



BakBone
Redefining Data Protection™

NetVault® : Backup

User's Guide

for the

NetVault:Backup APM
for Microsoft Exchange
Server 2000/2003

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NetVault:Backup - User's Guide for the NetVault:Backup APM for Microsoft Exchange 2000/2003 APM

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BakBone Software

NetVault[®]: Backup

User's Guide

The Microsoft Exchange 2000/2003 APM

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EX.0.0 About the Microsoft Exchange 2000/2003 APM

One feature available with Microsoft Exchange 2000/2003 is the *storage group*, a grouping of databases that share a single transaction log set and therefore a single point of administration, backup, and restore. Multiple databases can be created for each storage group, and multiple storage groups are possible. (A maximum of **four** storage groups can be created, each containing a maximum of **five** databases.) Therefore, numerous separate databases are possible on one Exchange 2000/2003 Server.

Storage groups are the recommended unit of backup with Microsoft Exchange 2000/2003, enabling administrators to back up an entire storage group while only one copy of the system transaction log set is written to tape. At the same time, each database can be restored individually while all other databases are still online and servicing other users. This allows for very fast restoration from backup while affecting a minimal number of users.

To provide greater flexibility and granularity for data protection, the **Microsoft Exchange 2000/2003 APM** features the following:

- **Support for Microsoft Exchange 2000/2003 Server Features** - including multiple storage groups, mailbox stores and public folder stores
- **Transaction Log Backup and Restore** (incremental and differential)
- **Backup and Restore Databases in a Storage Group** (individually or together)
- **Parallel Backup of Storage Groups** - This offers increased performance.
- **Online Restore** - Restore of a storage group or database while other storage groups or databases remain online and accessible

EX.0.1 Target Audience

Microsoft Exchange administration skills are not generally required for routine backup operations. However, initial configuration and all recovery operations require administrator-level experience and access.

Important: Multiple references (i.e., URL links) are given in this guide to required articles that exist on Microsoft's web sites. At any given time Microsoft may change the structure of their web pages, rendering these links invalid. If this is the case, please contact BakBone Technical Support for obtaining the necessary information.

EX.1.0 Installation

The NetVault:Backup **Microsoft Exchange 2000/2003 APM** is installed via the NetVault:Backup **Client Management** window. To add the software, review the installation instructions that follow.

EX.1.1 | Pre-Installation Requirements

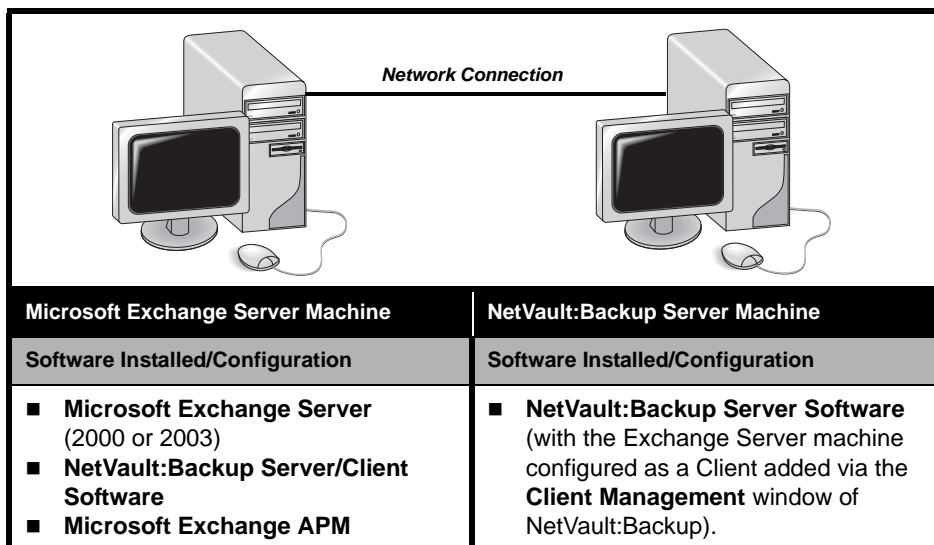
The following tasks must be performed prior to installation of the **Microsoft Exchange 2000/2003 APM**:

Important:

1. In a traditional environment (i.e., one not implementing NetVault:Backup ver. 7.3's **Application Cluster Support** - see the following note), the **Microsoft Exchange 2000/2003 APM** *must* be installed on the Exchange 2000/2003 Server.
2. NetVault:Backup version 7.3 offers support for the backup/restore of clustered instances of Microsoft Exchange Server. NetVault:Backup's **Application Cluster Support Functionality** is used for this purpose. For details on the installation, configuration and backup procedures required to set up this functionality with the **Microsoft Exchange 2000/2003 APM**, please see the section *Microsoft Exchange and Application Cluster Support* on page 42.
3. If installing version 1.7 or earlier of the **Microsoft Exchange 2000/2003 APM**, the **March 2000 Server Post-Service Pack 3 Rollup** must be performed before performing the installation. If any version of the APM prior to 1.7 is to be used, it is strongly recommended that you contact BakBone Technical Support to obtain at least version 1.8 of the **Microsoft Exchange 2000/2003 APM** (which resolves this issue).

- **NetVault:Backup Software (Client or Server versions)** - Installed on the machine configured as the Microsoft Exchange Server (running either Exchange version 2000 or 2003).

Figure EX-1:
An ideal configuration in which the NetVault:Backup Server and Exchange Server are two different machines



Important: For complete details on adding a Client machine to the NetVault:Backup Server, please see the *NetVault®: Backup - Administrator's Guide*.

- **The Exchange Server (when configured as a NetVault:Backup Client) Must be Added to the NetVault:Backup Server for Access** - In the event that the machine configured as the actual NetVault:Backup Server and the Microsoft Exchange Server are separate machines, the Microsoft Exchange 2000/2003 APM can be installed to the Exchange Server via the NetVault:Backup Server.

EX.1.2 Installation Procedure

1. From the machine acting as the NetVault:Backup Server, launch the GUI and open the **Client Management** window by clicking the **Client Management** button (or select **Client Management** from the **Administration** pull-down menu).
2. Right-click on the desired machine in the **Clients** window and select **Install Software** from the pop-up menu.
3. Navigate to the location of the **“.npk”** installation file (e.g., the NetVault:Backup APM Installation CD or the directory where the file was downloaded). Select the file (e.g. **etkxxxx.npk**) and click on **Open** to proceed.
4. The installation process will occur automatically and once it has completed, a successful installation message will appear in the **Install Software** dialog box.
5. The APM is now installed and ready for use.

Figure EX-2:
The Client Management window of NetVault: Backup

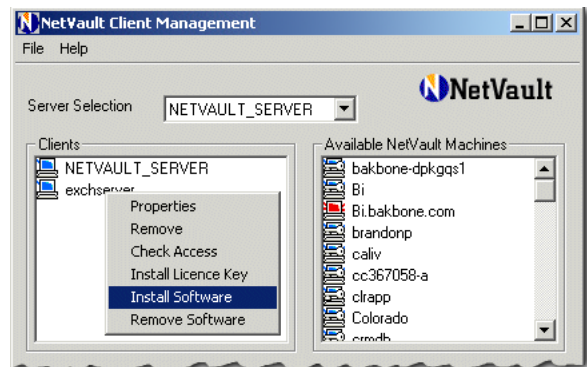
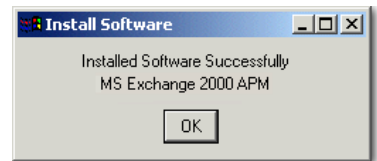


Figure EX-3:
The dialog box launched upon the successful installation of this APM



Important:

1. Based on the operating system being used, the directory path for this installation software may vary, but the file required for this process should be entitled **“etkxxxx.npk”** (where **“xxxx”** represents various software platforms and version numbers).
2. To install this software on a remote Client via the NetVault:Backup Server, the Client must first be successfully added. For complete details on adding a Client to the NetVault:Backup Server, please see the *NetVault®: Backup - Administrator's Guide*.

EX.1.3 Removing the Microsoft Exchange 2000/2003 APM

Figure EX-4:
The Remove Software window with the Microsoft Exchange 2000/2003 APM selected for removal

1. Open the NetVault:Backup **Client Management** window by clicking the **Client Management** button on the NetVault:Backup GUI (or select **Client Management** from the **Administration** pull-down menu).

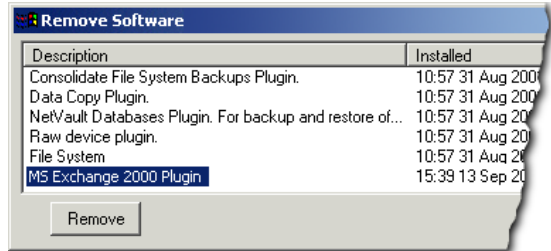
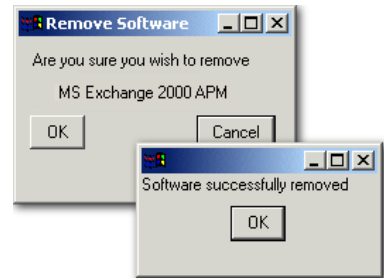


Figure EX-5:
The two dialog boxes issued during the removal process for the Microsoft Exchange 2000/2003 APM

2. Right-click on the NetVault:Backup Server in the **Clients** list and select **Remove Software** from the pop-up menu.
3. Select **MS Exchange 2000/2003 APM** from the displayed list and click the **Remove** button.
4. A dialog box will appear asking for confirmation of the remove command. Click **OK** to proceed (or **Cancel** to abort). Clicking **OK** results in the removal of the software and a confirmation message will appear. Click **OK** to close this dialog box and return to the **Client Management** window.



EX.2.0 Backing Up Data

Important: Version 2.4 and later of the **Microsoft Exchange 2000/2003 APM** supports the backup of data comprised of extended ASCII characters. However, in order to successfully support this functionality on a Microsoft Exchange Server running in a Windows 2000 environment, **at least** Service Pack 1 must be applied to the operating system.

The **Microsoft Exchange 2000/2003 APM** is designed so that it is not necessary to take Exchange offline to perform backups. When setting up a basic backup job, the steps required can be broken down into three phases:

- **Phase 1: Selecting Data for a Backup**
- **Phase 2: Setting Options in the Backup Options Pane**
- **Phase 3: Finalizing and Submitting the Backup Job**

The sections that follow offer step-by-step instructions for each of these phases.

EX.2.1 Phase 1: Selecting Data Items for a Backup

1. From the NetVault:Backup Server, launch the **Backup** window by clicking either of the **Backup** buttons from the main GUI (or by selecting the **Backup** command from the **Operations** pull-down menu).

Important: All items in the tree of the **Selections** frame can be opened in one of two ways:

- **Double-click on the Item's Name/Icon**
- **Right-click on the Item and Select Open from the Pop-Up Menu**

Figure EX-6:
The Selections
tab of the
Backup
window with
various
Information
Stores
selected for a
backup

2. Open the added NetVault:Backup Client that is serving as the Exchange Server to display the list of installed APMs and plugins.

3. Locate the **Exchange 2000 APM** node and open it to display the Exchange Server and available information stores.

4. Expand the desired Microsoft information store to display all of the storage groups contained within. It is also possible to open an individual group to display all of the stores contained within that group.

5. Select data as desired for backup by clicking the box to the left of that item (i.e., to mark it with a green check). It is possible to select groups as follows:

- **The Entire Information Store**
- **Individual Storage Groups**
- **Sets of Storage Groups**
- **Individual Databases**
- **Groups of Databases**



Important: While selecting individual databases for inclusion in a backup is possible, once the job is launched, the entire log file for the storage group (i.e., the database's parent) will be included with the backup of **each** selected database. This creates the possibility of multiple copies of the same transaction log being copied to tape. Although this will not compromise data integrity, it may result in media being used unnecessarily. Therefore, to conserve space on the backup media, it is recommended that a storage group be the smallest unit selected for inclusion in a backup.

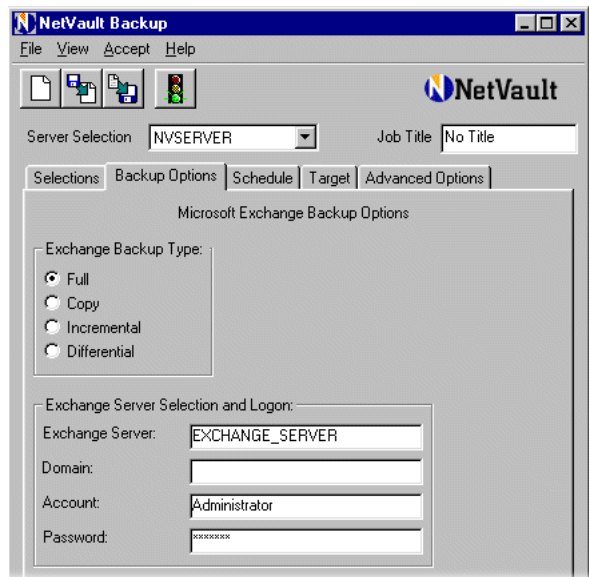
EX.2.2 Phase 2: Setting Backup Options

With the desired data items selected for a backup, the **Backup Options** tab can be selected to configure the options available here. The section that follows outlines the options offered in this tab and their use.

