the same memory buffers without transferring data between them. This method is chosen automatically if all of the following conditions apply:

1. The operation type is backup.
2. NetBackup shared memory is in use.
3. The backup is non-multiplexed.
4. The NetBackup buffer size equals the SQL Server blocksize.

The default NetBackup buffer size is 64 kilobytes, but this may be overridden by the value contained in *install_path*\NetBackup\db\config\SIZE_DATA_BUFFERS. To start your backups with the desired SQL Server blocksize, you can either set this parameter in the Client Options dialog box of the NetBackup Database Extension GUI or you can adjust it directly using the BLOCKSIZE option in your batch file.

5. The NetBackup for SQL Server must be started with the same account as the NetBackup Client service.

Backups started with the NetBackup scheduler are started with the NetBackup Client service so the same account is already in use. However, if you start an SQL Server backup through NetBackup for SQL Server or through `dbbackex`, then your NT logon account must be the same as the NetBackup Client service account in order for your backups to be candidates for the alternate buffer method.

You can verify that the alternate buffer method is being used by looking for the words `Using alternate buffer method`, which appear in the `dbclient log`, the `dbbackup log`, and the progress report.

After completing the installation and configuration, you can use the NetBackup Administration Console to start Microsoft SQL Server backups and restores.

The most convenient way to back up your Microsoft SQL Server databases is to set up Microsoft SQL Server policy and schedules for automatic, unattended backups. To add a new schedule or change an existing schedule for automatic backups, follow the guidelines given in “Configuring a NetBackup Policy” on page 18.

The administrator on the master server can use the NetBackup Administration Console to manually execute an Automatic Backup schedule for an Microsoft SQL Server policy. See the *NetBackup System Administrator’s Guide for Windows* and the *NetBackup System Administrator’s Guide for UNIX* for instructions.

The rest of this chapter describes how to perform user-directed operations for Microsoft SQL Server on a Windows client.

You can initiate backups from the NetBackup client using either the command line interface program, `dbbackex`, or the NetBackup for SQL Server GUI.

The following sections describe each of these processes in detail.



Using dbbackex

dbbackex can be executed from a Windows MS-DOS command prompt as

```
install_path\NetBackup\bin\dbbackex -f file [-p policy][-u userid][-pw password]  
[-s server][-np]
```

where:

file is the name of the batch file, (see “Run NetBackup Batch Files” on page 144) which describes the operations you wish to start.

policy is the MS-SQL-Server type policy, used by NetBackup for the operations specified in the batch file.

userid is the Microsoft SQL Server userid for logging into the database management system.

password is the Microsoft SQL Server password for logging into the database management system.

server is the name of the host for the NetBackup master server that you wish to backup to or restore from.

-np tells dbbackex not to create a message box to indicate the operation status when it has completed.

Note Any of the options can be delimited with double quotation marks. Use delimiters, for example, if the file name contains spaces.

The *policy* parameter is ignored for restore operations as the NetBackup server can retrieve the dump file based entirely on the image names specified in the batch file for each restore. Policy is used for backing up databases. If *policy* is omitted, then NetBackup server uses the first active Microsoft SQL Server policy that it finds in its policy list for carrying out all of the backup operations specified in the batch file.

If *server* is omitted, then the client will use the default server according to the Windows NetBackup client configuration. See the *NetBackup User's Guide for Microsoft Windows* for more information.

Tip If you are concerned about protecting login passwords for Microsoft SQL Server, do not use the -u or -pw parameters. By omitting these parameters, you can force that NetBackup for SQL Server to read the default Microsoft SQL Server login data from an encrypted file as described in “Initial Startup” on page 62.

Unless you specify -np, a message will appear when dbbackex completes. This message will tell you how many operations in the batch file were successful and how many failed.

Using Client-based Schedulers with dbbackup

dbbackup allows you to employ your choice of client-based schedulers to automatically initiate NetBackup for SQL Server operations. Two examples follow.

- ◆ The Windows NT/2000 Scheduler. This scheduler is initiated through the MS-DOS at command. Instructions for using the Windows Scheduler are provided in the Microsoft Windows online documentation.
- ◆ The Microsoft SQL Server Scheduler. This scheduler is closely integrated with Microsoft SQL Server. It is accessed through the Microsoft SQL Server Enterprise Manager, from the server menu. Online help is provided.

One distinct advantage of the Microsoft SQL Server Scheduler is that you can create scripts for database maintenance operations which will be initiated as a result of database events that you define. For example, you can create a script that initiates dbbackup, telling it to dump a particular transaction log, and then create an alert which invokes that script when the transaction log for this database becomes full.

No matter which scheduler you use, remember that NetBackup for SQL Server determines the Microsoft SQL Server login parameters to use based upon the NT username which starts the schedule. Therefore, you must:

- ◆ establish a default Microsoft SQL Server login file for this account
- or
- ◆ provide login parameters through the USERID and PASSWORD keywords in the batch files used by NetBackup for SQL Server

See “Set SQL Server Login for Scheduled Operations” on page 48 and “Set Database Login Parameters” on page 182 for more information.

Tip If you use dbbackup through a client-based scheduler, specify the `-np` option to ensure that a message box is not generated. However, before using the scheduler with dbbackup, try the dbbackup syntax on the console *without the -np option* in order to test for the successful completion of the batch file that you have created for your operation.



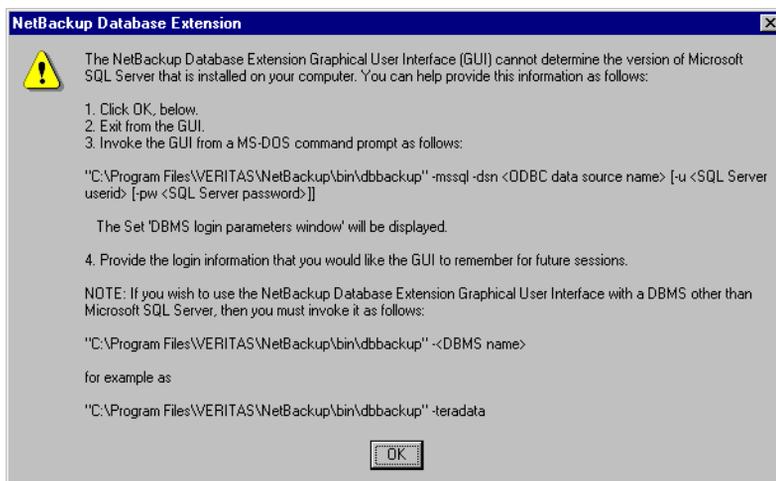
Using the NetBackup Database Client Graphical User Interface

These instructions describe how to use the NetBackup Database Extension GUI to perform NetBackup operations on Microsoft SQL Server.

Initial Startup

Use this procedure to log on to the NetBackup Database Extension GUI for the first time.

1. From the **Start** menu, select **Program, VERITAS NetBackup**, then **NetBackup MS SQL Client**. The following message box appears.



2. Follow steps 1 through 4 provided in the message box.

For example, if you have created an ODBC data source name of **PRODUCTION**, you could start the NetBackup Database Extension GUI by entering the following:
install_path\NetBackup\bin\dbbackup -mssql -dsn PRODUCTION.

Note NetBackup for SQL Server does not remember the DSN or userid/password that you provide through the `dbbackup` command line. These are only used to enable the GUI for the first time. Use the Set DBMS Login Parameters for This Session dialog box to set the parameters for the current and future sessions.

If the user id does not have a password, do not use the `-pw` options.

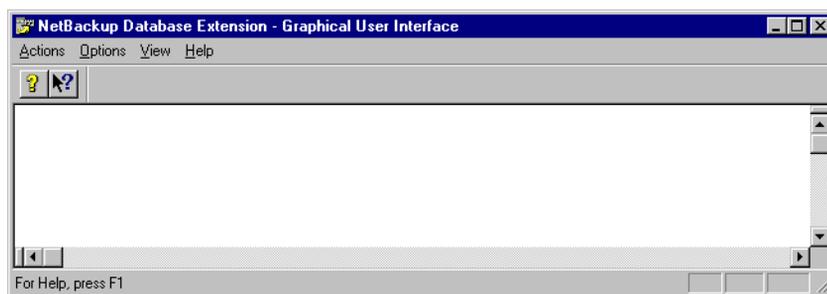
Set Database Login Parameters

Use this procedure to set the DBMS login parameters that the NetBackup Database Extension GUI uses when it accesses SQL Server. You will set your DBMS userid and password in addition to the ODBC Data Source Name that you want to use.

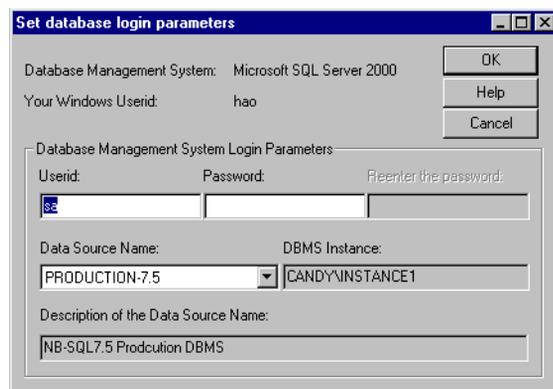
Note The ODBC Data Source Name is mapped to a DBMS instance. Therefore, choosing a data source name also allows you to choose which database instance you want to work with.

Note The userid and password that you enter through this dialog box is only applicable if your SQL Server instance uses standard security. See "DBMS (Database Management System) Privileges" for more information.

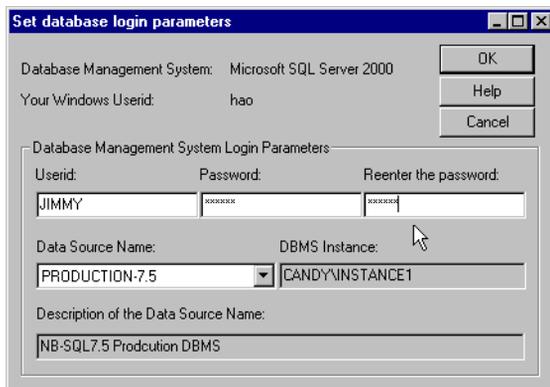
1. From the **Start** menu, select **Program, VERITAS NetBackup**, then **NetBackup MS SQL Client**. The NetBackup for Microsoft SQL Server GUI will appear.



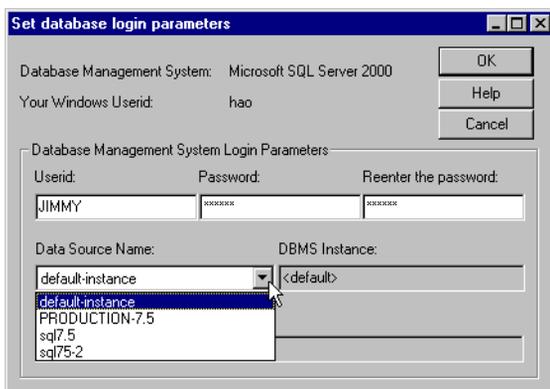
2. From the **Options** menu, select **Set DBMS Login Parameters**. The Set Database Login Parameters dialog box appears.



3. Type a DBMS userid and DBMS password, then re-enter the DBMS password.

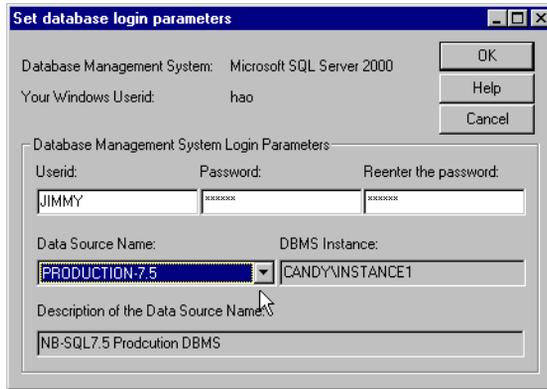


4. To select a data source name, open the **Data Source Name** drop-down list.



Notice that the list of available data source names appear.

5. Select the data source name that you would like to make current.



6. Select **OK** in order to save your changes and close the dialog box.



NetBackup Backup Operations

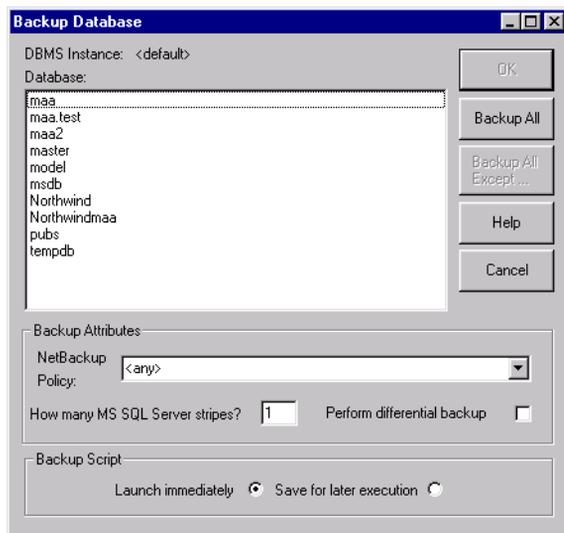
This tutorial contains information on:

- ◆ Backing up a Database
- ◆ Backing up a Transaction Log
- ◆ Performing a Database Files and Filegroups Backup

Backing up a Database

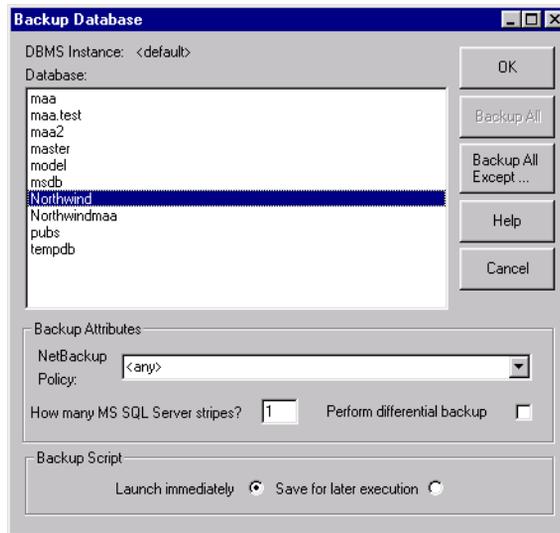
1. Complete the procedure for typing your default login parameters as described in “Set Database Login Parameters” on page 63.
2. On the **Actions** menu, select **Backup**, then **Database**.

The Backup Database dialog box appears.



Note Select the checkbox entitled **Perform differential backup** if you want to perform a differential backup rather than a full backup.

3. Select a database from the **Database:** box. For this example, we are going to back up Northwind.



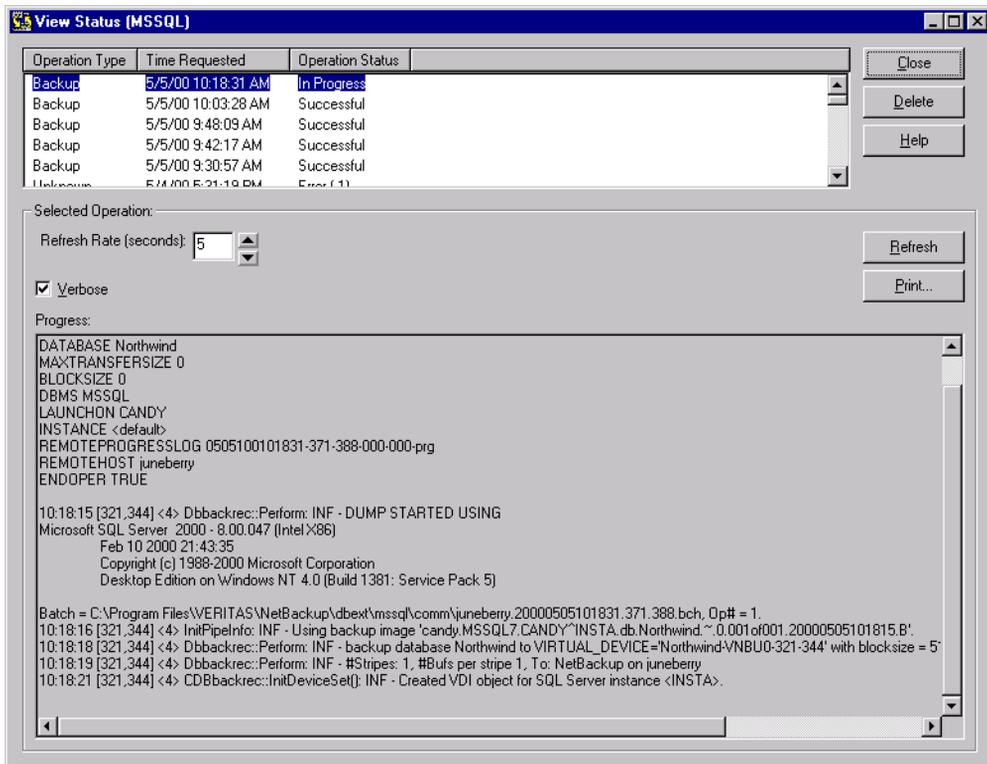
4. Click **OK**. The following appears.



5. Click **Yes**.
6. On the **View** menu, select **Monitor Jobs**.



The View Status dialog box appears.



Backing up a Transaction Log

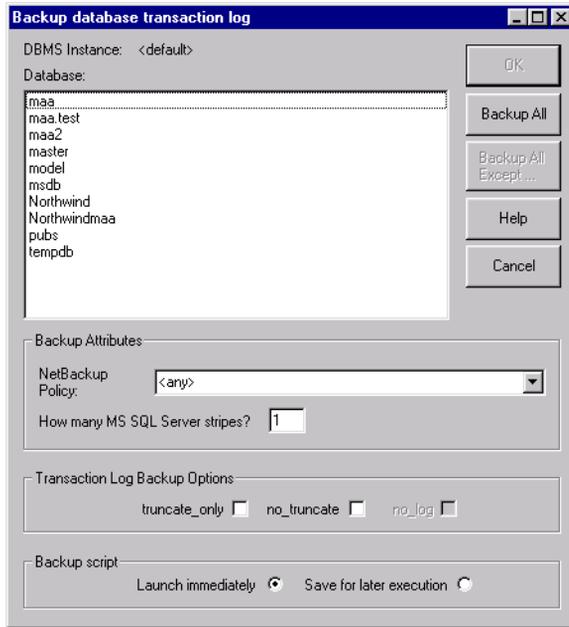
1. Before starting a transaction log backup, the database administrator should perform the following actions on the Microsoft SQL Server.
 - If Microsoft SQL Server 6.5 is installed, place the transaction log onto a separate database device from its database.
 - If Microsoft SQL Server 2000 is installed set the Recovery Model setting to either Full or Bulk-logged.
 - If Microsoft SQL Server 7 is installed, set the **Truncate Log On Checkpoint database** option to off. This is an option on the Microsoft SQL Server interface that applies to the database.

Caution You are responsible for ensuring that the entire sequence of transaction logs generated following any database dump are maintained on the same NetBackup server. This means that they should all be backed up to the same facility and that none should be allowed to expire before the others. NetBackup for SQL Server requires that you follow these guidelines in devising your backup strategy in order to provide maximum assistance in restoring your databases.

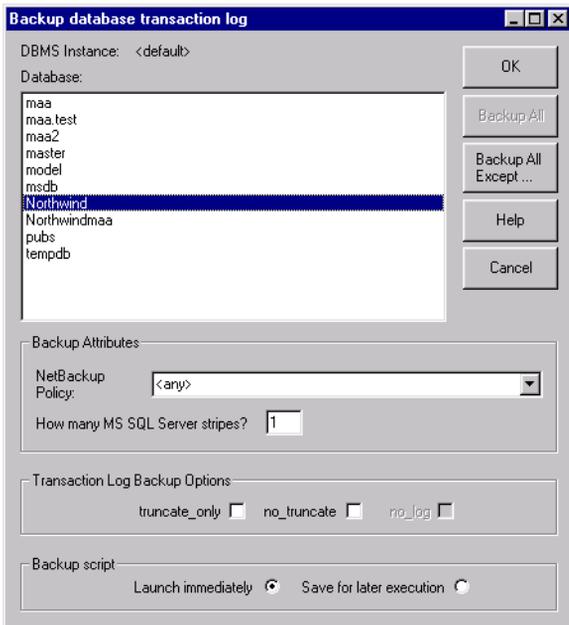
2. Complete the procedure for typing your default login parameters as described in “Set Database Login Parameters” on page 63.
3. From the **Actions** menu, select **Backup**, then **Transaction Log**.



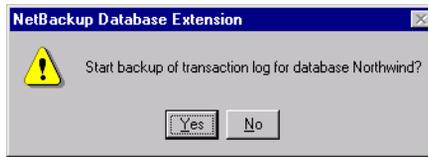
The Backup Database Transaction Log dialog box appears.



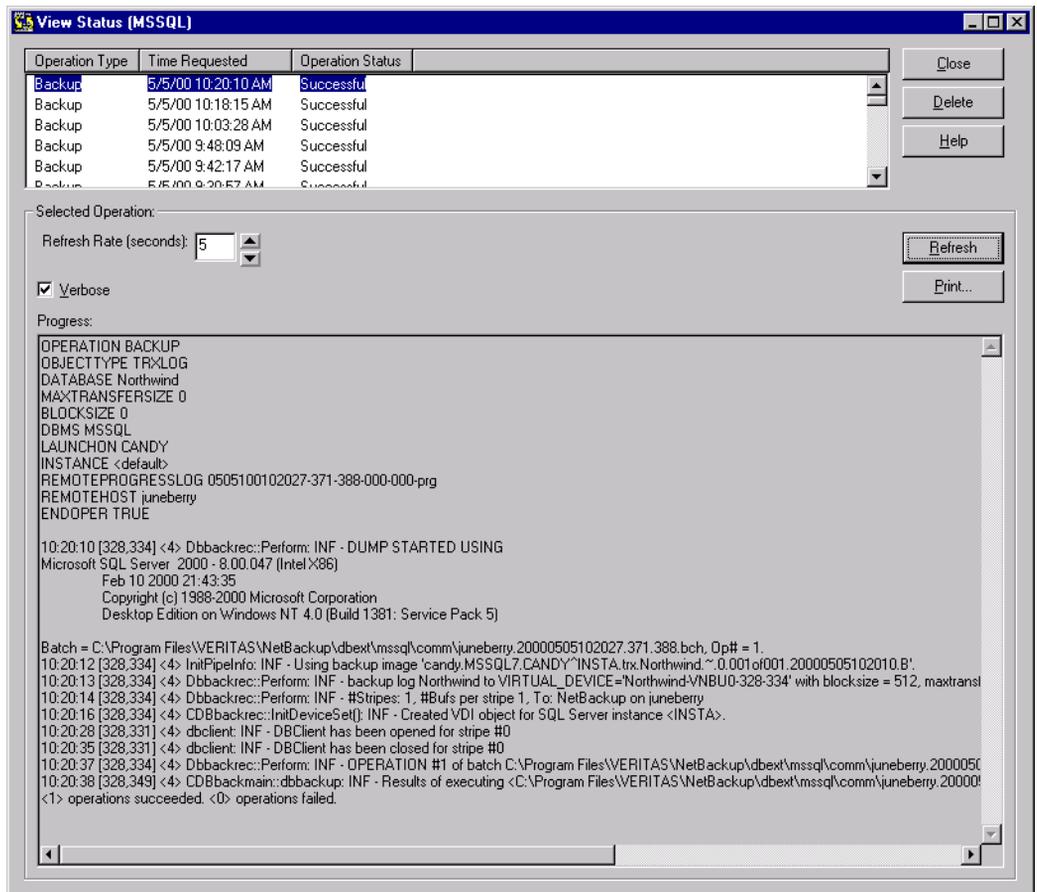
4. Select a database transaction log from the **Database:** box. For this example, we are going to back up Northwind.



- Click **OK**. The following appears.



- Click **Yes**.
- On the **View** menu, select **Monitor Jobs**.
The View Status dialog box appears.

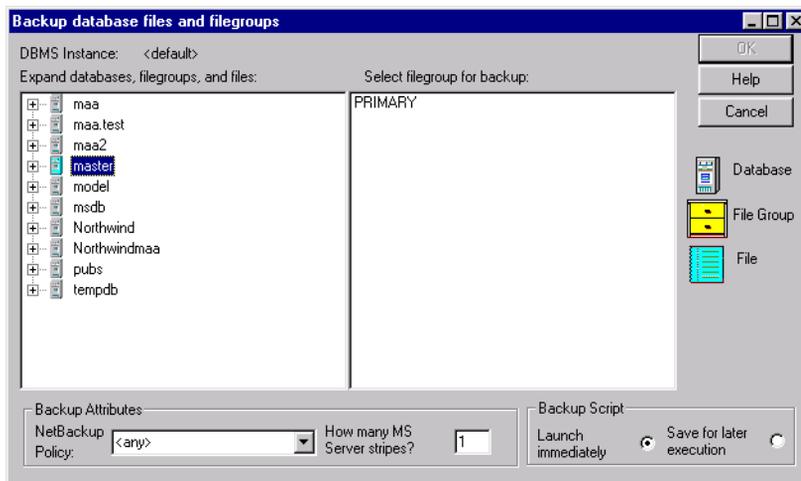


Performing a Database Files and Filegroups Backup

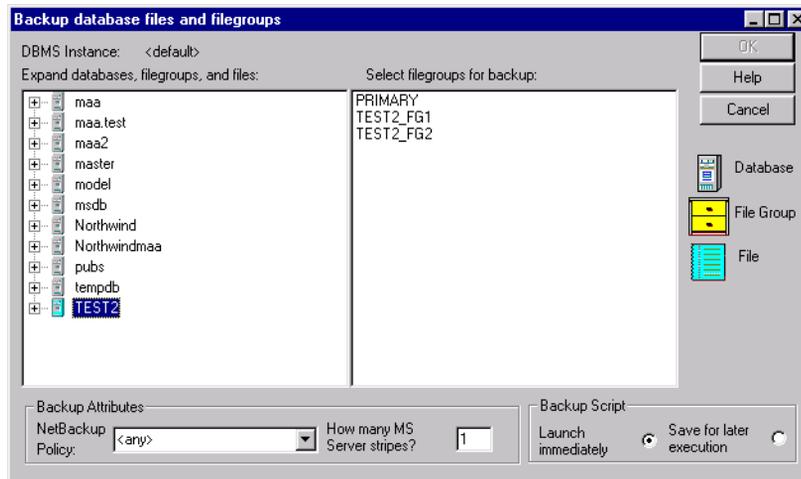
Caution Do not use NetBackup for SQL Server to perform file or filegroup backups for a database that contains any table in which any one of the indices is in a different file or filegroup than its data. See “Preparation for Backing Up Files and Filegroups” on page 51.

1. Complete the procedure for entering your default login parameters as described in “Set Database Login Parameters” on page 63.
2. From the **Actions** menu, select **Backup**, then **Database Files and Filegroups**.

The Backup database files and filegroups dialog box appears.

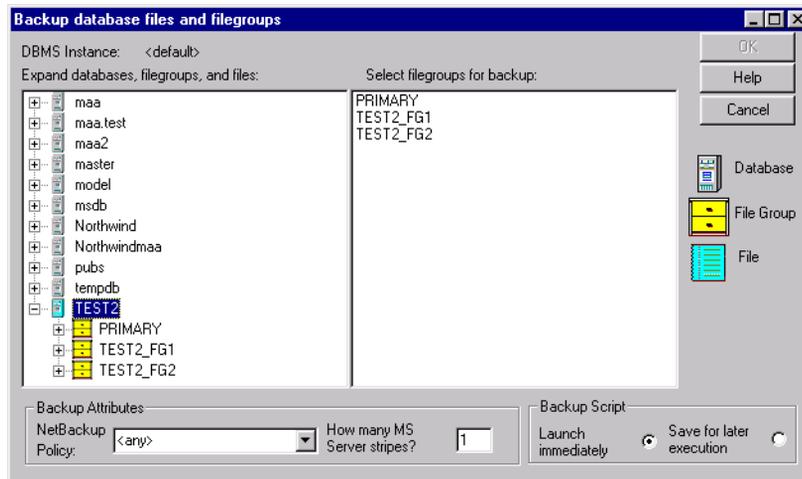


- Highlight the database you want to back up in the left-hand pane.



Notice that the constituent filegroups appear as a list in the right-hand pane.

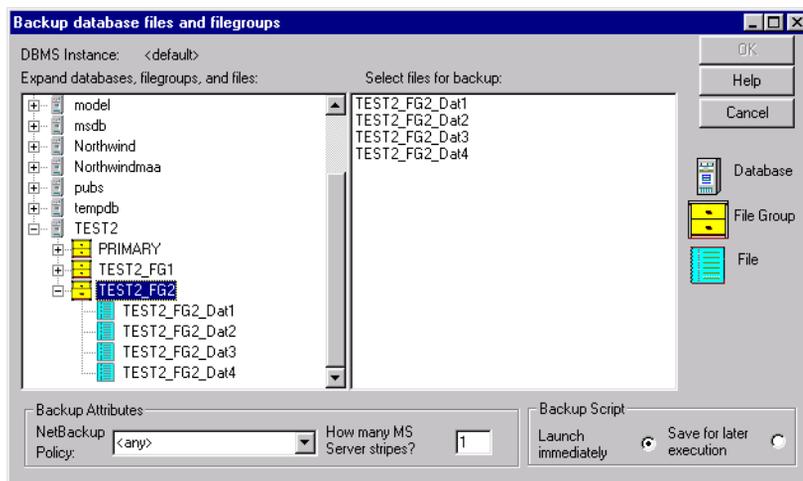
- Expand the database in the left-hand pane by clicking on the plus (+) symbol. For this example, we will use TEST2.



Notice that the filegroups now appear underneath the database icon.

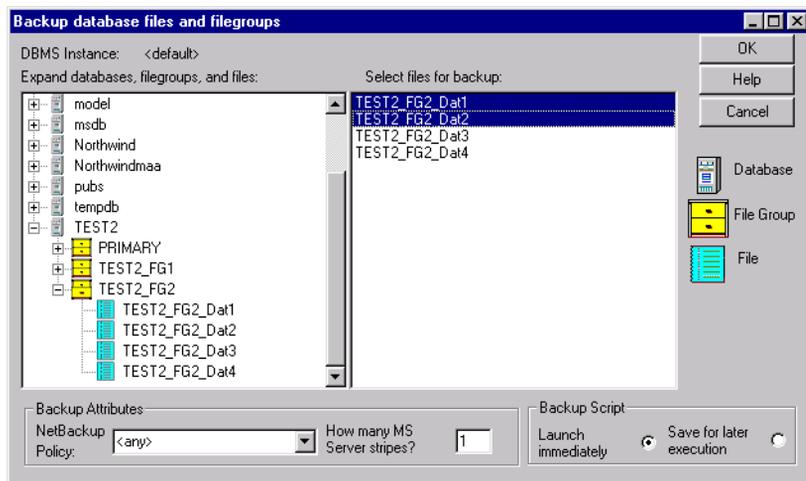


5. Select one of the filegroups in the left-hand pane and click on the plus (+) symbol to expand it.



Notice that the files that constitute the filegroup are listed under the filegroup icon.

6. Highlight one or more of the files in the right-hand pane and click OK.



The following appears:



7. Click **Yes** to start the backup of the selected files.

Note If you wish to back up filegroups instead of files, then following step 3, highlight one or more filegroups in the right-hand pane, click **OK**, and answer **Yes** to start the backup.



NetBackup Restore Operations

This tutorial contains information on:

- ◆ Restoring Database, Differential, and Transaction Log Backups

This includes restoring a database from:

- a database dump
- a differential dump
- a transaction log dump
- a series of objects which include a database dump, an optional differential dump, and a series of transaction log dumps.

