3PAR Recovery Manager 3.0.0 For Microsoft Exchange 2003/2007 User's Guide

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1 Introduction

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This guide provides the information you need to install, deinstall and use 3PAR Recovery Manager 3.0.0 for Microsoft Exchange 2003/2007 with the Microsoft Windows 2003/2008 Operating System.

1.1 Audience

This guide is designed for System Administrators and Microsoft Exchange Administrators who are responsible for backing up Microsoft Exchange mailbox or public store databases and who understand Microsoft Exchange 2003 and/or 2007.

1.2 Related Documents

The following documents also provide information related to the InServ storage server:

For information about…	Read the…
Using the InForm command line interface (CLI) to configure and manage the InServ Storage Server	*3PAR InForm OS CLI Administrator's Manual*
Using the InForm Graphical User Interface (GUI) to configure and manage the InServ Storage Server	*3PAR InForm OS Management Console Online Help*
Using the InForm Command Line Interface (CLI) for remote clients to install and configure Recovery Manager	*3PAR InForm OS Command Line Interface Reference*.
Identifying InServ storage server components and fixing problems	3PAR *InForm OS Messages and Operator's Guide*
Understanding the InServ Storage Server and its features	*3PAR InForm OS Concepts Guide*
Implementing shadow copies using 3PAR VSS Provider for Microsoft Windows	*3PAR VSS Provider for Microsoft Windows User Guide*

1.3 Organization

This guide is organized as follows:

- This chapter provides an overview of this guide, including intended audience, related documentation, typographical conventions, and advisories.
- Chapter 2, *Overview of Recovery Manager*, provides an overview of virtual copies and how Recovery Manager interacts with Microsoft Exchange.

- Chapter 3, *Installation and Deinstallation*, describes how to install, verify, and deinstall Recovery Manager.
- Chapter 4, *Configuring Recovery Manager*, contains instructions for configuring the database and the 3PAR Virtual Copy DBA.
- Chapter 5, *Configuring NetBackup for Recovery Manager*, contains instructions for configuring Veritas NetBackup for use with the 3PAR Virtual Copy DBA.
- Chapter 6, *Using the Recovery Manager GUI*, describes procedures for working with Recovery Manager through the GUI (Graphical User Interface).
- Chapter 7, *Using the Recovery Manager CLI*, describes procedures for working with Recovery Manager through the CLI (Command Line Interface).
- Chapter 8, *Rapid Backup and Recovery for Exchange*, discusses methods for performing the backup and recovery of data using virtual copies.
- Appendix A, *Server Virtualization Environments*, provides instructions for creating environments for VMWare and Egenera.
- Appendix B, *Troubleshooting*, lists some common issues that may arise and suggested solutions for helping solve the problems.
- Appendix C, *Event Messages*, lists events, provides descriptions and describes possible actions.
- This guide also contains an index for your reference.

1.4 Typographical Conventions

The following typographical conventions are used in this guide:

Typeface	Meaning	Example
ABCDabcd	Used for dialog box elements such as titles and button labels.	Enter your system name in the **Value** box and click **OK**.
ABCDabcd	Used for file names, paths, and screen output, and for text you are to enter.	`Found < 12 > 73G disks.` Enter `cli` at the Windows command prompt.
ABCDabcd	Used to contrast your input with system output.	`cli% removevv VV1` `Removing vv VV1.`
ABCDabcd **ABCDabcd**	Used for variables in file names, paths, and screen output, and variables in user input.	[root@(*systemID-nodeID*)root] `To continue Enter your system name ==>` **`systemname`**

1.5 Advisories

To avoid injury to people or damage to data and equipment, be sure to observe the cautions and warnings in this guide. ***Always be careful when handling any electrical equipment.***



NOTE: Notes are reminders, tips, or suggestions that supplement the procedures included in this guide.



CAUTION: Cautions alert you to actions that can cause damage to equipment, software, or data



WARNING: Warnings alert you to actions that can cause injury to people or irreversible damage to data or the operating system.

2 Overview of Recovery Manager

In this chapter

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2.1 System Requirements

For Exchange 2003

- Microsoft Exchange 2003
- 3PAR InForm OS
- Recovery Manager for Exchange license in the InServ Storage Server

For Exchange 2007

- Microsoft Exchange 2007
- 3PAR InForm OS
- Recovery Manager for Exchange license in the InServ Storage Server



NOTE: For platform-specific release levels, please refer to the InForm OS 2.2.4 Configuration Matrix (PN 320-200099) which can be accessed through the 3PAR Document Control System (DCS).

Snapshot space must be available on 3PAR Virtual Volumes. In order to take snapshots on 3PAR's base volume, the volume itself must have snapshot space allocated during the base volume creation. Please see the *3PAR InForm OS Command Line Reference* for information on creating a base volume with snapshot capability, or assigning snapshot space after the base volume is created.

2.2 Features Supported

- Exchange online virtual copy creation using Volume Shadow Copy Service
- Supports Volume Shadow Copy Service "Full" backup type
- Virtual copy creation using 3PAR VSS Provider for Microsoft Windows
- Access 3PAR InServ Storage Server via InForm CLI for Microsoft Windows
- Mount virtual copies on Recovery Manager installed Windows hosts with read/write permissions
- Unmount virtual copies
- Delete virtual copies
- Backup using Veritas NetBackup
- Restore using Veritas NetBackup
- Filecopy restores
- Volume promote restores

- Virtual copy creation of LCR databases where the active and passive copies both reside on a single InServ (Exchange 2007 only)
- Recovery Manager GUI



NOTE: For platform-specific release levels, please refer to the InForm OS 2.2.3/ 2.2.4 Configuration Matrix (PC 320-200099) which can be accessed through the 3Par Document Control System (DCS).I

- Recovery Manager CLI
- Supports virtual copy creation of local and remote Exchange servers
- Support Single Copy Cluster for Exchange 2007 and Microsoft Clustering (MCS) for Exchange 2003
- Centralized virtual copy management with multiple Exchange servers

2.3 Features not Supported

- Exchange 2000
- Exchange 2003 offline backup
- VSS backup types "Incremental", "Differential", "Copy" and "Log" are not supported.
- Exchange servers on different InServs
- All backup tools excluding Veritas NetBackup
- Access to 3PAR InServ storage server via SSH
- Create virtual copy on System Volume
- Cross-domain Exchange server management
- Cross management of Exchange 2003 and Exchange 2007 on the same backup server.

2.4 What's New in Recovery Manger for Exchange 3.0.0

This section contains information on the enhancements and new features available in the latest version of Recovery Manager for Exchange.

2.4.1 Support for Exchange 2007

Exchange 2007 comes with new features, ease-of-use management tools and runs on 64-bit machines to provide higher performing software. Recovery Manager for Exchange 3.0.0 provides support for this new Exchange platform and utilizes Exchange Management Shell to perform its tasks. The ability to take snapshots of LCR-enabled volumes is included in the Recovery Manager for Exchange 3.0.0 package. Both the active and passive copies of the LCG need to be on the same InServ to support taking snapshots of the active or passive mailbox stores.

2.4.2 Filecopy Restores

Restores are now easier to perform with filecopy restores. Users may dismount a storage group, mount a virtual copy, and perform a filecopy restore with this command.

2.4.3 Volume Promote Restores

Restores are now easier to perform with volume promote restores. Users may dismount a storage group and perform a volume promote restore with this command.



WARNING: Please DO NOT perform a volume promote restore if multiple storage groups share any volumes. This includes all data files .LOG, .EDB, .CHK (and .STM for Exchange 2003). If you are not sure how or if your storage groups share volumes, please execute the script "chk_multi_storage.cmd" by default installed at "Program Files/3Par/vcdba/Exchange/bin" to determine how any storage groups may be sharing volumes.

2.4.4 Removal of vclock and Server Locks

Users would see issues of Recovery Manager commands being locked on certain servers and needed to perform specific steps to continue operations. Now those locks are removed and will not occur anymore for easier use of Recovery Manager for Exchange.

2.5 Microsoft Volume Shadow Copy Service

Microsoft includes VSS (Volume Shadow Copy Service) in Windows to simplify the enterprise's storage environment. It provides a framework for creating a point-in-time copy of a single or multiple volumes.

Microsoft Windows Server VSS works with VSS-aware applications that are in use to determine when a volume shadow copy (snapshot) can be made. A snapshot is a copy of some data set, for example, a disk volume, at a point in time. VSS then communicates with the operating system and applications and freezes computing tasks to allow snapshot creation. Without the freeze function, data could become corrupted when the snapshot is taken because the system might be in the middle of a task. Meanwhile, applications continue to run uninterrupted. The original volume continues to change as the process continues, but the shadow copy of the volume remains constant. VSS also gives permission to the backup application to access the volume and back it up in its "frozen" state. The shadow copy volume is then used for the actual backup. After the shadow copy volume is saved on the backup device, the shadow copy is deleted.

VSS coordinates between Requestors (backup applications – Recovery Manager), Writers (applications in windows services – Exchange 2003/2007) and providers (components that create the shadow copies).

Table 2-1. VSS Components

VSS Component	VSS Component Description
Requestor	The requestor is backup software that initiates the creation of the shadow copy.
Writer	The writer is any application software that participates in the shadow copy process and whose files and data are included in the process.
Provider	The provider is the storage technology that does the actual shadow copy.