EX.2.2.a The Exchange Backup Type Frame

This frame allows the user to select the desired type of backup to be performed. The following types are available.

- **Full** - This will backup all Exchange data selected for the backup including the current transaction logs and patch files. With a full backup, existing transaction logs will be cleared out.
- **Copy** - This will backup all Exchange data selected, including the current transaction logs and patch files. With this selected, the backup will copy the data without altering the Exchange 2000/2003 Server state. This allows for other types of backup to be performed later.
- **Differential** - This will backup all data that has changed since the most recent full or incremental backup. Only transaction log files will be backed up and not the actual data stores. With this form of backup selected, the log files will not be cleared.
- **Incremental** - This will backup all data that has changed since the last full or incremental backup. Only transaction log files will be backed up and not the actual data stores. With this form of backup selected, the log files will be cleared.



*Figure EX-7:
The Backup
Options tab for
the Microsoft
Exchange
2000/2003
APM*

Important:

1. It is not possible to perform an incremental or differential backup with the Exchange utility, **Circular Logging** enabled. With this utility enabled, Exchange 2000/2003 Server will overwrite files, making it impossible to reliably restore from the transaction logs

2. Both **Incremental** and **Differential** backup types require certain pre-requisites before they can be selected as a backup type. For complete details on how to properly perform either of these types of backup, please see the relevant section:

- **Differential Backups** - See the section *Using Differential Backups* on page 12.
- **Incremental Backups** - See the section *Using Incremental Backups* on page 13.

EX.2.2.b The Exchange 2000/2003 Server Selection and Logon Frame

This frame is comprised of the following options:

- **Exchange Server** - The machine name of the Microsoft Exchange 2000/2003 Server appears in this box. To change machines for backup, input the name of the desired machine here.
- **Domain** - In the event that multiple domains exist in the network, input the name of the domain to which the Exchange Server is a member. Otherwise, this field can remain blank.
- **Account** - The administrator account appears by default in the **Account** box. This account *must* have the proper backup and restore permissions.
- **Password** - Input the password value associated with the account named in the **Account** field. Failure to input the correct password will result in denied access to the Exchange database and the backup job will fail.

EX.2.3 Phase 3: Finalizing and Submitting the Backup Job

With desired data items selected and the necessary **Backup Options** set, follow the steps below to finalize set up of the backup job and submit it.

1. The remaining tabs (e.g., **Schedule**, **Target** and **Advanced Options**) contain additional options that can be set as desired. These options are consistent throughout all plugins and APMs in NetVault:Backup. For more information on these options and their use, please see the *NetVault®: Backup - Administrator's Guide*.
2. Enter a suitable title for the job in the **Job Title** box. It is highly recommended that a name be assigned that will differentiate this job from any others performed with this APM. This will allow for easier recognition of the job during restore.
3. Submit the backup job by clicking the **Submit** button on the command toolbar. Further information on the job can be viewed in various other windows of the NetVault:Backup GUI, in regards to job status, progress and its associated log entries. Please see the *NetVault®: Backup - Administrator's Guide* for information on accessing these separate windows to view this information.

EX.2.4 Other Backup Operations

With a standard full Microsoft Exchange 2000/2003 APM backup covered in the previous sections, this section has been dedicated to offering instructions on the use of the APM in other backup scenarios.

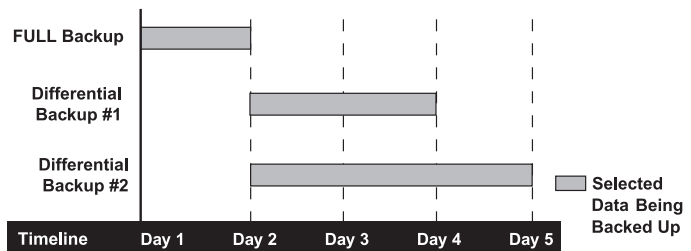
EX.2.4.a Using Differential Backups

The following procedure details the steps necessary to perform a **Differential** backup with the **Microsoft Exchange 2000/2003 APM**.

Figure EX-8:
An example
Differential
backup
scenario

- **Step 1: Run the Initial Full backup.** This will backup all selected Exchange 2000/2003 data, including the related data stores and the current transaction logs. A **Backup Selection Set** is required to successfully perform an Incremental backup. Follow the sub-steps below to accomplish this and submit the job:
 1. With the desired data items selected for the Full backup, locate the **Backup Selection Set** options available at the bottom of the **Selections** tab, and click on the **Save As** button.
 2. In the window that appears, Click to place the cursor in the top-most field and input a desired name for the **Set** of selected data items.
 3. Click on the **OK** button to save the **Set** and close this window. The **Backup Selection Set** field will be updated to reveal the **Set** name, and a truncated version of the selection tree will be revealed, comprised only of the items selected for the backup.
 4. Select the **Backup Options** tab and ensure that the **Exchange Backup Type** is set to **Full**. Set other options in this tab as required (i.e., as explained in the section, *Phase 2: Setting Backup Options* on page 10).
 5. In the **Job Title** field, input a name for the job using something to mark it as the Initial Full backup.
 6. Click on the **Submit** button to launch the job.

- **Step 2: Run Differential Backups as Required.** A Differential backup always looks back to the initial Full backup as its point of reference,



regardless of any other Differential backups that may have been previously performed. For example, an initial Full backup is performed followed by a Differential backup of the same set of data the following day. If on the third day another Differential backup is performed, the first Differential will be

ignored. This second one will look back to the Full backup and include all data that is new or changed since it was performed. With each Differential backup performed, transaction logs will be retained. The steps below roughly outline the procedure required to set up a Differential backup.

1. From the **Selections** tab of the **Backup** window, locate the **Backup Selection Set** options and click on the **Load** button.
2. In the window that appears, locate the **Set** in the lower field, that was created for the initial Full backup and click on it to select it.
3. Click on the **OK** button to accept the selection and close the window. The **Backup Selection Set** field will be updated to reveal the selected **Set**, and a truncated version of the selection tree will be revealed, comprised only of the items that were included in the Full backup.
4. Select the **Backup Options** tab and set the **Exchange Backup Type** to **Differential**. Set other options in this tab as required (i.e., as explained in the section, *Phase 2: Setting Backup Options* on page 10).
5. In the **Job Title** field, input a name for the job, using something to mark it as a Differential backup.
6. Click on the **Submit** button to launch the job.

Important: For ease of set up, it is recommended that a schedule be established for a Differential backup scenario. For example, through the use of the **Schedule** tab of the **Backup** window, you could set up a Full backup of a selected **Set** of data to occur each Monday night and follow this by setting up a single Differential job that will occur on other nights of the week. As each subsequent Monday passes, a new Full backup will be generated, thereby creating a new point of reference for future Differentials. For complete details on the use of the **Schedule** tab, please see the *NetVault®: Backup - Administrator's Guide*.

EX.2.4.b Using Incremental Backups

The following procedure details the steps necessary to perform an **Incremental** backup with the **Microsoft Exchange 2000/2003 APM**.

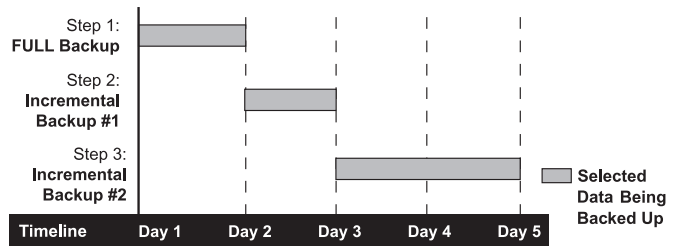
- **Step 1: Run the Initial Full Backup.** This will backup all selected Exchange 2000/2003 data, including the related data stores and the current transaction logs. A **Backup Selection Set** is required to successfully perform an Incremental backup. The procedure required to create one and submit this job is the same as what is described for the initial Full backup in a Differential scenario. Repeat **Steps 1 - 6**, as described in the section, *Using Differential Backups* on page 12.
- **Step 2: Run the Initial Incremental Backup.** This will create a backup of the data that has changed since the most recent **Full** backup and should be run at a later date. With this backup, the transaction log will be truncated. This

requires that the Backup Selection Set created for the original Full backup be loaded. To accomplish this and submit the job, follow the sub-steps below:

1. From the **Selections** tab of the **Backup** window, locate the **Backup Selection Set** options and click on the **Load** button.
2. In the window that appears, locate the **Set** that was created for the initial Full backup in the lower field and click on it to select it.
3. Click on the **OK** button to accept the selection and close the window. The **Backup Selection Set** field will be updated to reveal the selected **Set**, and a truncated version of the selection tree will be revealed, comprised only of the items that were included in the Full backup.
4. Select the **Backup Options** tab and set the **Exchange Backup Type** to **Incremental**. Set other options in this tab as required (i.e., as explained in the section, *Phase 2: Setting Backup Options* on page 10).
5. In the **Job Title** field, input a name for the job, using something to mark it as an Incremental backup.
6. Click on the **Submit** button to launch the job.

Figure EX-9:
An example
Incremental
backup
scenario

- **Step 3: Run Additional Incremental Backups in the Future (as required).** This will create further backups and include only data that has changed since the most recent **Incremental** backup. Again, the transaction log will be truncated.



Important: Incremental backups are best set up using a backup schedule. For example, through the use of the **Schedule** tab of the **Backup** window, you could set up a Full backup of a selected **Set** of data to occur each Monday night and follow this by setting up a single Incremental job that will occur Tuesday through Friday nights. For complete details on the use of the **Schedule** tab, please see the *NetVault®: Backup - Administrator's Guide*.

EX.3.0 Restoring Data

In the same manner as a backup, a restore of data with the Microsoft Exchange 2000/2003 APM can be broken down into separate phases. The sections that follow illustrate the steps required to complete each of the following phases:

- **Phase 1: Restore Preparations**
- **Phase 2: Selecting Data for a Restore**
- **Phase 3: Setting Options in the Restore Options frame**
- **Phase 4: Finalizing and Submitting a Restore Job**

Important: Restoring is a sensitive operation, so a **Copy** backup is recommended before recovering an Exchange 2000/2003 Server. In Microsoft file systems, files are overwritten and truncated at the beginning of a copy operation. Exchange 2000/2003 Server truncates the original file when the Restore file process starts, and if a restore fails, the original file will be lost.

EX.3.1 Phase 1: Restore Preparations

Prior to restoring data, it is necessary to complete a few tasks in order for the restore to run properly. These procedures are detailed below.

EX.3.1.a Dismounting the Store

Figure EX-10:
The pop-up menu revealed when right-clicking a Storage Group in Windows 2000

Dismount the storage group to be restored by doing the following:

1. Launch the **Exchange System Manager**.
2. Expand the Administrative Groups to show the available stores.
3. Right-click on the desired store and select **Dismount Store** from the pop-up menu.
4. A warning dialog box will appear indicating that the selected information store will not be available if this process takes place. Click on **Yes** to accept the warning and dismount the store.

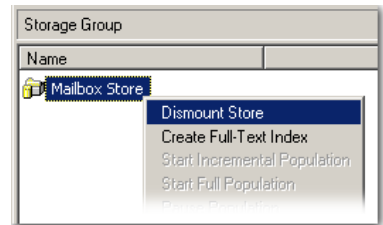


Figure EX-11:
The warning box revealed when attempting to dismount an Information Store

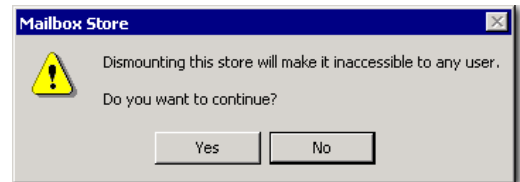
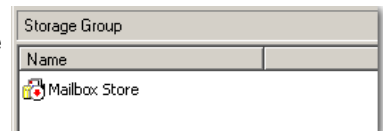


Figure EX-12:
A dismounted Information Store

5. Once the information store has been successfully dismounted, its icon will change to reflect this (i.e., the normal icon of an information store will be replaced by one with a circled red dot).



Important: NetVault:Backup can be configured to issue a request to the Exchange Server to have it automatically mount the store again once the restore has completed.