- ◆ Restoring File and Filegroup Backups

This includes restoring from:

- a database files and filegroups dump
- a database transaction log dump
- a series of database files and filegroups dumps and transaction log dumps

- ◆ Performing Database Move Operations

This includes:

- performing a database move operation
- performing a partial database restore

- ◆ Restoring from Backup Exec Images

This includes restoring a database, backed up with Backup Exec, from:

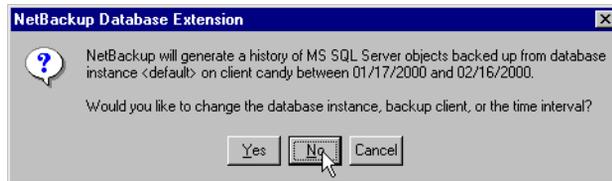
- a database, database differential, or database transaction log
- a database filegroup or database filegroup differential
- a table

Restoring Database, Differential, and Transaction Log Backups

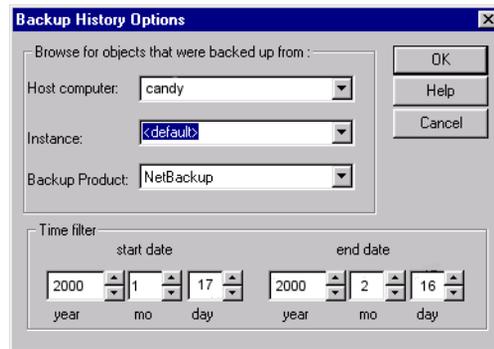
1. Complete the procedure for typing your default login parameters as described in “Set Database Login Parameters” on page 63.
2. From the **Actions** menu, select **Restore**, then **Databases, Differentials, and Transaction Logs**.



A NetBackup Database Extension GUI message box appears.



If you select **Yes**, the Backup History Options dialog will appear.



This dialog box allows you to modify the set of images that will be displayed in the Restore Database and Transaction Logs dialog box.

Note The images displayed in the Restore Database and Transaction Logs dialog box are those backed up to the NetBackup Server that is identified in the Client Options dialog box. To change servers, you must modify the **Current NetBackup Server** field of the Client Options dialog box.

Use the fields in Backup History Options as follows:

Host Computer

Identifies the Microsoft SQL Server host machine whose backup history you would like to display.

Note The NetBackup administrator must give you permission to redirect restores to a different client, if you wish to choose any host besides the local host.

Instance

Identifies the Microsoft SQL Server instance on the host computer whose instance you would like to display.



Note If you would like the history displayed based on the default instance, choose <default> in the Instance field. If Microsoft SQL Server 6.5 is active and you would like to display the history based on images created prior to NetBackup 3.4, then choose NB_LEGACY_SQL65. If Microsoft SQL Server 7.0 or 2000 is active and you would like to see legacy images, then choose NB_LEGACY_SQL7.

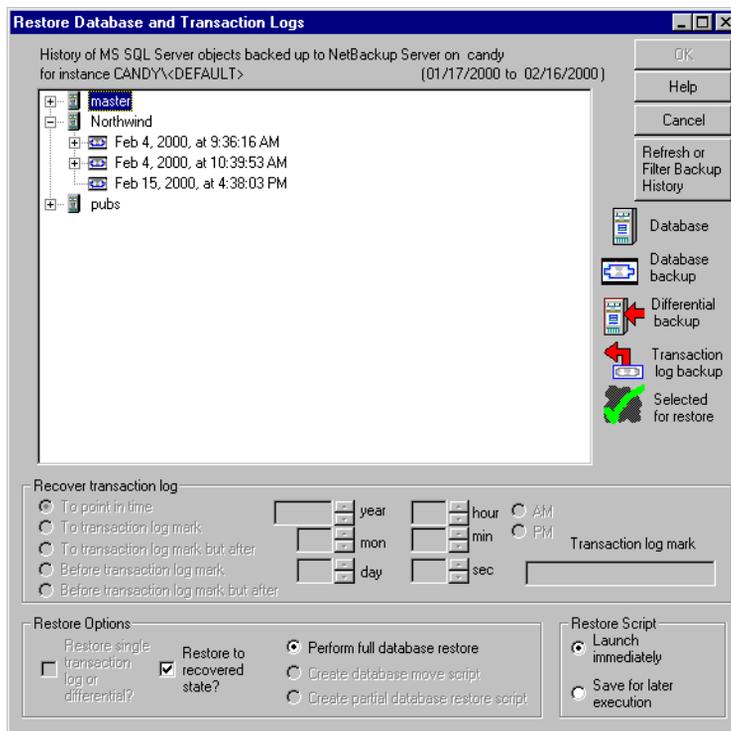
Backup Product

Identifies the type of backup images to display for restoring.

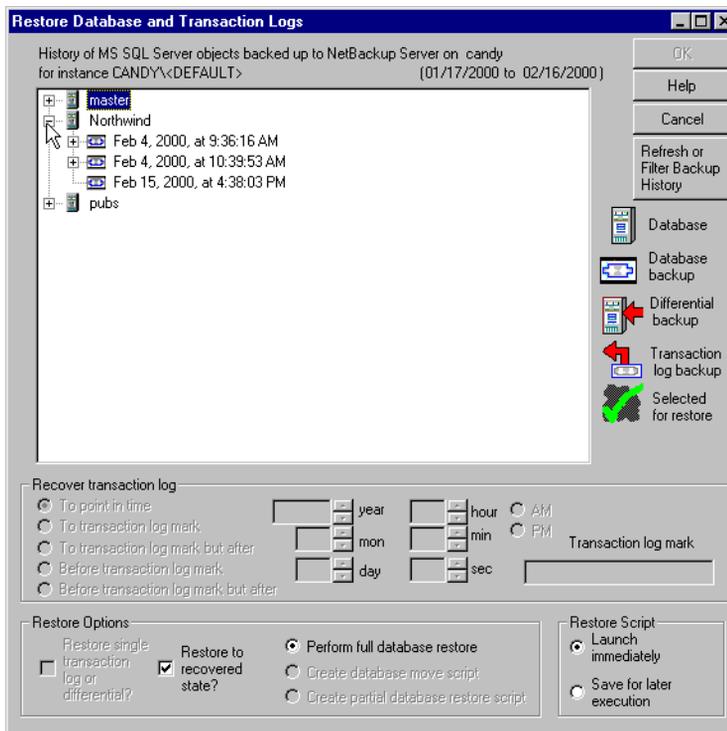
Time Filter

Use the time filter to modify the date range of the items displayed in the Restore Database and Transaction Logs dialog box.

If you select **No**, the Restore Database and Transaction Logs dialog box appears.



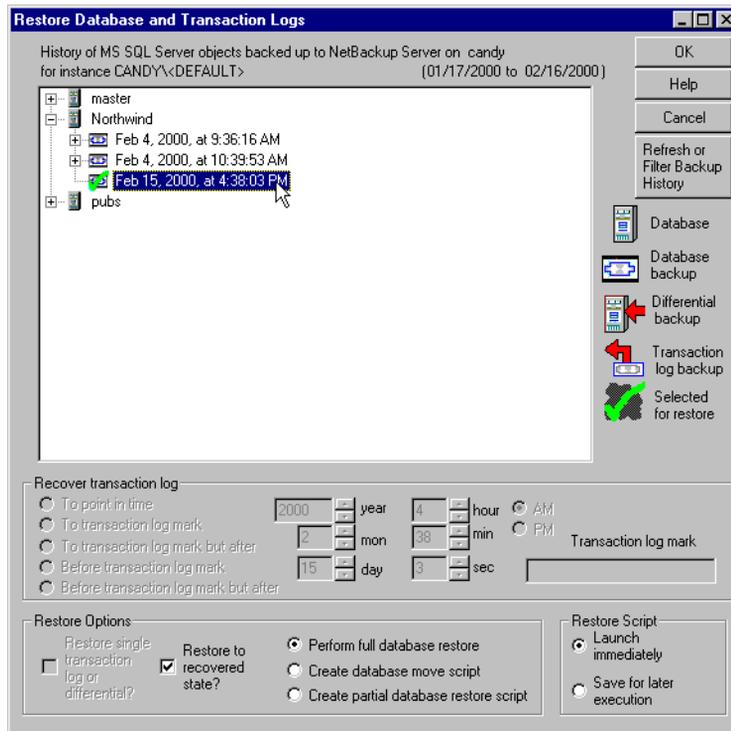
3. Locate the database you want to restore and click the plus sign to expand its tree.



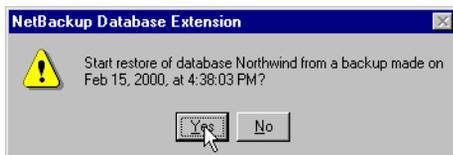
4. Go to:
 - step 5 to restore a database.
 - step 6 to restore a database and a series of transaction logs, when Microsoft SQL Server 6.5 is active.
 - step 7 to restore a database, an optional differential, and a series of transaction logs, when Microsoft SQL Server 7.0 or 2000 is active.
 - step 8 to restore a single differential dump, when Microsoft SQL Server 7.0 or 2000 is active.
 - step 9 to restore a single transaction log, when Microsoft SQL Server 7.0 or 2000 is active.
 - step 10 to restore a single transaction log, when Microsoft SQL Server 6.5 is active.



5. Restore a database from a database backup without restoring transaction logs.
 - a. Select the database backup under the database icon for the database backup that you wish to restore.

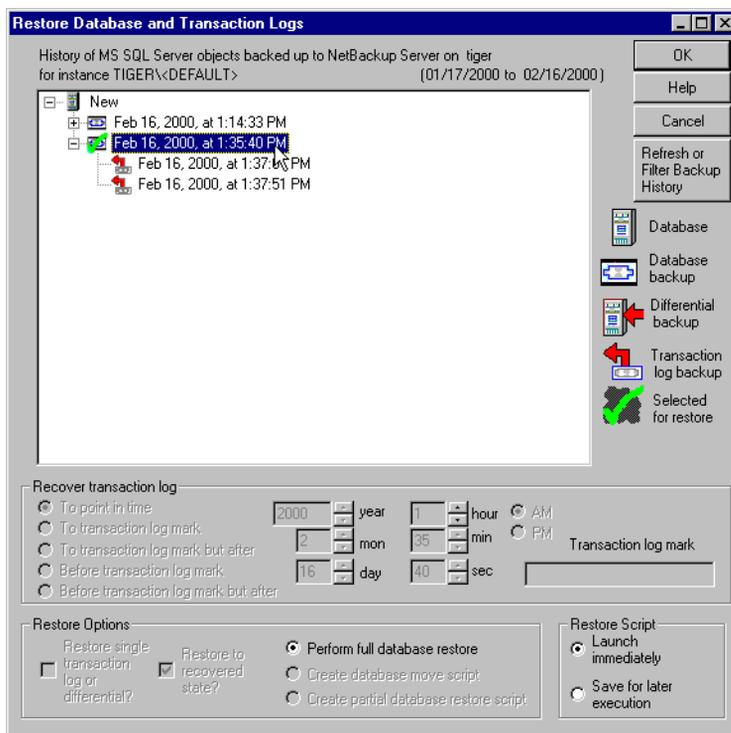


- b. Click **OK**. A NetBackup for SQL Server message box appears.



- c. Click **Yes**. NetBackup for SQL Server starts the restore.
 - d. Go to step 11.

6. Restore a database from a database backup and its transaction logs when Microsoft SQL Server 6.5 is active.
 - a. Under the database you want to restore, locate the database backup from which you want to initiate your restore operations.
 - b. Expand the database backup icon by clicking the plus sign which is on its left.



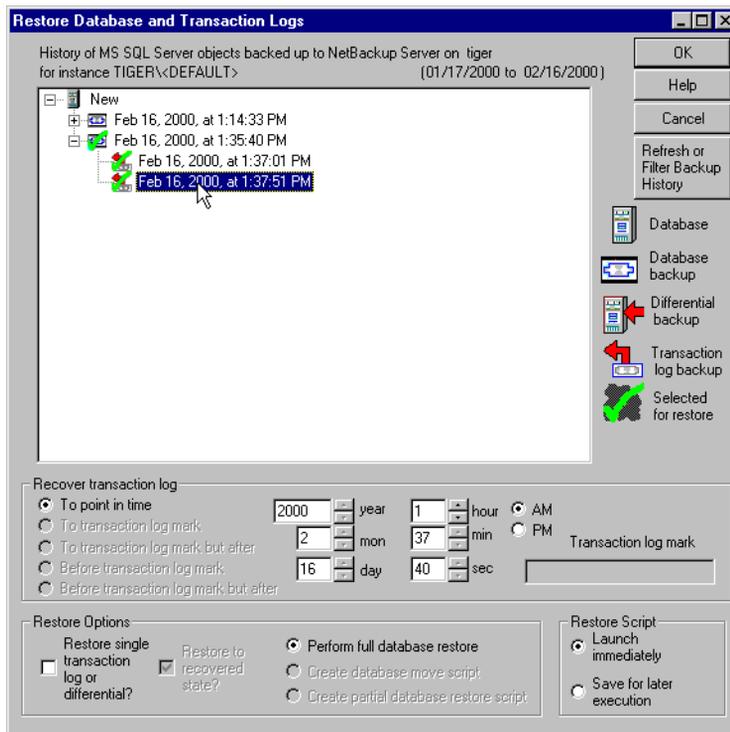
Note that the transaction log backups associated with the highlighted database backup appear underneath the database backup icon.

- c. Select the transaction log icon which includes the time to which you want to restore the database.



For example:

If you wish to restore New to Feb 16, 2000 at 1:37:51 PM, then make your selection as shown below.

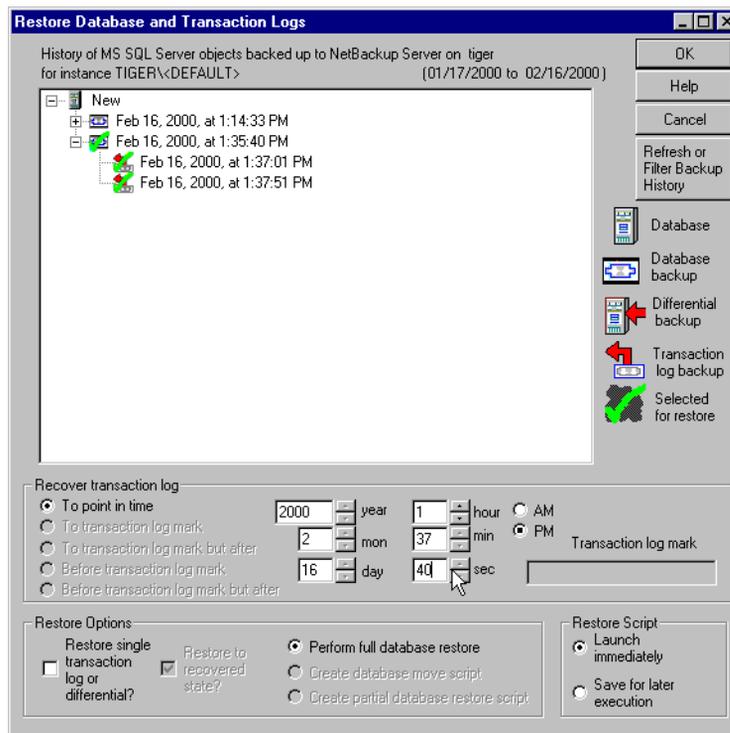


Notice that the transaction log icon you selected now has a green checkmark, as do the preceding transaction log icons and the preceding database backup icon. The green checkmarks indicate which items are marked for restore.

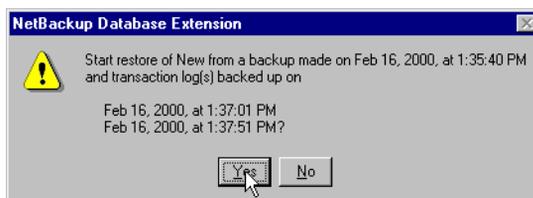
- d. If you wish to restore all of the database transactions that are included in the last transaction log that has a checkmark, then proceed to step e. Otherwise, click on the **To point in time** check box in the **Recover Transaction Log** group and type the precise point in time to which you wish the database to be restored.

For example:

If you want database New to be restored to precisely Feb 16, 2000, at 1:37:40 PM, then type the timestamp in **Recover transaction log** group as shown below:

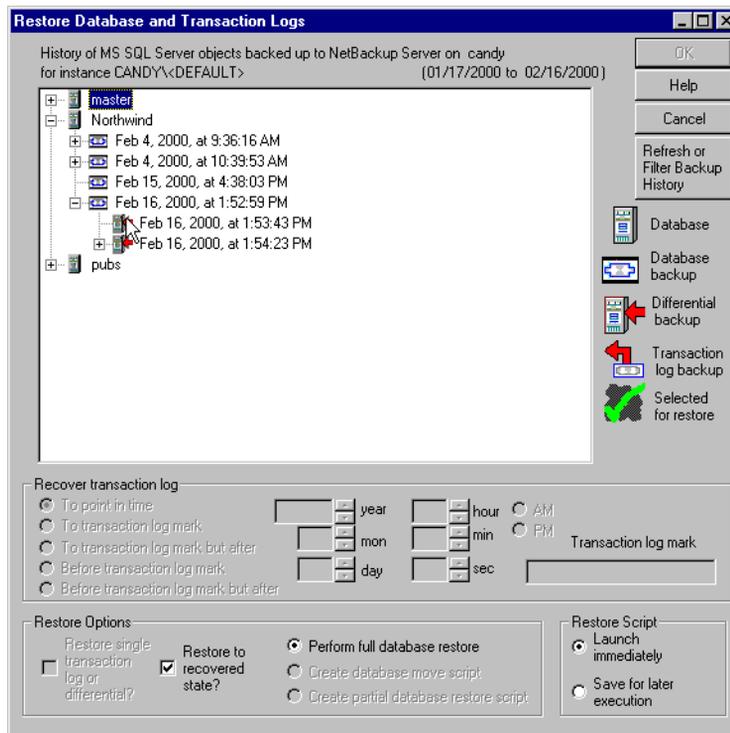


- e. Click **OK**. The NetBackup for SQL Server message will appear.



- f. Click **Yes**. NetBackup for SQL Server starts the restore of the selected database and continues by restoring the transaction logs that are listed above.
- g. Go to step 11.

7. Restore a database from a database backup, an optional differential, and a series of transaction logs, when Microsoft SQL Server 7.0 or 2000 is active.
 - a. Under the database you want to restore, locate the database backup from which you want to initiate your restore operations.

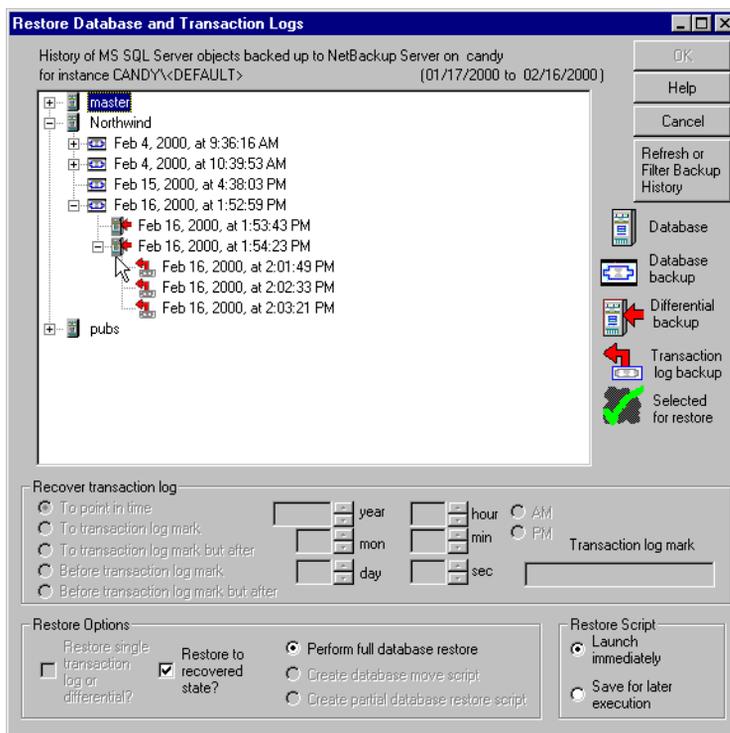


- b. Expand the database backup icon by clicking the plus (+) symbol which is on its left.

Notice that the differential backups associated with the highlighted dump file appear underneath the Database backup icon.

Note If transaction logs have been backed up for the database that you selected, but a differential has not been backed up, a placeholder differential backup icon will appear with the caption `differential not found`.

- c. Locate the differential that you want to use for your restore operation and expand its icon by clicking on the plus (+) symbol which is on its left.



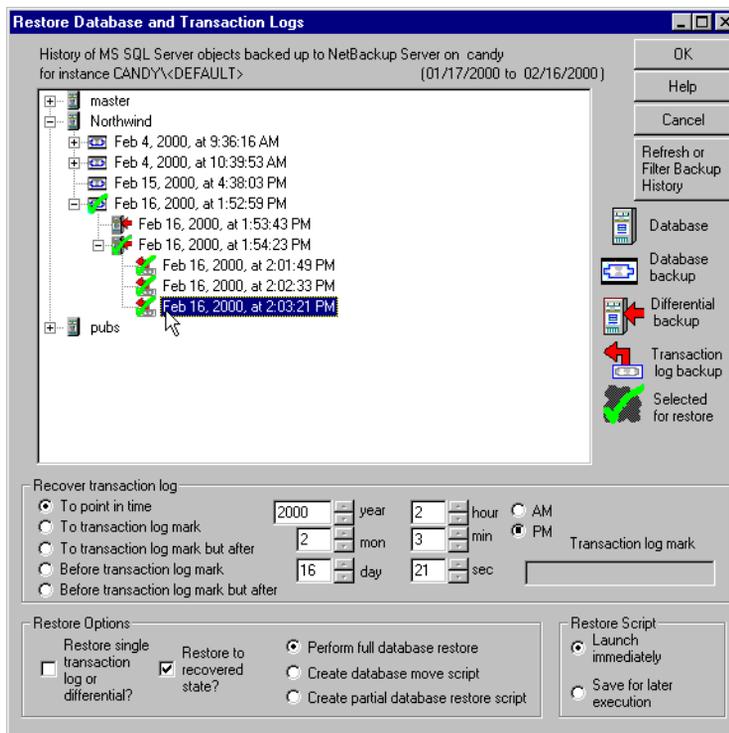
Note that the transaction log backups associated with the highlighted differential appear underneath the differential icon.



- d. Select the transaction log icon which includes the time to which you want to restore the database.

For example:

If you wish to restore Northwind to Feb 16, 2000, at 2:03:21 PM, then make your selection as shown below.

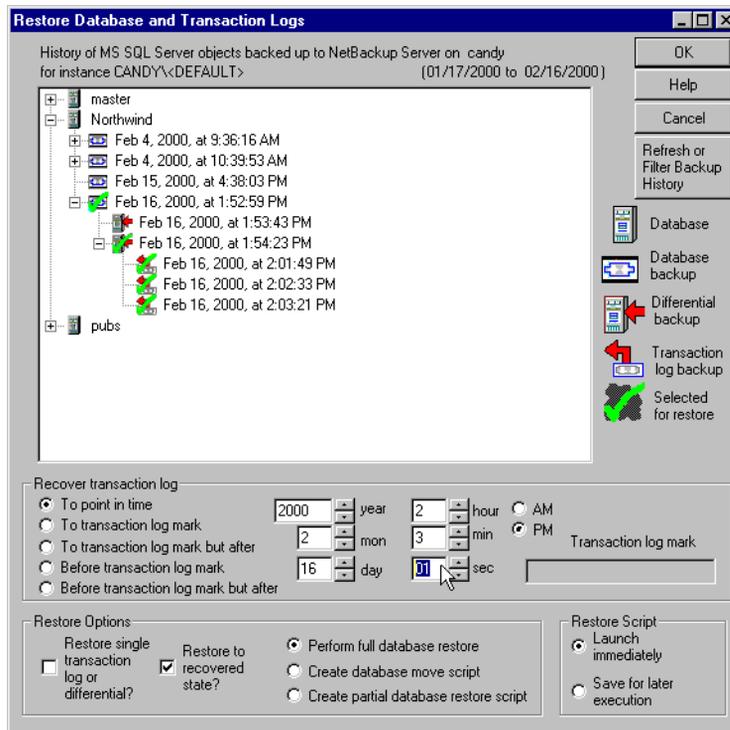


Notice that the transaction log icon you selected now has a green checkmark, as do the preceding transaction log backup icons, the preceding differential backup icon and the preceding Database backup icon. The green checkmarks indicate which items are marked for restore.

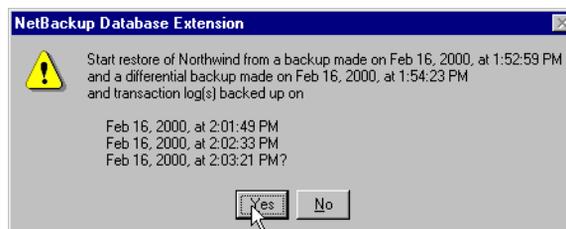
- e. If you wish to restore all of the database transactions that are included in the last transaction log that has a checkmark, then proceed to step f. Otherwise, click on **To point in time** in the **Recover Transaction Log** group and enter the precise point in time to which you wish the database to be restored.

For example:

If you want Northwind to be restored to precisely Feb 26, 2000, at 2:03:01 PM, then enter the timestamp in **Recover Transaction Log** group as shown below:



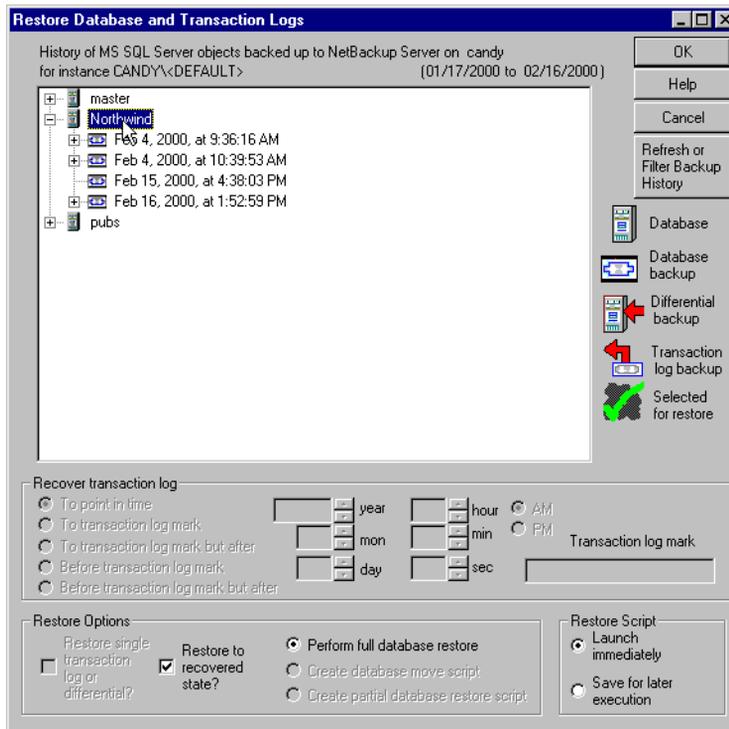
- f. Click **OK**. The NetBackup for SQL Server message will appear:



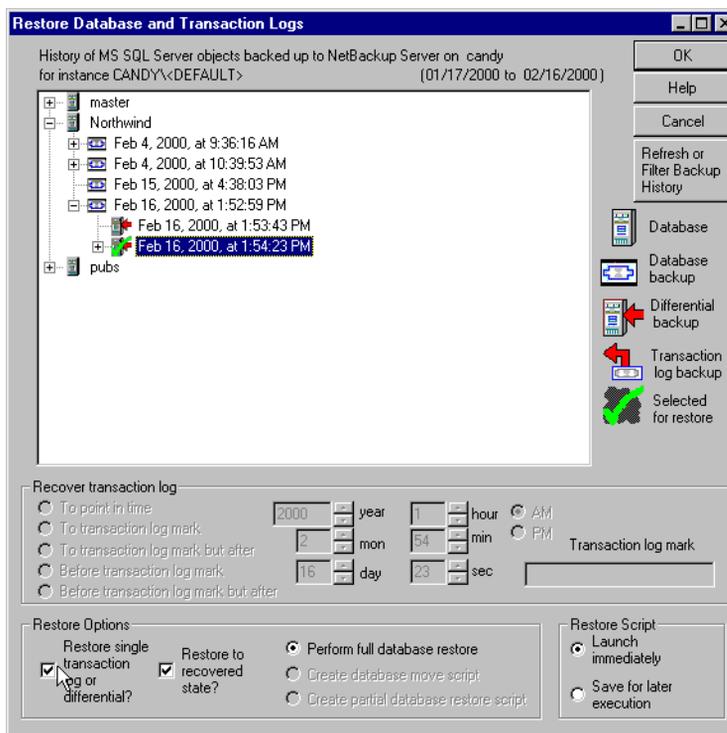
- g. Click **Yes**. NetBackup for SQL Server will start the restore of the database dump, differential, and transaction logs. Go to step 11.



8. Restore a single differential dump when Microsoft SQL Server 7.0 or 2000 is active.
 - a. Expand the database backup icon under the database that you wish to restore. In this example, we will restore a differential backup from database Northwind.



- b. Select the differential backup icon that you wish to restore. Notice that the **Restore Single Transaction Log or Differential?** check box is enabled.

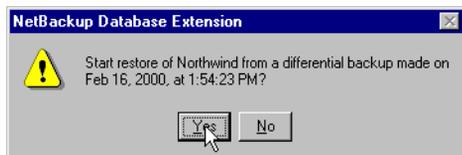


When the **Restore Single Transaction Log or Differential?** check box is selected, only the transaction log icon which you highlighted will be superimposed with a green checkmark.

Caution If you attempt to restore a single differential backup without first restoring the preceding database backup file, Microsoft SQL Server will halt the load process with an error such as 4305 or 4306. If you plan to restore a single differential, then you are responsible for first restoring the database backup file. You can avoid this problem by backing up the entire sequence of transaction logs, the differential backup, and the backup file to the same NetBackup Server and restoring the entire sequence of backup objects as described in step 7.

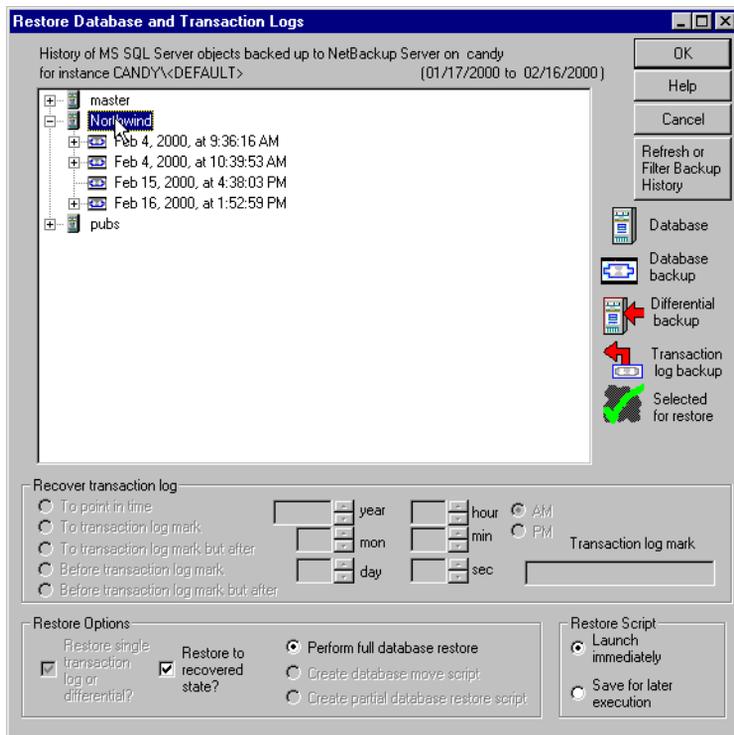


- c. Click **OK**. The NetBackup for SQL Server message will appear.