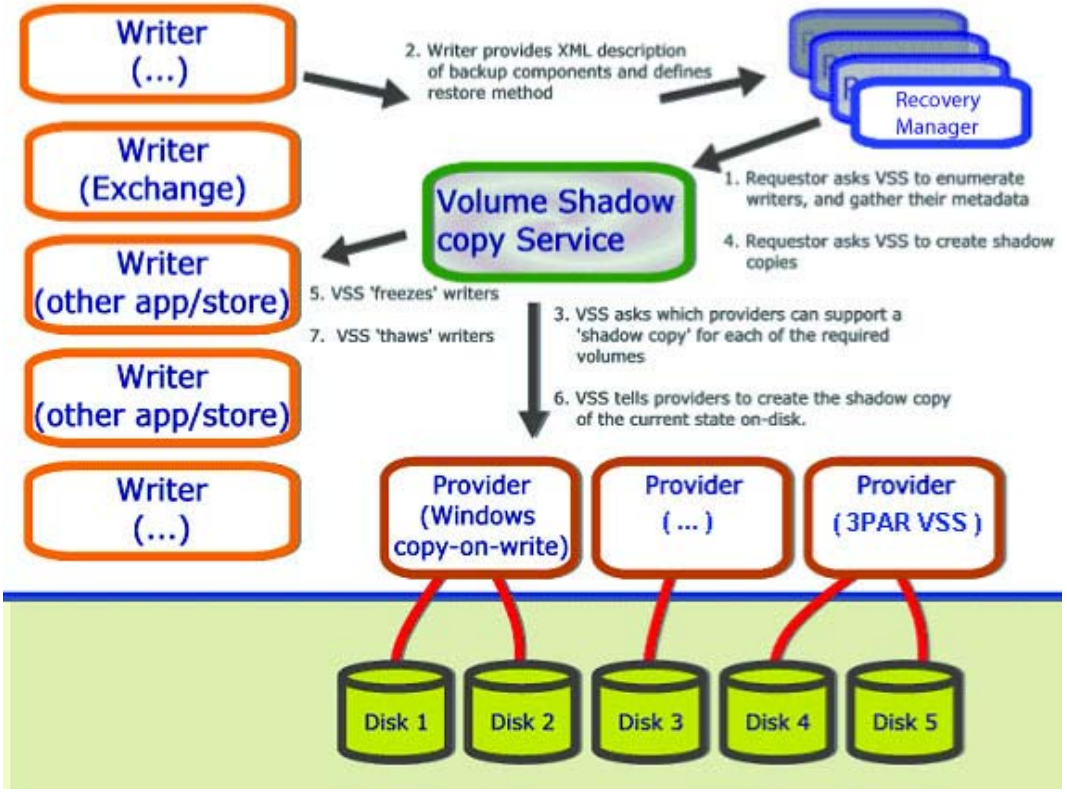


Figure 2-1. 3PAR VSS Provider for Microsoft Windows Operation Overview

2.6 How VSS works with Exchange

1. The requestor (Recovery Manager) sends a command to the Volume Shadow Copy service to take a shadow copy of the selected Exchange storage group.
2. The Volume Shadow Copy service communicates with the Exchange writer to flush the current log file generation to disk and suspend any writes to the log files and to the .edb file. The .stm file will not be allowed to grow, however read-only access is still allowed. So anything that is already there can still be accessed from the client.
3. Volume Shadow Copy service communicates with the provider to initiate the shadow copy process for the disk volumes that contain Exchange data. VSS talks to the writers and

providers to fix a point in time for the shadow copy to take place; it is the provider that actually does the shadow copy.

4 The shadow copy typically takes less than a minute. Clients that use Microsoft Outlook in cached mode will not notice any disruption. Clients of earlier versions of Outlook may see the hourglass for several moments during the shadow copy process.

5 When the shadow copy has been taken, Volume Shadow Copy service communicates with the Exchange writer to let it know that it can resume writing to disk.

6 The queues of e-mail transactions are written to the logs.

7 The shadow copy is now available to the requestor for backing up.

2.7 Supported VSS Components

VSS components currently supported by 3PAR Provider for Microsoft VSS include:

1 Requestor

   a Recovery Manager

   b Veritas NetBackup™ for Windows

2 Writer - Microsoft Exchange 2003/2007



NOTE: For Veritas NetBackup supported version and Microsoft Exchange Server specific release levels, please refer to the latest InForm OS 2.2.4 Configuration Matrix (PN 320-200099) which can be accessed through the 3PAR Document Control System (DCS).

2.8 Recovery Manager Requirements

- The Exchange Datastores for which virtual copies will be taken must be online.
- The same level of software updates is required on all Exchange servers.
- Microsoft Exchange System Management tools is required on the Backup Server.
- Microsoft .Net Framework V2.0 and above is required.
- 3PAR VSS Provider for Microsoft Windows.



NOTE: For software-specific version support, see the 3PAR InForm OS 2.2.4 Configuration Matrix (PN 320-200099), which can be found on the Document Control System (DCS).

2.9 Recovery Manager Layout

Recovery Manager provides two types of configuration for users depending on their environment setup: a centralized backup configuration and a single host backup configuration as described in the following sections.

2.9.1 Centralized Backup Configuration

A centralized backup configuration, as shown in Figure 2-2 on page 2.9 allows a user to maximize the resources and performance of their Exchange servers through off-host central control management capabilities. A single backup server can remotely create virtual copies on multiple Exchange servers and manage all virtual copies on the backup server. This type of configuration is recommended if the user needs to manage multiple Exchange servers or is in a clustered environment.

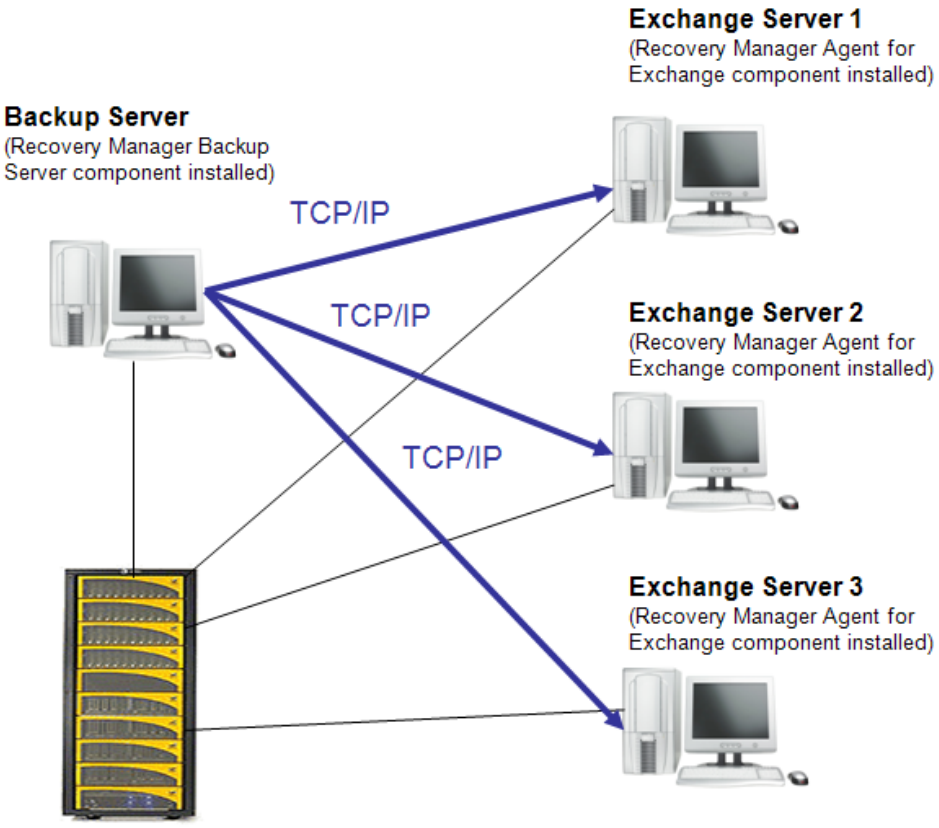


Figure 2-2. Centralized Backup Configuration

NOTE: Installment of the Exchange System Management Tools is required on the Recovery Manager Backup Server for Exchange database for validation purposes. In addition, the Exchange Servers and the Management Tools must utilize matched release and service pack versions.

NOTE: All the Exchange servers, including the Recovery Manager Backup Server component, must be in the same Windows domain.

2.9.2 Single Host Backup Configuration

A single host backup configuration, as shown in Figure 2-3 on page 2.10, allows a user to manage virtual copies locally on the Exchange server.

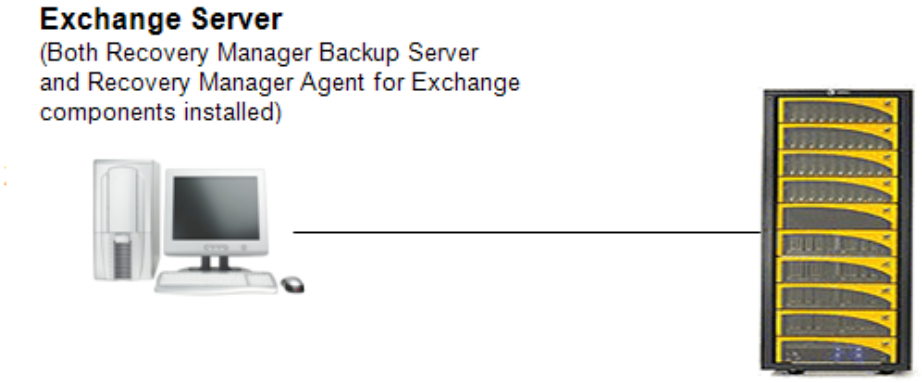


Figure 2-3. Single Host Backup Configuration

2.9.3 The Server Relationship

The following defines the roles and relationship between the server types:

Backup Server:

- The Backup Server plays a central control point for the Recovery Manager that controls and manages the backup and restore on different Exchange servers.