EX.3.2 Phase 2: Selecting Data for a Restore

With the restore preparations completed and a proper restore strategy in mind, follow the steps below to select data for the restore:

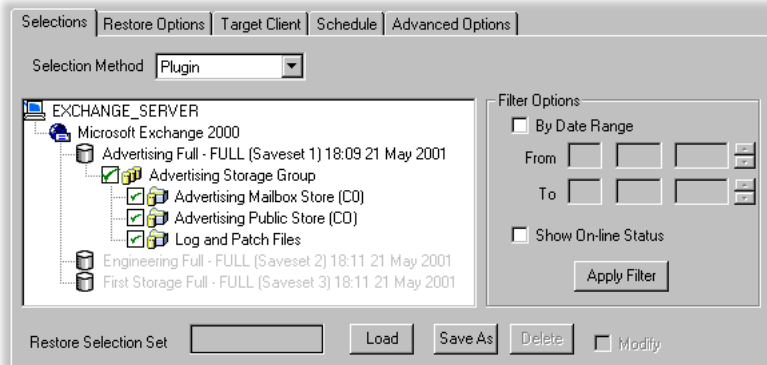
1. Open the **Restore** window by clicking the **Restore** button on the command toolbar (or by selecting the **Restore** command from the **Operations** pull-down menu). The window will launch revealing the **Selections** tab. In this tab's window, a list of Clients is displayed from which successful backups have been completed.

Important: In the same manner as the **Selections** tab of the **Backup** window, all items in the selection tree can be opened in one of two ways:

- **Double-click on the Item's Name**
- **Right-click on the Item and Select Open from the Pop-Up Menu**

2. Select the Client containing the data to be restored, and open it to display a list of APMs/plugins currently installed there for use.

Figure EX-13:
The **Selections** tab of the **Restore** window with various information stores selected for a restore



3. Locate the **Microsoft Exchange 2000** icon and open it. A list of backup savesets created using this APM will be revealed. Each **backup saveset** will show the type of backup performed (i.e., before the saveset number).
4. Expand an individual **backup saveset** to show the individual storage groups contained within that were included in the backup.

Important: Below the Backup Saveset level of the **Selections** tab, it is only possible to open items for browsing by double-clicking on them (i.e., the pop-up menu accessible at various levels of the tree **below** the **backup saveset** does not contain an **Open** menu item).

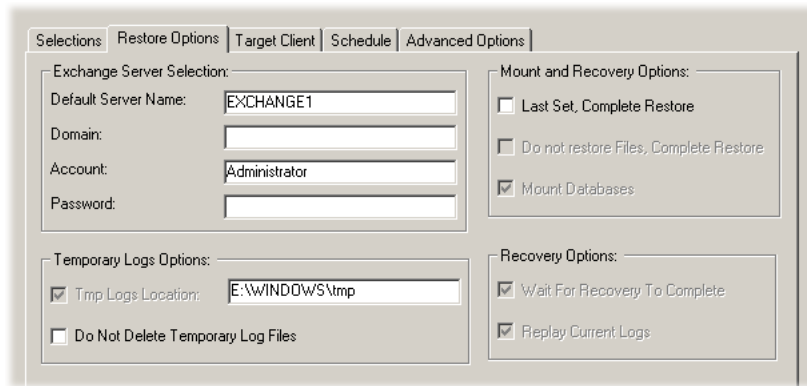
5. Each storage group can be opened to reveal the individual stores that were included in the backup. Select the data for restore by clicking in its associated check box. NetVault:Backup makes it possible to select from the following items for inclusion in a restore job.
 - **Entire Information Store**
 - **Individual Storage Groups**
 - **Sets of Storage Groups**
 - **Individual Databases**
 - **Sets of Databases**
 - **Transaction Logs/Patch Files** (for incremental and differential restores)

EX.3.3 Phase 3: Setting Options in the Restore Options Tab

With the desired items selected for a restore, the **Restore Options** tab can be accessed to set the options available there. The points below outline these options and their use.

Important: It is highly recommended that each option's description in this section be thoroughly reviewed, as some of these options *must be* set prior to submitting *any* restore job.

Figure EX-14:
The Restore Options tab for the Microsoft Exchange 2000/2003 APM



EX.3.3.a The Exchange Server Selection Frame

Fill in the following fields with the appropriate information in order to perform the restore:

- **Default Server Name** - The machine name of the original target Microsoft Exchange Server will appear in this field by default (i.e., the Exchange Server from which the selected backup saveset was generated). To target a different Exchange Server for the restore, type in the machine name of the desired system here. Unless performing a relocation restore, it is recommended that this field be left at its default.

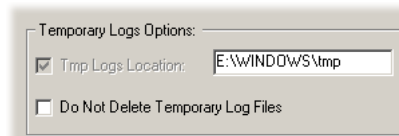
- **Domain** - When conducting a standard restore, this option is not used, and should be left blank. If left blank, the restore will occur on the original target machine. This field is primarily used for one of two reasons:
 - ❖ **The Exchange Server that was Backed Up from Exists in a Domain Outside that of the NetVault:Backup Server** - In this case, the domain would have been named in this same field in the **Backup Options** tab when the backup was originally taken, and therefore it must be renamed here in order to grant NetVault:Backup access to the domain for restore.
 - ❖ **The Restore is to be Relocated to a Different Exchange Server** - Input the name of the domain to which the new restore target is a member in this field (as well as inputting the relocation target's name in the **Default Server Name** field and provide suitable **Account** and **Password** values to allow access to this new domain). For more information on relocating a restore, please see the section *Recovering to a Different Exchange Server* on page 31.
- **Account** - By default, this field will contain the administrator-level account that was used to backup the original target Exchange Server (i.e., the account named in the **Exchange Server Selection and Logon** frame of the **Backup Options** tab for this backup job). This value can be changed as required, but the account named must have the proper backup and restore permissions for the machine that is to serve as the target of the restore.
- **Password** - Enter the password that corresponds to the account named in the **Account** field. For security reasons, this field will always appear blank at default.

EX.3.3.b The Temporary Logs Options Frame

*Figure EX-15:
The
Temporary
Logs Options
frame*

The following options are available in this frame:

- **Temporary Logs Location** - Log and patch files will be stored in a temporary location during the restore process and before the databases are mounted. This field allows the user to define this temporary location.



Important: If a directory other than the default is to be used, this directory must actually exist on the restore target **before** the restore job is submitted.

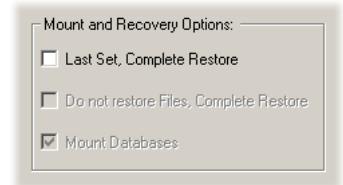
- **Do Not Delete Temporary Log Files** - Check this box to retain temporary files and temporary log and patch files in the directory named in the accompanying field. Leaving this box unchecked will result in the automatic deletion of the log and patch files after the recovery process is completed.

EX.3.3.c The Mount and Recovery Options Frame

Figure EX-16:
The Mount and
Recovery
Options frame

Set these options as required:

- **Last Set, Complete Restore** - When performing **any** restore of a sequence of backups, select this option when performing the restore job of the **last backup in the sequence**. This option finalizes the restore sequence upon completion of the restore job for which it was selected (i.e., Microsoft Exchange will be alerted to perform any necessary recovery tasks). For examples of how this option is used in the restore of a sequence of backups, please see the section *Examples of Various Restore Procedures* on page 21.



Important: Selection of this option is required for the final restore in **all** sequences. This applies to a sequence of Incremental/Differential backups or even the restore of a single Full backup.

- **Do Not Restore Files, Complete Restore** - In the event that the **Last Set, Complete Restore** option was **not** selected for the intended last restore in a sequence, this option can be used in an additional restore job to rectify this. With this option set, NetVault:Backup will perform the necessary steps to finalize the restore sequence without re-transferring data to the Exchange Server. It is first necessary to select the **Last Set, Complete Restore** option to activate this option for use. For an example of this option in use, please see the section *The Do Not Restore Files, Complete Restore Option and Restore Sequences* on page 29.
- **Mount Databases** - Since a pre-requisite to initiating a restore of Microsoft Exchange data is to dismount the target Microsoft store (e.g., whole information stores, individual mail stores, individual databases, etc. -- whatever component is to be the target of a recovery), this option can be selected to re-mount the databases within the Information Store after the restore has been completed.

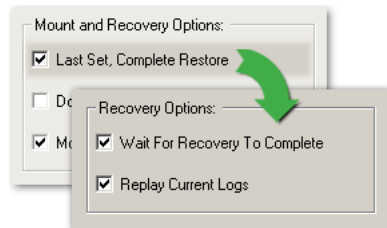
Important: The **Mount Databases** option is only to be used in conjunction with the **last restore in a sequence** (i.e., it will remain greyed-out and unavailable unless the **Last Saveset, Complete Restore** option is selected). Once the **Last Saveset, Complete Restore** option is selected, this option will be default selected, meaning that NetVault:Backup will send a prompt to Exchange requesting that the target information store be re-mounted upon completion of the restore. It is recommended that this option be left default selected, otherwise it will be necessary to manually re-mount the information store upon completion of the restore in order to bring it back online.

EX.3.3.d The Recovery Options Frame

This frame contains the following options:

Figure EX-17:
With the Last Set, Complete Restore option selected, the options in the Recovery Options frame are made available

- **Wait For Recovery to Complete (Default Selected)** - With this option selected, NetVault:Backup will wait for the Exchange Server to complete its own recovery operations for each selected storage group, **before** continuing with the data restore of any additional storage groups and record these results in the NetVault:Backup logs for the job (i.e., these logs would be viewable via the **Logs** window of the NetVault:Backup GUI). This may result in a longer overall restore process, but the end results of the Exchange Server recovery operations for each storage group can be viewed locally on the NetVault:Backup Server. If this option is **de-selected**, NetVault:Backup will proceed to restore each selected storage group, without waiting for the end results from the Exchange Server. As a result, none of this data will be recorded in the NetVault:Backup logs. Regardless of this option's setting, these results will be logged in the **Windows Application Event Log** on the Exchange Server and can be viewed with the **Windows Event Viewer** utility.



Important:

1. If the above option is de-selected, NetVault:Backup will not report the overall successful completion of a restore job. Therefore, it will be necessary to log on locally to the target Exchange Server and verify the status of any restored data.
2. Due to the nature of this option, when it is used in conjunction with the **Mount Databases** option, NetVault:Backup may not automatically re-mount all databases included in the restore, once the restore completes. The stores the selected databases belong to can be successfully re-mounted using the **Exchange System Manager** utility. Please see the relevant Microsoft Exchange documentation for information on re-mounting stores.

- **Replay Current Logs (Default Selected)** - With this selected, NetVault:Backup will request that the target Exchange Server access any additional log files that were generated after the point in time the backup was taken. Once the log files have been accessed, they will be played back during the Exchange Server's recovery operations (i.e., after data restore is complete) in order to bring any applicable databases to their most up-to-date state.

Important:

1. Both of the options available in this frame are only to be used in conjunction with the last restore in a sequence (i.e., they will remain greyed-out and unavailable unless the **Last Saveset, Complete Restore** option is selected).
2. If the **Replay Current Logs** option is *de-selected*, once the restore job has completed, *no* current logs will be accessed on the Exchange Server during its recovery operations phase (i.e., after the restore of backed up data from NetVault:Backup). This will result in the loss of *all* data that is new or has been changed since the point in time of the backup.
3. If performing a **Full Recovery** of the Exchange Server (as outlined in the section *Full Recovery of the Exchange 2000/2003 Server* on page 30), the **Replay Current Logs** option *must* be selected to successfully perform this operation.
4. The **Replay Current Logs** option *must not* be selected when performing a restore from a **Copy Backup Saveset**. Doing so will force the logs to sync to the most recent transaction log backup, mis-aligning the logs and Exchange Server data. This will result in an illogical state and the database will not respond.

EX.3.4 Phase 4: Finalizing and Submitting a Restore Job

With desired data items selected and the desired options set in the **Restore Options** pane, these last few steps are to be followed to finalize the restore job and submit it to be run.

1. The remaining available tabs (e.g., **Target Client, Schedule** and **Advanced Options**) contain additional options that can be set as desired. These options are consistent throughout all plugins and APMs in NetVault:Backup. For more information on these tabs and the options available within, please see the *NetVault®: Backup - Administrator's Guide*.
2. Enter a suitable title for the job in the **Job Title** field. It is strongly recommended that a specific name value be used to allow for easy recognition of the restore job in the other windows of the NetVault:Backup GUI (e.g., the **Logs** and **Job Management** windows).
3. Submit the restore job by clicking the **Submit** button. As with a backup, the job status, progress and log entries can be viewed in selected windows of the NetVault:Backup GUI. Please see the *NetVault®: Backup - Administrator's Guide* for information on accessing these windows for this purpose.

EX.3.5 Examples of Various Restore Procedures

All restore scenarios using the **Microsoft Exchange 2000/2003 APM** are seen by NetVault:Backup as a sequence of restores; from the recovery of a series of 10 Incremental backups to the recovery of a single Full backup. Therefore, it is necessary to follow a specific set of steps to successfully recover data using this

APM. The following sub-sections offer examples on the steps required to restore the various available types of backup.