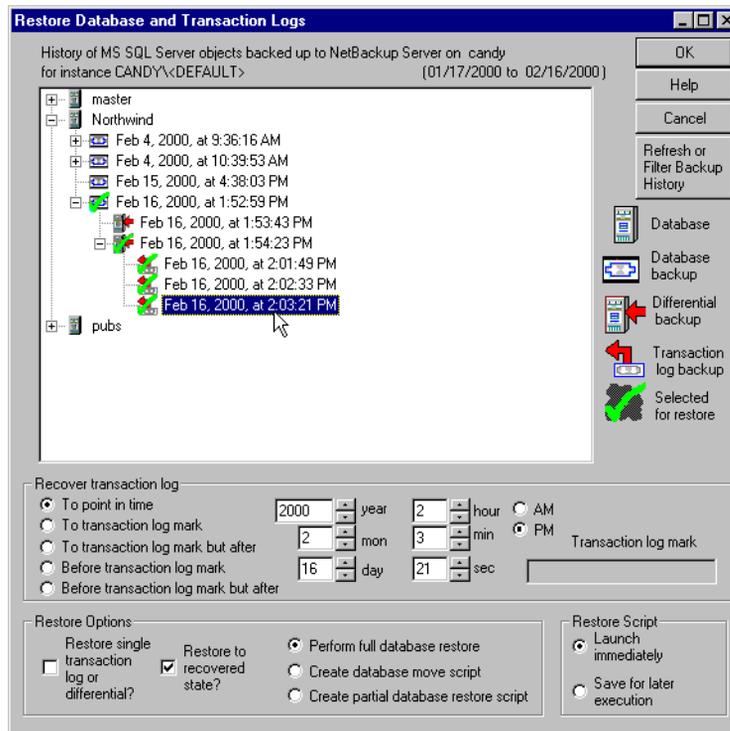


- d. Click **Yes**. NetBackup for SQL Server will start the restore of the database from the differential backup. Go to step 11.
9. Restore a single transaction log when Microsoft SQL Server 7.0 or 2000 is active.

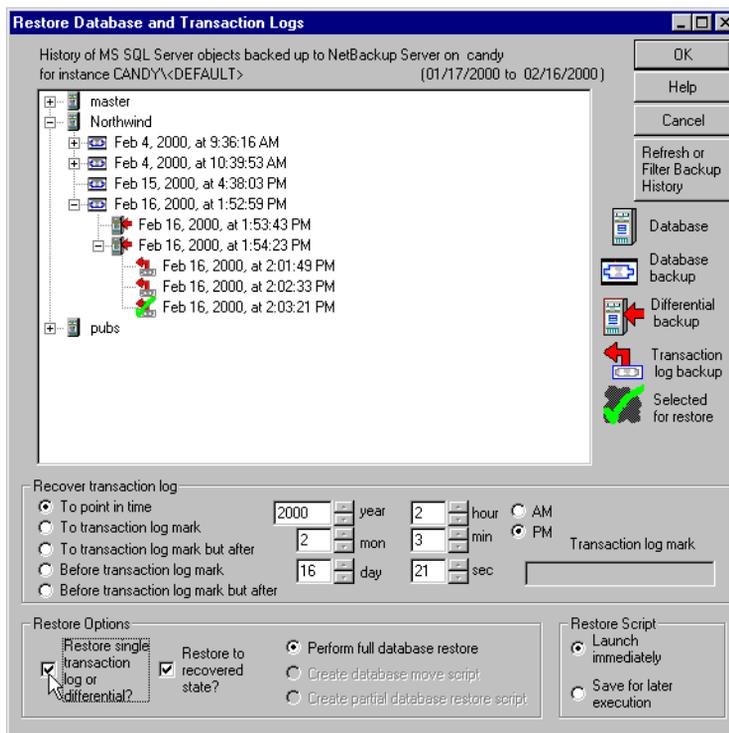
- a. Expand the database backup icon under the database that you wish to restore. In this example, we will restore a transaction log dump from database Northwind.



- b. Expand the differential which most closely precedes the time of your transaction log; and select the transaction log that you want to restore.



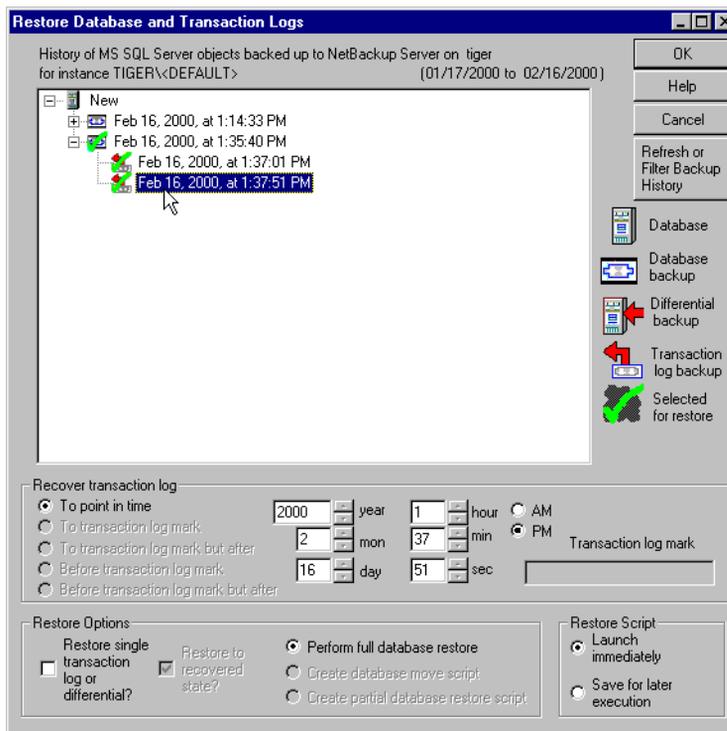
When the **Restore Single Transaction Log or Differential?** check box is selected, only the transaction log backup icon which you highlighted will be superimposed with a green checkmark.



Caution If you attempt to restore a single transaction log backup without first restoring the preceding transaction logs, the differential backup, and the database backup, Microsoft SQL Server will halt the load process with an error such as 4305 or 4306. If you plan to restore a single transaction log, then you are responsible for restoring all of these additional objects first. You can avoid this problem by backing up the entire sequence of transaction logs, the differential backup, and the database backup to the same NetBackup Server and restoring the entire sequence of backup objects as described in step 7.

- c. Click **OK**. NetBackup for SQL Server will start the restore of the database from the transaction log. Go to step 11.

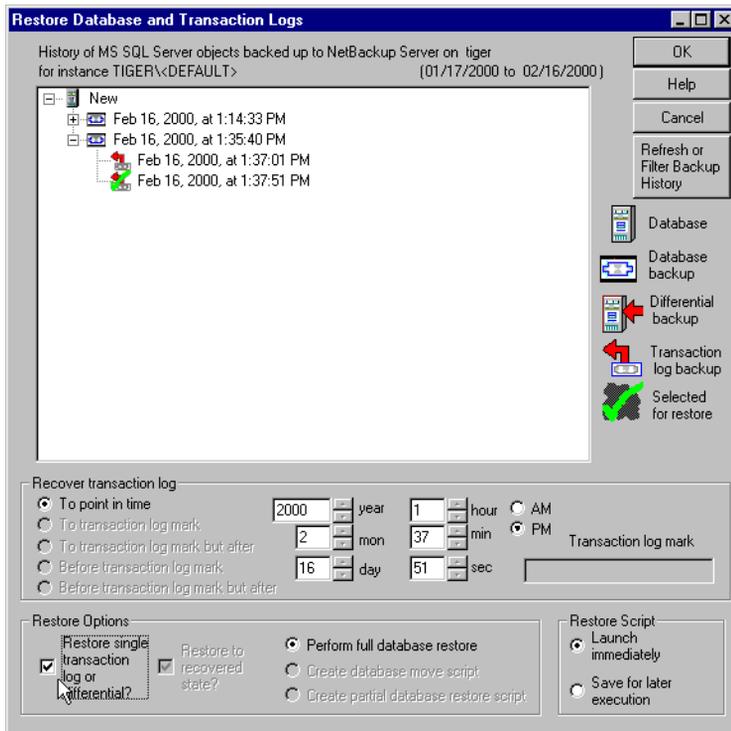
10. Restore a single transaction log when Microsoft SQL Server 6.5 is installed.
- Expand the database dump under the database that you wish to restore. In this example, we will restore a transaction log from database New.



- Select the transaction log icon that you wish to restore. Notice that the **Restore Single Transaction Log or Differential?** check box becomes enabled when you make your selection.



- c. Click on the **Restore single transaction log or differential?** check box. Notice that with **Restore single transaction log or differential?** in a checked state, only the transaction log icon which you highlighted will be superimposed with a green checkmark.



Caution If you attempt to restore a single transaction log without first restoring the transaction logs and the database backup which preceded it, Microsoft SQL Server will halt the load process with an error such as 4305 or 4306. If you plan to restore single transaction logs, then you are responsible for ensuring that you restore the database backup and transaction logs in the order in which they were created. You can avoid this problem by backing up the entire sequence of transaction logs and the database backup to the same NetBackup Server and restoring the entire sequence of backup objects as described in step 6.

- d. Click **OK**. The NetBackup Database Extension GUI message will appear.



- e. Click **Yes**. NetBackup for SQL Server will start the restore of the single transaction log indicated above.

11. On the **View** menu, select **Monitor Jobs**.

The View Status dialog box appears.

Restoring File and Filegroup Backups

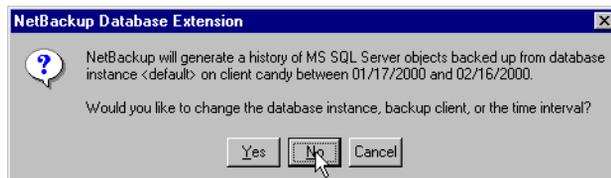
You can use the Restore Files and Filegroups dialog box to perform a full restore of a Microsoft SQL Server 7.0 or 2000 database if NetBackup contains:

- ◆ A set of file and/or filegroup backup images that constitute the complete database.
- ◆ An unbroken chain of transaction log backups which span this entire set.

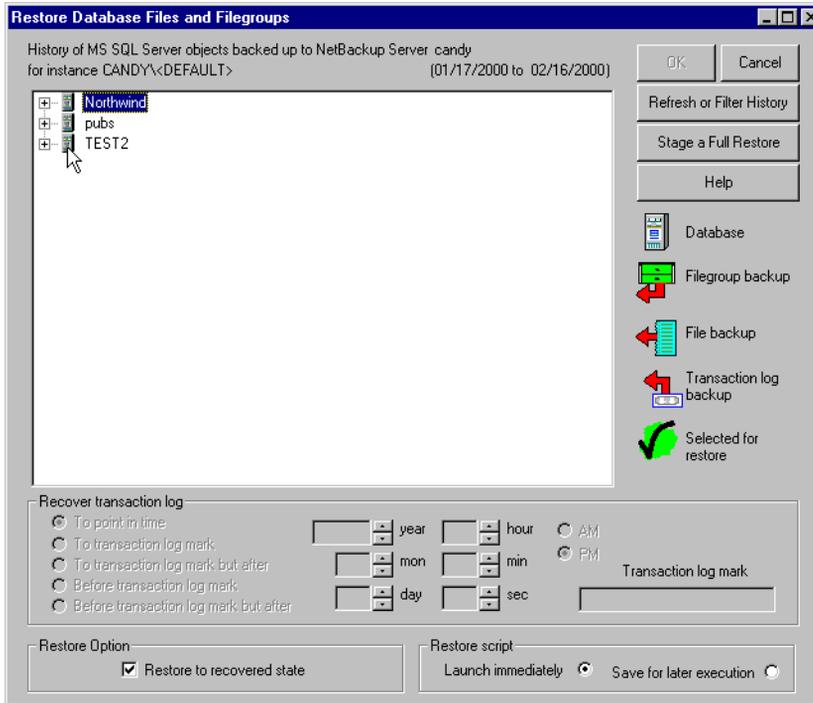
If multiple sets exist, NetBackup for SQL Server identifies the last set to have been backed up. If a full set does not exist, you can still restore individual files and filegroups that you have backed up. This section shows you how to perform a restore from either a full set or an individual file or filegroup backup.

1. Complete the procedure for entering your default login parameters as described in “Set Database Login Parameters” on page 63.
2. From the **Actions** menu, select **Restore**, then **Database Files and Filegroups**.

The following appears.

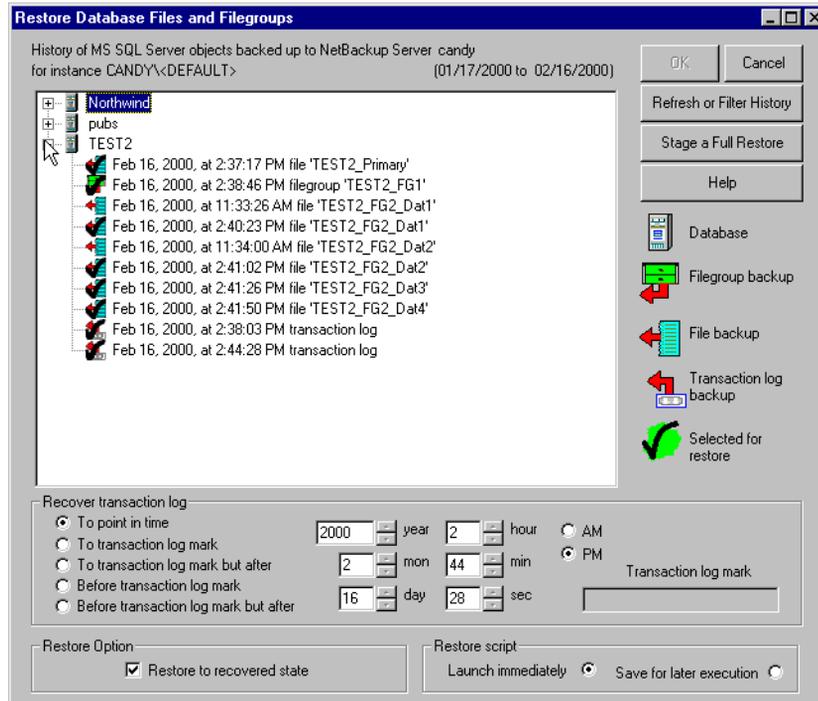


3. Click **No**. The Restore Database Files and Filegroups dialog box appears.



- Expand the icon of the database that you want to restore. In this example we will use TEST2.

The expanded database icon shows file, filegroup, and transaction log backups.



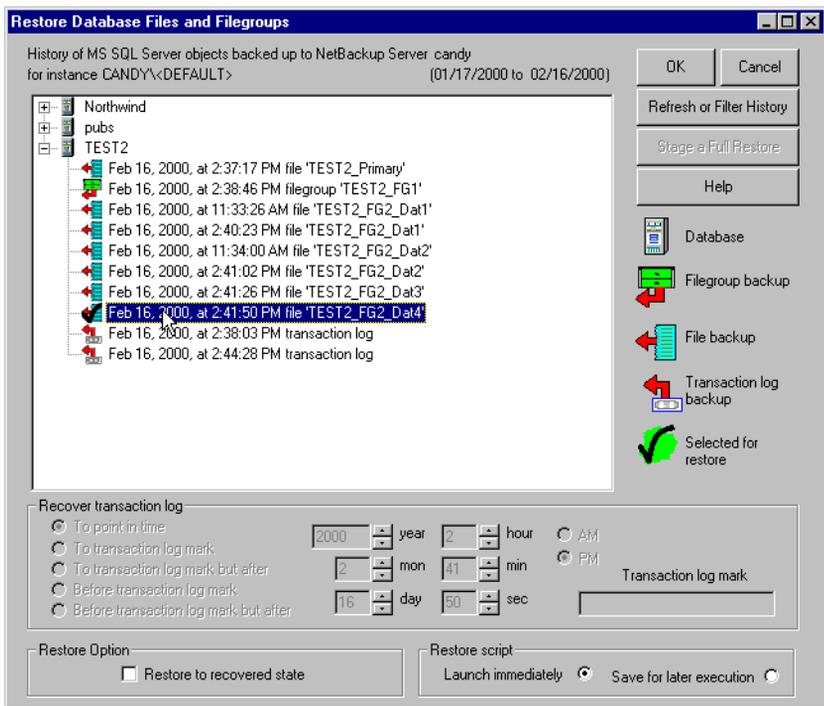
Note In this example, NetBackup for SQL Server was able to find a full restore set. The members of this set were overlaid with black checkmarks.

Go to:

- step 5 to perform a full database restore.
- step 6 to restore a single file or filegroup.

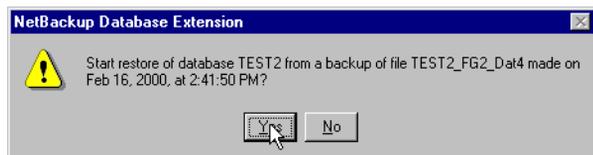


5. Perform a full database restore from files and filegroups.
 - a. Click **Stage a Full Restore** to display a dialog box that lists the selected files to restore.
 - b. Click Yes and go to step 8.
6. Restore a single file or filegroup.
 - a. Select the file or filegroup that you want to restore.



Notice that the **Stage a Full Restore** box has been disabled.

- b. Click **OK**.
The following appears.



- Click **Yes**. NetBackup for SQL Server will start the restore process.
- On the **View** menu, select **Monitor Jobs**.
The View Status dialog box appears.

Performing Database Move Operations

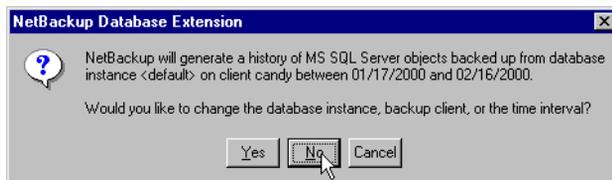
The following instructions show you how to perform a database move operation and a partial database restore. Database copy allows you to use a full set of backup images to copy an existing database to a new database having a different name. Partial database restore lets you select individual filegroup components of a database and restore them to a new database having a different name.

Tip When you are preparing your database design, map logically related database components such as tables, indexes, keys, etc., to the same filegroup. This will enable you to use the partial database restore procedure, which follows, to recover these logically related components as a single unit.

Note Partial database restore is only available if SQL Server 2000 is installed. Database move is available for 2000 and 7.0.

- Complete the procedure for typing your login parameters as described in “Set Database Login Parameters” on page 63.
- On the **Actions** menu, select **Restore**, then **Databases, Differentials, and Transaction Logs**.

A NetBackup for Database Extension message box appears

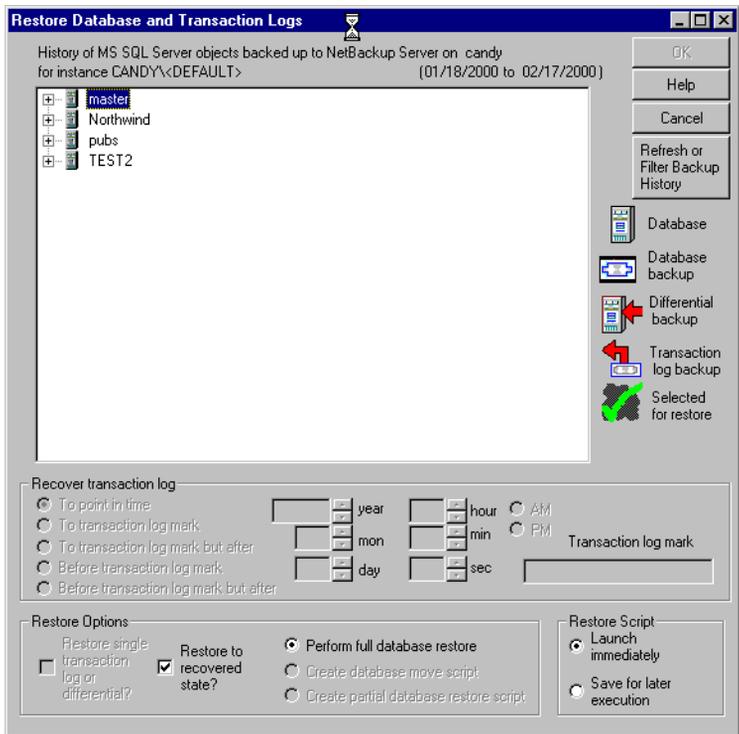


- Select **No**.

See “Restoring Database, Differential, and Transaction Log Backups” on page 76, for instructions on modifying backup history options.

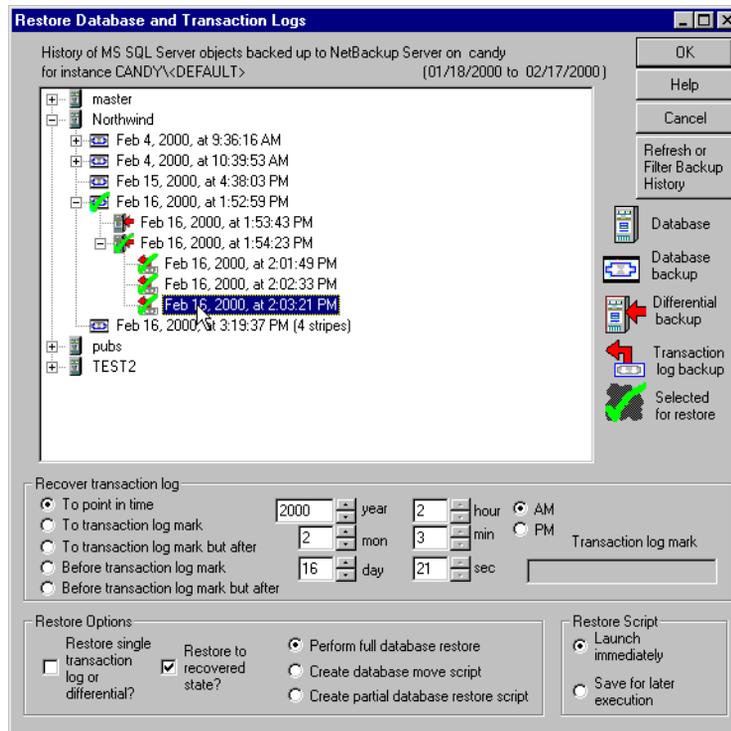


The Restore Database and Transaction Logs dialog box appears.



4. Locate the database you want to restore and expand it down to the set of transaction logs that you want to recover from.

- Highlight the the last transaction log that you want to restore to.



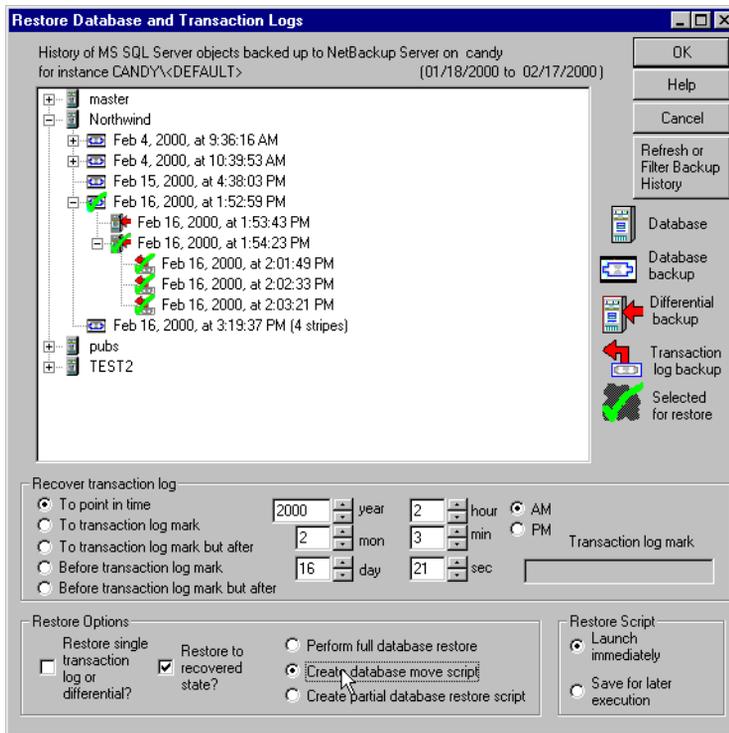
Go to:

- step 6 to perform a database move
- step 7 to perform a partial database recovery.

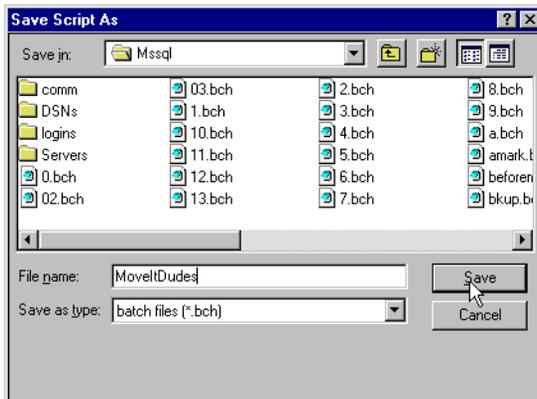
- Move a database to a new database with a different name.



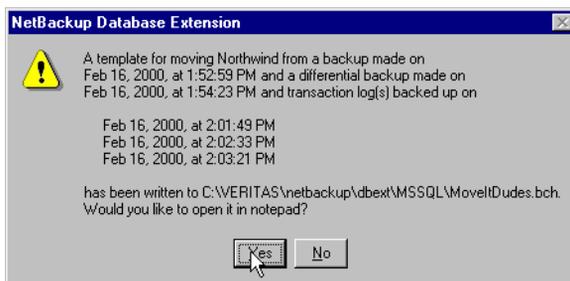
- a. In the Restore Options dialog box, select **Create database move script**.



- b. Click **OK**. The **Save Script As** dialog box appears.
- c. Type the name you want for the move template in the **File name** field.
- d. Click **Save**.



- e. A NetBackup Database Extension message box describing the move operation is displayed. Click **Yes** to open it in Notepad.



The contents of the sample move template are displayed below. Notice that it contains instructions on how you can modify this template in order to perform a full database restore operation to a database with a different name.

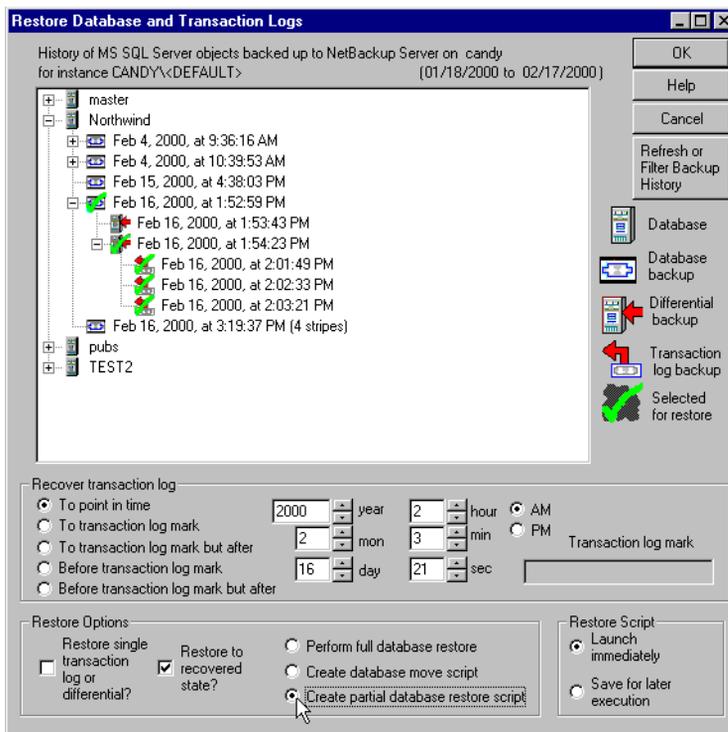
```
#
# This is a template for the database MOVE command.
#
OPERATION RESTORE
OBJECTTYPE DATABASE
#
# Replace the database name in the following line with the name of the database that you
# want to move to. Also remove the hash mark <#> which precedes the keyword <DATABASE>.
#
#DATABASE Northwind
#
# Replace the file path <e:\Program Files\Microsoft SQL Server\MSSQL\DATA\northwnd.mdf>
# with a new file path. Also remove the hash mark <#> which precedes the keyword <TO>.
# The target of the MOVE keyword must be "Northwind".
#
#MOVE Northwind TO 'e:\Program Files\Microsoft SQL Server\MSSQL\DATA\northwnd.mdf'
#
# Replace the file path <e:\Program Files\Microsoft SQL Server\MSSQL\DATA\northwnd.ldf>
# with a new file path. Also remove the hash mark <#> which precedes the keyword <TO>.
# The target of the MOVE keyword must be "Northwind_log".
#
#MOVE Northwind_log TO 'e:\Program Files\Microsoft SQL Server\MSSQL\DATA\northwnd.ldf'
#
NBIMAGE candy.MSSQL7.CANDY.db.Northwind.~.0.001of001.20000216135259..C
MAXTRANSFERSIZE 0
BLOCKSIZE ODBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
OPERATION RESTORE
OBJECTTYPE DATABASE
#
# Replace the database name in the following line with the name of the database
# that you want to move to. Also remove the hash mark
# <#> which precedes the keyword <DATABASE>.
```



```
#DATABASE Northwind
DUMPOPTION INCREMENTAL
NBIMAGE candy.MSSQL7.CANDY.inc.Northwind.~.0.001of001.2000021613 5423..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
OPERATION RESTORE
OBJECTTYPE TRXLOG
#
# Replace the database name in the following line with
# the name of the database that you
# want to move to. Also remove the hash mark <#> which precedes the keyword <DATABASE>.
#
#DATABASE Northwind
NBIMAGE candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.2000021614 0149..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
OPERATION RESTORE
OBJECTTYPE TRXLOG
#
# Replace the database name in the following line with the name of the database
# that you want to move to. Also remove the hash mark <#> which precedes the keyword DATABASE>.
#
NBIMAGE candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.2000021614 0233..C
#DATABASE Northwind
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
OPERATION RESTORE
OBJECTTYPE TRXLOG
#
# Replace the database name in the following line with the name of the database
# that you want to move to. Also remove the hash mark <#> which precedes the keyword
# <DATABASE>.
#
#DATABASE Northwind
NBIMAGE candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.2000021614 0321..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
ENDOPER TRUE
```



- f. Go to step 8.
7. Perform a partial database restore.
 - a. In the Restore Options group, select the **Create partial database restore script**.

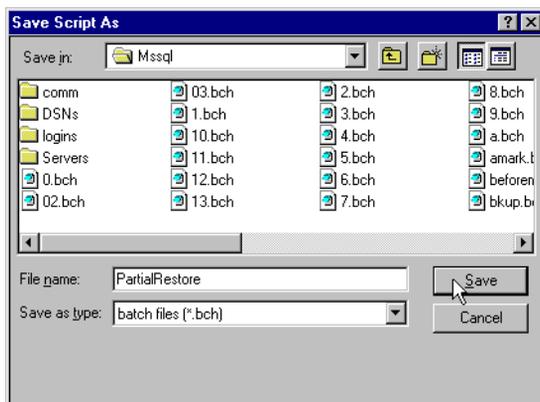


- b. Click **OK**.

The Save script As dialog box appears.

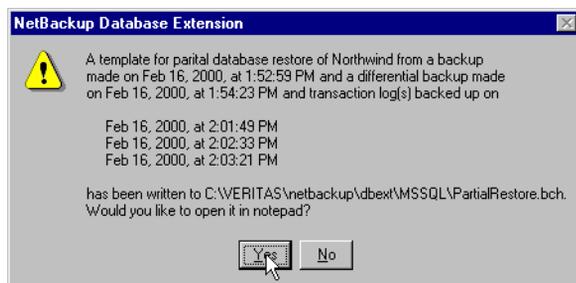


- c. In the **File name** text box, type the name you want for the partial database restore template and click **Save**.