Exchange Servers:

- The Exchange Servers can be standalone servers or cluster virtual servers.

Connectivity:

- Both the Backup Server and Exchange Servers need to be connected to the same InServ. They also need to be in the same active directory domain.

3 Installation and Deinstallation

In this chapter

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3.2 Installing Recovery Manager **3.6**

3.3 Verifying the Installation **3.13**

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3.4 Understanding the Registry **3.14**

3.5 Environment Variables **3.17**

This chapter describes how to install, verify, and deinstall Recovery Manager 3.0.0.

3.1 Upgrading to Recovery Manager for Exchange

Recovery Manager 3.0.0 for Exchange does not support a direct upgrade from any previous version. Instead, the user is required to run the migration utility (RMRepUtil.exe) that comes with the 3.0.0 installation to convert existing repository information to the new structure. See *Using the Recovery Manager Replication Utility* on page 3.4 for more details.

This utility also allows the user to migrate the repository from a single host configuration on an Exchange Server to a centralized backup configuration on a Backup Server.



NOTE: The following migration steps are only required if you are upgrading from Recovery Manager version 2.2.3 to 3.0. Upgrading Recovery Manager from 2.2.4 to 3.0, because there is no change in the repository structure, requires no migration steps. Simply uninstall your current 2.2.4 and re-install 3.0 on backup and production servers.



NOTE: Once the repository is converted, it cannot be undone.

To migrate repository information from the single host backup configuration to a centralized backup configuration, follow these steps:

1. Install the Recovery Manager Backup Server component to the designated backup server.
2. Copy the RMRepUtil.exe from the <InstallationFolder>\Exchange\goodies folder on the Recovery Manager Backup Server component installed system to the other system that needs to export the repository information.
3. Run the utility with the export option to save/convert the repository structure to a zip file.
4. Repeat step 1 and 2 for every server that used to be the single host backup configuration and now needs to be managed by a centralized Recovery Manager Backup Server.
5. Open the Recovery Manager for Exchange user interface on the Recovery Manager Backup Server component installed system and register the Exchange Servers.
6. Run the utility with the import option to extract the repository structure.
7. Deinstall the previous version of Recovery Manager for Exchange software from systems that have migrated their repository structure and install the new Recovery Manager package.

To perform the same server upgrade for a single host backup configuration, follow these steps:

1. Backup the entire repository folder (default folder is <InstallationPath>\Exchange\Repository) to another location.
2. Deinstall the previous version of Recovery Manager for Exchange.

3 Install Recovery Manager 3.0.0 for Exchange at the same location as the previous installation.

4 From Command Prompt, run RMRepUtil.exe from the <InstallationFolder>\Exchange\goodies, with the export option "-e" to save/convert the repository structure to a zip file.

   For example:

   C:\Program Files\3Par\vcdba\Exchange\goodies> RmRepUtil repository -e ExchRep1.zip

5 Policy structure can also be exported into a zip file, for example:

   C:\Program Files\3Par\vcdba\Exchange\goodies> RmRepUtil policy -e ExchPolicy1.zip

6 Open the Recovery Manager for Exchange user interface and register the Exchange Server.

7 Run the utility with the import option to extract the repository structure.

   For example:

   C:\Program Files\3par\vcdba\Exchange\goodies> RmRepUtil repository -i ExchRep1.zip

   C:\Program Files\3par\vcdba\Exchange\goodies> RmRepUtil policy -i ExchPolicy1.zip

To perform the same server upgrade for a Recovery Manager Backup Server installed system, perform the following steps:

1 Backup the entire repository folder (default folder is <InstallationPath>\Exchange\Repository) to another location.

2 Deinstall the previous version of Recovery Manager for Exchange.

3 Install Recovery Manager 3.0.0 for Exchange at the same location as the previous installation.

4 From Command Prompt, run RMRepUtil.exe from<InstallationFolder>\Exchange\goodies with the export option "-e" to save/convert the repository structure to a zip file.

   For example:

   C:\Program Files\3Par\vcdba\Exchange\goodies> RmRepUtil repository -e ExchRep1.zip

5 Policy structure can also be exported into a zip file, for example:

   C:\Program Files\3Par\vcdba\Exchange\goodies> RmRepUtil policy -e ExchPolicy1.zip

6 Open the Recovery Manager for Exchange user interface and register the Exchange servers.

7 Run the utility with the import option to extract the repository structure.

For example:

C:\Program Files\3par\vcdba\Exchange\goodies> RmRepUtil repository -i ExchRep1.zip

C:\Program Files\3par\vcdba\Exchange\goodies> RmRepUtil policy -i ExchPolicy1.zip

To perform the same server upgrade for Recovery Manager Agent for Exchange installed system, follow these steps:

1 Deinstall previous version of Recovery Manager for Exchange.

2 Install Recovery Manager 3.0.0 for Exchange.

3.1.1 Using the Recovery Manager Replication Utility

The Recovery Manager includes a utility (RMRepUtil) that is used to migrate an existing virtual copy repository from one server to another. This is useful for moving repository information from production servers that have previous single-hosed based Recovery Manager software installed to a Recovery Manager Backup Server installed system.



NOTE: Repository migration can only be applied to systems that connect to the same InServ.

To migrate repository information, follow these steps:

1 Copy the Rmreputil utility to the system that needs to export the repository information.

2 Run the utility with the export option to save the repository structure to a zip file.

3 Repeat step 1 and 2 for every server that will be managed by the Recovery Manager Backup Server.

4 Install the Recovery Manager Backup Server component onto the intended backup server.

5 Open the Recovery Manager for Exchange user interface and register the Exchange servers that have repository information for import.

6 Copy the utility and the zip file to the Recovery Manager Backup Server component installed system.

7 Run the utility with the import option to extract the repository structure.

3.1.2 Rmreputil

SYNOPSIS

```
RmRepUtil.exe [Options] ZipFileName
```

DESCRIPTION

This utility exports and imports existing repository information. If no option is specified, the utility usage is displayed.

SYNTAX

This utility has the following features:

- Exports and imports existing repository information.

  Syntax:
  `RmRepUtil.exe repository [Options] ZipFileName`

- Exports and imports existing policy information.

  Syntax:
  `RmRepUtil.exe policy [Options] ZipFileName`

  If no option is specified, utility usage is displayed. The following option combinations are available:

  `-e` export information to the specified zip file.

  `-i` import information from the specified zip file.

EXAMPLES

```
RmRepUtil.exe repository -e MyServerRep.zip
RmRepUtil.exe repository -i MyServerRep.zip
RmRepUtil.exe policy -e RMPolicy.zip
RmRepUtil.exe policy -i RMPolicy.zip
```

3.2 Installing Recovery Manager



CAUTION: Do a backup of your data before upgrading the Recovery Manager or all data will be lost. See *Upgrading to Recovery Manager for Exchange* on page 3.1 for instructions on performing a backup.



NOTE: If you are installing Recovery Manager for Exchange on a system that also has a NetBackup service running in the background, the NetBackup service needs to be restarted after the installation of Recovery Manager for Exchange is complete. This is required for the environment path to be registered in the NetBackup service.



NOTE: If you are installing the application through a remote desktop session, the newly added environment variables will not become effective until you log off the session. It is recommended that you install the application directly from the system console.

Before installing Recovery Manager, install the InForm OS Command Line Interface (CLI) for remote clients. For details on installing the CLI, see the *3PAR InForm OS Command Line Interface Reference*.

You must also load the VSS Provider application before installing Recovery Manager for Microsoft Exchange.

Install Recovery Manager for Exchange on a host computer where Microsoft Exchange is running.



WARNING: Before installing Recovery Manager, create a backup of your repository data.

To install Recovery Manager:

1 Log on as the System Administrator.

2 Insert the Recovery Manager CD into a CD-ROM drive.

3 Open a Windows Explorer window:

Click **Start** > **All Programs** > **Accessories** > **Windows Explorer**.

4 Click the CD-ROM drive to expand the files.

5 Double-click the **VCDBAExchange2003** or **VCDBAExchange2007** folder depending on the version you are installing.

6 Double-click **vcdba_Exs2003.msi** or **vcdba_Exs2007.msi** depending on the version you are installing.

Result: Recovery Manager installation wizard launches.



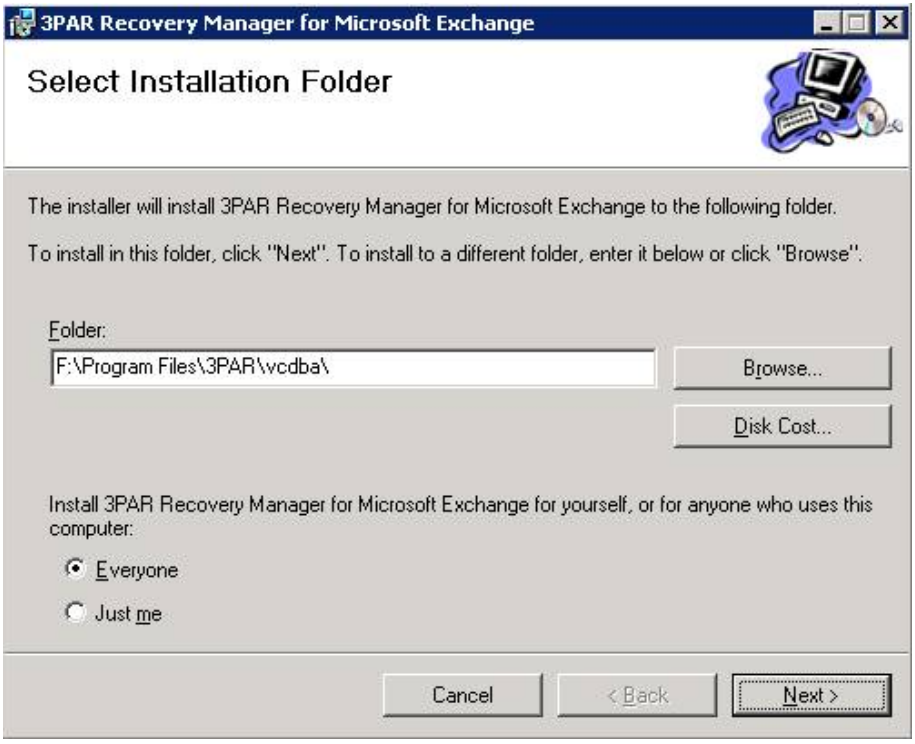
7 Click **Next**.