EX.3.5.a Restoring a Standalone Full Backup

As noted above, even the restore of a single Full backup is seen as a sequence by the **Microsoft Exchange 2000/2003 APM**. Therefore, certain steps must be followed to successfully restore a standalone Full backup, in order to make its recovered data suitable for use by Microsoft Exchange.

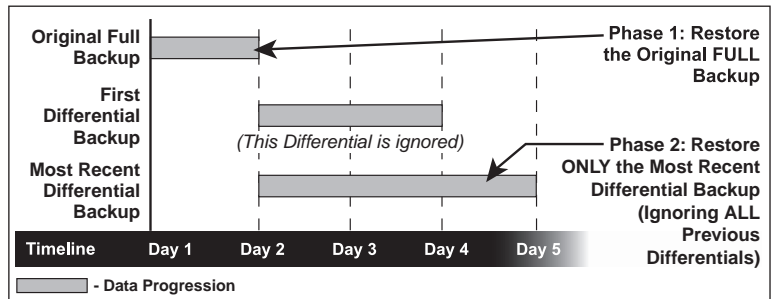
Important: This section offers an example of the steps required to successfully recover a **single** Full backup. The instructions offered here **do not apply** to the recovery of the Full backup associated with a Differential or Incremental sequence of restores.

1. Dismount the target store(s) on the target Microsoft Exchange Server (as outlined in the section *Dismounting the Store* on page 15). The target Exchange Server store(s) must be dismounted prior to launching a restore job, otherwise it will fail.
2. Create a restore job, exactly as outlined in the section *Restoring Data* on page 15. Ensure that the data selected exists in a FULL backup saveset.
3. In the **Restore Options** tab, input the proper values in the **Default Server Name**, **Domain** (if applicable), **Account** and **Password** fields of the **Exchange Server Selection** frame for the target Exchange Server.
4. Ensure that the **Last Set, Complete Restore** option is selected, thereby marking this restore job as the last in the sequence. Also, ensure that the **Do Not Restore Files, Complete Restore** option remains **de-selected**. Leave the **Mount Databases** option **selected** so that NetVault:Backup will send a request to the Exchange Server to have it re-mount the store(s) upon completion of this restore.
5. Other options in this tab can be set as desired (for the sake of this example they are all left at their default settings).
6. Review the section, *Phase 4: Finalizing and Submitting a Restore Job* on page 21 for details on submitting the job to run.
7. On job completion, NetVault:Backup will finalize the restore process and all restored data will be readily accessible to Microsoft Exchange.

EX.3.5.b Restoring a Differential Backup Sequence

Figure EX-18:
The phases required to restore a sequence of Differential backups in order to bring the Exchange Server to its most recently backed up state

The process required to successfully recover a sequence of Differential backups can be broken down into **two** phases:



- **Phase 1: Restore the Original Full Backup**
- **Phase 2: Restore the Desired Differential Backup**

In the example process that follows, an initial Full backup and two subsequent Differentials were performed. The end user would like to restore the Microsoft Exchange Server to its most up-to-date state, therefore the two phases required to restore would be performed as follows:

Phase 1: Restore the Original Full Backup

1. Dismount the target store(s) on the Microsoft Exchange Server (as outlined in the section *Dismounting the Store* on page 15). The target store(s) must be dismounted prior to launching the initial restore job, otherwise all restores will fail.
2. From the **Selections** tab of the **Restore** window, access the desired Microsoft Exchange Server and locate the FULL backup saveset that served as a starting point for the desired Differential backup sequence.
3. Drill-down in the backup saveset until the selectable data items are available, and choose the desired data items for inclusion. Make note of the exact items that were selected for the restore.
4. In the **Restore Options** tab, input the proper values in the **Default Server Name, Domain** (if applicable), **Account** and **Password** fields of the **Exchange Server Selection** frame for the target Exchange Server. **Leave all other options in this tab at their default.**

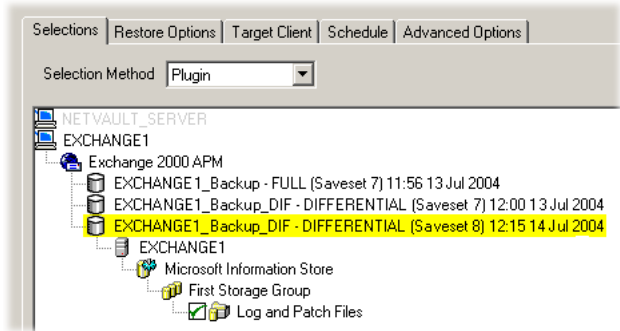
Important: Ensure that **Last Set, Complete Restore** and **Mount Databases** options are **de-selected**.

5. For the sake of this example the options in the remaining tabs (i.e., **Schedule, Target** and **Advanced Options**) are left at their default.

- Input a suitable name for this restore in the **Job Title** field. For example, a title referencing the name of the Exchange Server as well as the type of restore -- “**EXCHANGE1_FULL**”. Follow this by clicking on the **Submit** button to launch the job.

Phase 2: Restore the Desired Differential Backup

- With the restore of the original Full backup successfully completed, access the **Selections** tab of the **Restore** window and drill-down to the backup saveset belonging to the desired Differential



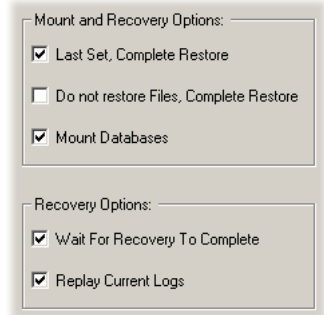
- backup in the sequence. In this example, the Exchange Server is to be restored to its most recently backed up state. Therefore, it would only be necessary to target the most recently performed Differential backup, and ignore any previously performed ones.
- Open this backup saveset and navigate to the selectable data items contained within in order to select the desired ones. Since this is a Differential backup, only the transaction log and patch files should have been included in the backup. Select this entire item to recover all items included in the backup, or open it and select only those items that are to be recovered.
- In the **Restore Options** tab, input the proper values in the **Default Server Name**, **Domain** (if applicable), **Account** and **Password** fields of the **Exchange Server Selection** frame for the target Exchange Server.
- In the **Mount and Recovery Options** frame, select the **Last Set, Complete Restore** option in order to set this restore as the last in the sequence. Ensure that the **Do Not Restore Files, Complete Restore** option remain *de-selected*.

Figure EX-19:

In order to restore to the most recently backed up state, the last Differential in the sequence would be opened and its data items selected, as desired

Figure EX-20:
With the last restore in the sequence, the Last Set, Complete Restore option is selected, thereby activating all of its associated options

5. Leave the **Mount Databases** option **selected** so that NetVault:Backup will send a request to the Exchange Server to have it re-mount the store(s) upon completion of this restore. Also, to achieve the desired result for this example, the remaining **Recovery Options** (i.e., **Wait For Recovery To Complete** and **Replay Current Logs**) should be left at their default, **selected** state.
6. For the sake of this example, all other options in the remaining tabs (i.e., **Schedule, Target Client** and **Advanced Options**) are left at their default.
7. Input a suitable name for this restore in the **Job Title** field. For example, a title referencing the name of the Exchange Server as well as the type of restore -- "**EXCHANGE1_Differential**". Follow this by clicking on the **Submit** button to launch the job.
8. With the above settings made, NetVault:Backup will finalize the restore sequence after successful job completion. The Exchange Server will then perform its recovery operations after which recovered data will be readily accessible to Microsoft Exchange.



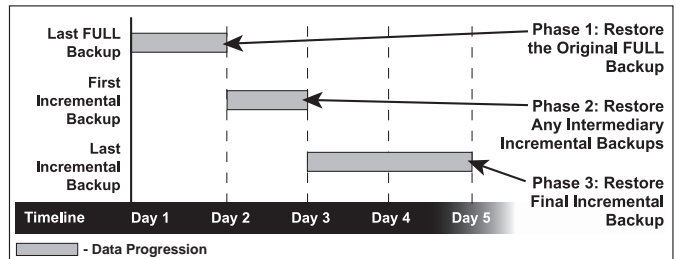
Important: It is also possible to restore an Exchange Server to a specific point in time (rather than to its most up-to-date state, as outlined in the process above). To accomplish this, follow the steps outlined in the section above, but rather than recovering the most recent Differential backup, select the one taken from the desired point in time. However, in difference to this procedure, ensure that the **Replay Current Logs** option in the **Restore Options** tab is **de-selected** before launching the restore job. If this option is left selected, the Exchange Server will be prompted to scan all recent logs and update all data to its most up-to-date state, rather than leaving the restored data at its desired, "point-in-time" state.

EX.3.5.c Restoring an Incremental Backup Sequence

Figure EX-21:
The phases required to restore a sequence of Incremental backups in order to bring the Exchange Server to its most recently backed up state

The process required to successfully recover a sequence of Incremental backups can be broken down into three phases:

- **Phase 1: Restore the Original Full Backup**
- **Phase 2: Restore All Intermediary Incremental Backups**



■ Phase 3: Restore the Final Incremental Backup

In the example process that follows, an initial Full backup and two subsequent Incrementals are to be recovered, to bring an Exchange Server back to its most up-to-date state (i.e., to the point in time of the most recent Incremental backup).

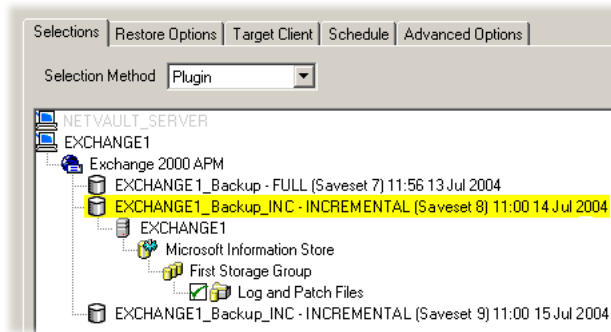
Phase 1: Restore the Original Full Backup

1. Dismount the target store(s) on the Microsoft Exchange Server (as outlined in the section *Dismounting the Store* on page 15). The target store(s) must be dismounted prior to launching the initial restore job, otherwise all restores will fail.
2. From the **Selections** tab of the **Restore** window, access the desired Microsoft Exchange Server and locate the FULL backup saveset that served as a starting point for the desired Incremental backup sequence.
3. Drill-down in the backup saveset until the selectable data items are available, and choose the desired ones for inclusion. Make note of the **exact** items that were selected for the restore.
4. In the **Restore Options** tab, input the proper values in the **Default Server Name**, **Domain** (if applicable), **Account** and **Password** fields of the **Exchange Server Selection** frame for the target Exchange Server. Leave all other options in this tab at their default.
5. For the sake of this example, all other options in the remaining tabs (i.e., **Schedule**, **Target Client** and **Advanced Options**) are left at their default.
6. Input a suitable name for this restore in the **Job Title** field. For example, a title referencing the name of the Exchange Server as well as the type of restore -- "**EXCHANGE1_FULL**". Follow this by clicking on the **Submit** button to launch the job.

Phase 2: Restore All Intermediary Incremental Backups

1. From the **Selections** tab of the **Restore** window, access the desired Microsoft Exchange Server and locate the backup saveset that served as **first** Incremental backup in the sequence. NetVault:Backup will label each backup saveset as to its backup type (i.e., **FULL**, **INCREMENTAL**, etc.). This label will also include the date and time the job was performed.
2. Open this backup saveset and drill down until the available data items are revealed. Since this is an Incremental backup, only the transaction log and patch files should have been included in the backup. Select this entire item to recover all items included in the backup, or open it and select only those items that are to be recovered. It is recommended that you make note of the exact items selected for this phase of the recovery. This will allow for selection of the same data items with further Incrementals in the sequence.

Figure EX-22:
Once the original FULL backup has been restored, access the backup saveset for the first incremental backup in the series and select the relevant data



3. In the **Restore Options** tab, input the proper values in the **Default Server Name, Domain** (if applicable), **Account** and **Password** fields for the target Exchange Server. Leave all other options at their default setting.

Important: At this phase of the procedure, ensure that the **Last Set, Complete Restore** and **Mount Databases** options are *de-selected*.

7. For the sake of this example, the options in the remaining tabs (i.e., **Schedule, Target Client** and **Advanced Options**) are left at their default.
8. Input a suitable name for this restore in the **Job Title** field. For example, a title referencing the name of the Exchange Server as well as the type and order (if applicable) of the incremental restore -- **"EXCHANGE1_Incremental_1"**. Follow this by clicking on **Submit**.

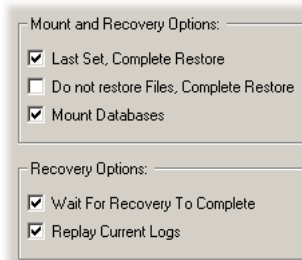
Important: If additional Incremental backups exist in a sequence, the above section would be followed to restore each additional one, in the order they were performed, except for the *last* Incremental in the sequence. Specific settings must be made for this final restore, all of which are covered in the following section.