A NetBackup Database Extension message box describing the partial database restore operation is displayed.

- d. Click **Yes** to open it in Notepad.



The contents of the sample partial database restore template are displayed below. Notice that it contains instructions on how you can modify this template in order to perform a partial database restore operation to a database with a different name.

```
#
# This is a template for PARTIAL DATABASE RESTORE.
# It requires Microsoft SQL Server 2000.
#
OPERATION RESTORE
OBJECTTYPE DATABASE
#
# Replace the database name in the following line with the name of the database
# that you want as the target of the partial restore. Also remove the hash mark
# <#> which precedes the keyword <DATABASE>.
#DATABASE Northwind
RESTORETYPE PARTIAL
```



```

#
# If you wish to restore file
# <e:\Program Files\Microsoft SQL Server\MSSQL\DATA\northwnd.mdf>,
# then replace this path with a new file path. Also remove the hash marks <#>
# which precede the keywords <MOVE> and <TO>.
# The target of the MOVE keyword must be "Northwind".
#MOVE Northwind
#TO 'e:\Program Files\Microsoft SQL Server\MSSQL\DATA\northwnd.mdf'
#
#
# If you wish to restore file
# <e:\Program Files\Microsoft SQL Server\MSSQL\DATA\northwnd.ldf>,
# then replace this path with a new file path. Also remove the hash marks <#>
# which precede the keywords <MOVE> and <TO>.
# The target of the MOVE keyword must be "Northwind_log".
#MOVE Northwind_log
#TO 'e:\Program Files\Microsoft SQL Server\MSSQL\DATA\northwnd.ldf'
#
NBIMAGE candy.MSSQL7.CANDY.db.Northwind.~.0.001of001.20000216135259..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
OPERATION RESTORE
OBJECTTYPE DATABASE
#
# Replace the database name in the following line with the name of the database
# that you want as the target of the partial restore. Also remove the hash mark
# <#> which precedes the keyword <DATABASE>.
#DATABASE Northwind
DUMPOPTION INCREMENTAL
NBIMAGE candy.MSSQL7.CANDY.inc.Northwind.~.0.001of001.20000216135423..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
OPERATION RESTORE
OBJECTTYPE TRXLOG
#
# Replace the database name in the following line with the name of the database
# that you want as the target of the partial restore. Also remove the hash mark
# <#> which precedes the keyword <DATABASE>.
#DATABASE Northwind
NBIMAGE candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.20000216140149..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE

```



```
OPERATION RESTORE
OBJECTTYPE TRXLOG
#
# Replace the database name in the following line with the name of the database
# that you want as the target of the partial restore. Also remove the hash mark
# <#> which precedes the keyword <DATABASE>.
#DATABASE Northwind
NBIMAGE candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.20000216140233..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
OPERATION RESTORE
OBJECTTYPE TRXLOG
#
# Replace the database name in the following line with the name of the database
# that you want as the target of the partial restore. Also remove the hash mark
# <#> which precedes the keyword <DATABASE>.
#DATABASE Northwind
NBIMAGE candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.20000216140321..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
ENDOPER TRUE

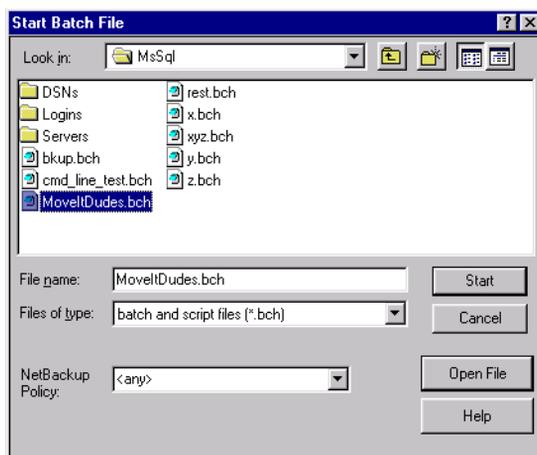
OPERATION RESTORE
OBJECTTYPE TRXLOG
#
# Replace the database name in the following line with the name of the database
# that you want as the target of the partial restore. Also remove the hash mark
# <#> which precedes the keyword <DATABASE>.
#DATABASE Northwind
NBIMAGE candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.20000216140233..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE

OPERATION RESTORE
OBJECTTYPE TRXLOG
#
# Replace the database name in the following line with the name of the database
# that you want as the target of the partial restore. Also remove the hash mark
# <#> which precedes the keyword <DATABASE>.
#DATABASE Northwind
NBIMAGE candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.20000216140321..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
```



```
DSN default-instance  
ENDOPER TRUE
```

- e. Go to step 8.
8. After you have completed modifying the script template created in step 6 or 7, open the **Batch Files** dialog box from the **Actions** menu.
9. Select the batch file that you just created.
10. Click **Start**.



A NetBackup Database Extension message appears.



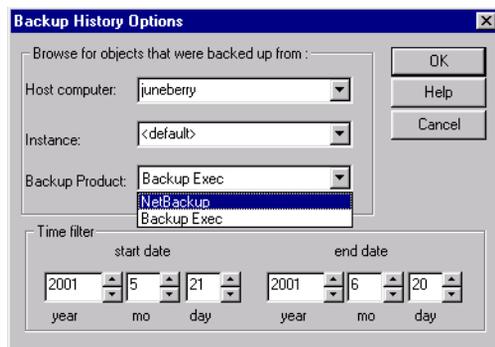
11. Click **Yes** to launch the operation.
12. On the **View** menu, select **Monitor Jobs**.
The View Status dialog box appears.



Restoring from Backup Exec Images

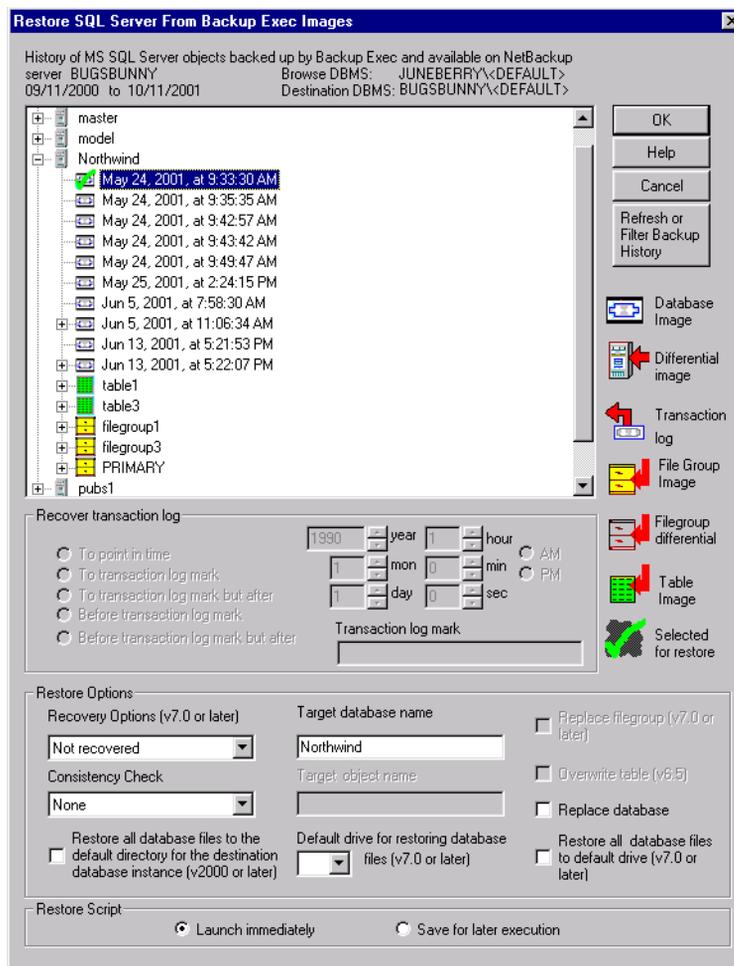
Use the following procedures if the NetBackup catalog contains SQL Server images that have been converted from a Backup Exec catalog.

- ▼ **To restore a database, database differential, or database transaction log from a Backup Exec image**
 1. Complete the procedure for typing your login parameters as described in “Set Database Login Parameters” on page 63. The default instance will identify the target SQL Server instance that you want to restore to.
 2. On the **Actions** menu, select **Restore**, then **Databases, Differentials, and Transaction Logs**.
A NetBackup Database Extension GUI message box appears.
 3. Select **Yes**.
The Backup History Options dialog will appear.
 4. Select the parameters that you want to use for browsing images.
 - a. In the **Host Computer** field, type the name of client machine that contains the SQL Server instance whose images you want to browse.
 - b. In the **Instance** field, select the name of the SQL Server instance which you want to browse. Select **<default>** for the default instance.
 - c. To browse images that were backed up using Backup Exec, select **Backup Exec** from the **Backup Product** list.
 - d. In the **Time Filter** field, enter the start and end dates that you want to use for delimiting the browse range.

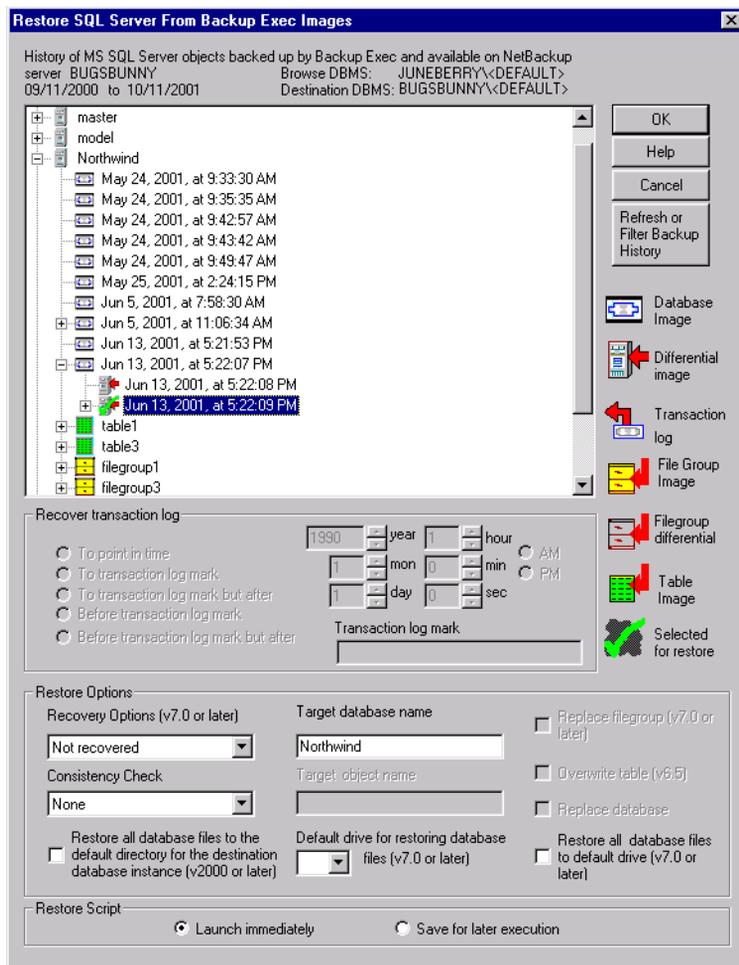


The Restore SQL Server From Backup Exec Images dialog will appear.

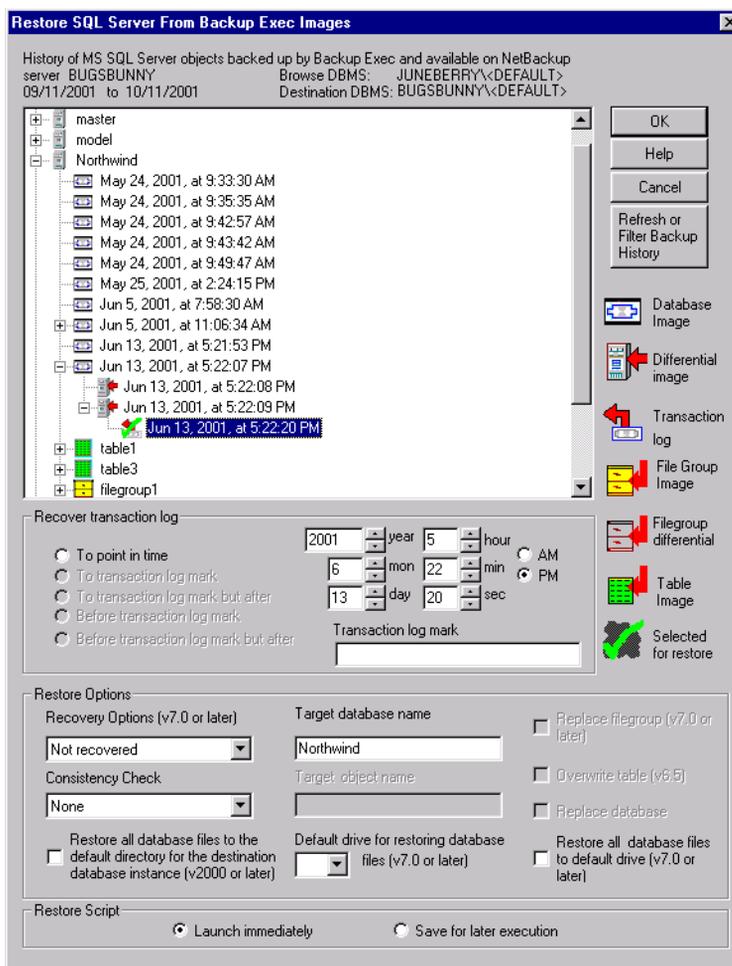
5. Expand the database that contains the image you wish to restore.
6. Expand the Database Image that contains the object you wish to restore.
 - If restoring a database, select the database backup image to restore.



- If restoring a database differential, expand the Database Image and select the Differential Image to restore.



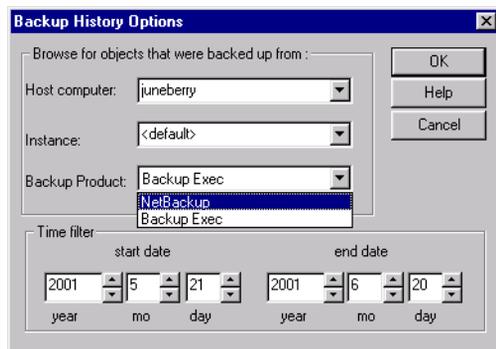
- If restoring a transaction log, expand the Database Image and the Differential Image and select the Transaction log to restore.



7. Select the desired Restore Options. For more information, refer to “Restore Database Objects from Backup Exec Images” on page 201.
8. Click **OK**.
A NetBackup for Microsoft SQL Server message box appears.
9. Click **Yes** to begin the restore.
10. On the **View Menu**, choose **Monitor Jobs**.
The View Status dialog box appears.



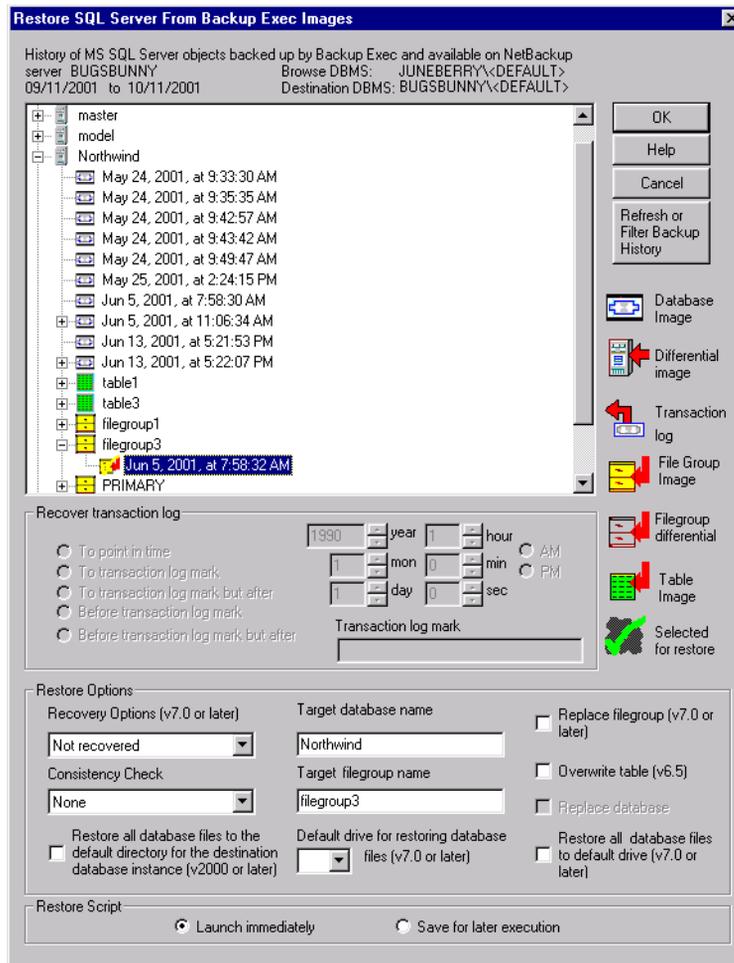
- ▼ **To restore a database filegroup or database filegroup differential from a Backup Exec image**
 1. Complete the procedure for typing your login parameters as described in “Set Database Login Parameters” on page 63. The default instance will identify the target SQL Server instance that you want to restore to.
 2. On the **Actions** menu, select **Restore**, then **Databases, Differentials, and Transaction Logs**.
A NetBackup Database Extension GUI message box appears.
 3. Select **Yes**.
The Backup History Options dialog will appear.
 4. Select the parameters that you want to use for browsing images.
 - a. In the **Host Computer** field, type the name of client machine that contains the SQL Server instance whose images you want to browse.
 - b. In the **Instance** field, select the name of the SQL Server instance which you want to browse. Select **<default>** for the default instance.
 - c. To browse images that were backed up using Backup Exec, select **Backup Exec** from the **Backup Product** list.
 - d. In the **Time Filter** field, enter the start and end dates that you want to use for delimiting the browse range.



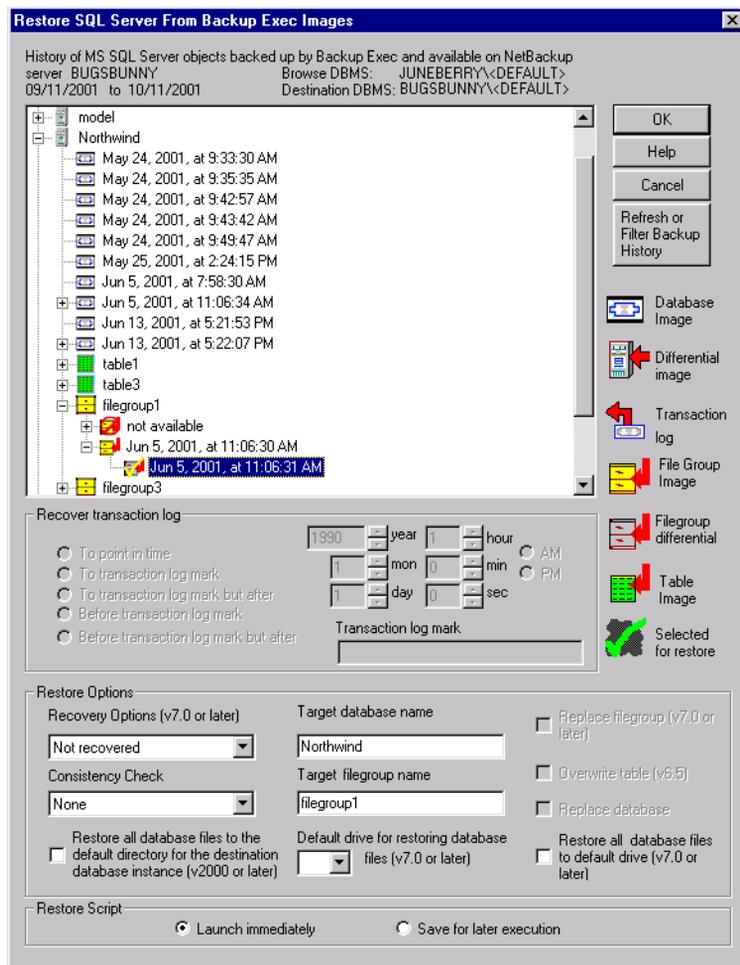
The Restore SQL Server From Backup Exec Images dialog will appear.

5. Expand the database that contains the image you wish to restore.

- If restoring a database filegroup, expand the filegroup and select the File Group Image to restore.



- If restoring a database filegroup differential, expand the filegroup and the File Group Image and select the Filegroup differential to restore.



6. Select the desired Restore Options. For more information, refer to “Restore Database Objects from Backup Exec Images” on page 201.

7. Click **OK**.

A NetBackup for Microsoft SQL Server message box appears.

8. Click **Yes** to begin the restore.

9. On the **View Menu**, choose **Monitor Jobs**.

The View Status dialog box appears.



▼ **To restore a table from a Backup Exec image**

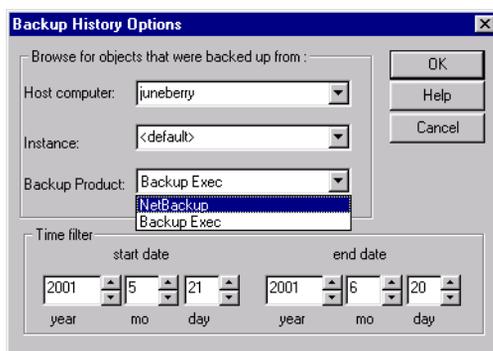
1. Complete the procedure for typing your login parameters as described in “Set Database Login Parameters” on page 63. The default instance will identify the target SQL Server instance that you want to restore to.
2. On the **Actions** menu, select **Restore**, then **Databases, Differentials, and Transaction Logs**.

A NetBackup Database Extension GUI message box appears.

3. Select **Yes**.

The Backup History Options dialog will appear.

4. Select the parameters that you want to use for browsing images.
 - a. In the **Host Computer** field, type the name of client machine that contains the SQL Server instance whose images you want to browse.
 - b. In the **Instance** field, select the name of the SQL Server instance which you want to browse. Select **<default>** for the default instance.
 - c. To browse images that were backed up using Backup Exec, select **Backup Exec** from the **Backup Product** list.
 - d. In the **Time Filter** field, enter the start and end dates that you want to use for delimiting the browse range.

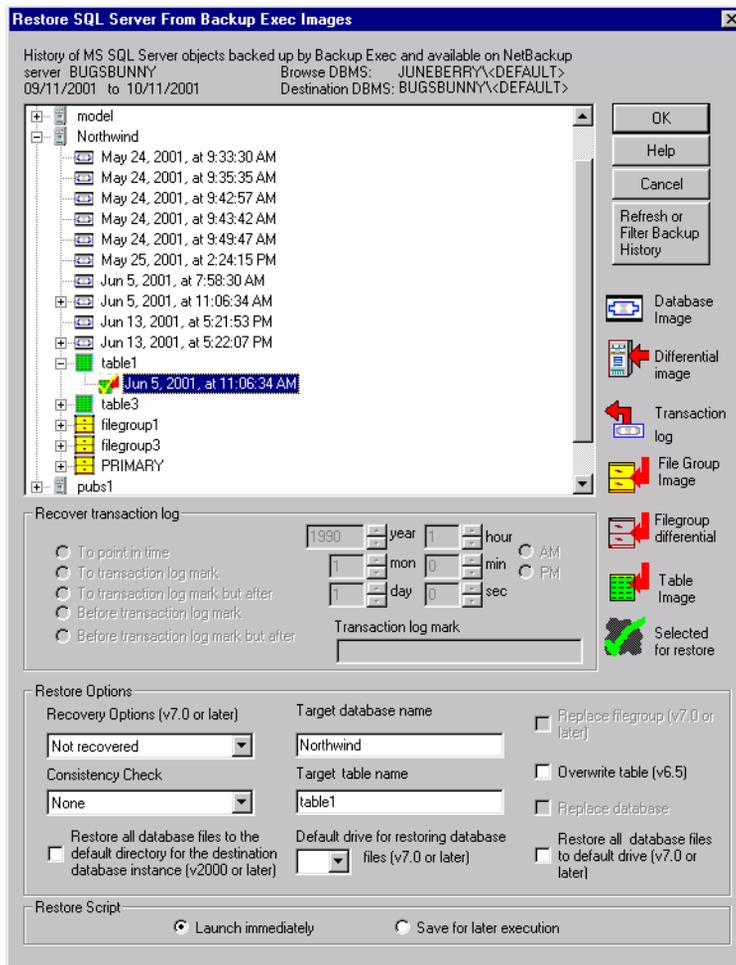


The Restore SQL Server From Backup Exec Images dialog will appear.

5. Expand the database that contains the Backup Exec backup image you wish to restore.
6. Expand the table that contains the Table Image you wish to restore.



7. Select the Table Image you wish to restore.



8. Select the desired Restore Options. For more information, refer to “Restore Database Objects from Backup Exec Images” on page 201.

9. Click **OK**.

A NetBackup for Microsoft SQL Server message box appears.

10. Click **Yes** to begin the restore.

11. On the **View Menu**, choose **Monitor Jobs**.

The View Status dialog box appears.



Redirecting a Restore to a Different Host

Multiple NetBackup database clients may be configured to use a single NetBackup master server for backing up Microsoft SQL Server databases. If this is done, you can back up SQL Server database objects from one client and restore them to another. To perform this kind of redirected restore, you must establish permission settings on the Master Server. Either:

- ◆ Create a file called `install_path\NetBackup\db\altnames\No.Restrictions`, to allow unrestricted redirected restore privileges
- or
- ◆ Create a file called `install_path\NetBackup\db\altnames\<HostA>`, to allow redirected restore privilege of HostA's data to any other client served by the Master.

▼ To perform a redirected restore of a SQL Server object backed up on HostA to HostB

1. Use the DBMS Options window to log onto the target instance on HostB.
2. From the **Options** menu, choose **Client Options** and select the current Master Server to be a host which is common to both HostA and HostB.
3. After selecting the Restore menu item, answer "Yes" when asked if you would like to modify the filtering criteria that are used for creating the backup history.
4. From the Browse History window, select HostA as the host computer and select the instance on HostA from which the target objects were backed up.

When the restore window appears it will contain a history of objects that were backed from HostA. You can then select those objects and restore them to HostB.

Redirecting a Database to a Different Location

The database move operation is used to redirect the restore of a database to a different location. The new location may be a different instance on the same host, a different host, or a different file path. The move operation also allows you to restore the database under a different name than the original one. The move operation is not available for images created using SQL Server 6.5, nor can SQL Server 7.0 or 2000 images be moved to a SQL Server 6.5 installation.



Note The destination host\instance of a move or restore operation is the one that you log into as indicated by the ODBC data source name (DSN). Select the DSN using the Set database login parameters dialog box. The source host\instance for move or restore operations is designated using the Backup History Options dialog box to specify a “host computer” and “instance.”

NetBackup for SQL Server creates a move template when you select the **Create database move script** option in the Restore Database and Transaction Logs dialog box. You can specify the exact criteria of the redirection by modifying the template to establish your own batch file.

In order to create a move template, NetBackup for SQL Server needs to know the file structure of the source database. For NetBackup for SQL Server images created with version 4.5 or greater, this information is stored in the NetBackup catalog. However, in order to create a move script using an image created in an earlier version of NetBackup, you must log into the same SQL Server instance on the same host machine from which the image was backed up. In addition, for pre-4.5 images, you must not have changed the file structure of the database by adding or deleting files or filegroups.

You do not necessarily need to use a move script when you restore a database to a different host or database instance. However, if you do not use a move script, then you may get SQL Server error messages such as 3156 or 3157, which indicate that the original source file path is not available on the destination machine. This may occur because the path is already in use for a different database or because the path does not exist. You can generally resolve these errors by creating a move script and designating new file paths, which do exist and are unused, on the destination host.

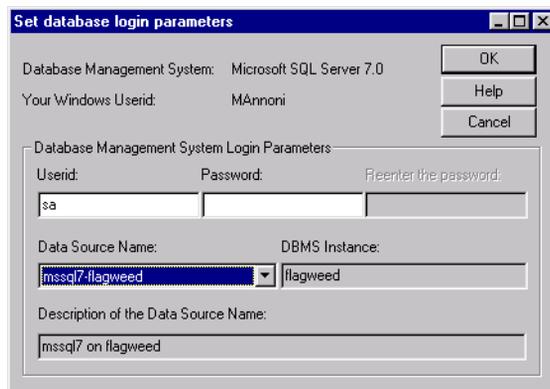
When you perform a move or restore, the images must be available on the host machine which is acting as the NetBackup master server for the destination host. If this master server is contained in the destination’s server list, then you can select the current server using the NetBackup for SQL Server Client Options dialog box. If the master server is not in the server list of the destination host — perhaps, because the server machine is remote or has access limitations — then you must duplicate the images onto a unique media id that is removable, transport that media to the master server used by the destination host, and import the images to the master server used by the destination host. After the images have been imported, use the Backup History Options dialog box to designate the instance and host name of the source SQL Server database.

The following example shows how to use NetBackup for SQL Server to move a database from one database instance to another. An assumption is made that the database was backed up from the destination machine to a NetBackup master server which is contained in the server list of both machines. If the backup had been done to a NetBackup master server that was not in the server list of the destination host, then the steps would be the same except that the backup images would first have to be duplicated from the master

server used by the source host onto a unique media id that is removable, the media transported to the master server used by the destination host, and the images imported to the master server used by the destination host.

▼ **To redirect a database to another location**

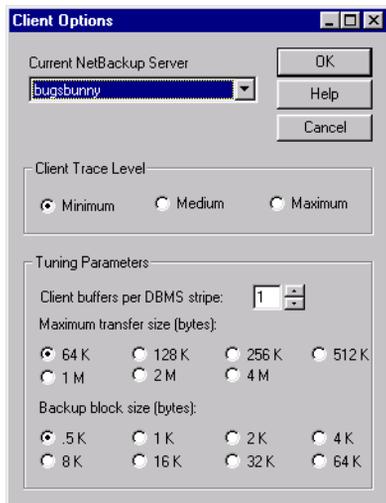
1. Complete the procedure for typing your default login parameters as described in “Set Database Login Parameters” on page 63.
2. On the **Options** menu, select **Set DBMS Login Parameters**.
The Set database login parameters dialog box appears.
3. From the **Data Source Name** list, select the ODBC data source name which corresponds to the SQL Server instance of the destination host.



4. Click **OK**.
5. On the **Options** menu, select **Set NetBackup Client Options**.
The Client Options dialog box appears.

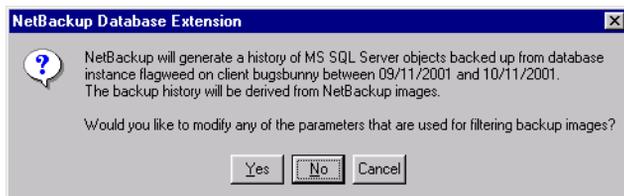


- From the **Current Netbackup Server** list, select the NetBackup Server which contains the SQL Server backup images that you want to restore to on the destination host.



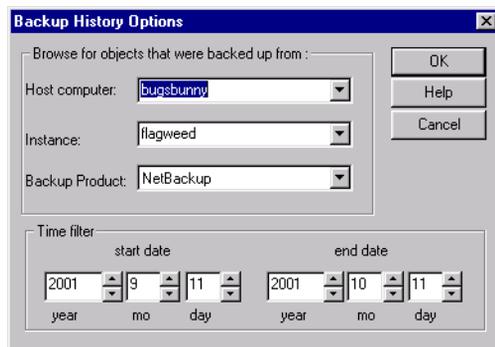
- Click **OK**.
- On the **Actions** menu, point to **Restore**, then **Databases, Differentials, and Transactions Logs**.

A NetBackup Database Extension Graphical User Interface message box appears.