Result: The **License Agreement** window appears.



8 Agree to the license, then click **Next**.

Result: The **Select Installation Folder** window appears.



9 Specify the installation directory for Recovery Manager.

NOTE: The **Disk Cost** button analyzes the amount of available storage space and compares it to the amount required for the Recovery Manager installation. Default options to install for **Everyone** will create the necessary program folder and desktop icon for everyone who has access to the system. Accept the default settings.

10 Click **Next** to confirm the installation destination.

Result: The **Select Recovery Manager Installation Type** window appears.



11 Specify the installation type for the local system.

- **Recovery Manager Backup Server** installs components required for local system to perform centralized backup management.
- **Recovery Manager Agent for Exchange Server** installs components for local system to be managed by the Recovery Manager Backup Server component installed server.
- **All of above** is for a single host setup where the local system manages its own virtual copies.

12 Click **Next** to confirm the local server selection.

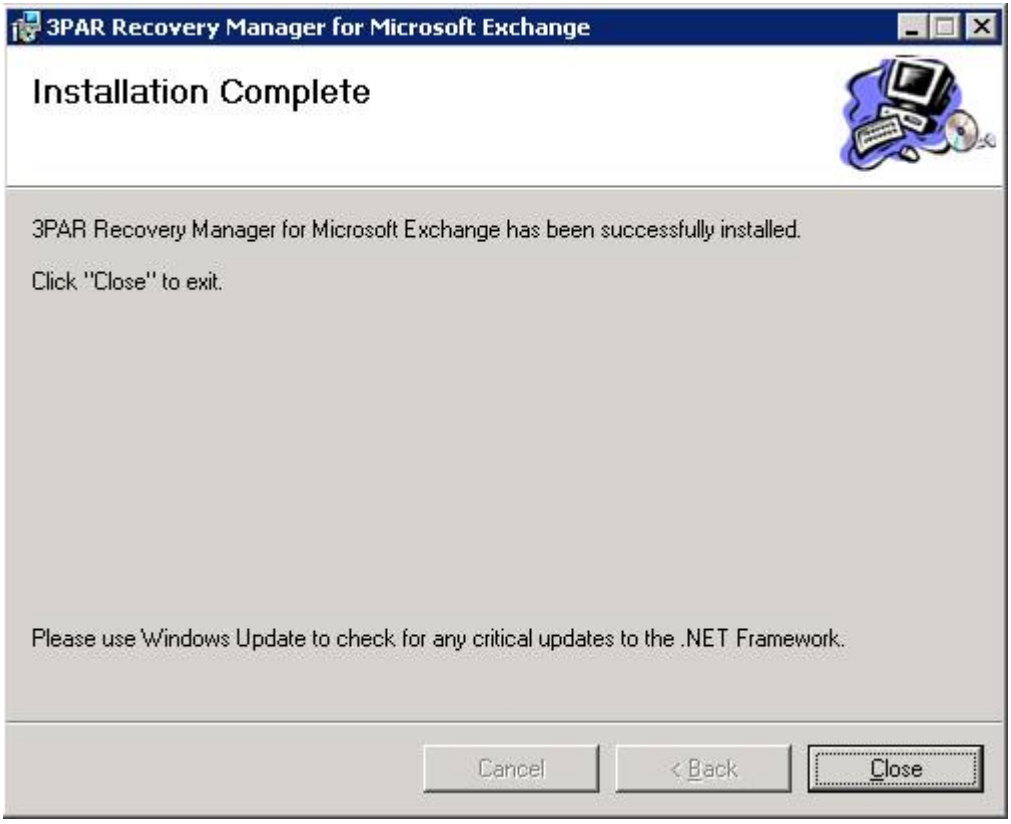
Result: The **Confirm Installation** window appears.



13 Click **Next** to start the installation. The following screen appears:



When the installation is completed, the following screen appears:



14 Click **Close** upon the completion of installation.

NOTE: When using a remote desktop connection, log off as Admin and then log on again to update the path before starting to use Recovery Manager.

3.3 Verifying the Installation

Verify the Recovery Manager installation as follows:

1 Log on as the System Administrator.

2 Click **Start** > **Control Panel** > **Add/Remove Programs**.

Result: The **Add/Remove Programs** window appears.

3 Verify Recovery Manager appears under the **Currently installed programs** column.

3.4 Understanding the Registry

After Recovery Manager is installed successfully, some information is written into the registry database under: `HKEY_LOCAL_MACHINE\SOFTWARE\3PAR\VCDBA_Exchange`.



CAUTION: DO NOT try to edit the registry key value unless asked by your local service provider for support purposes.



NOTE: For tracking purposes, you will be asked to modify the value of **TraceLevel** to a higher number to record more detailed information to the log file.

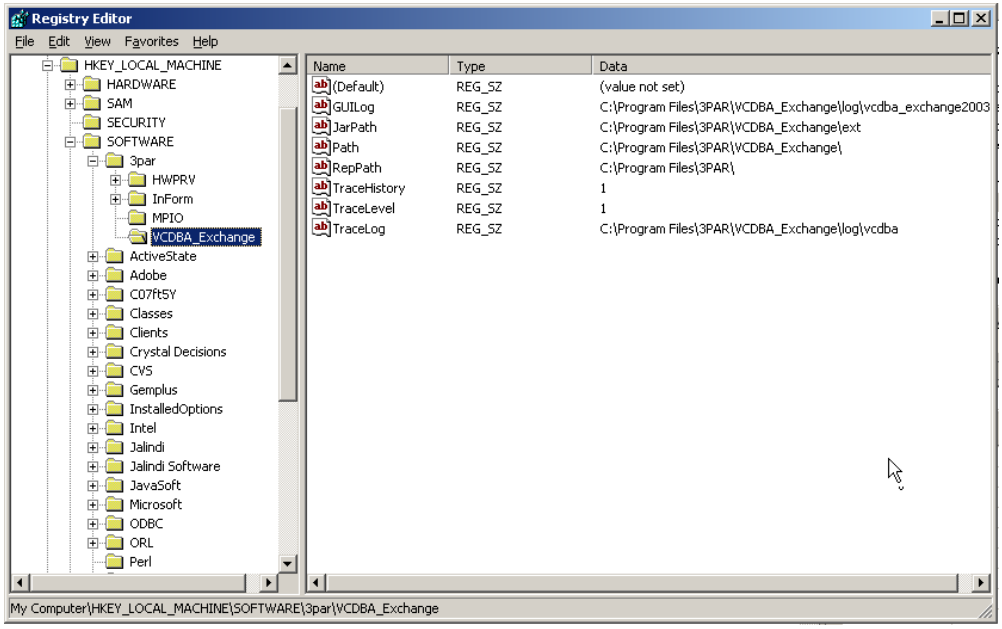
The Tracelevel has the following values:

- 1 - Error messages logged.
- 2 - Error and warning messages logged.
- 3 - Error, warning, and informational messages logged.
- 4 - Error, warning, informational and debug messages logged.
- 5 - Error, warning, informational, debug and verbose messages logged.

To edit registry data for Recovery Manager:

1 Click **Start** > **Run...,** then enter **regedit** in the **Run** window and click **OK**.

Result: The **Registry Editor** window displays:



2 Expand **HKEY_LOCAL_MACHINE** > **SOFTWARE** > **3par** > **VCDBA_Exchange** from the left-side of the window.

3 Double click on the name **TraceLevel** from the right-side of the window.

Result: The **Edit Value** popup appears.

4 Modify the **Value Data** field and click **OK** to save the change.

Table 3-1. System Registry Values for Recovery Manager

Name	Value
BackupTimeout	The timeout value for the NetBackup initialization process detection in minutes. This setting is optional if the default is not appropriate.
GUILog	Location of the GUI Log File (java errors only)
InstallPath	Recovery Manager Installation path.
JarPath	Path to the GUI jar file.
RCQueryTimer	The monitoring interval for remote copy progress on the target server in minutes. This setting is optional if the default is not appropriate.
RepPath	Root path to the Recovery Manager repository.
TraceHistory	Number of Trace files to keep before deleting.
Tracelevel	The trace level for the log file: 1 Error Messages 2 Warning Messages 3 Informational Messages 4 Debug Messages 5 Routines called The default value is set to "5"
TraceLog	The location where the log file resides.



NOTE: See *Event Messages* on page C.1 for descriptions of events and possible actions to fix possible problems.

3.5 Environment Variables

Installation of Recovery Manager adds the full path to its executables and libraries to the systems PATH environment variable. If for some reason this has not been done, the GUI or CLI will not work. If this is the case, manually add the full paths for the `bin` and `ext` directories under **VCDBA/Exchange** to the PATH environment variable. If Veritas NetBackup is used, make sure the bin directory of NetBackup is present in the search path. If Veritas NetBackup software is used in conjunction with Recovery Manager for Exchange, make sure the Veritas NetBackup service is restarted to use the new environment variable setting after Recovery Manager installation.