Phase 3: Restore the Final Incremental Backup

1. With all previous restores successfully completed, including the original Full and all Incrementals, access the **Selections** tab of the **Restore** window and drill-down to the backup saveset belonging to the last Incremental backup in the sequence.
2. Open this backup saveset and navigate to the selectable data items contained within in order to select the desired ones. Again, refer to the noted data items restored for the restore of the Full and all previous Incremental backups and select these **exact same items** for the restore
3. In the **Restore Options** tab, input the proper values in the **Default Server Name, Domain** (if applicable), **Account** and **Password** fields of the **Exchange Server Selection** frame for the target Exchange Server.

Figure EX-23:
With the last restore in the sequence, the Last Set, Complete Restore option is selected, thereby activating all of its associated options

4. In the **Mount and Recovery Options** frame, select the **Last Set, Complete Restore** option in order to set this restore as the last in the sequence. Ensure that the **Do Not Restore Files, Complete Restore** option remains *de-selected*.
5. Leave the **Mount Databases** option *selected* so that NetVault:Backup will send a request to the Exchange Server to have it re-mount the store(s) upon completion of this restore. Also, to achieve the desired result for this example, the remaining **Recovery Options** (i.e., **Wait For Recovery To Complete** and **Replay Current Logs**) should be left at their default, *selected* state.
6. For the sake of this example the options in the remaining tabs (i.e., **Schedule**, **Target Client** and **Advanced Options**) are left at their default.
7. Input a suitable name for this restore in the **Job Title** field. For example, a title referencing the name of the Exchange Server as well as the type and sequence order of the backup -- "**Exchange_1_Incremental_Last**". Follow this by clicking on the **Submit** button to launch the job.
8. With the above settings made, NetVault:Backup will finalize the restore sequence after successful job completion. The Exchange Server will then perform its recovery operations after which recovered data will be readily accessible to Microsoft Exchange.



Mount and Recovery Options:

- Last Set, Complete Restore
- Do not restore Files, Complete Restore
- Mount Databases

Recovery Options:

- Wait For Recovery To Complete
- Replay Current Logs

Important: It is also possible to restore an Exchange Server to a specific point in time using a sequence of Incremental backups (rather than to its most up-to-date state, as outlined in the previous process). To accomplish this, follow the steps outlined in the previous section, but rather than recovering *all* Incremental backups in the sequence, only recover up to the Incremental taken at the desired point in time. Complete the process by restoring the Incremental backup marking the desired point in time using the procedure outlined in the section *Phase 3: Restore the Final Incremental Backup* on page 27. However, ensure that the **Replay Current Logs** option in the **Restore Options** tab is *de-selected* before launching this final restore job. If this option is left selected, the Exchange Server will be prompted to scan all recent logs and update all data to its most up-to-date state, rather than leaving the restored data at its desired, "point-in-time" state.

EX.3.5.d The Do Not Restore Files, Complete Restore Option and Restore Sequences

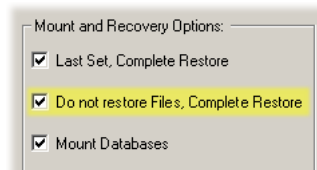
As pointed out in the description for this **Restore Option** tab utility, it can be used if a backup that was just restored was supposed to serve as the last in a sequence, but the **Last Set, Complete Restore** option was *not* selected. With the **Do Not Restore Files, Complete Restore** option selected, no files are transferred, but the finalization procedure required to bring all restored Microsoft Exchange data online is performed. The steps that follow provide an example of how this functionality can be used successfully.

Important:

1. The functionality covered in this section should **only be used** in the event that the last restore job in a sequence was not set as such, via the **Last Set, Complete Restore** option available in the **Restore Options** tab.
2. Ensure that the target information store is still dismounted from the previously performed restore before attempting the procedure that follows.

Figure EX-24:
Ensuring that
the Do Not
Restore Files,
Complete
Restore option
is selected

1. From the NetVault:Backup Server, access the **Job Management** window of the GUI. In the list of jobs that is displayed, locate the job that was **supposed to serve as the last restore in a sequence** (but did not have the **Last Set, Complete Restore** option set for it). Right-click on this job's listing and select the **Edit/View Job** command.
2. The **Restore** window will launch with this job loaded. In the lower corner of this window are the **Restore Selection Set** utilities. Locate the **Modify** option and click to select it.
3. Select the **Restore Options** tab. In the **Mount and Recovery Options** frame, select the **Last Set, Complete Restore** option. This will activate all associated options.
4. Select the **Do Not Restore Files, Complete Restore** option. It is also recommended that all other associated options remain at their default settings.
5. Input a new name for this job in the **Job Title** field. Leaving the same name for this job will prompt NetVault:Backup to overwrite the original job (i.e., because they both have the same name). Follow this by clicking on the **Submit** button to launch the job.
6. With the above settings made, NetVault:Backup will **only** finalize the restore sequence (i.e., send a request to the Exchange Server to perform its recovery operations) and **not actually transfer any files**. Once complete, the actual restored data will then be readily accessible to Microsoft



Exchange.

EX.3.6 Restoring Over an Existing Database

In the event that a database (or an entire information store) is to be restored to a system which already contains this specific data (i.e., the database/information store already exists on the target machine), it is necessary to perform the following steps to prepare the item for overwriting:

1. Access the **Exchange Manager** utility locally on the Exchange Server that is to serve as the target for the restore, and locate the desired database/information store to be overwritten.
2. Right-click on the item to access the **Properties** command from the pop-up menu.
3. In the window that appears, select the option, **This Database Can Be Overwritten by a Restore**. This will allow the desired data item to be overwritten.

Important:

1. This procedure must be performed from the desired level of the information store for the restore to work properly. For example, if only a single database within an information store is to be restored, navigate to the specific database within it and perform the steps illustrated above. If an entire information store is to be recovered, perform these steps on the actual information store, etc.
2. The procedure above must be followed to recover an existing database/information store. Otherwise, the restore operation will fail.

EX.3.7 Full Recovery of the Exchange 2000/2003 Server

This section offers a brief synopsis on how to fully recover an Exchange 2000/2003 system utilizing backups performed with the **Microsoft Exchange 2000/2003 APM**. However, it is strongly recommended that the Microsoft documentation for the Exchange version in use (e.g. 2000 or 2003) be consulted for complete details on the proper way to perform this type of recovery.

1. Re-install Windows 2000/2003 (with system settings) and applications.
2. Re-install Exchange 2000/2003 in **Recovery Mode**.
3. Re-install the NetVault:Backup Client and the **Exchange 2000/2003 APM**.
4. Add the Exchange 2000/2003 Server to the NetVault:Backup domain as a Client. (For details on this procedure, please see the *NetVault®: Backup - Administrator's Guide*.)
5. Follow the steps detailed in *the section Restoring Data* on page 15 to recover the remaining Exchange 2000/2003 data.

EX.3.8 Recovering to a Different Exchange Server

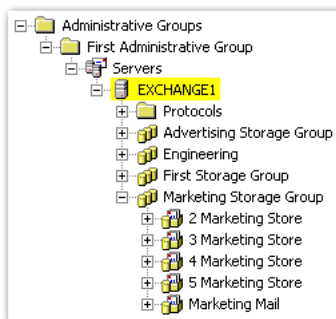
NetVault:Backup's **Exchange 2000/2003 APM** also makes it possible to take the backup of a storage group performed on one Exchange Server and restore it to a secondary one. This can be beneficial when it is necessary to recover a storage group to access its contents while leaving the initial Exchange Server untouched and operational. In addition, restoring to a secondary Exchange Server can be a good method for testing the integrity of backed up data (while not interfering with a running Exchange Server). This section offers instructions on how to perform this.

EX.3.8.a Restore Preparations

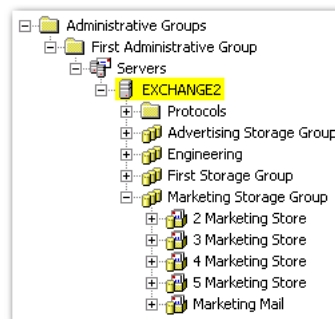
Prior to performing a restore of data in this manner, the following actions must be performed on the machine that is to serve as the new target for the restored Exchange Server data:

- **A Clean Installation of Exchange has been Performed on the New Target Server** - It is recommended that this operation be performed on a newly installed instance of Microsoft Exchange, rather than an existing one.
- **Target Server Established on a Different Segment** - In order for this operation to work properly, the target machine for this operation *must* reside on a segment different than the original Exchange Server (i.e., it must be set up in a different domain). If these two machines were set up on the same segment, NetVault:Backup will always attempt to recover the selected data to the *original* Exchange Server.
- **Storage Groups Set Up on the Target Machine must Match the Original Exchange Server Exactly** - Before attempting the restore of a specific storage group, the target machine must be set up to mirror that storage group's structure as it appeared on the original machine, in regards to names *and* directory paths. For example, if the "**Marketing Storage Group**" (as shown in the figure below) contains five individual stores and originally existed in the root of the "**C:**" partition, a storage group must be established on the target machine with the same name; it *must* contain five stores all named *exactly* the same as the originals; and it *must* be located in the root of the **C:** partition.

Figure EX-25:
Two Exchange Servers, one with a new Storage Group set up to mirror the original



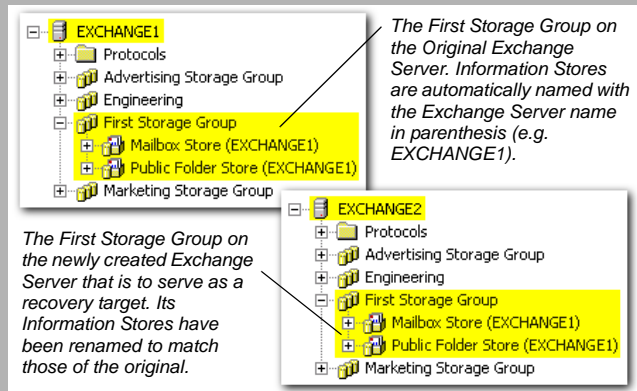
Storage Group structure on the initial Exchange Server



Storage Group structure set up to match on the target Exchange Server

Important:

1. As Exchange is set up on a new target machine, all of the information stores contained in the automatically created **First Storage Group** will be given a title which includes the name of the Exchange Server itself, enclosed in parenthesis. To ensure proper recovery, these information stores must be renamed to **identically** match those from the original Exchange Server. For example, if the information stores on the original Exchange Server were accompanied by the name of that server (e.g. Mailbox Store (Exchange1)), the newly created information stores on the target machine must be renamed to match (e.g., as revealed in the figure above). Failure to rename the information stores in this manner will result in a failed restore.



2. The previous process **must** take place for **all** storage groups that are to be recovered by a restore.

- **Dismount the Information Stores** - Each individual information store **must be** dismounted on the target Exchange Server prior to initiating the restore. For complete details on dismounting a store, please see the section *Dismounting the Store* on page 15.

- **Set Overwrite Permissions** - Before submitting a restore, **each** information store must have an option set allowing for its data to be overwritten during a restore. To complete this process, perform the following steps:

- a. Launch the **Exchange System Manager** on the target machine and navigate to the desired storage group. Open it (by double-clicking on it) to reveal the individual information stores contained within.
- b. Right-click on a store and select **Properties** from the pop-up menu.

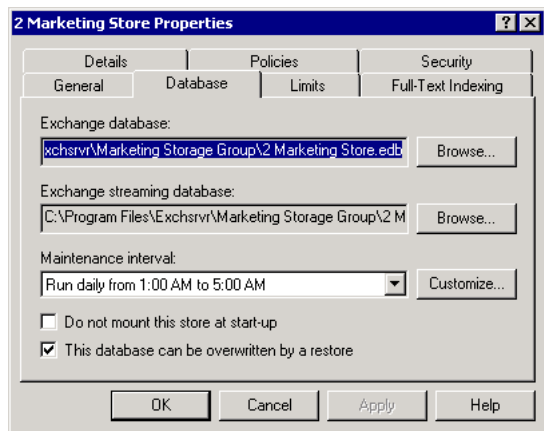


Figure EX-26:
The
Information
Store
Properties
window with
the Database
tab active and
the 'This
Database can
be Overwritten
by a Restore'
option
selected

- c. From the **Information Store Properties** window, select the **Database** tab and select the **This Database can be Overwritten by a Restore** option.
 - d. Click **OK** to close this window and confirm the selection.
 - e. Repeat steps **b - d.** until this option has been activated for **all** information stores in the target storage group.
- **NetVault:Backup Must be Installed on Both Machines** - For this operation to work properly, NetVault:Backup must be installed on **both** the original Exchange Server as well as the machine set up as the new target.

Important:

1. This must take place for **each** information store contained in **all** storage groups to be recovered by a restore, otherwise the restore will fail.
2. The option **This Database can be Overwritten by a Restore** automatically reverts to **deselected** as a restore job completes (thereby protecting the store). If it is necessary in the future to perform further restores to an information store, this option must be re-selected.