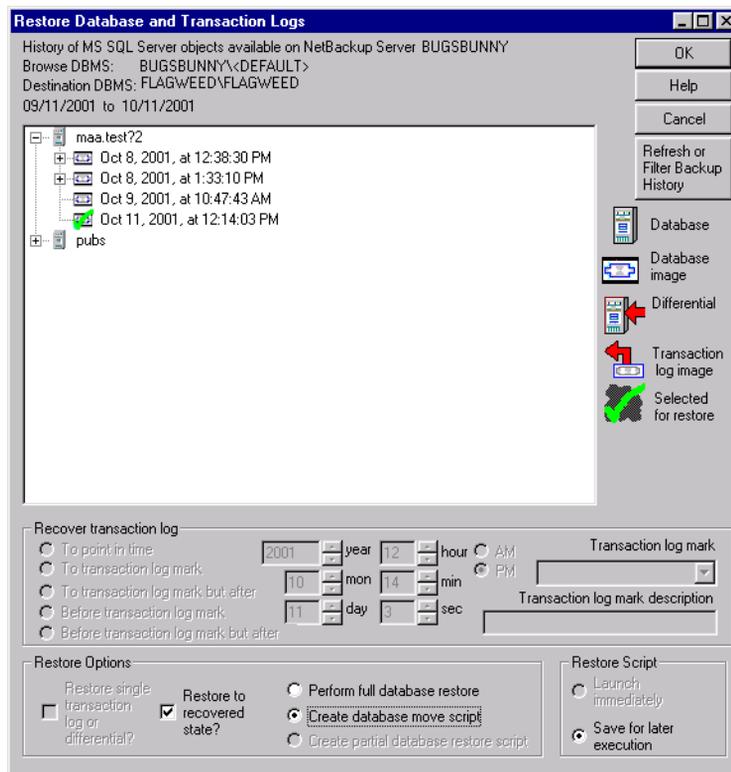


- Click **Yes**.
The Backup History Options dialog will appear.
- In the **Host Computer** box, enter the host name of the database source.

11. In the **Instance** box, enter the instance name of the source.



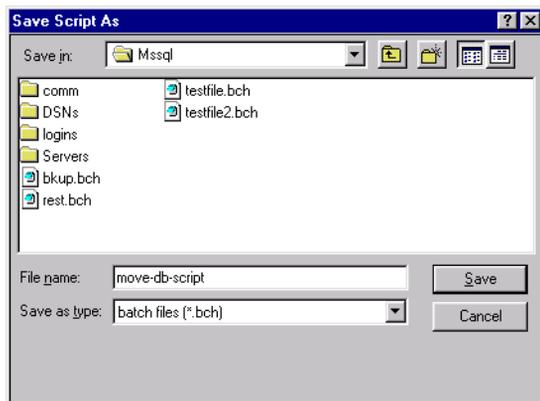
12. Click **OK**.
13. Browse for the database that you want to move to the new location.
14. Select **Create database move script**.



15. Click **OK**.

A Save As dialog box will appear.

16. Enter a batch file name, and click **Save**.



A NetBackup Database Extension message box appears.



17. Click **Yes** to open the move template that was created.

18. Edit this template to designate the name that you would like to use for the destination database as well as the file paths that you would like to use for each of the database files.

19. After you have edited the template, you can launch it from the Start a Batch File dialog.

Using Batch Files

NetBackup for SQL Server uses batch files for initiating backup and restore operations.

Create Batch Files

You will have to create a batch file if you start up operations with:

- ◆ the Start Batch File dialog box in NetBackup for SQL Server
- ◆ the `dbbackup` command line
- ◆ the NetBackup Server Scheduler
- ◆ the UNIX NetBackup Server GUI
- ◆ the NetBackup Administration Console for Windows NT/2000

You can easily create a fully functional batch file by selecting the **Save for Later Execution** radio button from any of the backup or restore dialog boxes and then clicking **OK**. This section, however, provides guidelines to help you to understand the contents of a batch file and how to modify or create one on your own.

When you create a batch file, you should give it a unique name with the extension `.bch`. Place the batch file in the `install_path\NetBackup\dbext\MSSQL\` folder. By following these guidelines, you will benefit as follows:

- ◆ When you open the Start Batch File dialog box from the NetBackup Database Extension GUI, icons for your batch files will appear immediately in the display window.
- ◆ When you launch a job through the `dbbackup` command line interface, specify only the file name (not the full path name) on the command line.
- ◆ When you specify a file name for the file list of an MS-SQL-Server policy schedule, you only need to specify the file name (not the full path name).

There are several points to remember about batch files.

- ◆ A batch file consists of a series of operations (backups and restores) which by default are run in sequence.
- ◆ Each operation consists of a series of `<keyword value>` pairs, which completely define the total operation.
- ◆ The keyword is not case sensitive but the value is. Generally, you will be safe if you code both the keyword and value in uppercase, with the exception that, if you use the `NBIMAGE` keyword option, then the value must be specified exactly as it is stored by NetBackup Server.
- ◆ Operations are not nested.



- ◆ With the exception of the BATCHSIZE parameter, <keyword value> pairs are not global. If you use BATCHSIZE, then it must appear only once in your batch file and it must appear in the first operation.
- ◆ Within an operation, the <keyword value> pairs may appear in any order except that each operation must be terminated by `ENDOPER TRUE`.
- ◆ You can include comment lines in your batch file by placing a hash mark ('#') in the first column.

The following describes the keywords and values used in a batch file.

Keywords and Values Used in Batch Files

Keyword	Values	Required?	Default	Description
ALTCLIENT (Same as BROWSECLIENT)	string	no	None	Restores images from a host other than the local host.
BATCHSIZE	Integer	no	1	Number of operations to start up simultaneously. Applies to all of the operations in the batch file. Must appear before the end of the first operation. Range is 1-10.
BLOCKSIZE	Integer	no	0	Used only if Microsoft SQL Server 7 or 2000 is installed. Applicable for backup operations only. Block size is calculated as 512 bytes * 2 ^{BLOCKSIZE} . Range is 1-7.
BROWSECLIENT (Same as ALTCLIENT)	string	no	None	Restores images from a host other than the local host.
BUFFERS	Integer	no	1	Number of buffers per stripe. Range is 1-32.
DATABASE	string	yes	none	Name of database. For backup operations, specify value \$ALL to designate all databases (except for tempdb.)



Keywords and Values Used in Batch Files

Keyword	Values	Required?	Default	Description
DBMS	MSSQL	no	MSSQL	You can specify MSSQL only.
DSN	string	no	saved from GUI user session	ODBC data source name
DUMPOPTION	INCREMENTAL	no	none	Specifies INCREMENTAL restoring from an incremental backup.
ENDOPER	TRUE	yes	none	Terminates each operation specified in the batch file.
MAXTRANSFERSIZE	Integer	no	0	Used only if Microsoft SQL Server 7 or 2000 is installed. Maximum transfer size is calculated as 64 kilobytes bytes * $2^{\text{MAXTRANSFERSIZE}}$. Range is 1-6.
MOVE	file group	no	none	Specifies a filegroup name. Used for restore types PARTIAL and MOVE.
NBIMAGE	string	Yes, for restore operations	none	Specifies a NetBackup image for the restore operations. See caution below.

Note You can use NetBackup for SQL Server 4.5 to restore SQL Server 6.5 or 7.0 objects that were backed up by NetBackup for SQL Server 3.2 or 3.3. However, the image name format has changed in Microsoft SQL Server 3.4, so use the NetBackup Database Extension GUI script generation function to generate the NBIMAGE parameter for you.

NBSCHED	string	no	none	If the NetBackup policy has several <i>Application Backup Policy</i> schedules, use NBSched to select amongst them.
---------	--------	----	------	---



Keywords and Values Used in Batch Files

Keyword	Values	Required?	Default	Description
NBSERVER	string	no	none	Specifies which master server to use for the backup or restore operation.
NUMBUFS				Refer to <code>BUFFERS</code> .
OBJECTNAME	string	Yes, if OBJECTTYPE = FILE or FILEGROUP	none	Specifies a file or filegroup name for file/filegroup backups and restores.
OBJECTTYPE	DATABASE TRXLOG FILEGROUP FILE TABLE	no	DATABASE	Specifies whether you are backing up or restoring a database, transaction log, filegroup, file, or table. TABLE can only be specified if you are restoring Backup Exec images.
OBJTYPE				Refer to <code>OBJECTTYPE</code> .
OPERATION	BACKUP RESTORE	no	BACKUP	Type of operation, either backup or restore.
PASSWORD	string	no	null	Password for logging into Microsoft SQL Server.
RECOVEREDSTATE	NOTRECOVERED RECOVERED STANDBY TRUE FALSE	yes	TRUE	Applicable to all Microsoft SQL Server 7 or 2000 restores. If <code>STANDBY</code> , can only be used for restoring images created by Backup Exec. If <code>TRUE</code> , database reverts to a recovered state when the operation is completed. See note below.



Keywords and Values Used in Batch Files

Keyword	Values	Required?	Default	Description
<p>Note For Microsoft SQL Server 7 or 2000 restores, use <code>RECOVEREDSTATE TRUE</code> if you want Microsoft SQL Server to revert the database to a recovered state following completion of the operation. If you intend to stage a series of restores on the same database (for example, applying multiple transaction log images), then you should use <code>RECOVEREDSTATE FALSE</code> or <code>RECOVEREDSTATE NOTRECOVERED</code> on all but the last operation in the series. <code>RECOVEREDSTATE STANDBY</code> is used in Backup Exec restores only.</p>				
<code>RESTOREBEFOREMARK</code>	string	no	none	SQL Server 2000 restore option. Specify transaction log mark.
<code>RESTOREBEFOREMARKAFTERTIME</code>	string	no	none	SQL Server 2000 restore option. Specify transaction log mark.
<code>RESTOREOPTION</code>	REPLACE	no	none	Indicates if the selected object is to be replaced.
<code>RESTORETOMARK</code>	string	no	none	SQL Server 2000 restore option. Specify transaction log mark.
<code>RESTORETOMARKAFTERTIME</code>	string	no	none	SQL Server 2000 restore option. Specify transaction log mark.
<code>RESTORETYPE</code>	FULL MOVE PARTIAL	no	"FULL"	SQL Server Restore database options.

Note `RESTORETYPE` is applicable only to `RESTORE` database operations. `PARTIAL` requires SQL Server 2000. `MOVE` requires SQL Server 7.0 or 2000. If `MOVE` is used, then the batch file should contain a series of one or more

```
<MOVE><filegroup>
<TO><file path>
```

sequences. If `PARTIAL` is used, then a similar sequence is also required, but the sequence for `PARTIAL` must specify all of the filegroups in the database whose backup image is referenced by the `NBIMAGE` keyword.



Keywords and Values Used in Batch Files

Keyword	Values	Required?	Default	Description
STOPAT	datetime string	no	none	Specifies point-in-time recovery of a transaction log. The datetime string is formatted as YYYY/MMDDHH:MM:SS.
<p>Note STOPAT, RESTORETOMARK, RESTORETOMARKAFTERTIME, RESTOREBEFOREMARK, and RESTOREBEFOREMARKAFTERTIME are mutually exclusive restore database parameters. If either RESTORETOMARKAFTERTIME or RESTOREBEFOREMARKAFTERTIME are used, then the batch file must also specify a datetime string with the keyword STOPAFTER.</p>				
STRIPES	integer	no	1	Number of stripes. Range is 1-32.
STOPAFTER	datetime string	no	none	Specifies datetime for SQL Server 2000 Restore to mark options. The datetime string is formatted as YYYY/MMDDHH:MM:SS.
TO	file path	no	none	Specifies a filegroup destination path. Required for each MOVE keyword. Also must sequentially follow each MOVE entry. The value may be delimited with single quotes.
TRACELEVEL	MIN MID MAX	no	MIN	Trace level.



Keywords and Values Used in Batch Files

Keyword	Values	Required?	Default	Description
TRXOPTION	NOTRUNC NOLOG TRUNCONLY	no	none	Microsoft SQL Server transaction log backup options. All three options are available with SQL 6.5. TRUNCONLY and NOTRUNC are available for SQL 7 and SQL 2000. If none of the options are selected, then the transaction log will be backed up and truncated.
USERID	string	no	sa	Userid for logging into Microsoft SQL Server.

The following describes additional keywords and values that can be used in a batch file only for restoring Backup Exec images.

Keywords and Values Used in Batch Files to Restore Backup Exec Images

Keyword	Values	Required?	Default	Description
BACKUPPRODUCT	NETBACKUP BACKUP EXEC	no	NETBACKUP	Specifies which product was used to create the image that is being restored.
CONSISTENCYCHECK	FULLUNCLUDINGINDICES FULLEXCLUDINGINDICES PHYSICALCHECKONLY	no	none	Performs the specified consistency check after the restore has been completed.
DEFAULTDRIVEFORRESTORE	char	no	none	Indicates the drive to which database files should be restored if the original drive does not exist. This keyword is applicable to SQL 7.0 or later.



Keywords and Values Used in Batch Files to Restore Backup Exec Images

Keyword	Values	Required?	Default	Description
INSTANCE	String	no	none	Specifies the name of the instance to which the files are restored.
RESTOREALLDBFILESTO DEAULTDIR	TRUE FALSE	no	FALSE	Restores files to the default data directory for the destination instance. This keyword is applicable to SQL Server 2000 or later.
RESTOREALLFILESTO DEFAULTDRIVE	TRUE FALSE	no	FALSE	Restores all files to their original directory on the default drive.

Create a Backup Batch File

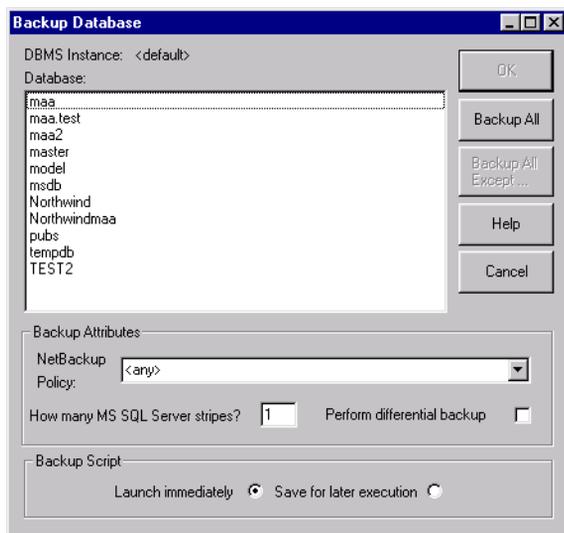
You can use any of the backup or restore dialog boxes to create a batch file containing a NetBackup for SQL Server script that can be executed at a later time from the Start Batch File dialog box, from the `dbbackex` command line program, or by the NetBackup server scheduler.

The following example demonstrates how to create and save a script for a simple backup operation.

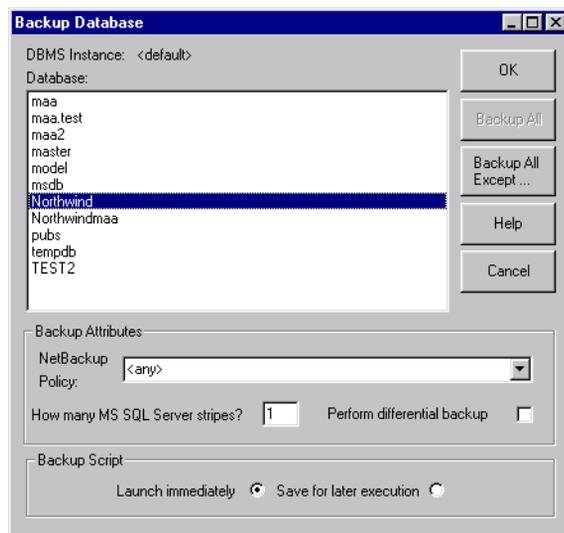


1. On the **Actions** menu, select **Backup**, then **Database**.

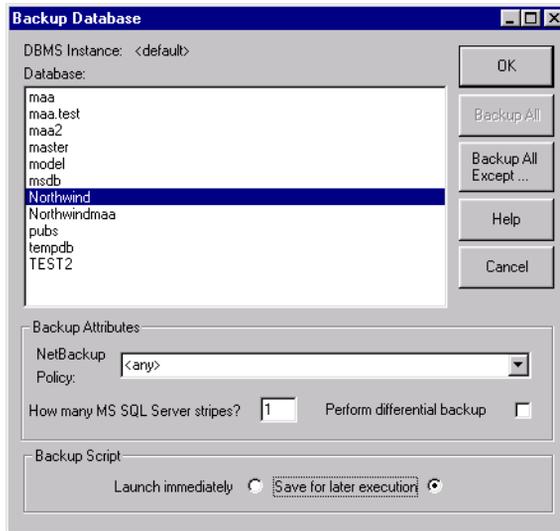
The Backup Database dialog box appears.



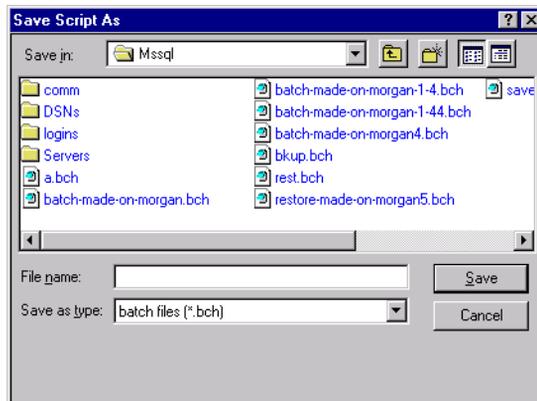
2. Select a database from the **Database** box. For this tutorial, we are going to back up Northwind.



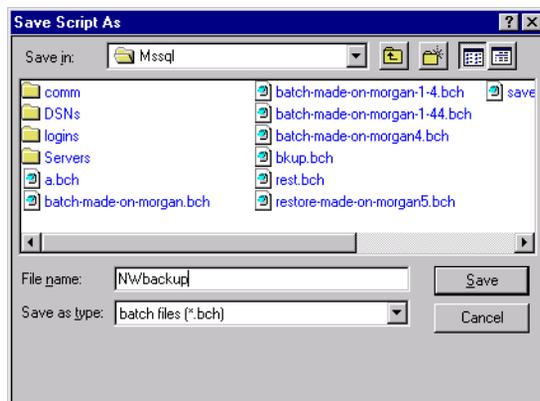
3. In the **Backup Script** radio group, pick **Save for Later Execution**.



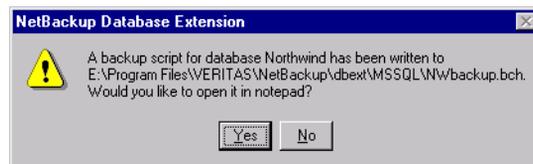
4. Click **OK**. The following appears.



5. Enter a filename and click **Save**.



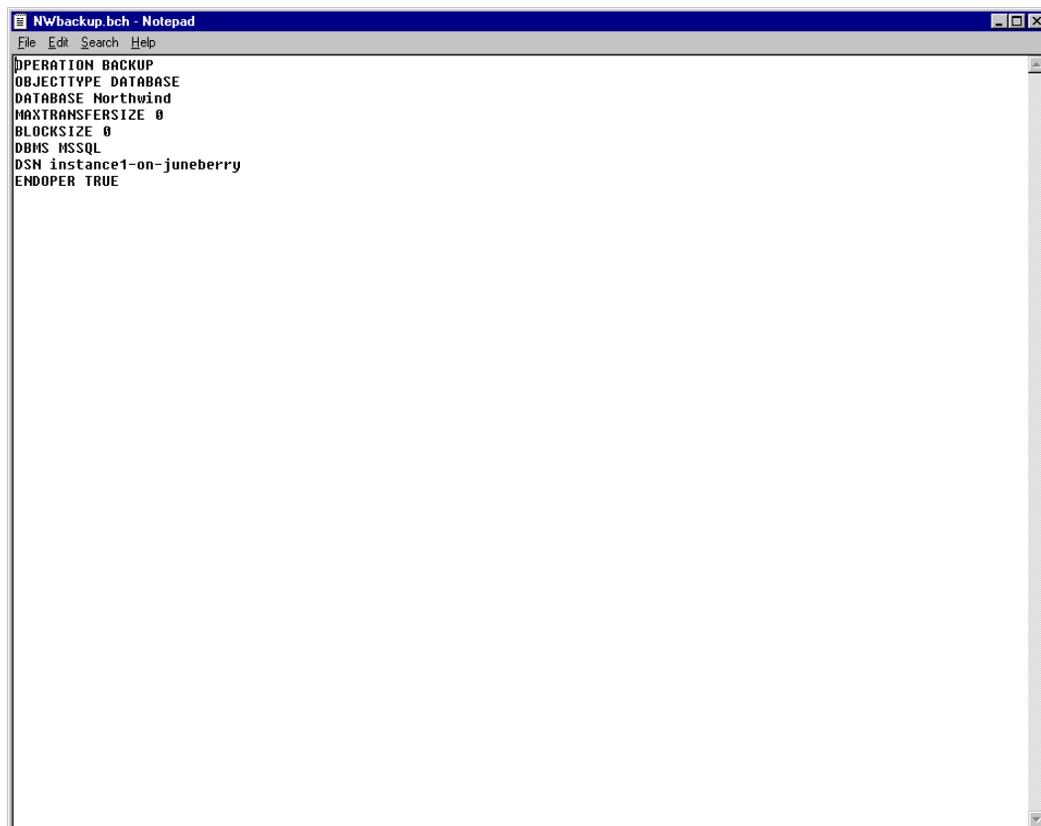
The following window appears.



Note Alternatively, in step 5 you can highlight the name of an existing file, and NetBackup for SQL Server will append the new script to it.



6. Click **Yes**. The batch file that you just created will open in Notepad.



```
OPERATION BACKUP
OBJECTTYPE DATABASE
DATABASE Northwind
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN instance1-on-juneberry
ENDOPER TRUE
```

Sample Batch Files

Sample 1 - Simple script to back up a database named BUSINESS.

```
OPERATION BACKUP
DATABASE BUSINESS
ENDOPER TRUE
```

Note that the parameters for this operation are guided by certain default values. For example, there will be one backup stripe, minimum trace level, and the object type will be a database (as opposed to a transaction log). This batch file will also use the ODBC data source name that is associated with the NT user account that executes it.

Sample 2 - Simple script to restore a database named pubs.

```

OPERATION RESTORE
OBJECTTYPE DATABASE
DATABASE pubs
NBIMAGE candy.MSSQL7.CANDY.db.pubs.~.0.001of001.20000203082050..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
ENDOPER TRUE

```

This sample restores database pubs based upon the backup NBIMAGE candy.MSSQL7.CANDY.db.pubs.~.0.001of001.20000203082050..C. You can find out which backups are available for restore by looking at the dbbackup.log file created when you did the backup or by using bplist. Refer to “Using bplist to Retrieve Microsoft SQL Server Backups” on page 149.

Note Use the “Restore Database and Transaction Logs” dialog box of the NetBackup Database Extension GUI in order to generate a restore script either for immediate launch or for later execution.

Sample 3 - Perform a striped database dump. Allow multiple internal buffers per stripe.

```

OPERATION BACKUP
DATABASE BUSINESS
STRIPES 4
NUMBUFS 2
DSN PRODUCTION
ENDOPER TRUE

```

This example backs up the BUSINESS database using 4 data streams. Each data stream uses 2 buffers. This backup will also use the data source name default-instance.

Sample 4 - Restore a database from multiple stripes.

```

OPERATION RESTORE
OBJECTTYPE DATABASE
DATABASE Northwind
NBIMAGE
candy.MSSQL7.CANDY.db.Northwind.~.0.001of004.20000216151937..C
STRIPES 004
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance

```



```
ENDOPER TRUE
```

For a striped restore, you must specify the number of stripes and the name of the first backup image name.

Notice that the backup in this example is embedded with the string `.001of004`, which indicates that it is the first of four backups.

Sample 5 - Restore a database transaction log up to a point in time.

```
OPERATION RESTORE
OBJECTTYPE TRXLOG
STOPAT 20000216/14:03:00
DATABASE Northwind
NBIMAGE
candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.20000216140321..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
ENDOPER TRUE
```

This script is executed after the database is restored. The database will be restored to the specified point in time (Feb 16, 2000 at 2:03:00 PM), which precedes the date of the backup log (Feb 16, 2000 at 2:03:21 PM).

Note If STOPAT is not specified, then the database would be restored to the date of the backup log.

Note You can avoid manually staging the restoration of the database backup and the associated log files by using the Restore Database and Transaction Logs dialog of the NetBackup for Microsoft SQL Server GUI.

Note Since RECOVEREDSTATE was not specified, the database will be restored to a recovered state following successful execution of this script.

Sample 6 - Perform an operation in which you explicitly specify the userid and password that you want NetBackup for SQL Server to use when it logs in to Microsoft SQL Server.

```
OPERATION BACKUP
DATABASE BUSINESS
USERID BOZO
PASSWORD OHMYGOSH
ENDOPER TRUE
```



This way of specifying a userid and password is applicable only if you are using standard Microsoft SQL Server security. See DBMS (Database Management System) Privileges for more information.

Sample 7 - Perform multiple operations in sequence.

```
OPERATION BACKUP
DATABASE BUSINESS
OBJECTYPE DATABASE
STRIPES 5
ENDOPER TRUE
```

```
OPERATION BACKUP
DATABASE RECREATION
OBJECTYPE TRXLOG
ENDOPER TRUE
```

```
OPERATION BACKUP
DATABASE EDUCATION
STRIPES 2
ENDOPER TRUE
```

```
OPERATION BACKUP
DATABASE GOVERNANCE
OBJECTYPE TRXLOG
ENDOPER TRUE
```

```
OPERATION BACKUP
DATABASE SURVIVAL
OBJECTYPE TRXLOG
ENDOPER TRUE
```

Five separate backups will be performed sequentially. Remember that each operation is required to be completely specified.

Sample 8 - Perform a set of operations in parallel.

```
BATCHSIZE 3
OPERATION BACKUP
DATABASE BUSINESS
OBJECTYPE DATABASE
STRIPES 5
ENDOPER TRUE
```

```
OPERATION BACKUP
DATABASE RECREATION
OBJECTYPE TRXLOG
```



```
ENDOPER TRUE
```

```
OPERATION BACKUP  
DATABASE EDUCATION  
STRIPES 2  
ENDOPER TRUE
```

```
OPERATION BACKUP  
DATABASE GOVERNANCE  
OBJECTYPE TRXLOG  
ENDOPER TRUE
```

```
OPERATION BACKUP  
DATABASE SURVIVAL  
OBJECTYPE TRXLOG  
ENDOPER TRUE
```

This sample is coded identically to the previous one except that the first operation contains `BATCHSIZE 3`. This tells NetBackup to start the first three operations in parallel, then after these are all completed begin the next set of 3. In this case, since there are just five operations, the second batch set will contain two operations.

Sample 9 - Specify the maximum transfer size and block size for an SQL Server 7.0 or 2000 backup.

```
OPERATION BACKUP  
DATABASE BUSINESS  
MAXTRANSFERSIZE 4  
BLOCKSIZE 6  
ENDOPER TRUE
```

This example backs up database business using a maximum transfer size of 64 kilobytes bytes * 2⁴ (1M) and a block size of 512 bytes * 2⁶ (32 kilobytes).

Sample 10 - Stage a database restore from a database backup, a differential backup, and a series of transaction backups.

```
OPERATION RESTORE  
OBJECTTYPE DATABASE  
DATABASE Northwind  
NBIMAGE  
candy.MSSQL7.CANDY.db.Northwind.~.0.001of001.20000216135259..C  
MAXTRANSFERSIZE 0  
BLOCKSIZE 0  
DBMS MSSQL  
DSN default-instance  
RECOVEREDSTATE FALSE
```



```
ENDOPER TRUE

OPERATION RESTORE
OBJECTTYPE DATABASE
DATABASE Northwind
DUMPOPTION INCREMENTAL
NBIMAGE
candy.MSSQL7.CANDY.inc.Northwind.~.0.001of001.20000216135423..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE

OPERATION RESTORE
OBJECTTYPE TRXLOG
STOPAT 20000216/14:03:00
DATABASE Northwind
NBIMAGE
candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.20000216140149..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE

OPERATION RESTORE
OBJECTTYPE TRXLOG
STOPAT 20000216/14:03:00
DATABASE Northwind
NBIMAGE
candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.20000216140233..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE

OPERATION RESTORE
OBJECTTYPE TRXLOG
STOPAT 20000216/14:03:00
DATABASE Northwind
NBIMAGE
candy.MSSQL7.CANDY.trx.Northwind.~.0.001of001.20000216140321..C
```



```
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
ENDOPER TRUE
```

This is an example of a script actually generated by the Restore Database and Transaction Logs dialog box.

Sample 11 - Stage a database restore from a filegroup backup, several file backups, and a series of transaction backups.

```
OPERATION RESTORE
OBJECTTYPE FILE
OBJECTNAME TEST2_Primary
DATABASE TEST2
NBIMAGE
candy.MSSQL7.CANDY.fil.TEST2.TEST2_Primary.0.001of001.20000216143717.
.C
```

```
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
```

```
OPERATION RESTORE
OBJECTTYPE FILEGROUP
OBJECTNAME TEST2_FG1
DATABASE TEST2
NBIMAGE
candy.MSSQL7.CANDY.fg.TEST2.TEST2_FG1.0.001of001.20000216143846..C
```

```
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
```

```
OPERATION RESTORE
OBJECTTYPE FILE
OBJECTNAME TEST2_FG2_Dat1
DATABASE TEST2
NBIMAGE
candy.MSSQL7.CANDY.fil.TEST2.TEST2_FG2_Dat1.0.001of001.20000216144023
..C
MAXTRANSFERSIZE 0
```



```
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE

OPERATION RESTORE
OBJECTTYPE FILE
OBJECTNAME TEST2_FG2_Dat2
DATABASE TEST2
NBIMAGE
candy.MSSQL7.CANDY.fil.TEST2.TEST2_FG2_Dat2.0.001of001.20000216144102
..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE

OPERATION RESTORE
OBJECTTYPE FILE
OBJECTNAME TEST2_FG2_Dat3
DATABASE TEST2
NBIMAGE
candy.MSSQL7.CANDY.fil.TEST2.TEST2_FG2_Dat3.0.001of001.20000216144126
..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE

OPERATION RESTORE
OBJECTTYPE FILE
OBJECTNAME TEST2_FG2_Dat4
DATABASE TEST2
NBIMAGE
candy.MSSQL7.CANDY.fil.TEST2.TEST2_FG2_Dat4.0.001of001.20000216144150
..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE
```



```
OPERATION RESTORE
STOPAT 20000216/02:44:28
OBJECTTYPE FILE
OBJECTNAME TEST2_FG2_Dat4
DATABASE TEST2
NBIMAGE candy.MSSQL7.CANDY.trx.TEST2.~.0.001of001.20000216143803..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
RECOVEREDSTATE FALSE
ENDOPER TRUE

OPERATION RESTORE
STOPAT 20000216/02:44:28
OBJECTTYPE FILE
OBJECTNAME TEST2_FG2_Dat4
DATABASE TEST2
NBIMAGE candy.MSSQL7.CANDY.trx.TEST2.~.0.001of001.20000216144428..C
MAXTRANSFERSIZE 0
BLOCKSIZE 0
DBMS MSSQL
DSN default-instance
ENDOPER TRUE
```

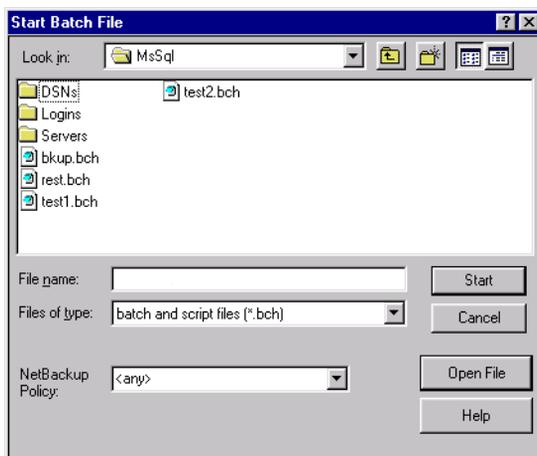
This is an example of a full database restore script actually generated by the Restore Database Files and Filegroups dialog box.