3.6 Deinstalling Recovery Manager

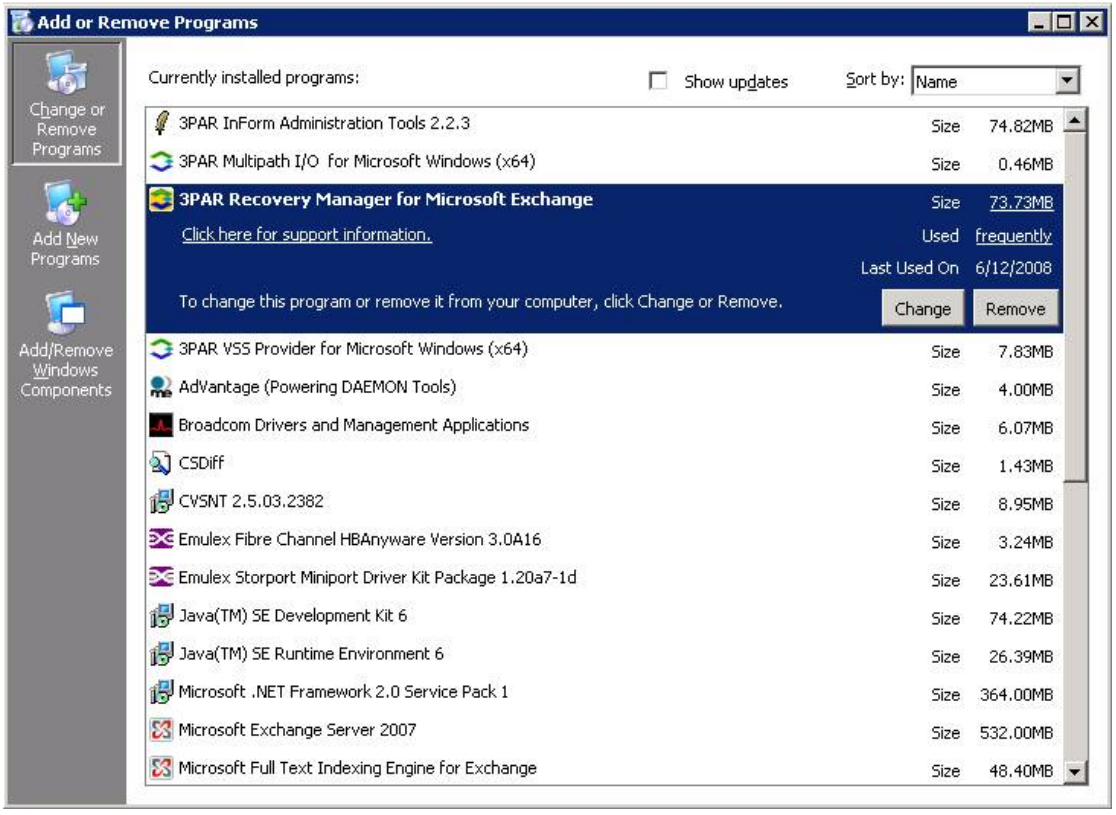


CAUTION: Do a backup of your data before upgrading the Recovery Manager or all data will be lost. See *Upgrading to Recovery Manager for Exchange* on page 3.1 for instructions on performing a backup.

To deinstall Recovery Manager from Windows 2003:

1. Log on as the System Administrator.
2. Click **Start** > **Settings** > **Control Panel** > **Add/Remove Programs**.

   Result: The **Add/Remove Programs** window appears.
3. Select **3PAR Recovery Manager for Microsoft Exchange.**
4. Click **Remove**.



NOTE: If the package is installed with the "Just for me" option, the user has to deinstall the software with the same user account used during installation.

4 Configuring Recovery Manager

In this chapter

4.1 Configuring the Database 4.1

4.2 Configuring Recovery Manager 4.2

4.3 Configuring the Host Computer and the 3PAR InServ Storage Server 4.2

This chapter contains instructions for configuring Exchange and Recovery Manager.

4.1 Configuring the Database

The system supports Microsoft Exchange 2003/2007 files created on basic disks using the NTFS file system.



NOTE: 3PAR recommends that each mailbox or public store, (as well as log files), be allocated to separate volumes. This configuration provides the greatest flexibility when performing individual mailbox or mailbox store recovery, thus reducing the exposure to conflicts between mailbox data stores.

4.2 Configuring Recovery Manager

4.2.1 Installation Location

By default Recovery Manager is installed in
`%SystemDrive%\Program Files\3PAR\VCDBA\Exchange`.

4.2.2 Search Path

The Recovery Manager executables are stored in the program folders directory chosen during installation. To use the command line components, the Recovery Manager directory must be added to the Windows Path variable. During installation, the search path is automatically added to the environment variable PATH.

4.3 Configuring the Host Computer and the 3PAR InServ Storage Server

See the *3PAR InForm OS Concepts Guide* and the *3PAR InForm OS CLI Administrator's Manual* for information about configuring the controller nodes on the InServ storage server to communicate with the host computer.

4.4 Configuring Recovery Manager Communications

- The Recovery Manager's (RM) listening service on each Recovery Manager Agent component installed server and Recovery Manager Backup Server component installed server uses a TCP/IP port to receive RM commands. The default port value is 9933. You can change the port value using the `RMExch portconfig` command. When one host's port configuration is changed, all hosts associated in the centralized backup configuration must be changed with Recovery Manager for Exchange Agent service restarted.

For Example:

- To show the current configured port for the Windows host named spotted, open a Command Prompt and type `RMExch portconfig -h spotted` and press **ENTER**.

```
Recovery Manager for Exchange, Version 3.0.0.13
```

```
Command: RMExch portconfig -h spotted
Current port: 9933
```

- To change the host's configured port to 9950, open a Command Prompt and type `RMExch portconfig -h spotted -p 9950` and press **ENTER**.

```
Command: RMExch portconfig -h spotted -p 9950
Updated the local Port to 9950
```

- Restart the Recovery Manager for Exchange Agent service on each server you ran the command against.

4.5 Configuring the Policy for an Exchange Server

Recovery Manager uses a policy to maintain the maximum number of virtual copies created for each storage group.

For Example:

- To see the current policy for a specific storage group (MyStorageGroup) of an Exchange server (spotted), open a Command Prompt and type `RMExch policy -s spotted -g MyStorageGroup` and press **ENTER**.
- To change the policy to 15, open a Command Prompt and type `RMExch policy -s spotted -g MyStorageGroup -i 15` and press **ENTER**.
- To change the policy to <n> and not allow automatic removal, open a Command Prompt and type `RMExch policy -s spotted -g MyStorageGroup -i <n> -r` and press **ENTER**.



NOTE: The minimum number of virtual copies allowed is **1** and the maximum is **500**. The default is **10**.

5 Configuring NetBackup for Recovery Manager

In this chapter

5.1 Overview 5.1

5.2 Defining a NetBackup Policy 5.1

This chapter contains instructions for configuring Veritas NetBackup for use with Recovery Manager.

5.1 Overview

Recovery Manager can be used with Veritas NetBackup for the backup and restore of virtual copies created by Recovery Manager. The following sections describe setting up Veritas NetBackup for use with Recovery Manager.

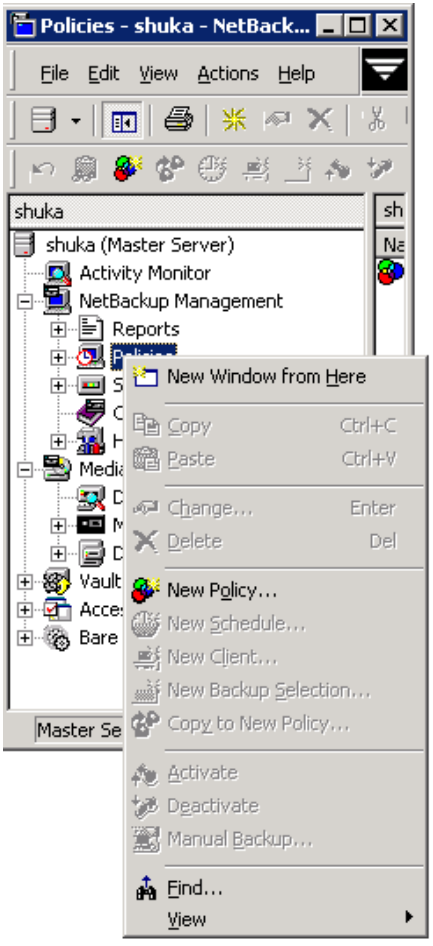
5.2 Defining a NetBackup Policy

Follow these instructions to set up a NetBackup policy for use with Recovery Manager.