- **Both Machines Must be Added to the NetVault:Backup Server as Clients** - From the **Client Management** window of the NetVault:Backup Server, ensure that **both** machines have been successfully added as Clients. (For details on adding Clients to the NetVault:Backup Server, please see the *NetVault®: Backup - Administrator's Guide*.)

EX.3.8.b Restore Procedure

With the pre-requisite operations complete, it is now possible to perform the restore of desired storage groups with the NetVault:Backup GUI. This process is similar to the standard restore process illustrated earlier in this manual, with the exception of a few steps.

Important: This procedure does not support the relocation or renaming of restored items. (NetVault:Backup's **Rename/Relocate** functionality can not be used when restoring a backup to a **different** Exchange Server.)

Figure EX-27:

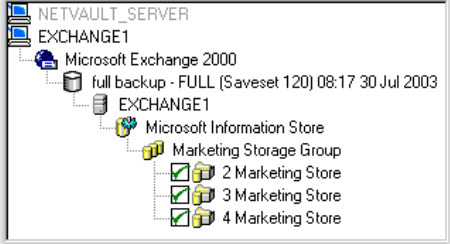
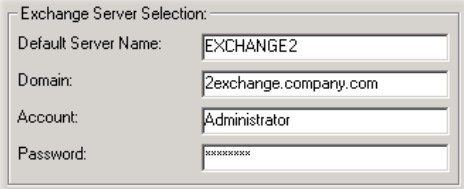
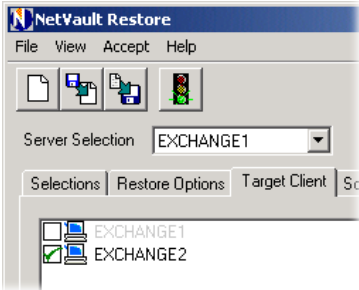
In this environment, the Exchange Server and the NetVault:Backup Server are two different machines and the Exchange Server is opened and data items are selected

Figure EX-28:

The Exchange Server Selection frame with options input with information required for this type of restore

Figure EX-29:

The Target Client tab with the new target machine selected

- From the **Restore** window of the NetVault:Backup GUI, various NetVault:Backup Clients that have completed successful backups will be revealed in the **Selections** tab. Locate the Exchange Server in this tab and double-click on it to open it and reveal the **Microsoft Exchange 2000/2003 APM**.
 
- Double click on the APM to open it and reveal the backup savesets created by past backup jobs. Locate the desired saveset and open it.
- With the backup saveset open, locate the desired storage group(s), open each and select each information store contained within them.
- Access the **Restore Options** tab and set the following options in the **Exchange Server Selection** frame accordingly:
 - **Default Server Name** - Input the system name (not the NetVault:Backup name) for the machine serving as the target for relocation.
 - **Domain** - Input the domain path that applies to the new target machine. As noted earlier, for this process to work properly, the two machines must reside on different segments. Therefore, it is necessary to input the proper domain information for the new target machine in this field.
 - **Account** - By default, this field will contain the "Administrator" account. This can be changed as required, but the account entered **must** have the proper backup and restore permissions on the new target machine.
 - **Password** - Enter the password that corresponds to the account named above. If this value is not input properly, the restore will fail.
- The other options of the **Restore Options** tab can be changed as desired or left at their default settings.
- Select the **Target Client** tab. From this tab, select the **desired target machine**.
- Input an appropriate name for the job in the **Job Title** field.
- Start the job by clicking on the **Submit** button.
 

Important:

1. The above procedure assumes that a full (non-incremental/differential) backup is being restored. In the event that a series of Incrementals/Differentials is to be recovered, this procedure would be followed to first recover the initial Full backup. Subsequent Incrementals/Differentials would then be recovered as is illustrated for a standard restore of this type (except that the proper information would need to be input in the **Exchange Server Selection** field of the **Restore Options** tab (as illustrated in **Step 4**, above) and the new target Exchange Server would be selected from the **Target Client** tab as illustrated in **Step 6**, above).
2. For this process to complete successfully, it is recommended that all of the individual information stores contained in a given storage group be selected for a recovery (rather than only selecting certain information stores).

EX.3.8.c Post-Restore Requirements

Once the restore has been completed, it is necessary to perform a few operations on the new Exchange Server to bring it up and online.

1. Launch the **Exchange System Manager** on the newly recovered Exchange 2000/2003 Server and navigate to a restored storage group. Open it (by double-clicking on it) to reveal the individual information stores.
2. Double-click on an information store to open it and locate the **Mailboxes** item. Right-click on it and select the **Run Cleanup Agent** command from the pop-up menu to establish the mailbox.
3. With the **Mailboxes** item successfully established, new user accounts must be created for each mailbox contained within the information store. By clicking the information store's **Mailboxes** item in the **Tree** tab, individual user mailboxes that have been restored to it will be revealed in the **Mailboxes** window.
4. User accounts must be created for each of these user mailboxes, and they must be given the same name.

*Figure EX-30:
Selecting the
Run Cleanup
Agent
command on
the Mailbox
item in the
Exchange
System
Manager*

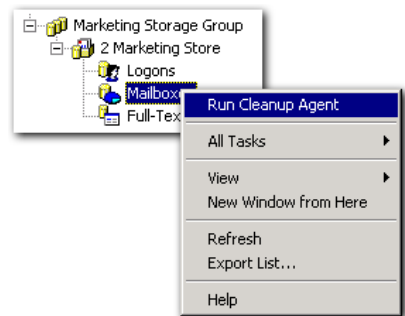
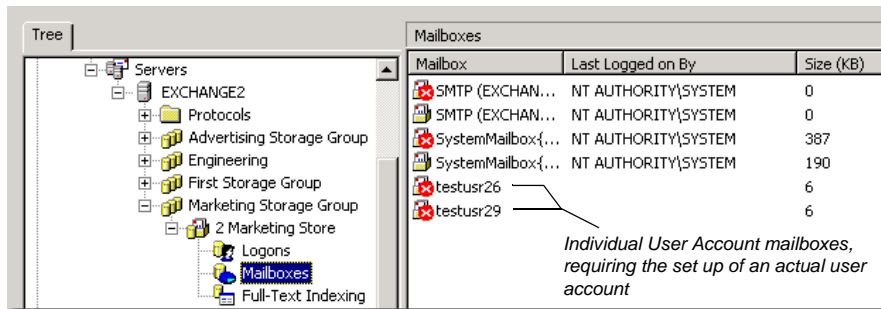


Figure EX-31:

With a **Mailboxes** item selected, individual mailboxes contained within are revealed, including those requiring the set up of new user accounts



Important: Once the **Run Cleanup Agent** command has been successfully run, individual mailboxes revealed when a **Mailboxes** item is selected will be marked with a red circle containing a white “x” indicating that the mailbox as disconnected.

Figure EX-32:
The first pane of the New Object - User window, accessed to create a new user account

- Make a note of the mailbox names contained within this window (e.g. “testusr26” and “testusr29” in the example image above).
- Access the **Active Directory Users and Computers** window and locate the **Users** folder in the **Tree** tab. Right-click on this folder and select the **New User** command from the pop-up menu.
- In the first pane of the **New Object - User** window that appears, enter one of the noted user account names in the **First Name** and **User Logon Name** fields and click **Next** to continue.

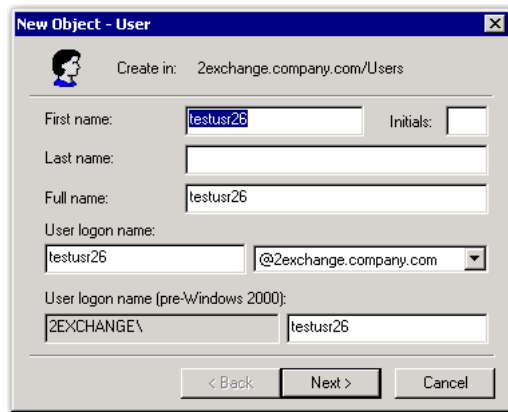


Figure EX-33:
The second pane of the New Object - User window, requesting password information

- In the next pane, enter the desired password information for this account. As this is just a formality at this point (i.e., these accounts belong to individual users who may want to establish their own password), it is recommended that a generic value is input for these options, and the **Password Never Expires** option is selected. With options set as desired, click on **Next** to continue.

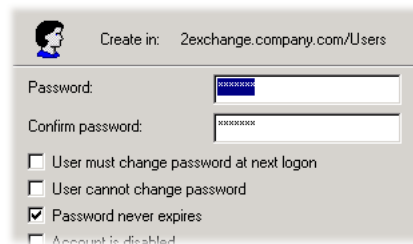
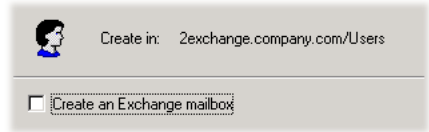


Figure EX-34:
The third pane of the New Object - Users window contains this option which must be de-selected

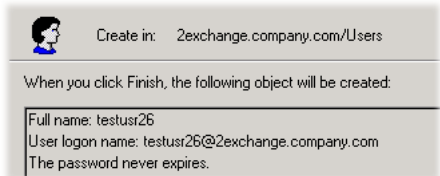
9. In the third pane of the **New Object - Users** window, ensure that the **Create an Exchange Mailbox** item is **de-selected**. This mailbox was already restored to this Exchange Server, and this process is being performed simply to create an account to associate with it. With the option de-selected, click **Next** to continue.



Important: If this option is not de-selected, Exchange will return an error when it attempts to create a mailbox that already exists (i.e., the mailbox recovered by the previous restore that this account is be set up to link to).

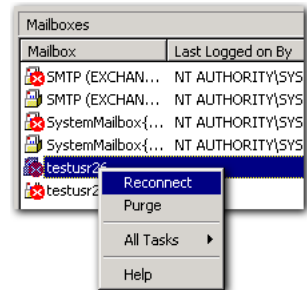
Figure EX-35:
The final pane of this window giving confirmation of the creation of this User Account

10. The final pane of this window will be revealed, giving confirmation of the creation of the user account. Click **Finish** to complete the process and close the **New Object - Users** window.



11. Repeat **Steps 5 - 10** for **each** restored user account mailbox that exists in this information store (as was noted in **Step 4**, above).

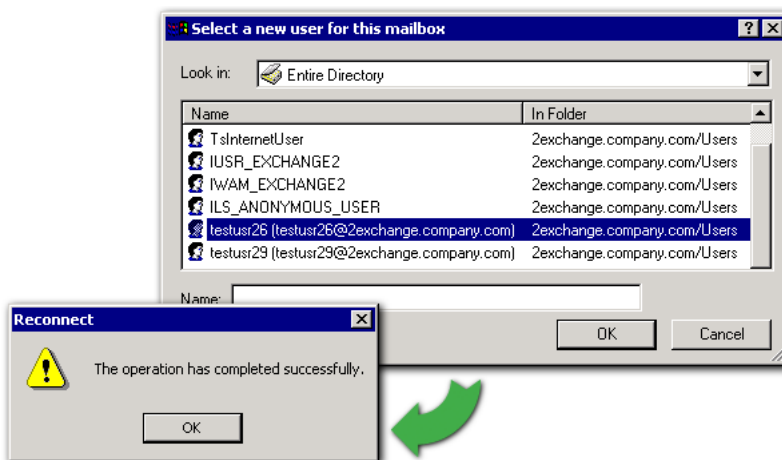
12. With new accounts established, it is now necessary to connect the restored mailboxes to these newly created accounts. From the **Exchange System Manager**, with the **Mailboxes** item still active to reveal the user account mailboxes contained within, right-click on one of the mailboxes and select **Reconnect** from the pop-up menu.



13. With the command selected, the **Select a New User for this Mailbox** window will appear. This window will contain several pre-created users, including those created in the previous steps of this section. Locate the desired user from the displayed list, click on it to select it and click **OK** to commit the selection.

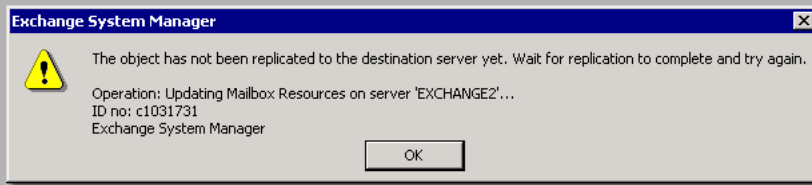
Figure EX-36:
Accessing the Reconnect command from the pop-up menu

Figure EX-37:
With a desired user selected, and the OK button clicked, the Reconnect dialog box will appear, confirming the successful reconnection of the Mailbox to the selected user account



Important: When performing the operation described in **Step 12**, a warning dialog box may appear stating that the selected object has not been replicated to the destination server. This is a known Microsoft Exchange issue that appears when attempting to recover a user mailbox. The message has no bearing on NetVault:Backup recovering the mailbox, and this process should recover it (i.e., this message can be ignored). When issued, click on **OK** to close the dialog box, and attempt the reconnect procedure again (as detailed in **Steps 11 - 12**).