Run NetBackup Batch Files

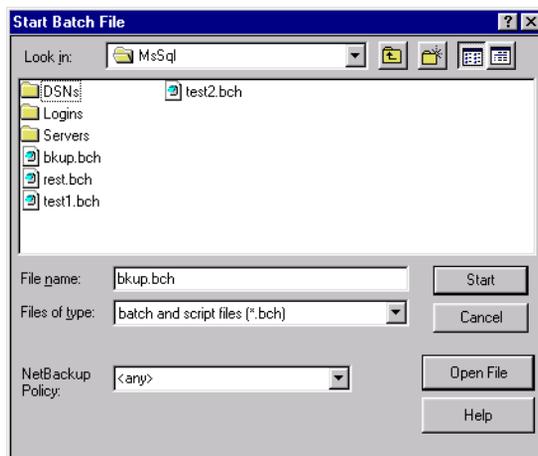
1. Complete the procedure for typing your default login parameters as described in “Initial Startup” on page 62.
2. On the **Actions** menu, select **Batch Files**.



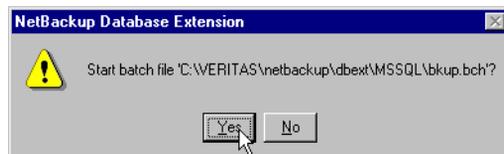
The following dialog box appears.



3. Double-click a batch file from the file list. For this tutorial, we are going to select `bkup.bch`. The name of the batch file will appear the **File Name:** box.



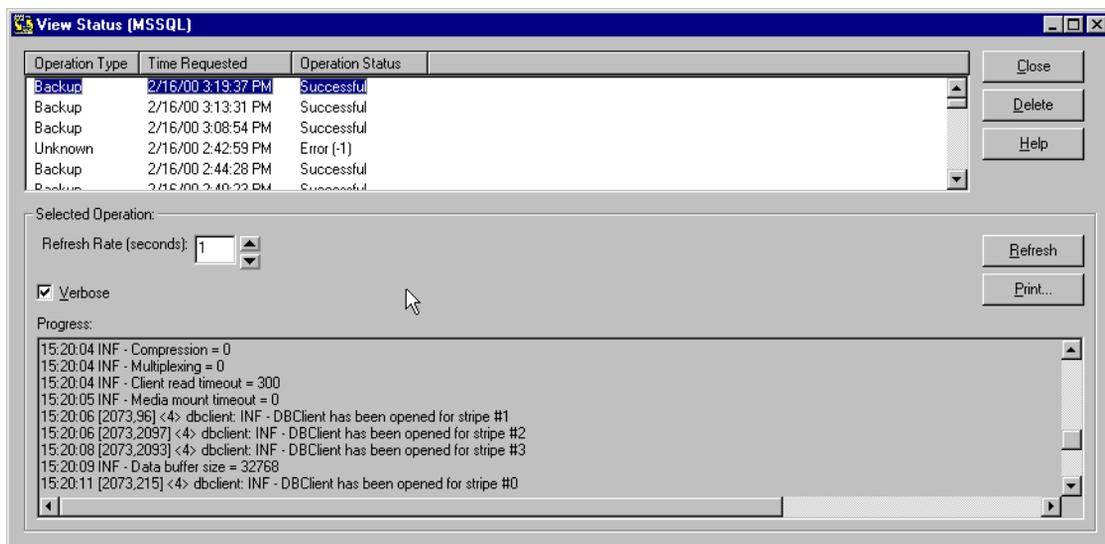
4. Click **Start**. The following appears.



5. Click **Yes**.
6. From the **View** menu, select **Monitor Jobs**.



The following dialog box appears.



Browsing Objects on Remote SQL Server Installations

You can use NetBackup for SQL Server to browse databases and database backup images on a remote host. Then, you can create batch files for backing up and restoring the SQL Server databases on the remote host. To actually perform the remote backup or restore operation, you need to save the generated batch file on the remote host and launch the operation from there. You can perform the job launch either by logging onto the remote host; or, you can launch the operation via the NetBackup scheduler.

To do remote browsing, SQL Server is required on the remote host as well as NetBackup for SQL Server. You must create an ODBC Data Source Name on your local host which identifies the remote SQL Server instance. To create a DSN for a remote host, specify the remote host name in the **Create a New Data Source for SQL Server** screen of the ODBC Administrator (see “Create ODBC Data Source Names” on page 43). Identify the remote instance as either hostname (for the default instance), or hostname\instance (for a named instance).

After you have created a remote DSN, select it from the **Data Source Name** list of the Set database login parameters dialog box. When you click **OK**, to confirm your selection, you will see a pop-up message that says: You have selected an ODBC Data Source Name for <hostname>, which is a non-local host. Click **OK** to close this pop-up message. NetBackup for SQL Server is now ready to browse databases for the remote host.

When you have selected a remote database instance from the Set database login parameters dialog box, notice that the backup and restore dialog boxes always open with the Backup (or Restore) Script radio group set to **Save for later execution**, and the **Launch immediately** option disabled. Immediate launch is disabled because the generated script must be executed on the remote host that you are logged on to. After you select **OK** from the backup or restore dialog box, use the Save Script As dialog box to navigate to the *install_path*\NetBackup\dbext\MSSQL\ folder on the remote host, and save the batch file there.

After saving the batch file on the remote host, you can either launch the batch file from the local installation of NetBackup for SQL Server or you can use the NetBackup Scheduler to launch the batch file. For information about launching a batch file using the NetBackup Database Extension GUI, see “Run NetBackup Batch Files” on page 144. For information about using the NetBackup Scheduler to launch a batch file, see “Configuring a NetBackup Policy” on page 18, which describes how to create an automatic backup schedule for an MS-SQL-Server backup policy.



Start Striped Backups and Restores

NetBackup for SQL Server supports backup striping in order to open multiple streams for a single backup or restore operation. This capability maps directly to functionality supported by the Microsoft version of the SQL backup and restore commands. When you back up an object to multiple streams, NetBackup stores each stream as a separate image. These backups can be multiplexed to a single storage unit or they can each be written to separate storage units depending on how you configured the NetBackup master server. (See “Configuring for Striped Backups and Restores” on page 42 for more information). Either way, all of the backups must be provided simultaneously to Microsoft SQL Server in order to perform the restore.

Caution Backup striping can have a negative impact on performance in Microsoft SQL Server 6.5, regardless of whether you use multiplexing.

Striped backups can be started by setting the “How Many MS SQL Server Stripes” box to a number greater than 1. When you create a batch file yourself, you can invoke backup striping by using the parameter `STRIPES` and setting it to an integer value greater than 1 and less than 33.

Restoring backups from multiple stripes is automatic from the Restore Database and Transaction Logs dialog box, and from the Restore Database Files and Filegroups dialog box. The backup object will be represented as a single backup with the accompanying notation, “<n> stripes”. You simply select the object you wish to restore and NetBackup for SQL Server will find all of the related backups and restore them.

If you wish to create your own batch file to restore a striped object, you need to use the `STRIPES` keyword to specify the number of stripes that were used on the backup. In addition, for the `NBIMAGE` keyword, you specify only the name of the first stripe. See “Using `bplist` to Retrieve Microsoft SQL Server Backups” on page 149 for more information about backup names used for Microsoft SQL Server objects.

Using bplist to Retrieve Microsoft SQL Server Backups

If you restore Microsoft SQL Server databases or create restore scripts from either of the NetBackup for SQL Server restore dialog boxes, then `bplist` is run internally by NetBackup for SQL Server. If you plan to create a restore script manually, then you can use `bplist` to obtain image names.

This section describes how to use the `bplist` command to obtain NetBackup for SQL Server restore images. See the *NetBackup User's Guide for UNIX* or the *NetBackup User's Guide for Windows* for general information about `bplist`. To extract all of the NetBackup for SQL Server backups from a specific server for a specific client, execute the following command from the MS-DOS prompt.

```
install_path\NetBackup\bin\bplist -C <client> -t 15 -S <server> -R \
```

where `<client>` is the host machine on which NetBackup for SQL Server resides and `<server>` is the host machine of NetBackup server.

The following example shows how to obtain the list of Microsoft SQL Server backups backed up from client `candy` to server `candy`:

Example

```
C:\Program Files\NetBackup\bin\bplist -C candy -t 15 -S candy -R \
candy.MSSQL7.CANDY.trx.pubs.~.0.001of004.20010822153001..C:\
candy.MSSQL7.CANDY.trx.pubs.~.0.004of004.20010822153001..C:\
candy.MSSQL7.CANDY.trx.pubs.~.0.003of004.20010822153001..C:\
candy.MSSQL7.CANDY.trx.pubs.~.0.002of004.20010822153001..C:\
candy.MSSQL7.CANDY.fg.pubs.PRIMARY.0.001of001.20010822152856..C:\
candy:\MSSQL7\CANDY\trx\maa.test\~\0\001of001\20010822151021\C:\
candy:\MSSQL7\CANDY\fg\maa.test\PRIMARY\0\001of001\20010822145719\C:\
candy:\MSSQL7\CANDY\fg\maa.test\PRIMARY\0\001of001\20010822145719\C:\
candy:\MSSQL7\CANDY\fg\maa.test\maa.dat2\0\001of001\20010822145658\C:\
candy:\MSSQL7\CANDY\trx\maa.test\~\0\001of001\20010822145445\C:\
candy:\MSSQL7\CANDY\inc\maa.test\~\0\001of001\20010822145319\C:\
candy:.MSSQL7.CANDY.db.master.~.0.001of001.20010822145319..C:\
candy:\MSSQL7\CANDY\inc\maa.test\~\0\001of001\20010822145319\C:\
candy:\MSSQL7\CANDY\inc\maa.test\~\0\001of001\20010822145319\C:\
candy:\MSSQL7\CANDY\db\maa.test\~\0\001of001\20010822144623\C:\
candy:\MSSQL7\CANDY\INSTANCE1\db\maa.test\~\0\001of001\20010822143025\C:\
candy:\MSSQL7\CANDY\inc\maa.test\~\0\001of001\20010822140737\C:\
candy:\MSSQL7\CANDY\trx\maa.test\~\0\001of001\20010822140424\C:\
candy:\MSSQL7\CANDY\inc\maa.test\~\0\001of001\20010822140131\C:\
candy:\MSSQL7\CANDY^INSTANCE1\db\maa.test\~\6\001of001\20010822135825\C:\
candy:\MSSQL7\CANDY^INSTANCE1\db\maa.test\~\6\001of001\20010822135825\C:\
candy:\MSSQL7\CANDY^INSTANCE1\db\maa.test\~\6\001of001\20010822135825\C:\
candy:\MSSQL7\CANDY^INSTANCE1\db\maa.test\~\6\001of001\20010822135825\C:\
candy:\MSSQL7\CANDY^INSTANCE1\db\maa.test\~\6\001of001\20010822135825\C:\
candy:\MSSQL7\CANDY^INSTANCE1\db\maa.test\~\0\001of001\20010822135825\C:\
candy:\MSSQL7\CANDY^INSTANCE1\db\maa.test\~\0\001of001\20010822135825\C:\
candy:\MSSQL7\CANDY^INSTANCE1\trx\maa.test\~\0\001of001\20010822131741\C:\
```



```
candy:\MSSQL7\CANDY\fil\maa.test\Maa.dat\0\001of001\20010822095014\C:\
candy:\MSSQL7\CANDY\fg\maa.test\maa.dat2\0\001of001\20010822094829\C:\
candy:\MSSQL7\CANDY\fg\maa.test\PRIMARY\0\001of001\20010822094752\C:\
candy:\MSSQL7\CANDY\db\maa.test\~\0\001of001\20010822094555\C:\
candy.MSSQL.CANDY.db.maa.~.~.001of001.20010821162717..C:\
candy.MSSQL.CANDY.db.maa.~.~.001of001.20010821153544..C:\
candy.MSSQL.CANDY.trx.maa.~.~.001of001.20010821132516..C:\
candy.MSSQL.CANDY.db.maa.~.~.001of001.20010821131456..C:\
candy.MSSQL.CANDY.trx.maa.~.~.001of001.20010821125842..C:\
candy.MSSQL.CANDY.trx.maa.~.~.001of001.20010821125814..C:\
candy.MSSQL.CANDY.db.maa.~.~.001of001.20010821124837..C:\
candy.MSSQL.CANDY.trx.maa.~.~.001of001.20010821124733..C:\
candy.MSSQL.CANDY.trx.maa.~.~.001of001.20010821122059..C:\
```

Note The colon and backslash, which terminate each line, are not part of the backup name.

The backup name is a string consisting of the following components separated by a delimiter specified by the character preceding the “C” at the end of the backup image name.

1. The host machine where SQL Server resides.
2. The Microsoft SQL Server version
 - MSSQL, for version 6.5
 - MSSQL7, for version 7.0 or 2000
3. The instance name.

Named instances are formatted as *host^instance-name*. The default instance is simply the name of the host machine.
4. The object type
 - db, for database
 - inc, for differentials
 - trx, for transaction log
 - fg, for filegroup
 - fil, for file
5. Database name
6. The name of the file or filegroup if the object type is a file or filegroup; otherwise the symbol ~ is used.



7. For Microsoft SQL Server 7, the blocksize, specified as 256 kilobytes bytes * 2^{blocksize}. For Microsoft SQL Server 6.5, the file is specified as ~.
8. *<stripe number>of<total stripes>*
For non-striped dumps, this item is always 001of001. For striped dumps, there is one backup for each backup stripe. *<total stripes>* is the total number of stripes for the backup. *<stripe number>* is the count number of the backup for that backup, starting with 001.
9. The timestamp in YYYYMMDDHHMMSS.
10. The character immediately preceding the version indicator is the delimiter, which by default is a period. However, if a period is used in any of the fields, the delimiter may be another character. Version indicator for NetBackup for SQL Server. “A” indicates that the image was created for NetBackup 3.2. “B” is for NetBackup 3.4. “C” is for NetBackup 3.4.1 and higher.

Note If you restore Microsoft SQL Server databases or create restore scripts from either of the NetBackup for SQL Server restore dialog boxes, `bplist` is run internally by NetBackup for SQL Server.



Disaster Recovery

This section contains information and instructions on restoring the Microsoft SQL Server in a disaster recovery scenario.

Preparing for Disaster Recovery of Microsoft SQL Server

When developing a Microsoft SQL Server disaster preparation strategy, consider the following suggestions:

- ◆ Keep hard copy information concerning the structure of each database as it exists on Microsoft SQL Server.

For Microsoft SQL Server 6.5, include information such as what devices the database occupies, devices used for any indexes and job logs, and any other configuration notes. Make sure to include the device and database size and characteristics. These devices must be re-created before a database can be recovered.

You can also find rebuild information in NetBackup in the backup log files for any database that has been backed up.

- ◆ NetBackup cannot back up the actual flat database files while Microsoft SQL Server is running because the files are open and in use. Using the NetBackup for Microsoft SQL Server database extension, NetBackup is able to backup the data contained in the database, but not the physical structure of the database. Consequently, databases must be manually rebuilt using SQL Server Setup (Microsoft SQL Server 6.5) or Rebuild Master (Microsoft SQL Server 7.0 or later) to recover from a catastrophic failure. While this procedure is not difficult, it can be time consuming on slower machines, and requires hard copy records to complete the rebuild process.
- ◆ Back up the master database whenever any changes are made to Microsoft SQL Server.

Disaster Recovery Requirements for Microsoft SQL Server

- ◆ The latest backup of the Microsoft SQL Server directory (`\MSSQL`, `\MSSQL7`, or for SQL 2000 Server, `\Program Files\Microsoft SQL Server\MSSQL`), and the Windows NT/2000 registry.
- ◆ The Microsoft SQL Server Database, Differential (Microsoft SQL Server 7.0 or later) and Log backups to be recovered, and any subsequent user-defined table or user-defined filegroup backups.
- ◆ An Administrator login account (or an Administrator equivalent) during this procedure.

Disaster Recovery of Microsoft SQL Server

Automatic Recovery is a feature built into Microsoft SQL Server. It is intended to correct minor problems created when there is a relatively small, temporary problem with the server, such as a short term power failure or a partial media failure (bad sector). However, most disasters are beyond the scope of the automatic recovery feature. For example, if a database becomes severely corrupted, or there is a catastrophic failure, recovery must be initiated by the system administrator.

User-initiated recovery could entail either restoring the entire server, including the Microsoft SQL Server databases, from full system backups, or restoring only the Microsoft SQL Server databases to a newly-installed or other available Microsoft SQL Server.

Restoring the entire server has the added benefit of recovering other applications and data which may have resided on the server at the time of failure, and can be accomplished using one of the following methods:

- ◆ Manual recovery of the server. This method involves manually restoring the server from full system backups (see “Preparing for Disaster Recovery of Microsoft SQL Server” on page 152 and “Disaster Recovery Requirements for Microsoft SQL Server” on page 152).
- ◆ The Intelligent Disaster Recovery option. This option provides a more automated method of restoring the server from full system backups. Refer to the *NetBackup System Administrator’s Guide* for more information.

Alternatively, the Microsoft SQL Server databases can be restored to a newly-installed or other available server. This server must be running the same version of Windows NT/2000 on the same hardware platform (cross-platform restores are not supported), the same Service Pack level, and the same version of Microsoft SQL server with the same service pack as the original server.

For the purposes of disaster recovery, you should only be restoring to a new installation of Microsoft SQL Server. If you want to restore to an existing installation of Microsoft SQL Server with other active databases, refer to “Disaster Recovery.”

After recovery of the server is complete, or after the new server installation is available, recovery of the Microsoft SQL Server databases can begin.

Disaster Recovery of Microsoft SQL Server Databases

If you are restoring to a new Microsoft SQL Server installation, skip the steps for rebuilding the master database and proceed with recreating database devices and databases (Microsoft SQL Server 6.5) or starting Microsoft SQL Server in single-user mode (Microsoft SQL Server 7.x or later).



▼ **To rebuild the master database**

1. For Microsoft SQL Server 6.5, use Microsoft SQL Server Setup to select the Rebuild Master Database and rebuild the master database using the same character set and sort order as the master database backup that is to be restored.

For Microsoft SQL Server 7.0 or later, use the Rebuild Master utility (`\MSSQL7\bin\Rebuiladm.exe`).

2. When complete, restart the Microsoft SQL Server services if necessary.

▼ **To recreate database devices and databases (SQL Server 6.5)**

1. For Microsoft SQL Server 6.5, use the SQL Enterprise Manager to recreate all of the Microsoft SQL Server devices that were current when the master database was backed up:

The devices must be created in the same order (use the virtual device number) and of the same sizes as when they were initially created. If necessary, the devices must also be regrown on the same increments as they were during the lifetime of the devices.

2. For Microsoft SQL Server 6.5, recreate all Microsoft SQL Server databases that were current when the master database was backed up.

The databases and associated transaction logs must be created with the same sizes as when they were initially created. If necessary, the databases and associated transaction logs must also be regrown in the same increments as they were during the lifetime of the databases and transaction logs.

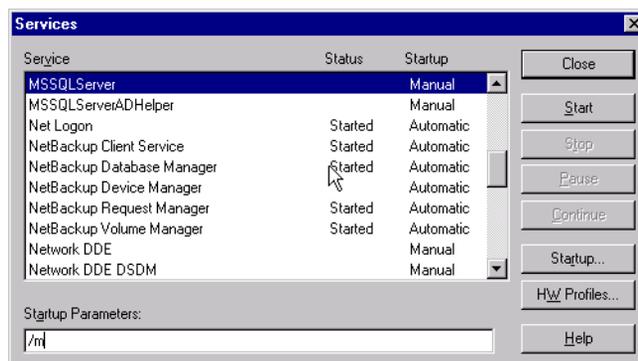
3. Click on the Windows **Start** menu, point to **Settings**, then click **Control Panel**.
4. Double-click on **Services**.
5. Stop all of the Microsoft SQL Server services.

▼ **Starting SQL Server in single-user mode**

1. On the Windows **Start** menu, point to **Settings**, then click **Control Panel**.
 - On Windows NT, double-click on **Services**.
 - On Windows 2000, double-click on **Administrative Tools**, then double-click on **Services**.

2. Start the MSSQLServer service or the default instance of SQL Server in single-user mode by typing the following in the **Startup Parameters** box of the Services dialog box:

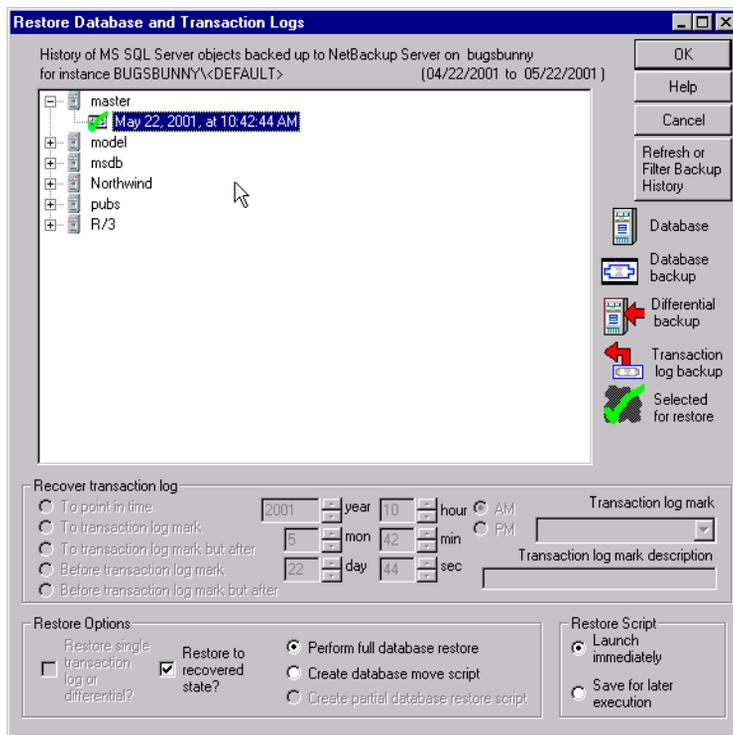
/m



3. Click **Start**.
4. Click **Close** to close the Services dialog box.
5. Open the NetBackup for MS SQL Client.
6. Locate all the media required to perform the restore operations. From the **Actions** menu, choose **Restore and Databases, Differentials and Transactions**.



7. Select the backup image that contains the copy of the master database to be restored.



Select only the master database at this time. Also, ensure that the **Restore to recovered state checkbox is checked**.

8. Click OK.

Note While in single-user mode, the Microsoft SQL Server automatically stops immediately after the master database restore completes.

9. After the restore operation has completed, restart the MSSQLServer service, or the appropriate instance service for SQL 2000.
10. Continue restoring the remaining SQL Server Databases.

Follow the instructions for restoring Microsoft SQL databases, differentials, transaction logs, files and filegroups from the “NetBackup Restore Operations” on page 76.

When all of the restore operations have completed successfully, then the recovery of the Microsoft SQL Server databases is complete.



After the recovery has been completed, it is strongly recommended that a full database backup be performed as soon as possible.



Using NetBackup for SQL Server with Microsoft Cluster Server

Note This information is for a *two* node configuration. NetBackup supports up to four node clusters for SQL Server.

This section describes how to use NetBackup for Microsoft SQL Server to back up and restore a virtual SQL Server 7 and SQL Server 2000 installation that has been configured with Microsoft Cluster Server. The procedures described are applicable if SQL Server exists in its own cluster or if it shares a cluster with a virtual NetBackup Media Server. If SQL Server shares a cluster with a virtual NetBackup media or master server, then SQL Server and the NetBackup server may be placed in the same group; but they must have different IP and network names.

You can use NetBackup for SQL Server to back up both active-passive and active-active SQL Server installations.

In the following sections, example names are used. For example, let VIRTUALSERVER be the name of the virtual SQL Server instance in an active-passive configuration. Also, let NODEA and NODEB be the names of the physical nodes in the cluster. Let NODE0 be the name of the master server.

For an active-active configuration, there would be two or more SQL Server instances, say, VIRTUALSERVER1 and VIRTUALSERVER2. To configure for active-active, use the following instructions first to configure VIRTUALSERVER1 and then to configure VIRTUALSERVER2. Continue with the same procedure for any additional virtual SQL Server instances.

NetBackup Server Configuration Parameters

Perform the following configuration steps after the virtual installation of SQL Server (VIRTUALSERVER) has been created and (if applicable) the virtual installation of NetBackup media server has been created, as well. The following actions must be performed on the master server (or on a NetBackup remote client console acting for the master server).

1. Using the NetBackup Administration Console, create a MS-SQL-Server policy (for example, VIRTSQLPOLICY), to specify the storage attributes of the backup. Set up the following attributes:
 - a. Policy-storage unit: Specify a storage unit belonging to the storage group intended for backup. If you are using a virtual media server, then specify a storage unit belonging to the virtual media server.
 - b. Create a backup policy schedule for VIRTSQLPOLICY.
 - c. Add the virtual SQL Server name (VIRTUALSERVER) to the client list.
2. To incorporate SQL Server backup scheduling, create an automatic schedule in the VIRTSQLPOLICY. Create the automatic schedule as follows:
 - a. Add an automatic backup schedule to VIRTSQLPOLICY.
 - b. Add one or more script names (batch files) to the file list.
3. Create a standard backup policy (say, STDPOLICY). Add both physical nodes (NODEA and NODEB) to the client list of STDPOLICY.
4. Establish the permissions settings as follows for a redirected restore to a different client: On the master server, either:
 - Create a file called
install_path\NetBackup\db\altnames\No.Restrictions
 - or
 - Create each of the files, *install_path*\NetBackup\db\altnames\NODEA,
install_path\NetBackup\db\altnames\NODEB.

Note Creating the *No.Restrictions* file allows all clients to perform redirected restores to different clients. This parameter may need to be added and removed according to site policies.

NetBackup Client Configuration Parameters

Install NetBackup for SQL Server on each physical node. Perform the following steps on both NetBackup clients, NODEA and NODEB:



1. Check to make sure that the Master Server NODE0 is in the server list for this NetBackup client. If it is not, then add it using the Backup, Archive, and Restore interface.
2. Create a user ODBC data source name (for example, VIRTUALDSN) for the virtual SQL Server. Specify the server as VIRTUALSERVER. Be sure to add a description.
3. Open the NetBackup for SQL Server interface.
4. From the **Options** menu, choose **Set Database Login Parameters**.
5. Select VIRTUALDSN from the **Data Source Name** list.
6. From the **Options** menu, choose **Set NetBackup Client Options**.
7. Select NODE0 from the **Current NetBackup Server** list.
8. Close the NetBackup for SQL Server interface.

Note Perform these steps on both physical nodes.

Performing a SQL Server Backup

Although NetBackup for SQL Server supports browsing for databases and images on either of the physical nodes, a user backup or restore will not be successful unless it is launched from the platform host that is active. After NetBackup has been configured as described in the previous sections, backing up a SQL Server database from a virtual instance is similar to backing up a database from a non-virtual one.

1. Open the NetBackup for SQL Server interface on the active platform node.
2. From the **Actions** menu, choose **Backup** and point to **Database**.
3. Select one or more databases.
4. In the **NetBackup Policy** field, enter the name of the MS-SQL Server policy (VIRTSQLPOLICY) that was created for specifying storage attributes for the virtual SQL Server backup.
5. Click **OK**.



Performing a SQL Server Restore

1. Open the NetBackup for SQL Server interface on the active platform node.
2. From the **Actions** menu, select **Restore** and point to **databases, differentials, and transaction logs**.
3. When asked, Would you like to change the database instance? choose **Yes**.
The Backup History dialog box appears.
4. From the **Host computer** list, select the Virtual Server name (VIRTUALSERVER) as the host computer.
5. Choose <default> as the instance name.
6. Click **OK**.
The Restore Database and Transaction Logs dialog box appears.
7. Select a backup image or staged image list.
8. Click **OK**.



Performing Backups and Restores in a SAP Environment

With NetBackup you can perform scheduled SAP backups, in accordance with a predefined backup strategy, or manual backups that are not planned and may be necessary in exceptional situations. The practices described here are based on the practices recommended by SAP in *SAP/MS SQL Server 2000 DBA in CCMS*.

The NetBackup backup and restore procedures for the SAP R/3 database are identical to the NetBackup procedures with any other Microsoft SQL Server database.

NetBackup for SQL Server allows you to create scripts in order to perform full or differential backups of databases and backups of transaction logs. In addition to the database backups and restores, NetBackup also provides the capabilities to backup the SAP file systems.

Manual Backups

The administrator on the master server can use the NetBackup Administration Console to manually execute an automatic backup schedule for an “MS-SQL-Server” policy, where the R/3 database is specified in the backup script. For more information, see the section on manual backups in the *Netbackup System Administrator Guide - Windows NT/2000*.

Policy Configuration

In order to automatically perform backups of a SAP environment, you need to create backup policies. A backup policy with the “MS-SQL-Server” policy type selected must be created for R/3 database backups. Batch files, which will initiate the backup of the database and transaction logs, must be added to the Scripts list in the policy. For information on creating the scripts needed, see “Creating Scripts to be Used in Automatic Backup Schedules” below. For information on MS-SQL-Server policies, see the instructions in “Configuring a NetBackup Policy” on page 18.

For backups of the executables disk (a file-system backup), a backup policy must be created with the “MS-Windows-NT” policy type selected. For information on MS-Windows-NT policies, see the *Netbackup System Administrator Guide for Windows*.

Creating Scripts to be Used in Automatic Backup Schedules

NetBackup for SQL Server uses batch files to initiate database backup and restore operations. A batch file must be created for database backups and for transaction log backups. These batch files must then be added to the Scripts list in the backup policies you've created.

▼ To create a script for database backups

1. From the Windows **Start** menu, select **Programs, NetBackup, then NetBackup MS SQL Client.**

The NetBackup for Microsoft SQL Server Graphical User Interface will open.

2. On the **Actions** menu, select **Backup, then Database.**

The Backup Database dialog box will appear.

Select **Perform Differential Backup** if you want to perform a differential backup, rather than a full backup.

3. Select the R/3 database in the **Database** list
4. Select **Save for later execution** to save the generated script for scheduled backups.
Select **Launch immediately** in the **Backup Script** group to run the backup immediately.
5. Click **OK.**
6. Indicate a filename and click **Save.**
7. On the **View** menu, select **Monitor Jobs.**

Note You must check that each backup operation is completed successfully. See “Monitoring Backups” on page 164 for more information.

▼ To create a script for transaction log backups

1. Before starting a transaction log backup, the database administrator should perform the following actions on the SQL Server.
 - If SQL Server 6.5 is installed, place the transaction log onto a separate database device from its database.
 - Set the **Transaction Log Backup Options** database option to off. This is an option on the SQL Server interface that applies to the databases

The entire sequence of transaction logs generated following any database dump must be maintained on the same NetBackup server. NetBackup for SQL Server requires that you follow these guidelines in devising your backup strategy in order to ensure success in restoring your database.

2. On the **Actions** menu, select **Backup, then Transaction Log.**



The Backup Database Transaction Log dialog box appears.

3. Select the R/3 database transaction log in the Database list box.
4. Select **Save for later execution** to save the generated script for scheduled backups.
Select **Launch immediately** in the **Backup Script** group to run the backup immediately.
5. Click **OK**.
6. Indicate a filename and click **Save**.
7. On the **View** menu, select **Monitor Jobs**.

Note You must check that each backup operation is completed successfully. See “Monitoring Backups” for more information.

Monitoring Backups

Scheduled backups should be checked regularly to ensure they were completed successfully.