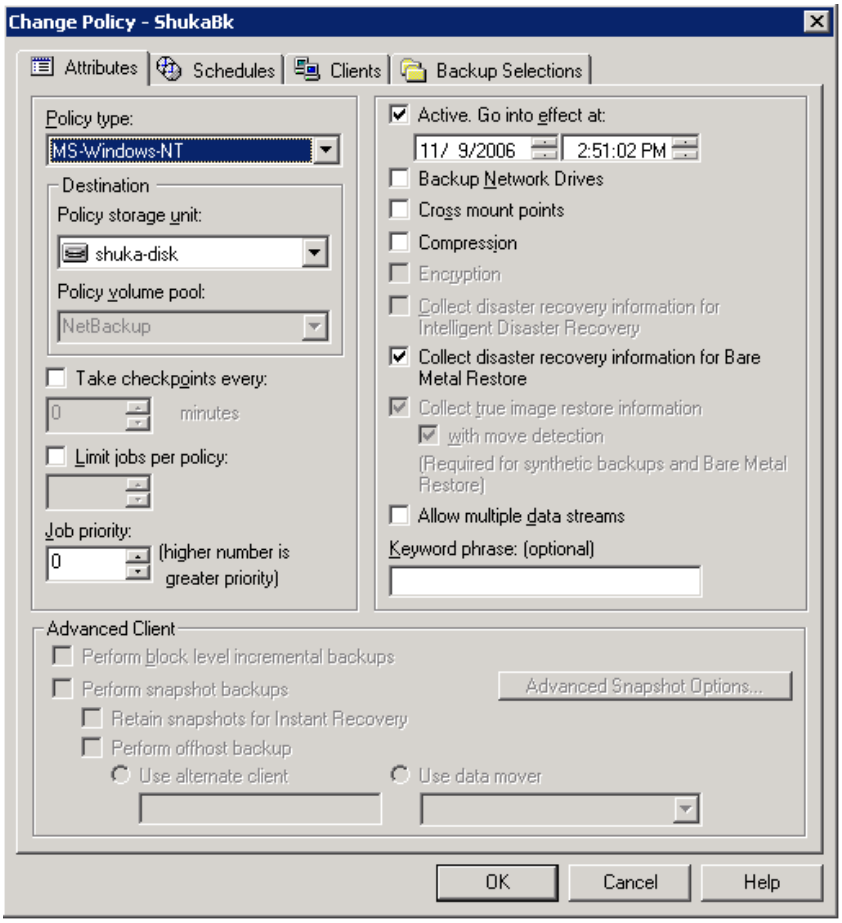
NOTE: A storage unit to store the virtual copy backups should already be set up. See the Veritas NetBackup documentation for setting up a storage unit.

1 Launch the Veritas **NetBackup Administration Console**.



2 Right-click the **Policies** node in the left pane to open the drop-down menu.

3 Double click **New Policy...** from the drop-down menu.

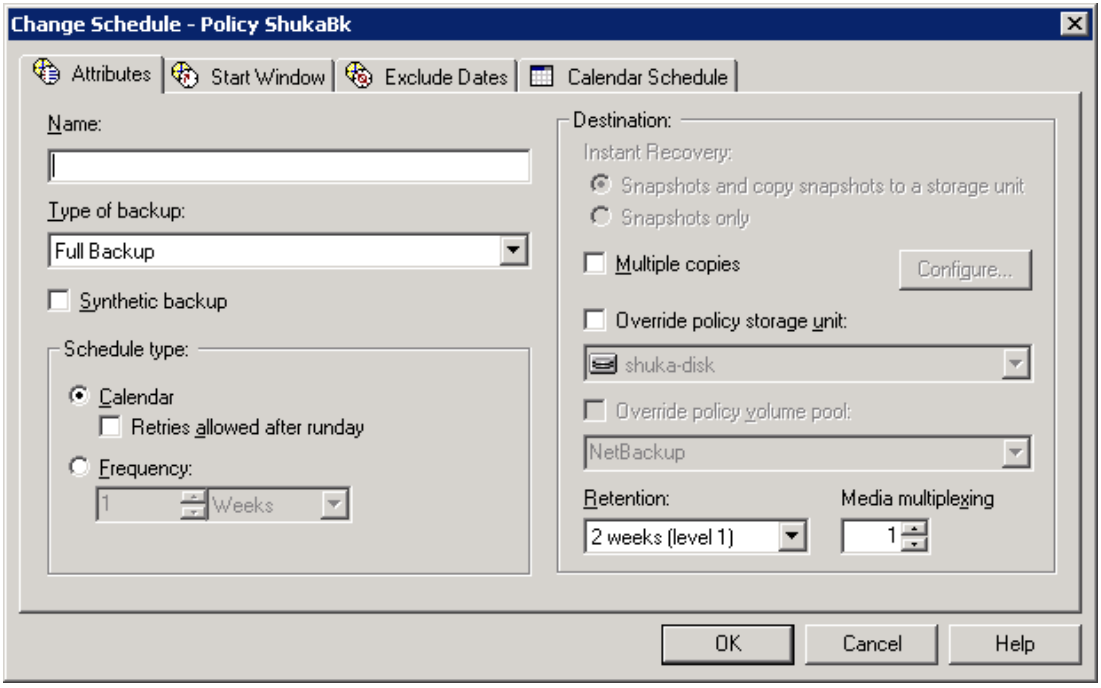


4 On the **Attributes** tab:

   a Select **MS-Windows-NT** from the Policy type menu.

   b Select the storage unit where the virtual copy backups will reside from the Policy storage unit menu.

5 Select the **Schedules** tab and click **New...**



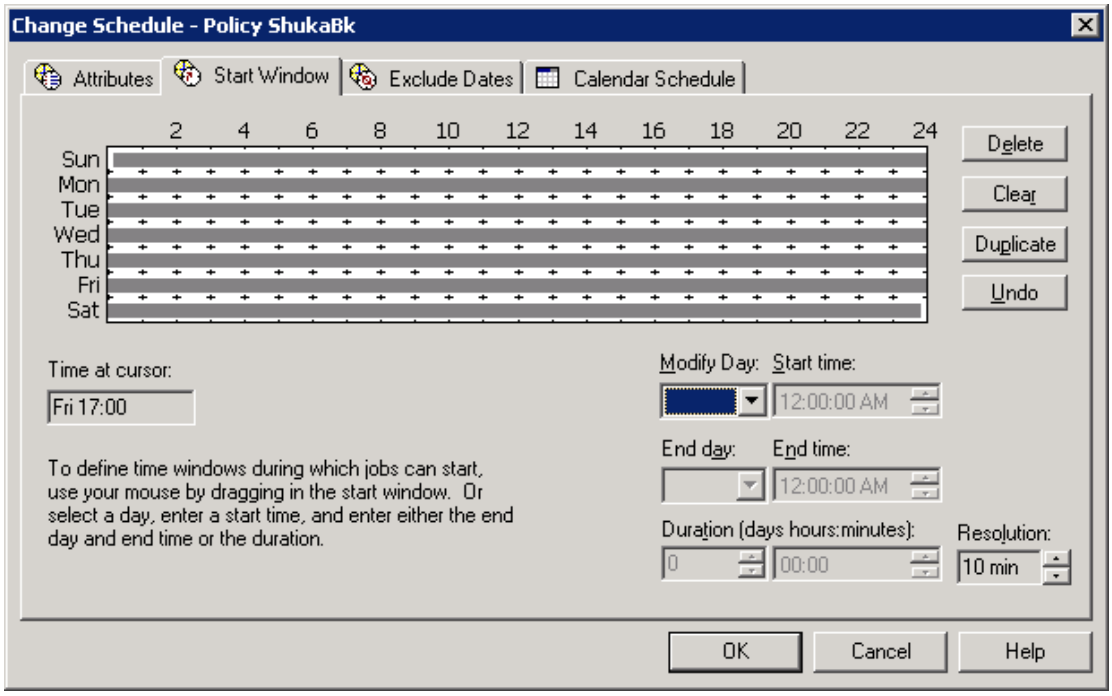
6 On the **Schedule-Attributes** tab:

a Enter a name for the schedule in the **Name** box.

b Select **Full Backup** from the Type of backup drop-down menu.

Select **User Backup** if you are using the NetBackup client interface from the machine where the Recovery Manager Agent for Exchange Server component is installed.

7 Select the **Start Window** tab.

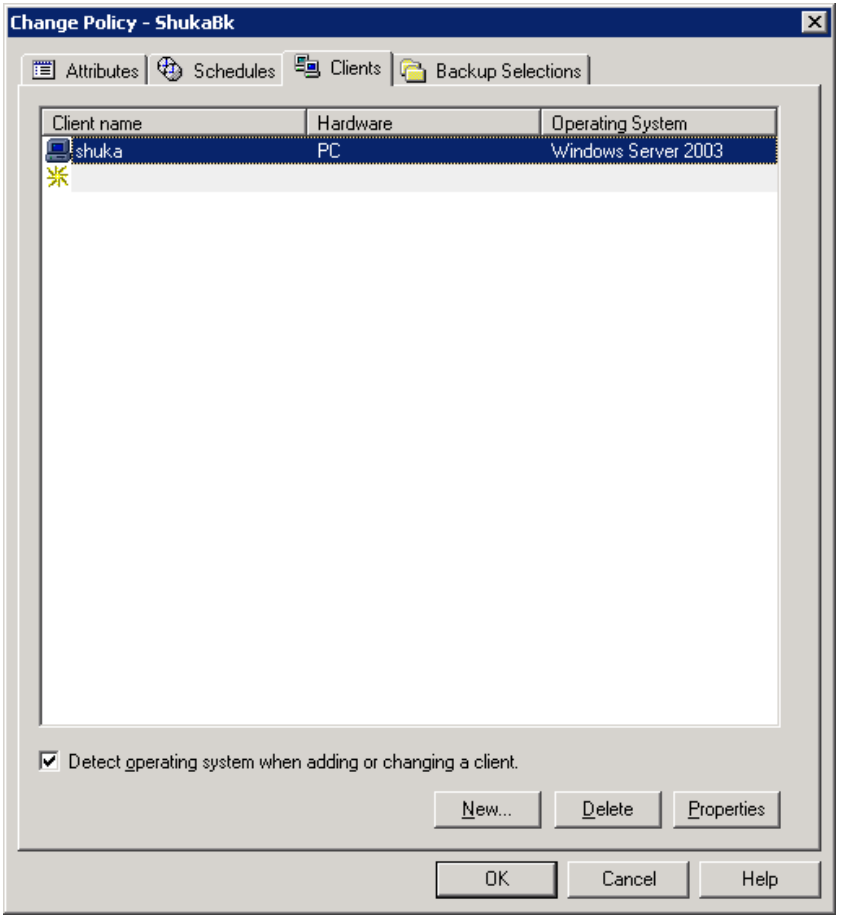


8 Activate all the time slots by selecting from the drop down menus:

- Modify Day: **Mon**
- Start Time: **12:00:00AM**
- End Day: **Sun**
- End Time: **12:00:00AM**
- Duration (days): **7**

9 Click **OK** to return to the Policy window and to activate the schedule.

10 Select the **Clients** tab from the Policy window.



11 Enter the machine name where the Recovery Manager Backup Server component is installed.

12 Click **OK** to confirm the client setup.

NOTE: Recovery Manager supports full backups when running with a NetBackup Master server. Recovery Manager also supports the user backup when running with a NetBackup client machine.