Figure EX-38:
The dialog box issued by Microsoft Exchange when attempting to reconnect a mailbox to a User Account



14. Repeat **Steps 11 - 12** for each recovered mailbox contained in the information store.
15. Finally, the procedures outlined in **Steps 1 - 13** must be performed for **each** information store contained within the recovered storage group.

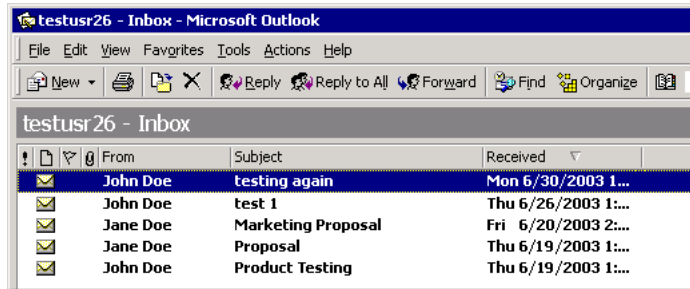
EX.3.8.d Accessing Recovered Mail

When all of the steps covered in the previous section have been performed for all information stores with the recovered storage group, it will be possible to access Microsoft Outlook to view recovered mail for a selected user. To accomplish this, complete the following steps.

1. Logged in as an Administrator, access MS Outlook on the Exchange Server and log in as the desired user (i.e., one that was recovered and re-established via the previous instructions).

- The account will open in **MS Outlook** revealing the recovered mail for the selected user, all of which will appear as new, un-read messages.

Figure EX-39:
Microsoft Outlook opened to a specific User Account to reveal recovered mail items



EX.3.9 Restoring Data to a Recovery Storage Group (Exchange 2003 *ONLY*)

A resource made available for use with Exchange 2003 is the Recovery Storage Group (RSG). A utility allows for the creation of this special storage group that exists outside of an actual Exchange 2003 Server's configuration to serve as a target for the restore of backed up data. With an RSG in place, previously backed up data can be restored to it without disrupting the existing structure of the Exchange Server. This can be ideal when individual Storage Group data (e.g., Mailbox Stores and their contents) that was previously backed up must be reviewed, but the Exchange Server must stay up and running. The procedures that follow illustrates the steps required to establish an RSG as well as how to use NetVault:Backup to restore backed up data to it.

EX.3.9.a Step 1: Creating a Recovery Storage Group (RSG)

Setting up a recovery storage group involves two basic steps:

- **Creating the Recovery Storage Group**
- **Adding the Databases to be Restored**

Complete instructions for both of these procedures can be found in the relevant Microsoft Exchange 2003 documentation or via the web on Microsoft's TechNet pages, at the following URL:

<http://www.microsoft.com/technet/prodtechnol/exchange/guides/UseE2k3RecStorGrps/cb5a35de-5d18-47eb-8bac-49bfc6d2ca07.mspx>

Important: The Adding the Databases to be Restored phase requires that the logical name of the desired database be known so that it can be selected for addition to the RSG. Therefore, it is recommended that the desired backup saveset be browsed in the **Selections** tab of the **Restore** window in order to record this information prior to performing this procedure.

EX.3.9.b Step 2: Restoring Data to the Recovery Storage Group (RSG)

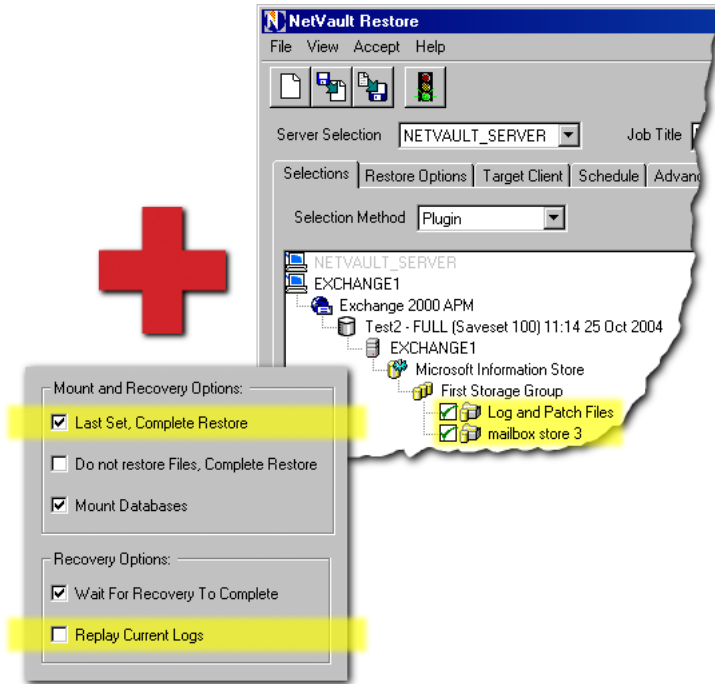
With the RSG successfully created and the appropriate database(s) added to it, perform the following steps for a restore of the desired data to the RSG.

1. Follow the steps outlined in the section *Restoring Data* on page 15 to access the desired Backup Saveset and select data items for a restore.

Important: To avoid complications in a restore of this type, it is recommended that Information Stores be restored on a one per job basis (i.e., only select a single Information Store for inclusion in a single restore job).

2. In addition to any desired data item(s), ensure that the **Log and Patch Files** data item is **selected** for inclusion.
3. Select the **Restore Options** tab and **select** the **Last Set, Complete Restore** option. In addition to this, ensure that the **Replay Logs** option is **de-selected**.
4. Continue setting up the restore job as desired and launch it (see **Steps 8 - 10** of the section *Phase 4: Finalizing and Submitting a Restore Job* on page 21).
5. As NetVault:Backup replaces data during a restore operation, the Exchange Server will redirect recovered data to the RSG rather than overwriting the original database.

Figure EX-40:
Select the desired data items as well as the Log and Patch Files data item. From the Restore Options tab, select the last Set, Complete Restore option followed by de-selecting the Replay Current Logs option



EX.3.9.c Viewing Data Restored to a Recovery Storage Group (RSG)

Once data has been restored to the RSG, it must be extracted for viewing. The Microsoft Exchange Server 2003 version of the **Mailbox Merge Wizard (ExMerge)** tool is the **only** supported method of extracting data from a database in an RSG. Please see the relevant Microsoft Exchange documentation pertaining to the use of this utility, or refer to the article, *Salvaging Data from the Recovery Storage Group* on Microsoft TechNet web site:

<http://www.microsoft.com/technet/prodtechnol/exchange/guides/UseE2k3RecStorGrps/53319df2-fb48-4ef1-af84-a2e30e108b5e.mspx>

EX.4.0 Microsoft Exchange and Application Cluster Support

NetVault:Backup version 7.3 offers support for the backup of Microsoft Exchange storage group information that exists in a clustered environment. However, a version of the APM that is **Cluster Friendly** must be used (i.e., version 2.3 and **later** of the **Microsoft Exchange 2000/2003 APM**). In addition, installation, configuration, backup and restore procedures differ slightly. This section of the documentation is intended to offer specifics on how to set up and operate the cluster friendly version of this APM.

Important:

1. This support is offered with the **Microsoft Exchange 2000/2003 APM** version 2.3 (and later) for **only** Microsoft Exchange 2000 and 2003.
2. NetVault:Backup Encryption functionality is not supported for use in environments incorporating NetVault:Backup's Application Cluster Support functionality. If you intend to use this support in conjunction with the **Microsoft SQL APM**, NetVault:Backup's Encryption functionality **must be disabled**. Please see the *NetVault:Backup Administrator's Guide* for details on disabling this functionality.

EX.4.1 Application Cluster Support - An Overview

NetVault:Backup ver. 7.3 offers backup and restore support to clustered environments at the virtual application level. This is referred to as **Application Cluster Support**. Various application softwares that are capable of running in a clustered environment can be tied to the NetVault:Backup Server for backup and restore.

A version of the **Microsoft Exchange 2000/2003 APM** that has been built to be cluster friendly is transferred to each of the desired machines within a cluster, via the NetVault:Backup Server. It is then possible for the NetVault:Backup Server to administer backups and restores of relevant data. This is all controlled via a virtual IP address that has been assigned to a specific clustered resource (in this case, a virtual Microsoft Exchange Server Instance). For example, using the clustered version of the Microsoft Exchange software, a virtual IP address is assigned to a specific Exchange Server Instance that is to be shared among the member clients in the cluster (i.e., this would need to occur during the virtual clustered Exchange configuration process). Through this virtual IP address, NetVault:Backup can identify a machine within the cluster that is currently in control of this Storage Group and target it for a backup.

EX.4.2 About this Section of the Guide

This section of the guide is designed to point out any differences between the set up and usage of the **Microsoft Exchange 2000/2003 APM** in a clustered environment vs. a traditional one. It has been broken down with the intent of mirroring some of the sections found in the standard instructions, as follows:

- **Installation**
- **Licensing**
- **Backup**
- **Restore**

Important:

1. Unless outlined in the sections that follow, backups and restores performed with the **Microsoft Exchange 2000/2003 APM** of clustered data are the same as those performed with traditional Microsoft Exchange 2000/2003 data.
2. The following sections of this guide only offer information on Microsoft Exchange-specific settings required for the use of this APM in a clustered environment. They do not offer instructions on how to set up NetVault:Backup's **Application Cluster Support** to administer backups/restores of a cluster. This process is not APM-specific and complete details can be found in *Appendix E: NetVault:Backup's Application Cluster Support* of the *NetVault:Backup Administrator's Guide* for version 7.3.
3. Prior to viewing the section contents that follow, it is strongly recommended that *Appendix E: NetVault's Application Cluster Support* of the *NetVault Administrator's Guide* for version 7.3 be thoroughly reviewed to obtain a better understanding of how the information presented here works in conjunction with the **Application Cluster Support** functionality.

EX.4.3 Installation

EX.4.3.a Pre-Requisites

The following pre-requisites must be met before it is possible to install the **Microsoft Exchange 2000/2003 APM** in a clustered environment:

- **Microsoft Exchange 2000/2003 Clustered Environment in Place** - It is necessary to have a properly configured clustered environment, capable of utilizing the cluster aware version of Microsoft Exchange software. As well, the specific Exchange items that are to be shared (i.e., the virtual Exchange Server instance) must be properly configured as such.
- **Cluster Friendly Version of the APM Obtained** - **At least** version **2.3** of the **Microsoft Exchange 2000/2003 APM** must be obtained for use in the creation of a Virtual Client. It is **not possible** to use an older version of the **Microsoft Exchange 2000/2003 APM** in a clustered environment.

- **Separate NetVault:Backup Server Machine** - The machine that is to serve as the NetVault:Backup Server must be properly configured and it **must exist outside** the cluster, but have network connectivity to the machines within the cluster.
- **Backup Device Must Exist Outside the Cluster** - Although *Appendix E: NetVault's Application Cluster Support* of the *NetVault Administrator's Guide* for version 7.3 offers various methods of configuring a backup device, in order for successful backups/restores of clustered Microsoft Exchange data, the device **must be** attached to a machine **outside** of the cluster (i.e., directly attached to the NetVault:Backup Server, or to an outside NetVault:Backup Client, configured as a SmartClient™).

EX.4.3.b Installation Procedure

Installation of the **Microsoft Exchange 2000/2003 APM** for a clustered environment is different than the traditional installation of this APM. This process is completed through the creation of a “**Virtual Client**” on the NetVault:Backup Server. Simply put, a Virtual Client is a group of machines within the cluster that are seen by the NetVault:Backup Server as a **single** client, that is created to backup a single clustered resource (e.g., a shared disk drive or, in the case of this APM, shared Microsoft Exchange data). During the Virtual Client creation process, the **Microsoft Exchange 2000/2003 APM** is transferred from the NetVault:Backup Server to selected member clients within a cluster and installed remotely.

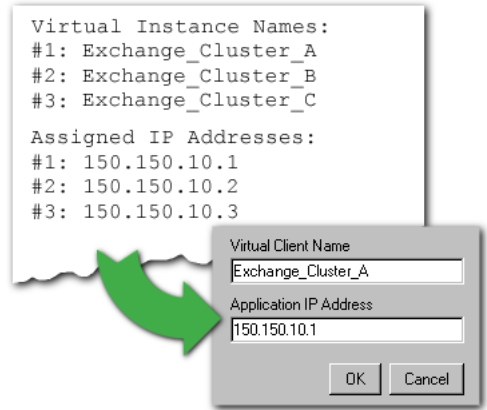
Installation Specifics - Creating a Virtual Client

As noted in an earlier section, the Virtual Client creation process is not APM-specific and complete details can be found in *Appendix E: NetVault:Backup's Application Cluster Support* of the *NetVault:Backup Administrator's Guide* for version 7.3. However, a couple of points should be taken into consideration during the Virtual Client creation process:

- **Step 1: Note the Specific IP Addresses Assigned to Each Virtual Exchange Server Instance** - During the installation/configuration of Microsoft Exchange Server, it was necessary to assign an individual IP address to be shared within the cluster. Be sure to take note of this IP address in regards to the virtual instance of Exchange to which it belongs.
- **Step 2: Make Note of the Name Given to Each Virtual Exchange Instance** - Prior to creating the Virtual Client, note the name of each virtual instance of Exchange that exists as shared within the cluster and is to be backed up/restored. Be sure to associate this name with the proper IP address.