Always check that:

- ◆ The most recent backup has run successfully. See “Progress Reports Created for NetBackup for SQL Server on the Client” on page 168.
- ◆ All the backups in the backup cycle are being executed according to the schedule. Gaps in a backup sequence can have serious consequences in a subsequent attempt to restore the database.

Restoring the R/3 Database

This section describes how to restore the R/3 database.

- ◆ Restoring the R/3 Database after a Disk Crash
- ◆ Restoring the Database and Transaction Log Backups

Note The R3 database must not be in use when performing a restore operation. Make sure that all SAP services are stopped before attempting a restore using NetBackup.

Including Differential Backups in a Restore Operation

If you incorporated *differential backups* in the backup strategy, the restore process differs depending on the type of backups available.

- ◆ If differential backups were made after the last full database backup, restore the last database backup followed by the most recent differential backup. Then apply all subsequent transaction logs.
- ◆ If no differential backups were made since the last full database backup, restore the last full database backup and then apply all subsequent transaction logs.
- ◆ If several differential backups are available, but the latest one cannot be read.
Restore the most recent full database backup and then you restore the latest readable differential backup. Then apply all subsequently created transaction logs.

Restoring the R/3 Database after a Disk Crash

This section describes how to restore the database when the R/3 database disk system is damaged or the transaction log disk system is damaged. This process is only applicable to a configuration with three disk systems: one system for the R/3 database, one for the R/3 transaction logs and one for all others.

The database restore is comprised of a number of phases.

1. Backing up the current transaction log

If the disk system on which the R/3 database resides is damaged, it is vital to immediately backup the currently active transaction log to prevent loss of data. Without a backup of the current log, the database can only be restored to the status at the time of the last transaction log backup. If work has been carried out on the R/3 system since then, this work will be lost.

2. Replacing damaged disks

Replacing damaged disks in a RAID disk system is normally a straightforward procedure. If you are uncertain how to proceed, refer to the documentation of your hardware vendor to find out how to handle the disks. The new disks must be formatted and assigned the same drive letter as the old disks.

3. Restoring the database and transaction logs

The central phase of a restore operation is the reloading of the database backup and the application of the available transaction logs. When the database backup is reloaded, the database files are automatically recreated and the data is copied from the backup device to the newly created files. Once this has been done, the transaction



logs are applied in the same sequence as they were originally made. In a final step, open transactions that were not completed at the time of the database failure are rolled back.

Restoring the Database and Transaction Log Backups

NetBackup MS-SQL Server Agent GUI provides for automatic staging. By selecting the latest transaction log backup, the GUI automatically restores the previous full database backup along with any optional differential backups and subsequent transaction log backups. There is also the option to specify a point in time to which to restore to.

The overall restore process consists of several restore phases:

1. Restoring the most recent database backup
2. Restoring the latest differential database backup (if available)
3. Restoring all succeeding transaction log backups
4. Restoring the latest transaction log backup

Caution To restore the R/3 database you first restore the most recent database backup and then the subsequent transaction logs. During the entire procedure, do not execute any transactions and do not shut down the database server. A server shutdown would write a checkpoint to the log and, as a result, you would not be able to restore further transaction logs.

This section describes the tools that are available to help you prevent some common, however infrequent, problems encountered with the daily operation of the SQL Server. For more in-depth information, please refer to the Microsoft Support web site.

This chapter contains information on the following troubleshooting tools:

- ◆ Progress Reports Created for NetBackup for SQL Server on the Client
- ◆ NetBackup for SQL Server Logs
- ◆ Changing the Debug Level
- ◆ NetBackup Reports
- ◆ Preventing Timeout Failures on Large Database Restores



Progress Reports Created for NetBackup for SQL Server on the Client

NetBackup for SQL Server creates a progress report for each operation that has been initiated. This report contains summary information concerning the overall status of your job. The reports are contained in directory *install_path\NetBackup\logs\user_ops\mssql\logs* and can be conveniently viewed by opening the progress report viewer from the NetBackup for SQL Server GUI.

The progress report contains the following types of information:

- ◆ the batch keywords and values which define the operation. See “Create Batch Files” on page 125 for information about the batch file syntax
- ◆ summary information about the operation
- ◆ information about the operation as it progresses
- ◆ any error conditions or warnings that cause the operation to fail
- ◆ the final outcome of the operation, whether it succeeded or failed and how long it took

The following is a typical progress report created for a database backup.

Line	Text
1	database pubs40
2	operation BACKUP
3	buffers 2
4	objecttype DATABASE
5	endoper TRUE
6	
7	17:30:43 [171,90] <4> dbbackrec: INF - DUMP STARTED. Batch = bkup21.bch, Op# = 1. -----
8	17:30:43 [171,90] <4> InitPipeInfo: INF - Using backup image 'tiger.MSSQL.db.pubs40.001of001.19971205173043'.
9	17:30:43 [171,90] <4> dbbackrec: INF - dump database pubs40 to pipe ='\\.\pipe\pubs40-pipe0'
10	17:30:43 [171,90] <4> dbbackrec: INF - #Stripes: 1, #Bufs per stripe 4, To: NetBackup on saturn
11	Backup started 12/05/97 05:30:43
12	
13	17:31:00 INF - Data socket = saturn.domain.com.4995
14	17:31:00 INF - Name socket = saturn.domain.com.4994

```
15 17:31:00 INF - New data socket = saturn.domain.com.4997
16 17:31:00 INF - Compression = 0
17 17:31:00 INF - Multiplexing = 0
18 17:31:01 INF - Client read timeout = 900
19 17:31:01 INF - Media mount timeout = 900
20 17:31:06 [171,76] <4> dbclient: INF - DBClient has been opened for stripe #0
21 17:31:07 INF - Data buffer size = 32768
22 17:31:09 INF - Beginning backup on server saturn of client tiger.
23 17:31:14 INF - Server status = 0
24 17:31:17 INF - Backup by Administrator on client tiger using policy HO_MSSQL_1: the
    requested operation was successfully completed.
25
26 17:31:18 [171,76] <4> dbclient: INF - DBClient has been closed for stripe #0
27 17:31:18 [171,90] <4> dbbackrec: INF - OPERATION #1 of batch bkup21.bch SUCCEEDED
    with STATUS 0 (0 is normal). Elapsed time = 35(2) seconds.
```

Observe the following:

- ◆ Lines 1 to 5 contain the batch syntax which drove this operation. This operation was started from a user created batch file. There is also batch syntax for operations started through NetBackup Database Extension GUI.
- ◆ The dump started at 5:30:43 PM from a batch file named `bkup21.bch`. (line 7).
- ◆ This operation has one stripe. Note that the image name is given. (line 8).
- ◆ The Microsoft SQL Server command was started using the SQL dump command. The exact syntax of this command is given in line 9.
- ◆ The operation used four buffers. (line 10)
- ◆ Lines 13 to 24 are various status data created by NetBackup for SQL Server. Note that line 24 indicates that a backup by 'Administrator' was successfully. Administrator is the NT username for this operation.
- ◆ Line 27 indicates the operation succeeded after an elapsed time of 35 seconds of which all but two seconds were spent opening and closing the connection to NetBackup (this includes positioning the tape, writing headers, etc.).



NetBackup for SQL Server Logs

For detailed troubleshooting information, create the following folders on each NetBackup for SQL Server host. You can disable logging by deleting the folders.

- ❖ Create the following folders and allow public access to them:

```
install_path\NetBackup\logs\bphdb\  
install_path\NetBackup\logs\dbclient\  
install_path\NetBackup\logs\dbbackup\  

```

Log Descriptions

Log names are formatted as `MMDDYY.log`. The resulting debug logs created will contain the following types of information. For additional NetBackup client logs and NetBackup master server logs, see the *NetBackup User's Guide - Microsoft Windows* and the *NetBackup System Administrator's Guide - Windows NT/2000* or the *NetBackup System Administrator's Guide - UNIX*.

bphdb Log

The `bphdb` log contains `bphdb` process information. `bphdb` is the NetBackup Hot Database Backup binary and is the client process that NetBackup for SQL Server uses to start the backup or restore operations schedules from the NetBackup master server logs. The `bphdb` logs are normally not very long.

Note Use the Debug Verbose Level option from the NetBackup Client browser to adjust the amount of information that appears in the `bphdb` log. This verbose level applies to all of the NetBackup logs used on the Windows NT/2000 client except for `dbclient` and `dbbackup`.

dbclient Log

The `dbclient` log contains process information on the VERITAS XBSA module.. The XBSA module is the NetBackup client interface program which connects to the NetBackup master server.

Note To specify how much information appears in the `dbclient` debug log, set the `TRACELEVEL` parameter to `MIN`, `MID`, or `MAX`. The `MAX` level will produce huge amounts of output, which is usually appropriate only for internal debugging. The `TRACELEVEL` parameter is set for individual operations either through the batch file or the NetBackup Database Extension GUI.

dbbackup Log

The dbbackup log contains process information for dbbackup and dbbackmain.

Note To specify how much information appears in the dbbackup debug log, set the TRACELEVEL parameter to MIN, MID, or MAX. The MAX level will produce huge amounts of output appropriate only for internal debugging. The TRACELEVEL parameter is set for individual operations either through the batch file or the NetBackup Database Extension GUI.

Changing the Debug Level

You can control the amount of information written to the debug log in the *install_path*\NetBackup\logs\dbclient folder 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.

You can also control the amount of information in the dbbackup debug log. The TRACELEVEL parameter is set for individual operations either through the batch file or the NetBackup Database Extension GUI.

▼ To change the Debug Level

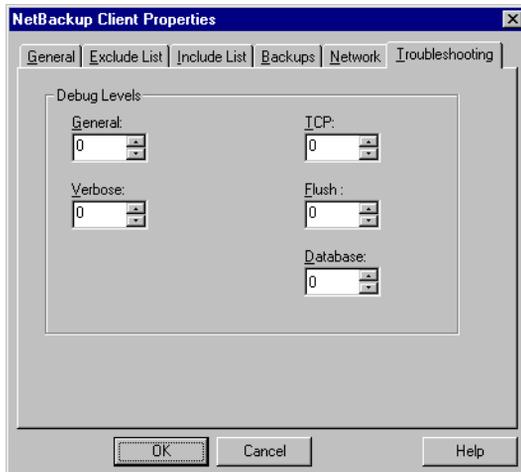
1. Click on the Windows **Start** menu, point to **Programs** and **VERITAS NetBackup**, then click on **Backup, Archive, and Restore**.

The Backup, Archive, and Restore - NetBackup window appears.

2. On the **File** menu, click **NetBackup Client Properties**.



3. Click the **Troubleshooting** tab.



By default, the settings are zero.

4. Set the **General** debug level to adjust the amount of information written to the NetBackup Server logs.
5. Set the **Database** Debug Level debug level to adjust the amount of information written to DBCLIENT log.
6. Click **OK** to save your changes.

You can also set the TRACELEVEL parameter to adjust the amount of information written to the dbbackup debug log. The TRACELEVEL key word can be specified in the batch file, or it can be set in the **Set NetBackup Client Options** option in the NetBackup Database Extension - Graphical User Interface.

To specify how much information appears in the dbbackup debug log, set the TRACELEVEL parameter to MIN, MID, or MAX. The MAX level will produce huge amounts of output, which is usually appropriate only for internal debugging.

NetBackup Reports

The administrator has access to operational progress reports through administrator interfaces. Reports may be generated for Backup Status, 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 BusinessServer System Administrator's Guide for UNIX* or *NetBackup BusinessServer System Administrator's Guide for Windows* for details.

Preventing Timeout Failures on Large Database Restores

A large SQL Server may fail with a Client Read Timeout error before any data has been read from the NetBackup media. This occurs because SQL Server may need to pre-write the database files before the restore operation begins. The time required for this process is a function of the size of the database files and the speed at which your host machine can write to disk. For example, if your system can perform disk writes at the rate of 60 megabytes per second and you have a 2.4 terabyte database, then it will take at least 12 hours for SQL Server to prep the disk before the actual restore can begin. In reality, the delay may be even longer than what you calculate by as much as 20% to 40%.

The timeout problem can be resolved by increasing the NetBackup Client Read Timeout setting. Use the NetBackup Administration Console on the server to change the properties of each client that contains a database you may need to restore. The default for the Client Read Timeout setting is 300 seconds (5 minutes). If you have clients which contain large SQL Server databases, you may need to set this value much higher.

Sometimes SQL Server can skip the pre-write step if the restore statement is scripted with the `RESTORE` option. To see if this works, add the keywords `"RESTOREOPTION REPLACE"` to your restore batch file. If the replace option is used, then SQL Server does not check whether the database files are already in use before starting the restore.



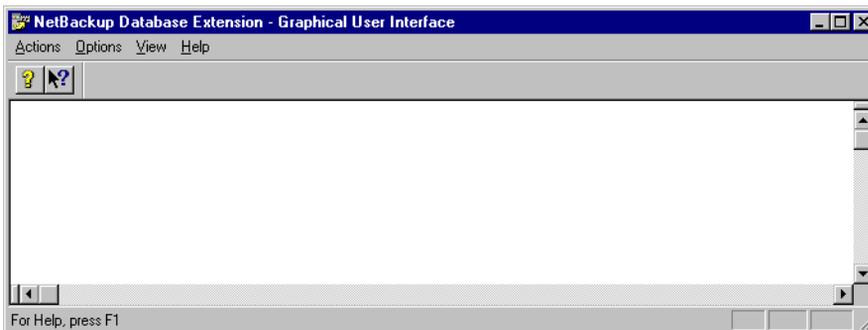


This chapter provides reference information for the NetBackup for SQL Server. This information includes:

- ◆ NetBackup for Microsoft SQL Server Graphical User Interface
- ◆ Menu Bar
- ◆ Dialog Boxes



NetBackup for Microsoft SQL Server Graphical User Interface



This window contains some familiar Windows NT/2000 elements: the Menu Bar, the Toolbar and the Status Bar. The Menu Bar has been customized for NetBackup Database Extension GUI. Refer to “Menu Bar” on page 177 for more details. The Toolbar and the Status Bar are standard features for Windows NT/2000 applications. Refer to “View Menu” on page 180 for details on viewing these features.

The NetBackup Database Extension GUI provides context-sensitive help. You can activate context-sensitive help by pressing **Shift + F1** or by using the context-sensitive help button from the MainFrame toolbar. The context-sensitive toolbar is shown here:

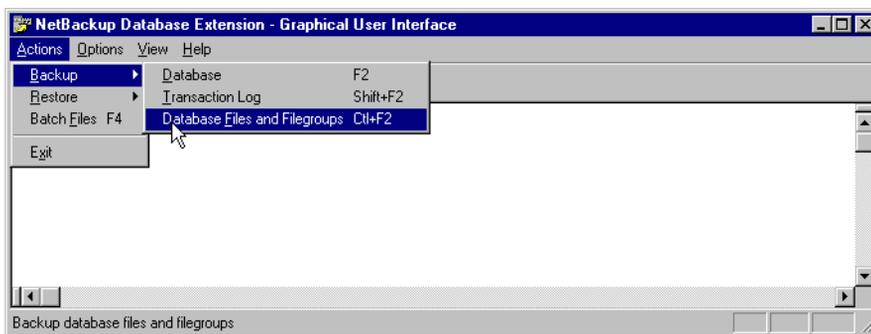


When context-sensitive help is activated, the mouse cursor will change to a question mark; and your next mouse click will show the help available for the object in the position of the cursor.

Menu Bar

The menus on the Menu Bar have been developed for NetBackup for SQL Server.

Actions Menu



Use this menu to start a backup operation.

Backup

This selection expands to allow you to choose from the following:

Database

Opens the Backup Database dialog box. Use this dialog box to back up a database. Refer to “Backup Database” on page 184 for more details.

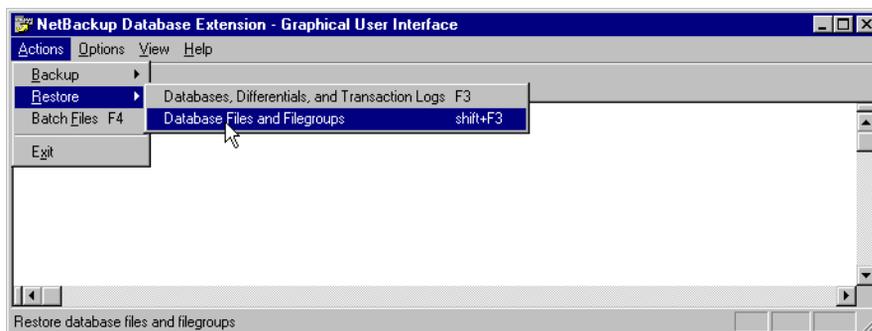
Transaction Log

Opens the Backup Database Transaction Log dialog box. Use this dialog box to back up a database transaction log. Refer to “Backup Database Transaction Log” on page 186 for more details.

Database Files and Filegroups

Opens the Backup Database Files and Filegroups dialog box. Use this dialog box to back up database filegroups and files. Refer to “Backup Database Files and Filegroups” on page 188 for more details.

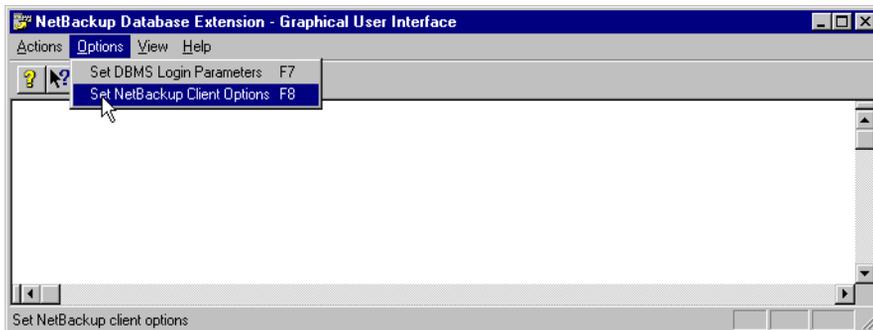




Use this menu to start a restore operation.

- | | |
|---|---|
| Restore | This selection expands to allow you to choose the following commands. |
| Databases, Differentials, and Transaction Logs | Opens the Restore Database and Transaction Logs dialog box. Use this dialog box to restore database, database differentials, and transaction logs. Refer to “Restore Database and Transaction Logs” on page 194 for more details. |
| Database Files and Filegroups | Opens the Restore Database Files and Filegroups dialog box. Use this dialog box to restore database filegroups and files. Refer to “Restore Database Files and Filegroups” on page 198 for more details. |
| Batch Files | Opens the Start Batch File dialog box. Use this dialog box to start batch files for NetBackup operations. Refer to “Start Batch File” on page 207 for more details. |
| Exit | Use this command to exit the NetBackup for Microsoft SQL Server GUI. |

Options Menu



Use this menu to set database management system (DBMS) options for your current session or for your defaults. You can also set certain NetBackup client options.

Set DBMS Login Parameters

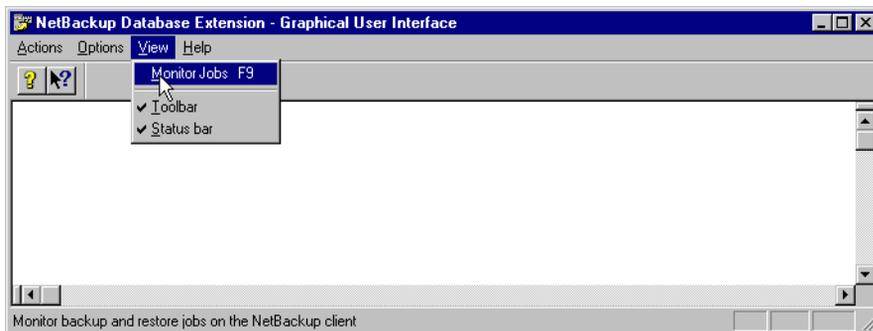
Opens the Set Database Login Parameters dialog box. Use this dialog box to set the userid and password that you want to use for logging into Microsoft SQL Server and for setting the ODBC data source name.

Set NetBackup Client Options

Opens the Client Options dialog box. Use this dialog box to set the current NetBackup for SQL Server trace level, and the block and certain tuning parameters.



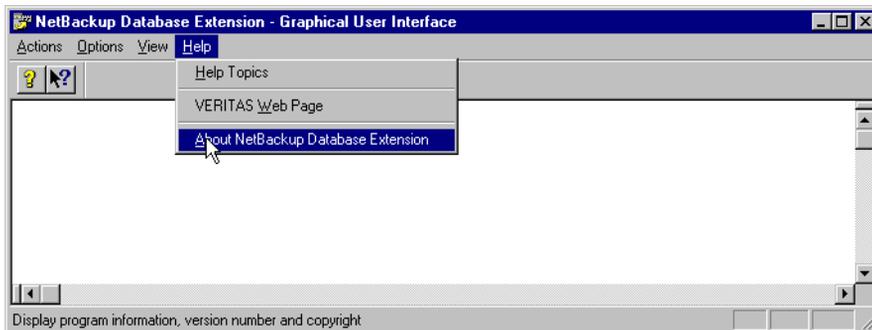
View Menu



Use this menu to view the status of NetBackup operations and to control the appearance of the Toolbar and the Status Bar.

- | | |
|---------------------|---|
| Monitor Jobs | Opens the View Status dialog box. Use this dialog box to view the status of NetBackup operations. |
| Toolbar | Turns the Toolbar on or off. |
| Status Bar | Turns the Status Bar on or off. |

Help Menu



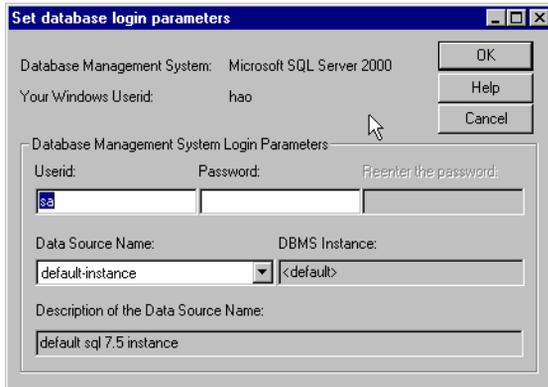
Use this menu to access the following help pages.

- | | |
|---------------------------------------|--|
| Help Topics | Opens the NetBackup Help topics. NetBackup Help contains the same information found in the user guide. You can also access NetBackup Help by using the context-sensitive button on the Toolbar. Refer to “NetBackup for Microsoft SQL Server Graphical User Interface” on page 120 for more details. |
| VERITAS Web Page | Displays the VERITAS world wide web page on your computer’s default browser. |
| About NetBackup for SQL Server | Displays the version number of NetBackup for SQL Server. |



Dialog Boxes

Set Database Login Parameters



Access this dialog box from the **Options** menu by selecting **Set DBMS Login Parameters**. Use this dialog box to set the login parameters that NetBackup for SQL Server uses when logging into Microsoft SQL Server. Refer to “Set Database Login Parameters” on page 63 for information about how to use this dialog box.

- | | |
|--|--|
| Userid | This box displays the username that NetBackup for SQL Server uses to log into Microsoft SQL Server for your NT user id.
Note See “DBMS (Database Management System) Privileges” on page 47 for a discussion on how the Microsoft SQL Server user name that you supply is used. |
| Password, Reenter the password | Use these fields to enter the Microsoft SQL Server password that is associated with the Userid that you enter in the previous field. |
| Data Source Name | This pull down menu displays all of the Microsoft SQL Server application ODBC data source names that are available on your host machine. The one displayed when the pull down component is closed is the instance that has been selected for your Windows username. |
| DBMS Instance | This is the name of the Microsoft SQL Server instance that is associated with the data source name selected in the previous edit box. |
| Description of the Data Source Name | This is the description of the data source name selected in the Data Source Name edit box. |
| OK | To accept changes to the parameters, click this button. |

Help

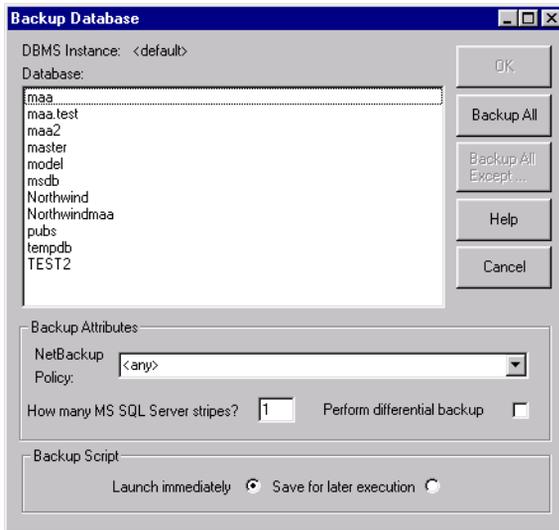
To view online help for this dialog box, click this button.

Cancel

To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.



Backup Database



Access this dialog box from the **Actions** menu by selecting **Backup**, then **Database**. Use this dialog box to initiate backup operations on a database or to create database backup scripts.

Database

The database box allows you to scroll through live databases in your DBMS. You can highlight one or more databases.

Backup Attributes

The attributes in this box allow you to set the NetBackup policy, the number of server stripes and the option to perform differential backups.

NetBackup Policy

When the policy type is MS-SQL-Server and the host is a NetBackup master server or a remote console, then a drop-down list is available from which you can choose from the list of the policies defined on the server.

Otherwise, type the NetBackup policy you want to use for this backup operation. The default is <any>. If you keep this default, NetBackup will back up the database to the first active policy for your DBMS Server. You can select a different policy by typing its name into the edit box.

How Many MS SQL Server Stripes?

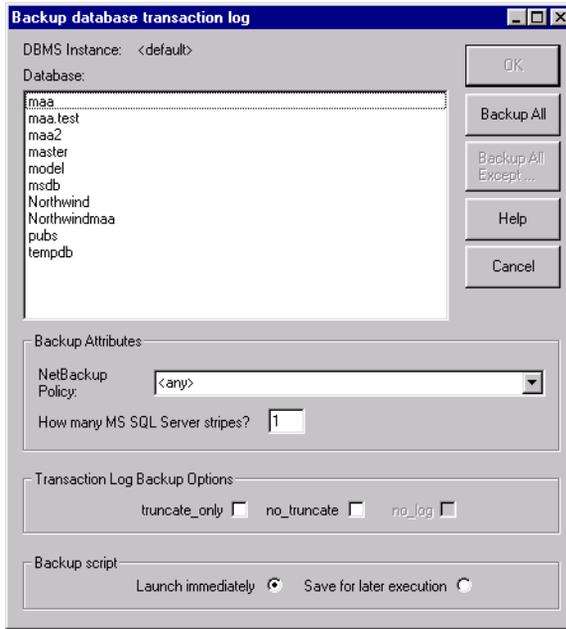
Use this box to set the number of backup stripes that you want Microsoft SQL Server to create for your backup. Type a number from 1 to 32. Refer to “Configuring for Striped Backups and Restores” on page 42.



Perform Differential Backup	Check this box if you want to create a differential backup image instead of a full backup. This check box is disabled if Microsoft SQL Server 6.5 is installed.
Backup Script	You can change these settings for current NetBackup operations.
Launch Immediately	Select Launch Immediately if you wish to start a backup operation.
Save for Later Execution	Select Save for Later Execution to generate a script that can be started at a later time.
OK	To start a database backup or to generate a database backup script, select one or more databases and click this button. This button is enabled when you select a database in the Database pane.
Help	To view online help for this dialog box, click this button.
Cancel	To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.



Backup Database Transaction Log



Access this dialog box from the **Actions** menu by selecting **Backup**, then **Transaction Log**. Use this dialog box to initiate a backup operation on a database transaction log.

Database The database box allows you to scroll through live databases in your DBMS. You can highlight one or more databases.

Backup Attributes The attributes in this box allow you to set the NetBackup policy and the number of server stripes.

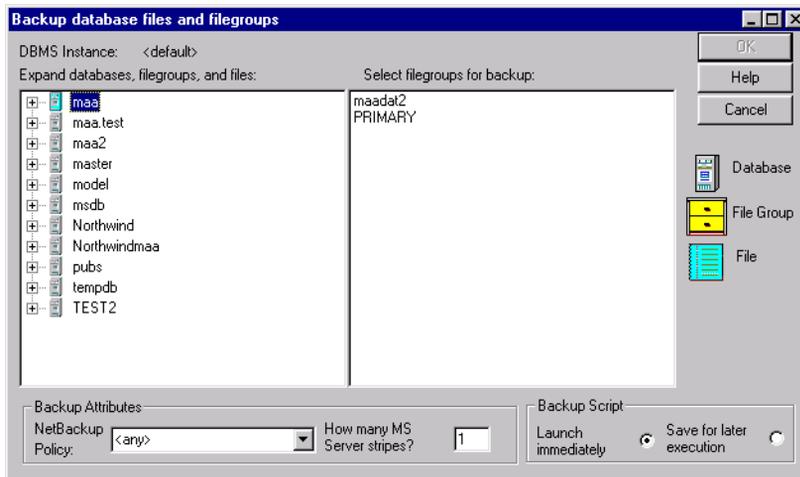
NetBackup Policy When the policy type is MS-SQL-Server and the host is a NetBackup master server or a remote console, then a drop-down list is available from which you can choose from the list of the policies defined on the server.

Otherwise, type the NetBackup policy you want to use for this backup operation. The default is <any>. If you keep this default, NetBackup will archive the database to the first active policy for your DBMS Server. You can select a different policy by typing its name into the edit box.

How Many MS SQL Server Stripes?	Use this box to set the number of backup stripes that you want Microsoft SQL Server to create for your backup. Type a number from 1 to 32. Refer to “Configuring for Striped Backups and Restores” on page 42.
Transaction Log Backup Options	You have the option to check one of the following transaction log options.
truncate_only	To signal Microsoft SQL Server to remove the inactive part of the transaction log without making a backup copy, select this checkbox. This checkbox is enabled only for Microsoft SQL Server 6.5 and above.
no_truncate	To signal Microsoft SQL Server to dump a transaction log without truncating it, select this checkbox.
no_log	To signal Microsoft SQL Server to remove the inactive part of the transaction log without making a backup copy and without logging the operation, select this checkbox. This checkbox is enabled only for Microsoft SQL Server 6.5.
Backup Script	You can change these settings for current NetBackup operations.
Launch Immediately	Select Launch Immediately if you wish to start a backup operation.
Save for Later Execution	Select Save for Later Execution to generate a script that can be started at a later time.
OK	To start a database backup or to generate a database backup script, select one or more databases and click this button. This button is enabled when you select a database in the Database pane.
Help	To view online help for this dialog box, click this button.
Cancel	To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.



Backup Database Files and Filegroups



Access this dialog box from the **Actions** menu by selecting Backup, then Database Files and Filegroups. Use this dialog box to initiate backup operations on database files and filegroups. This dialog box is not available if Microsoft SQL Server 6.5 is installed.

Expand databases, filegroups, and files

This pane allows you to traverse live databases. You can expand a database icon to view its filegroups; and you can expand a filegroup to view its files. You can select any object in this pane in order to view its constituent objects in the right-hand pane.

Select filegroup for backup

This pane displays the list of constituent objects of the highlighted object in the left hand pane. You can select one or more objects (files or filegroups) in this pane.

Backup Attributes

The attributes in this box allow you to set the NetBackup policy and the number of server stripes.

NetBackup Policy

When the policy type is MS-SQL-Server and the host is a NetBackup master server or a remote console, then a drop-down list is available from which you can choose from the list of the policies defined on the server.

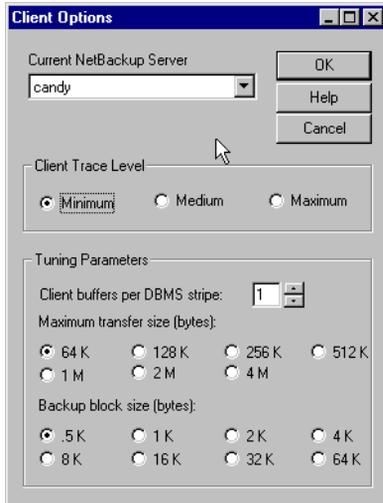
Otherwise, type the NetBackup policy you want to use for this backup operation. The default is <any>. If you keep this default, NetBackup will archive the database to the first active policy for your DBMS Server. You can select a different policy by typing its name into the edit box.