6 Using the Recovery Manager GUI

In this chapter

6.1 Overview of the Recovery Manager GUI 6.2

6.2 Starting the GUI 6.6

6.3 Stopping the GUI 6.6

6.4 Server Registration 6.6

6.5 Setting Recovery Manager Policy Configuration 6.8

6.6 Creating a Virtual Copy 6.11

6.7 Mounting a Virtual Copy 6.15

6.8 Unmounting a Virtual Copy 6.17

6.9 Refreshing Virtual Copy Information 6.18

6.10 Backing up a Virtual Copy Using Veritas NetBackup 6.18

6.11 Restoring from Virtual Copy Timestamp 6.21

6.12 Restoring a Virtual Copy Using Veritas NetBackup 6.26

6.13 Deleting a Virtual Copy 6.28

6.14 Virtual Copy Status 6.29

This chapter provides instructions for using the Recovery Manager Graphical User Interface (GUI) to back up and restore storage groups.

6.1 Overview of the Recovery Manager GUI

Recovery Manager provides a Graphical User Interface to backup and restore storage groups at a point-in-time.

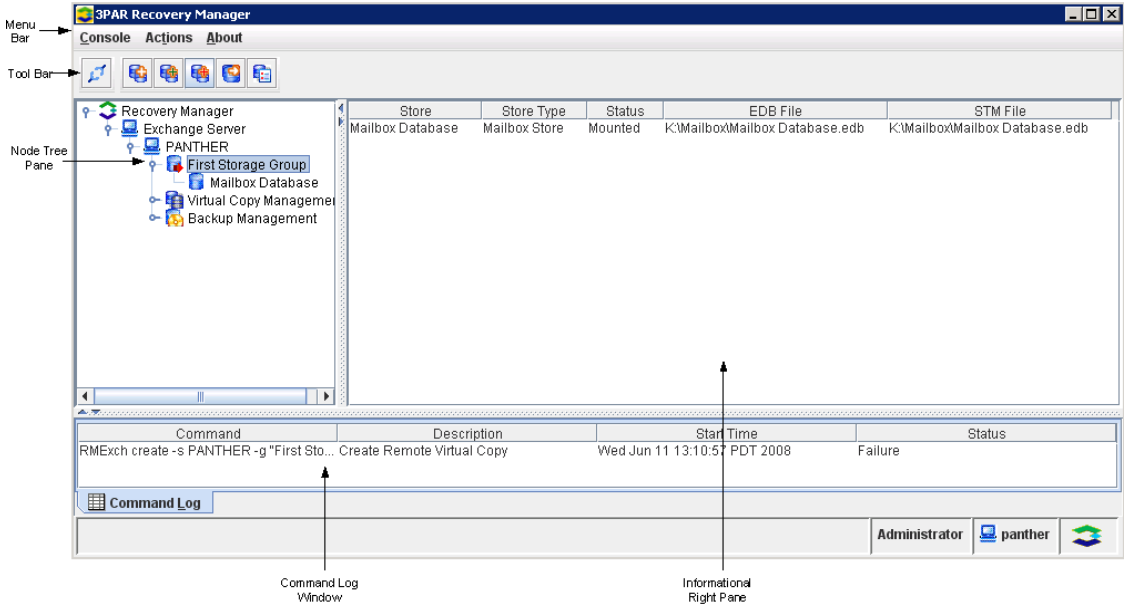
This version of Recovery Manager will support both Microsoft (MS) Exchange 2003 and 2007. The difference between MS Exchange 2003 and 2007 are; MS Exchange 2007 only supports 64 bits environment; MS Exchange 2007 can create Local Continuous Replication (LCR).

Recovery Manager provides the capability to create, remove, mount, and unmount, backup and restore the virtual copy for a storage group.

Recovery Manager GUI is a windows application, containing a menu bar, a node tree pane, informational right pane and a command log window



NOTE: The GUI will not be available for Recovery Manager Agent for Exchange Server installations.



6.1.1 Menu Bar

The menu bar consists of the following menu items:

- **Console** menu - allows you to exit the GUI and register the server.
- **Actions** menu - allows you to access virtual copy functionality.
- **About** menu - provides an **About 3PAR Recovery Manager** screen.

6.1.2 Node Tree Pane

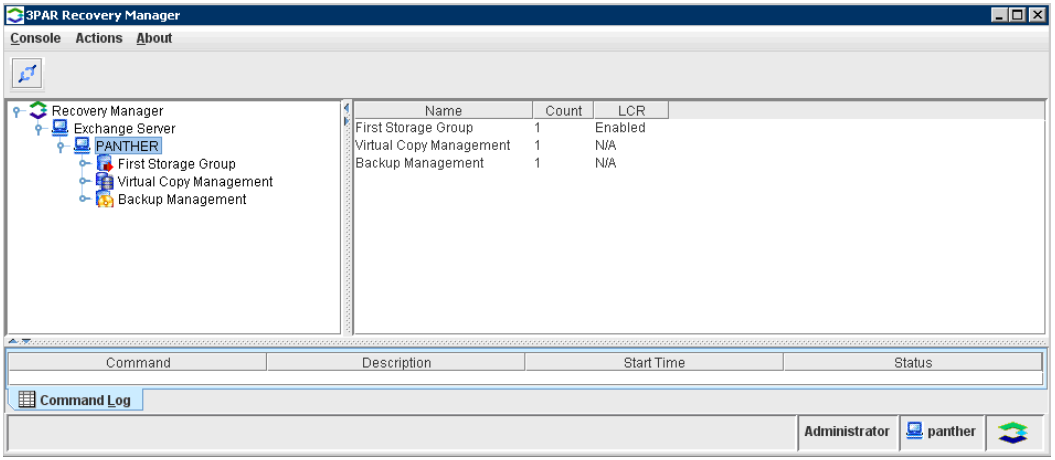
The node tree presents the system's Exchange server. When the Recovery Manager GUI starts, it analyzes the servers' storage groups, mailbox information, and virtual copies, then displays them graphically as a nested tree in the left pane.

6.1.3 Informational Right Pane

The right pane displays detailed information about each item selected in the node tree pane. The information displayed in the right pane is presented in columns. A scroll bar is provided at the bottom of the pane should the pane's contents exceed the pane's width.

6.1.4 Displaying Server Information

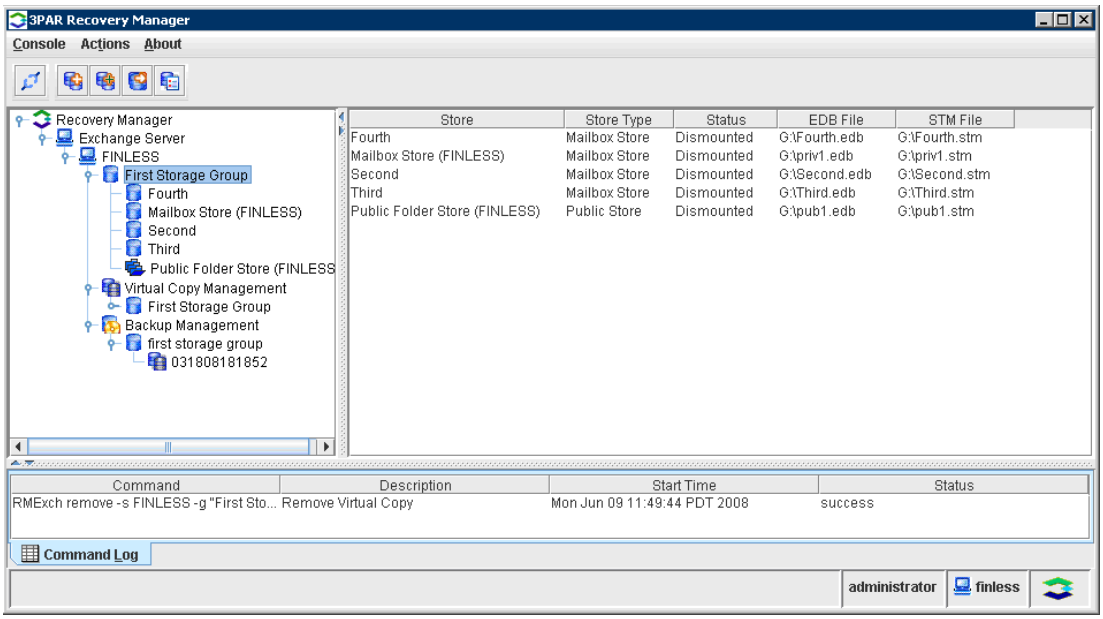
Recovery Manager supports feature Local Continuous Replication (LCR) which is available in Microsoft Exchange server 2007. LCR enabled storage group will be marked with the icon in the node tree pane. A new column called "LCR" is added to the informational pane to show which storage group is LCR is enabled. Performing a "Rescan Server Configuration" is required in order to view the updated LCR status icon.