Figure EX-41:
With the required values noted, the IP address, as well as a suitable name for the Virtual Client (which includes the MS Exchange virtual instance name) can be input in the required fields

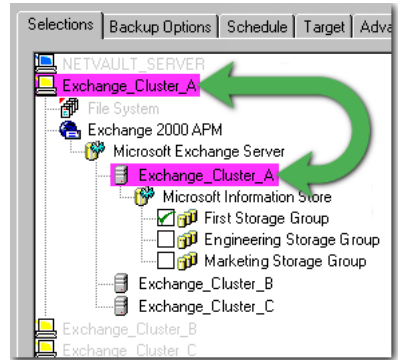
- Step 3: Create a Separate Virtual Client for Each Virtual Instance** - For each individual virtual instance of Exchange Server that has been configured as shared within the cluster, create a **separate** Virtual Client. During the creation process, ensure that the following are included:



- The Noted IP Address** - In the **Application IP Address** field of the **NetVault:Backup Virtual Client Installation** window, input the IP Address assigned to the appropriate Exchange Server instance. For example, if creating the first of two Virtual Clients for a clustered environment, the IP address assigned to the first instance would be input.

Figure EX-42:
A Virtual Client that has been set up with the same name as its associated virtual instance of Exchange. This way, the correct Exchange data can be easily identified for selection in the Selections tab

- Assign a Suitable Name to the Virtual Client** - It is highly recommended that a name be given to the Virtual Client that points out the specific virtual instance of Microsoft Exchange Server for which it was created. When a Virtual Client is browsed, NetVault:Backup will locate the cluster client currently in control of this clustered resource, and reveal **all** of its Microsoft Exchange Server data contents (e.g., in the **Selections** tab of the **Backup** window, when a Virtual Client is opened, not only will the intended shared virtual instance of Microsoft Exchange be revealed, but any other virtual instances that currently exist within the cluster will also be revealed). With a Virtual Client name set up to be the same as or similar to its specific shared virtual instance of Exchange Server, it will be easy to recognize the specific Microsoft Exchange virtual server instance for which the Virtual Client was created.



Important: It is only necessary to create a Virtual Client for a virtual instance of Exchange Server that has been configured within the cluster, and a virtual Exchange Server instance is only to be backed up through its associated Virtual Client. However, other Exchange Server instances that are **locally accessible and/or configured for access** to one of the cluster client machines (i.e., not configured as shared) can still be backed up/restored. These Exchange Server instances do not require the creation of a Virtual Client. Their backup/restore is controlled through the APM accessed via the actual cluster client and not a Virtual Client (see the section *Backup* on page 47 for complete details).

- **Only Include Relevant Cluster Clients in the Virtual Client** - The member clients that are to be included in the creation of a Virtual Client should only be those within the Cluster that are relevant to the application that is to be backed up/restored (e.g., if only two machines exist within a clustered Microsoft Exchange Server instance, only these two machines should be included).

EX.4.4 Backup/Restore Scenarios

As covered in the previous section, after the creation of the Virtual Client, the APM is transferred to all designated cluster clients and installed locally. The installed **Microsoft Exchange 2000/2003 APM** can be used via the Virtual Client to backup/restore shared data. It is also possible to use the APM to backup/restore Exchange Storage Group data that is **local** to each member client via the same installation of the APM. With this in mind, it is necessary to determine the desired backup/restore scenario for use.

- **Scenario A: Backup and Restore of Shared Data Only** - **Only** backups and restores of the data established as shared within the cluster can be performed.
- **Scenario B: Backup and Restore of Shared Data and Local Data** - Backups/restores of both the shared data between cluster clients, **and** Exchange Storage Group data that is **local** (i.e., not shared) on each individual member client.

With a scenario decided upon, continue on to the following sections which address the set up and use this APM in a clustered environment.

Important: Hereinafter, each scenario type will be referenced by its letter title when called out (e.g., “**Scenario A**”).

EX.4.5 Licensing

Another difference between using the **Microsoft Exchange 2000/2003 APM** in a clustered environment is how it is licensed for use. The licenses required vary, based on the type of scenario that is to be used in backing up/restoring data (i.e., as covered in the section *Backup/Restore Scenarios* on page 46). With the desired scenario selected, license keys can be obtained from BakBone Software's **Order Administration** department. Complete details on the licensing process, including how to obtain license keys, can be found in the section, *Licensing a Virtual Client* of *Appendix E: NetVault:Backup's Application Cluster Support* in the *NetVault:Backup Administrator's Guide* for version 7.3.

Important:

1. Once a Virtual Client is created using the **Microsoft Exchange 2000/2003 APM**, it is installed with a **45 DAY** evaluation license that allows for full usage. For this period, no license keys are required for the use of this APM, and either of the previously outlined Backup/Restore scenarios can be employed. Upon expiration of this period, one of the two aforementioned scenarios must be decided upon and license keys obtained accordingly.
2. In the event that an older version of the **Microsoft Exchange 2000/2003 APM** was already installed on a machine within the cluster, the version of the APM installed with the creation of a Virtual Client will **overwrite** this existing version. However, license keys in place for the existing APM are **still** valid. Therefore, "**Scenario B**" outlined in the previous section can be used without the need to obtain additional license keys for the backup/restore of local, non-shared data.

EX.4.6 Backup

Backing up data using the **Microsoft Exchange 2000/2003 APM** that has been set up for use in a Virtual Client is relatively simple. The only difference that should be noted is between the backup of shared data through the Virtual Client itself, and the backup of local, non-shared data on the individual member client machines.

- **Backup of a Virtual Client** - The **Microsoft Exchange 2000/2003 APM** is accessed from the Virtual Client and the instructions offered for a backup in *Appendix E: NetVault:Backup's Application Cluster Support* of the *NetVault:Backup Administrator's Guide* for version 7.3 should be followed.

Important:

1. When browsing a Virtual Client in the **Selections** tab, NetVault:Backup will reveal **all** Microsoft Exchange Server data available on the machine that is currently in control of the clustered resource. This includes both the shared data, **and** any non-shared, local data on the machine. Only data items that have been established as **shared** within the cluster should be selected when performing a backup of the Virtual Client (i.e., do **not** select any non-shared data items when backing up a Virtual Client).

2. In the event that multiple Exchange Server instances have been configured within the clustered environment, it is of critical importance that the correct Exchange Server instance be selected for a backup from its associated Virtual Client. If the section *Installation Procedure* on page 44 was followed correctly, a separate Virtual Client will have been established for each **virtual** instance of Exchange Server and its name should be the same or similar to its associated virtual Exchange Server instance. This will allow for the selection of the proper instance data for a backup in a multiple virtual instance environment.

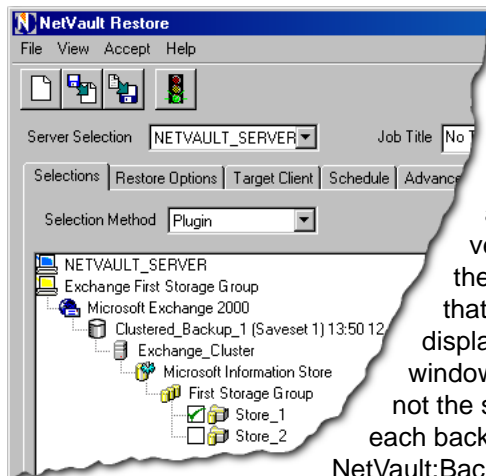
- Backup of Local, Non-Shared Microsoft Exchange Storage Group Data** - Backup of this type of data is performed by accessing the **Microsoft Exchange 2000/2003 APM** on the actual member Client machine, in the same manner as a traditional **Microsoft Exchange 2000/2003 APM** backup. Therefore, the instructions offered in this User's Guide can be used for the backup of local, non-shared data. Please see the section *Backing Up Data* on page 8 of this guide for complete details on performing a backup of this type.

Important: In the event that a member Client machine targeted for a backup is currently in control of the clustered application, all data items established as shared will be revealed when the Client is browsed in the **Selections** tab of the **Backup** window. If targeting an individual member Client machine, ensure that any shared data is **not selected** for a backup as it will not be fault tolerant and not be available on other nodes if a fail-over is to occur.

EX.4.7 Restore

EX.4.7.a Restoring a Virtual Client Backup

Figure EX-43:
Even though an individual Client machine was actually used for each backup, the restore is classified under the name of the Virtual Client in the Restore window



Restoring a backup of a Virtual Client is conducted in the same manner as a restore performed to a traditional NetVault:Backup Client. All options available for a restore with the **Microsoft Exchange 2000/2003 APM** are also available with the cluster friendly version, and data selection is performed in the same way as well. The only difference is that restorable backups of a Virtual Client are displayed in the **Selections** tab of the **Restore** window under the name of the **Virtual Client**, not the specific clients that were active during each backup. When a restore job is initiated, NetVault:Backup will communicate with all member clients, to determine which machine is currently in control of the clustered resource (e.g., a virtual instance of Exchange Server) and target this machine for the restore.

All of the instructions offered in this User's Guide in reference to performing a restore can be used in the recovery of a Virtual Client. Please see the section *Restoring Data* on page 15 for complete information on restoring a **Microsoft Exchange 2000/2003 APM** backup.

EX.4.7.b Restoring Data Backed up From a Member Client

A restore of this type is exactly the same as the restore of a traditional **Microsoft Exchange 2000/2003 APM** backup. The physical member client name will appear in the **Selections** tab of the **Restore** window and it can be opened to select restorable items accordingly. All of the instructions offered in this User's Guide in reference to performing a restore can be used in the recovery of this type of Client data.

EX.5.0 Troubleshooting

The table below details commonly encountered problems and possible solutions.

Symptom	Error Message	Explanation
Backup Completed with Warnings	<p><i>Once this status is revealed for backup, check the NetVault Log entries for the job to see if they display one or both of the following messages:</i></p> <ul style="list-style-type: none"> ■ <i>“Failed to add backup record”</i> ■ <i>“Failed to write index of backup to the database”</i> <p><i>These messages indicate that the selected data was actually backed up, but the job's index information was not properly added by NetVault to its database. Without this index information, the data can not be properly restored.</i></p>	<p>Method 1: Access the Device Management window of the NetVault GUI and perform a scan of the media targeted by the job (i.e., by right-clicking on a the target media and selecting the Scan command from the pop-up menu). NetVault stores index information for backup jobs in two locations: in the NetVault Database and on the media targeted by the backup. By performing this scan, the index information will be added to the NetVault Database. To verify this, open the Restore window and locate the specific job. If it can be browsed and a restore job set up, the scan process has corrected the problem.</p> <p>Method 2: If the previous method failed, it will be necessary to re-run the backup job.</p>

Symptom	Error Message	Explanation
Backup/Restore Fails	<i>Failed to connect</i>	The Exchange System Attendant Service needs to be running before any Exchange backup or restore operations can be performed. This service is never shut down by either NetVault:Backup or Exchange itself.
Backup Job Fails	<i>Failed to connect</i>	Make sure all relevant Exchange services are started before backing up, including Exchange Directory, Event Service, Information Store, Exchange system attendant and Message transfer agent.
Restore Job Fails	<i>Failed to connect</i>	Make sure the Exchange system attendant is started before attempting a restore.
Log File Errors	<i>Failed to log on as user <username></i>	Check to make sure you are entering the correct user in the Backup Options tab. Only use the user that originally installed Exchange; any other will cause this error. Also make sure the password is correct.
Log File Errors	<i>An error occurred. Please check that databases are dismounted.</i>	The specific storage group(s) to be restored needs to be dismounted. Use the Exchange System Manager to dismount them.
Log File Errors	<i>An error occurred. Please check that databases are dismounted.</i>	Check that the directory entitled "tmp" (default: "...\\WINNT\\tmp") doesn't contain files that belong to a previously failed restore. See Section above entitled Restore Preparations for more details.
Log File Errors	<i>An error occurred. Please check that databases are dismounted.</i>	Even if a specific information store has been dismounted, if the option This Database can be Overwritten by a Restore is <i>not</i> selected in the Information Store Properties window, this error will be given. On the target Exchange Server, ensure that this option is selected for <i>each</i> information store that a restore is targetting.