How Many MS SQL Server Stripes?	Use this box to set the number of backup stripes that you want Microsoft SQL Server to create for your backup. Type a number from 1 to 32.
Backup Script	You can change these settings for current NetBackup operations.
Launch Immediately	Select Launch Immediately if you wish to start a backup operation.
Save for Later Execution	Select Save for Later Execution to generate a script that can be started at a later time.
OK	To start a backup or to generate a backup script, select one or more objects in the “Select filegroup for backup” pane and click this button. This button is disabled if you have not selected any objects in the “Select filegroup for backup” pane.
Help	To view online help for this dialog box, click this button.
Cancel	To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.



Client Options



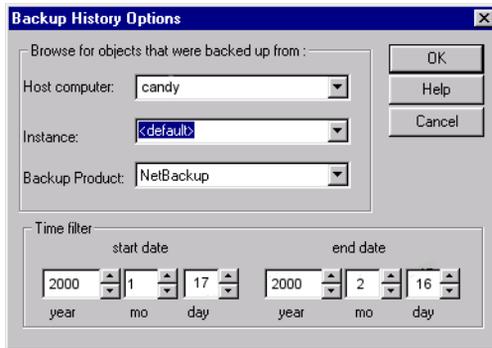
Access this dialog box from the **Options** menu by selecting **Set NetBackup Client Options**. Use this dialog box to set the following options for your current session.

- Current NetBackup Server** Use this drop down menu to select the NetBackup Server that you wish to use for NetBackup For SQL Server Operations.
- Note** The NetBackup Server that you select will be associated with any NetBackup for SQL Server operations that are started under your current user account.
- Client Trace Level Group** Use this radio group to set the trace level written to the `dbbackup` and `dbclient` logs. Normally, you should set the level to Minimum. Maximum generates a very large amount of debug data.
- Tuning Parameters** The attributes in this box allow you to set the number of client buffers per DBMS stripe, the maximum transfer size in bytes, and the backup block size in bytes.
- Client Buffers per DBMS Stripe** Use this parameter to set the number of buffers that Microsoft SQL Server uses per database stripe.
- Maximum Transfer Size (Bytes)** Use this radio group to set the maximum transfer size that Microsoft SQL Server uses for backing up and restoring database objects. It can be set to any of the indicated values between 64 kilobytes and 4 Megabytes. Disabled for Microsoft SQL Server 6.5.

Backup Block Size (Bytes)	Use this radio group to set the backup block size that Microsoft SQL Server uses for backing up database objects. It can be set to any of the indicated values between 0.5 kilobytes and 64 kilobytes. Disabled for Microsoft SQL Server 6.5.
OK	Click this button to change your client options.
Help	To view online help for this dialog box, click this button.
Cancel	To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.



Backup History Options



You can access this dialog box by clicking **Yes** in the information box, which appears, when you open the Restore Database and Transaction Logs dialog box.

Use the Backup History Options dialog box to:

- ◆ Set a different client on the NetBackup Server from which to browse for backup images
- ◆ Change the start and end times for which you would like to browse for images
- ◆ Set the Microsoft SQL Server instance for which you would like to browse backup images.
- ◆ Select the backup product (either NetBackup or Backup Exec) whose images you would like to browse.

Host Computers

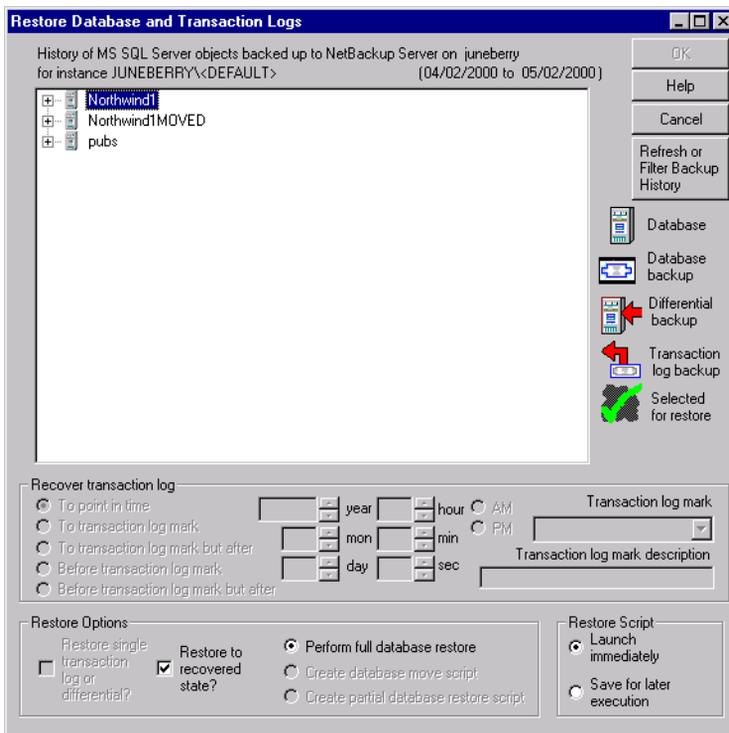
Use this edit box to set the Microsoft SQL Server client that you would like to generate a backup history for.



Instance	<p>Use this edit box to set the Microsoft SQL Server instance that you would like to generate a backup history for.</p> <p>Note The instance list in the Backup History Options dialog box always contains a pre-defined entry that you should select if you wish to generate a history of backup images generated from a previous version of NetBackup for SQL Server. Choose NB_LEGACY_SQL7, if Microsoft SQL Server 7.0 and/or 2000 are active and you wish to view 7.0 backup images that were generated by NetBackup 3.2 or 3.3. Choose NB_LEGACY_SQL65, if 6.5 is active and you wish to view 6.5 images generated from a previous version.</p> <p>The attributes in this box will allow you to perform a redirected restore to a different client. Ask the NetBackup administrator to give you the permissions to perform a redirected restore to a different client.</p>
Backup Product	<p>Use this drop-down list to select whether to scan for NetBackup or Backup Exec images.</p> <p>Note You can browse backup images that were created by either NetBackup or Backup Exec. To browse for Backup Exec images, the Backup Exec catalogs need to have been converted to the NetBackup catalog format, using the catalog converter utility. The “Backup Exec Tape Reader for NetBackup” option also needs to be installed on the NetBackup server. For more information, refer to the <i>VERITAS NetBackup DataCenter 4.5 System Administrator’s Guide for Windows</i>.</p>
Time Filter	Define the range of backups you want to search in this box.
Start Date	Enter the earliest date of the backup you want to search.
End Date	Enter the latest date of the backup you want to search.
OK	Click this button to change your backup history.
Help	To view online help for this dialog box, click this button.
Cancel	To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.



Restore Database and Transaction Logs



Access this dialog box from the **Actions** menu by selecting **Restore** and then **Databases, Differentials, and Transaction Logs**. Use this dialog box to restore a database from a database dump, a differential dump, a transaction log dump or a series of objects that include a database dump, an optional differential dump, and an optional series of transaction log dumps.

Note Differential dumps are not available for Microsoft SQL Server 6.5.

History of MS SQL Server Objects backed up to NetBackup Server

This is a tree display of the database backup history for a NetBackup client. The backup client is typically the local host on which you are running NetBackup for SQL Server. However, it may be different if a different client has been specified through the Backup History Options dialog box.

You can expand and collapse portions of the tree by clicking on the + and - elements.

Note The icons used in the following expansions are depicted to the right of the backup history pane.



If Microsoft SQL Server 6.5 is active, the tree can be expanded as follows:

Level 0: Database	Items at this level cannot be selected.
Level 1: Database backup	Each database backup is represented by an icon and the date and time of the backup. If a database dump has been selected for restore, it is superimposed with a green check mark.
Level 2: Transaction Log backup	Each transaction log dump is represented by an icon and the date and time of the backup. If a transaction log dump has been selected for restore, then a green check mark is placed on top of it.

Note For Microsoft SQL Server 6.5 only: If you select a transaction log icon and the **Restore Single Transaction Log or Differential?** box is not checked, then green check marks will automatically be placed on the parent database dump icon as well as all of the preceding transaction log icons. The green check marks indicate that these objects have been selected for staging in a full database restore.

If Microsoft SQL Server 7.0 or 2000 is active, the tree can be expanded as follows:

Level 0: Database	Items at this level cannot be selected.
Level 1: Database backup	Each database backup is represented by an icon and the date and time of the backup. If a database dump has been selected for restore, it is superimposed with a green check mark.
Level 2: Differential backup	Each differential dump is represented by an icon and the date and time of the backup. If a differential dump has been selected for restore, then a green check mark is placed on top of it.
Level 3: Transaction Log backup	Each transaction log dump is represented by an icon and the date and time of the backup. If a transaction log dump has been selected for restore, then a green check mark is placed on top of it.

Note For Microsoft SQL Server 7.0 and 2000. If you select a transaction log icon and the **Restore Single Transaction Log or Differential** box is not checked, then green check marks will automatically be placed on the parent database dump icon, the closest preceding differential dump (if one exists), as well as all of the preceding transaction log icons. If you select a differential dump, then a green check mark is also placed on the parent database dump icon. The green check marks indicate that these objects have been selected for staging in a full database restore.



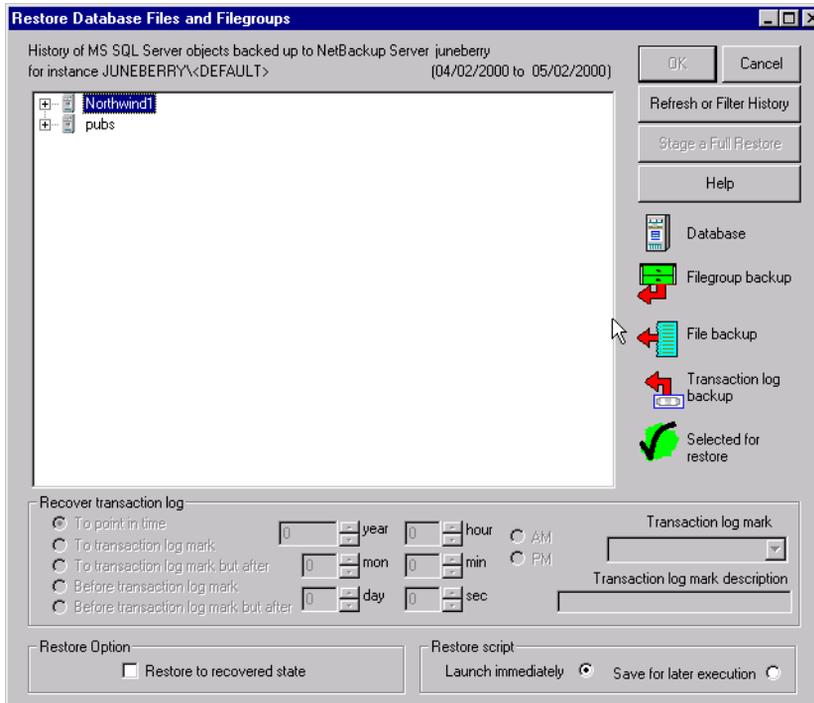
Recover Transaction Log	<p>This group contains the controls for you to restore a transaction log to a point in time that precedes the time at which the transaction log was dumped.</p> <p>The individual entries in this group are only enabled if you have highlighted a transaction log backup. If you have Microsoft SQL Server 6.5 or 7.0 active, then the only available option from this group is To point in time. The remaining options, which allow you to restore to a transaction mark, or to a time before or after a transaction mark, are enabled if you are working with an Microsoft SQL Server 2000 database. The controls are used as follows.</p>
To transaction log mark	Select this radio item to choose to have the transaction log recovered to a transaction log mark.
To transaction log mark but after	Select this radio item to choose to have the transaction log recovered to a transaction log mark but after a point in time.
Before transaction log mark	Select this radio item if you would like to have the transaction log recovered to a point before the occurrence of a transaction log mark.
Before transaction log mark but after	Select this radio item if you would like to have the transaction log recovered to a point before the occurrence of a transaction log mark but after a point in time.
Year, Mon, Day, Hour, Min, Sec, AM, PM	<p>Use these fields to specify the time to which you want the transaction logs restored. Use these fields if you have selected one of the following radio buttons:</p> <ul style="list-style-type: none"> - To point in time. - To transaction log mark but after. - Before transaction log mark but after.
Transaction log mark	<p>This pull-down menu is enabled if the you have highlighted a database transaction log for restore, and the transaction log contains one or more transaction log marks, and you have selected one of the following radio buttons:</p> <ul style="list-style-type: none"> - To transaction log mark - To transaction log mark but after - Before transaction log mark - Before transaction log mark but after.
Refresh or Filter Backup History	Use this button to refresh the backup history window.
Restore Script	You can change these settings for current NetBackup operations.



Launch Immediately	Select Launch Immediately if you wish to start a restore operation.
Save for Later Execution	Select Save for Later Execution to generate a script that can be started at a later time.
Restore Options	These options affect the restore operation.
Restore Single Transaction Log or Differential?	Mark this checkbox to restore a single transaction log or differential backup.
Restore to Recovered State?	Mark this checkbox if you want the database to be left in a recovered state when the restore operation has completed.
Perform full database restore	Select this radio button if you want to perform a database restore.
Create database move script	Select this radio button if you want to create a script template for moving the selected database.
Create partial database restore script	Select this radio button if you want to create a script template for a partial database restore. This option is available only if Microsoft SQL Server 2000 is installed.
OK	To start a restore or to generate a restore script, select one or more objects in the backup history pane and click this button. This button is disabled if you have not selected any objects in the backup history pane.
Help	To view online help for this dialog box, click this button.
Cancel	To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.



Restore Database Files and Filegroups



Access this dialog box from the **Actions** menu by selecting **Restore** and then **Database Files and Filegroups**. Use this dialog box to restore a database from a database filegroup, a database file, a transaction log dump or a series of objects that include database filegroups, database files, and transaction logs. This dialog box is not available if SQL Server 6.5 is installed.

History of MS SQL Server Objects backed up to NetBackup Server

This is a tree display of the database backup history for a NetBackup client. The backup client is typically the local host on which you are running NetBackup for SQL Server. However, it may be different if an different client has been specified through the Backup History Options dialog box.

You can expand and collapse portions of the tree by clicking on the + and - elements.

Note The icons used in the following expansions are depicted to the right of the backup history pane.

The backup tree can be expanded as follows:



Level 0: Database	Items at this level cannot be selected.
Level 1: Database backup objects	The database objects appearing at level 1 include files, filegroups, and transaction logs. Each is displayed with the date and time of the backup. Any items that are selected for restore are marked with a black check mark.

Note When you expand the database icon, all of the backup images for files, filegroups, and transaction logs are displayed. If the server contains a complete set of backup images which constitutes the full database plus an unbroken series of transaction logs which extend beyond the last member of the set to have been backed up, then the full set will be displayed with black check marks. You can stage a complete database restore by pressing **Stage a Full Restore**.

Stage a Full Restore Press this button to start a full restore or to create a full restore script. This button is enabled only if a complete set of database objects is checked in the backup history pane.

Recover Transaction Log This group contains the controls for you to restore a transaction log to a point in time that precedes the time at which the transaction log was dumped.

The individual entries in this group are only enabled if you have highlighted a transaction log backup. If Microsoft SQL Server 7.0 is active, then the only available option from this group is **To point in time**. The remaining options, which allow you to restore to a transaction mark, or to a time before or after a transaction mark, are enabled if you are working with an Microsoft SQL Server 2000 database. The controls are used as follows.

To point in time Select this radio item to choose to have the transaction log recovered to a point in time.

To transaction log mark Select this radio item to choose to have the transaction log recovered to a transaction log mark.

To transaction log mark but after Select this radio item to choose to have the transaction log recovered to a transaction log mark but after a point in time.

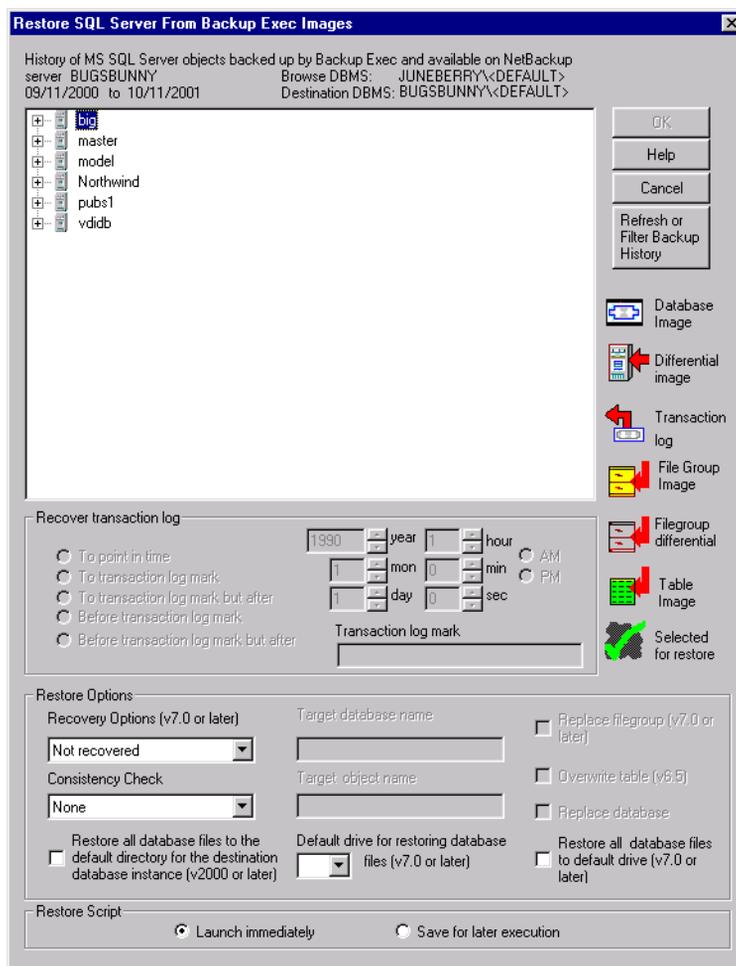
Before transaction log mark Select this radio item if you would like to have the transaction log recovered to a point before the occurrence of a transaction log mark.

Before transaction log mark but after Select this radio item if you would like to have the transaction log recovered to a point before the occurrence of a transaction log mark but after a point in time.



Year, Mon, Day, Hour, Min, Sec, AM, PM	Use these fields to specify the time to which you want the transaction logs restored. Use these fields if you have selected one of the following radio buttons: <ul style="list-style-type: none">- To point in time.- To transaction log mark but after.- Before transaction log mark but after.
Transaction log mark	This pull-down menu is enabled if the you have highlighted a database transaction log for restore, and the transaction log contains one or more transaction log marks, and you have selected one of the following radio buttons: <ul style="list-style-type: none">- To transaction log mark- To transaction log mark but after- Before transaction log mark- Before transaction log mark but after.
Refresh or Filter Backup History	Use this button to refresh the backup history window.
Restore Script	You can change these settings for current NetBackup operations.
Launch Immediately	Select Launch Immediately if you wish to start a restore operation.
Save for Later Execution	Select Save for Later Execution to generate a script that can be started at a later time.
Restore Option	This option affects the restore operation.
Restore to Recovered State?	Mark this checkbox if you want the database to be left in a recovered state when the restore operation has completed.
OK	To start a restore or to generate a restore script, select one or more objects in the backup history pane and click this button. This button is disabled if you have not selected any objects in the backup history pane.
Help	To view on-line help for this dialog box, click this button.
Cancel	To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.

Restore Database Objects from Backup Exec Images



Access this dialog box from the **Actions** Menu by selecting **Restore** and then **Databases, Differentials, and Transaction Logs**. Then select **Backup Exec** from the **Backup Product** drop list in the Backup History Options dialog box. Use this dialog box to restore database objects contained in the NetBackup catalog that have been converted from a Backup Exec catalog.

History of MS SQL Server objects backed up by Backup Exec

This window contains a tree display of SQL Server objects backed up by Backup Exec. The map is a hierarchy of databases, database differentials, transaction logs, filegroups, filegroup differentials, and tables.



Recover Transaction Log	<p>This group contains the controls for you to restore a transaction log to a point in time that precedes the time at which the transaction log was backed up.</p> <p>The remaining options, which allow you to restore to a transaction log mark, or to a time before or after transaction mark, are applicable only if you are restoring to a SQL 2000 database instance. The controls are used as follows.</p>
To point in time	<p>Select this radio item to choose to have the transaction log recovered to a point in time.</p> <p>This option is disabled until an entry is made in the Transaction log mark edit box.</p>
To transaction log mark	<p>Select this radio item to choose to have the transaction log recovered to a transaction log mark.</p> <p>This option is disabled until an entry is made in the Transaction log mark edit box.</p>
To transaction log mark but after	<p>Select this radio item to choose to have the transaction log recovered to a transaction log mark but after a point in time.</p> <p>This option is disabled until an entry is made in the Transaction log mark edit box.</p>
Before transaction log mark	<p>Select this radio item if you would like to have the transaction log recovered to a point before the occurrence of a transaction log mark.</p> <p>This option is disabled until an entry is made in the Transaction log mark edit box.</p>
Before transaction log mark but after	<p>Select this radio item if you would like to have the transaction log recovered to a point before the occurrence of a transaction log mark but after a point in time.</p> <p>This option is disabled until an entry is made in the Transaction log mark edit box.</p>
Year, Mon, Day, Hour, Min, Sec, AM, PM	<p>Use these fields to specify the time to which you want the transaction logs restored. Use these fields if you have selected one of the following options:</p> <ul style="list-style-type: none">- To point in time- To transaction log mark but after- Before transaction log mark but after

Transaction log mark	This edit allows you to enter the name of a database transaction log. It is enabled if you have selected one of the following radio buttons: <ul style="list-style-type: none">- To transaction log mark- To transaction log mark but after- Before transaction log mark- Before transaction log mark but after
Restore Options	This group contains the controls for you to specify various restore options.
Recovery Options (v7.0 or later)	Select the recovery option for the database object.
Not recovered	Use this option during a restore if additional differential or transaction log backups must be restored as well. This option is the default.
Recover database	Select this option when restoring the last Database, Differential, or Log backups in the restore sequence in order to have the restore operation roll back all uncompleted transactions. After the recovery operation, the database is ready for use. If Recover Database is not performed, the database is in an intermediate state and is not usable. If Recover Database is selected when an intermediate backup is being applied, you cannot continue to restore backups. You must restart the restore operation from the beginning.
Standby database	Use this option during transaction log and database restore to create and maintain a standby database. See your Microsoft SQL Server documentation for information on standby databases.
Consistency Check	Select the consistency check to be performed after the restore.

Note For Microsoft SQL Server v6.5, the consistency check may fail if a non-truncated log backup that is 10 MB or larger is restored. The Backup Exec job log will report the message text of Microsoft SQL Server Error 2519: "Database Corrupt: The last checkpoint in Sysdatabases is incorrect. Syslogs recorded a different checkpoint." The failed consistency check will not affect the database restore.

The occasional reporting of this error is not unusual, and it is normally resolved as database operations continue. See your Microsoft SQL Server documentation for more information about this error.



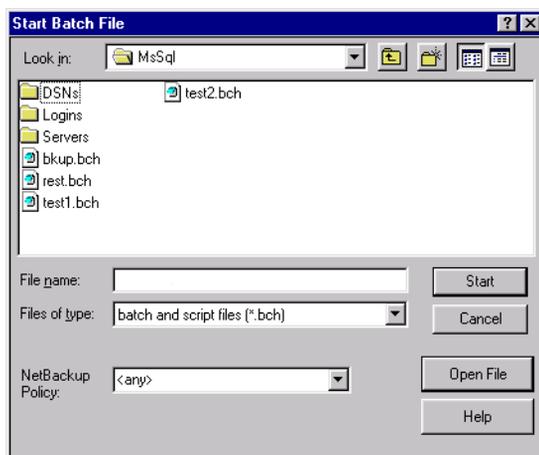
None	Select this if you are doing sequential restores. Do not run a consistency check after a restore until all sequential restores have been done. If a consistency check is selected during a restore, the restore will complete but the consistency check will not be done. Check the job log for this information. For Microsoft SQL Server v7.0 or later, if you need to recover the database after restores are complete, select one of the following consistency checks when you select the Recover Database option.
Full check, excluding indexes	Select this to exclude indexes from the consistency check. If indexes are not checked, the consistency check runs significantly faster but is not as thorough. Only the data pages and clustered index pages for each user table are included in the consistency check. The consistency of the non-clustered index pages are not checked.
Full check, including indexes	Select this to include indexes in the consistency check. Any errors are logged.
Physical check only (SQL 2000)	Select this to perform a low overhead check of the physical consistency of the SQL Server 2000 database. This option only checks the integrity of the physical structure of the page and record headers, and the consistency between the pages' object ID and index ID and the allocation structures.
Restore all database files to the default directory for the destination database instance (v2000 or later)	Use this option to restore files to the default data directory of the destination instance.
Target database name	Use this edit box to specify the target database name. By default, the target database will be the same as the source.
Target object name	Use this edit box to specify the target object name. The target object refers to a filegroup or table, if either one of these objects is selected for restore. By default, the target object will be the same as the source.

- Default drive for restoring database files (v7.0 or later)** Use this option to select a default drive to which SQL Server v7.0 or later database files can be restored if the drive where one or more of the database files previously resided no longer exists.
- When a Microsoft SQL Server database is backed up, the physical file names (which includes the directory path) of the files that make up the database are stored in the backup set by SQL Server. For example, for the logical file pubs, the physical file name is stored as C:\MSSQL7\DATA\pubs.mdf. If the database must later be restored, Microsoft SQL Server uses these same physical file names to target the restore to. During a restore, Backup Exec automatically creates any necessary subdirectories that do not exist.
- However, if the drive where one or more of the database files previously resided no longer exists, Backup Exec moves those files to their original directory path, but on the default drive specified. Using the same example, if the default drive E: is specified, then the file with the original directory path of C:\MSSQL7\DATA\pubs.mdf is restored to E:\MSSQL7\DATA\pubs.mdf.
- If no default drive is specified in this situation, the job will fail.
- Replace filegroup (v7.0 or later)** Use this option to replace a filegroup, even if another filegroup with the same name already exists on the server. If Replace Filegroup is not specified for a restore, Microsoft SQL Server performs a safety check to ensure that a different filegroup is not accidentally overwritten. Refer to your Microsoft SQL Server documentation for more information about the safety check that occurs when the Microsoft SQL Server v7.0 (or later) REPLACE option is not selected.
- Overwrite table (v6.5)** This option is available for Microsoft SQL Server v6.5 only. Select this option to overwrite user-defined tables when you restore them. If you choose not to overwrite tables, the data in the restored tables are appended; therefore, you should also select a Consistency Check After Restore option to remove duplicate records from the table.
- Replace database** Use this option to replace a database, even if another database with the same name already exists on the server. If Replace Database is not specified for a restore, Microsoft SQL Server performs a safety check to ensure that a different database is not accidentally overwritten. Refer to your Microsoft SQL Server documentation for more information about the safety check that occurs when the Microsoft SQL Server v7.0 (or later) REPLACE option is not selected.
- Restore all database files to default drive (v7.0 or later)** Use this option to restore all SQL Server v7.0 or later database files to their original directory path on the default drive, even if the drive where they originally resided exists. To make this option available, select a drive letter in Default drive for restoring database files.



Restore Script	The check boxes in this box were set, as defaults, in the Client Options dialog box. You can change these settings for current NetBackup operations.
Launch Immediately	Select Launch Immediately if you wish to start a restore operation.
Save for Later Execution	Select to generate a script that can be started at a later time.
OK	To start a restore or to generate a restore script, select one or more objects in the “Backup History Between Start Date and End Date for Client Backup Client” pane and click this button. This button is disabled if you have not selected any objects in the backup history pane.
Help	To view online help for this dialog box, click this button.
Cancel	To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.
Refresh or Filter Backup History	Use this button to refresh the Backup History window.

Start Batch File



Access this dialog box from the **Actions** menu by selecting **Batch Files**. Use this dialog box to start a NetBackup for SQL Server operation from a NetBackup for SQL Server batch file that you have written.

This dialog box displays the file icons for the contents of the *install_path\NetBackup\dbext\Mssql* folder. You are generally advised to keep your NetBackup for SQL Server batch files there; however, support is provided through common Microsoft Windows controls to navigate the file system to locate them anywhere.

Beside using this dialog box to start operations, you can also use it to open your batch files in NotePad for viewing or editing.

- | | |
|------------------|--|
| General | This dialog uses the common controls from the Microsoft Windows File menu. You can get additional help on many of the items in this dialog box by pressing F1 and clicking on that item. |
| File Name | Type the name of the file you want to use for starting a batch NetBackup for SQL Server operation or to open the file in NotePad. You can also select the file icon. |
| File Type | By modifying the file extension, which appears in this box, you can control what files will be displayed in the main window. |



- NetBackup Policy** When the policy type is MS-SQL-Server and the host is a NetBackup master server or a remote console, then a drop-down list is available from which you can choose from the list of the policies defined on the server. Otherwise, type the name of the NetBackup policy on the master server that you want to back up to. If you use the default (<any>), NetBackup will back up to the first available policy. Note that the NetBackup policy is applicable only for backup operations, not for restores.
- Start** Click this button to launch the NetBackup for SQL Server operation.
- Help** To view online help for this dialog box, click this button.
- Cancel** To cancel and return to the previous display without accepting changes to the parameters in this dialog box, click this button.
- Open batch file** Click this button to open the selected file in NotePad.

Note See “Create Batch Files” on page 125 for a description of how to create a batch file.



Glossary

activity logs

See “debug logs.”

administrator

A user that is granted special privileges to install, configure, and manage the operation of a system, network, or application

administration client

See “remote administration console.”

alternate-client restore

See “redirected restore (different client).”

back up

The act of copying and saving files and folders to storage media.

backup

Refers to the process of copying and saving files and directories to storage media. For example, *the backup is complete*. This term can also refer to the collection of data that NetBackup saves for a client during a backup or archive. For example, *duplicate the backup*.

Backup is two words when used as a verb. For example, *back up the file*.

catalogs

Internal NetBackup and Media Manager databases. These catalogs contain information about configuration, media, devices, status, errors, and the files and directories in the stored backup images.

class

See “policy.”



client

The system with the files to back up, archive, or restore.

debug logs

Logs that can be optionally enabled for specific NetBackup programs and processes and then used to investigate problems.

install_path

Directory where NetBackup and Media Manager software is installed. The default on Windows NT/2000 is `C:\Program Files\VERITAS` and on UNIX it is `/usr/openv`.

logs

Files where a computer or application records information about its activities.

master server

The NetBackup server that provides administration and control for backups and restores for all clients and servers in a master and media server cluster. NetBackup BusinessServer supports only a single server and it is the master.

media server

A NetBackup server that provides storage within a master and media server cluster. The master can also be a media server. A media server that is not the master is called a remote media server (or slave server). NetBackup BusinessServer does not support remote media servers.

policy

Defines the backup characteristics for a group of one or more clients that have similar backup requirements.

remote administration console

A Windows NT/2000 NetBackup client that has the administration interface software installed and can be used to administer NetBackup servers.

redirected restore (different client)

Restoring files to your client when they were originally backed up from a different client. The administrator using the interface on the master server can direct a restore to any client (this variation is called a server directed restore).



restore

(verb) The act of restoring selected files and directories from a previous backup or archive and returning them to their original directory locations (or to a different directory).

(noun) The process of restoring selected files and directories from a previous backup and returning them to their original directory locations (or to a different directory).





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