6.1.5 Displaying Storage Group Information

To display information about a particular storage group, click on the storage group name in the node tree. Detailed information about the selected storage group is displayed in columns in the right pane.

The following figure displays storage group information for the selected storage group **First Storage Group**.



The columns are explained below:

Column...	Provides...
Store	The name of the information store.
Store Type	The type of information store; either **Mailbox Store** or **Public Store**.
Status	The status of the data store; either **Mounted** or **Unmounted**.
EDB File	The location of the EDB (property store) file store.
STM File Only available in Exchange 2003.	The location of the STM (streaming) file store.

6.2 Starting the GUI

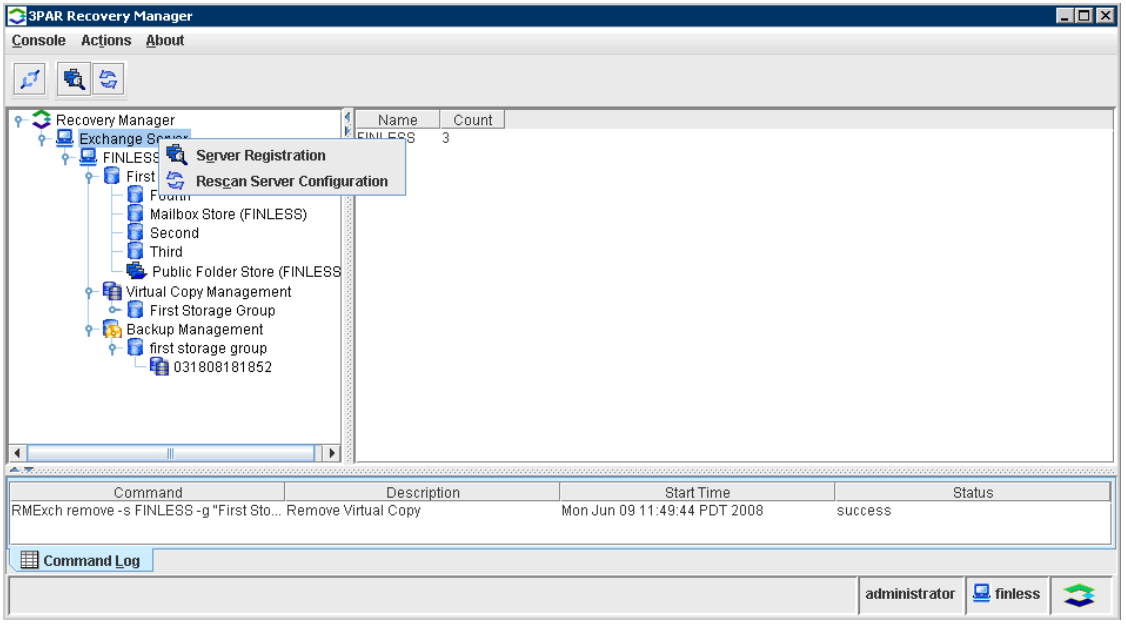
To start the Recovery Manager GUI, locate and double-click the **3PAR Recovery Manager for Exchange** icon on your desktop.

6.3 Stopping the GUI

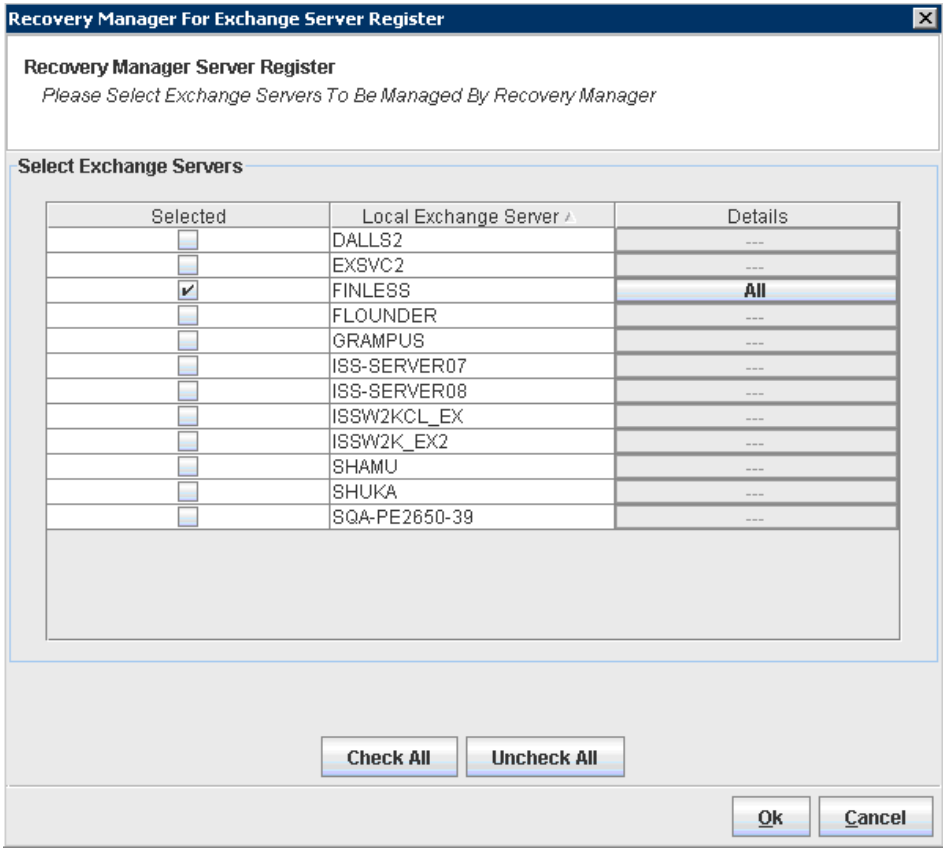
To stop the Recovery Manager GUI, on the menu bar, click **Console** > **Exit**. For additional information, see *Menu Bar* on page 6.3.

6.4 Server Registration

Before the GUI can manage Exchange Servers, all servers have to be registered. To register a server, right click on the "Exchange Server" node to bring up the pop up menu and select "Server Registration".

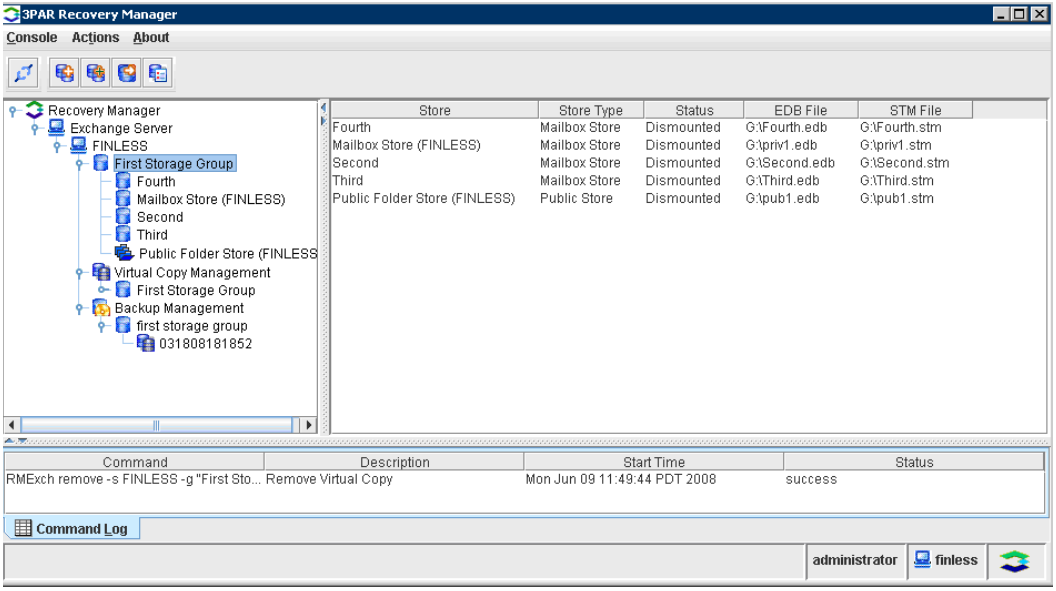


All Exchange servers on the same domain will be shown. Click on any server, which is managed by the Recovery Manager GUI for Exchange, and click **OK**.



NOTE: Recovery Manager will take 5 or more minutes to scan all Exchange Servers for the first time.

NOTE: When a new instance or a new Storage Group is created after the server registration, server configuration has to be rescanned before it can be managed by Recovery Manager. To rescan right click on the "Exchange Server" node to bring up the pop up menu and select **Rescan Server Configuration**.



6.5 Setting Recovery Manager Policy Configuration

By default, Recovery Manager creates a maximum of 10 virtual copies per storage group. When an 11th virtual copy creation is attempted, the default behavior is to delete the oldest virtual copy.

Recovery Manager provides a policy setting feature which allows you to set the maximum number of virtual copies permitted per storage group on the current Exchange server.

Policy setting is applied at the storage group level allowing each storage group to have its own policy configuration.

When setting the virtual copy limit, you can also optionally select the **Remove Old Virtual Copies** radio button indicating that the oldest virtual copy for each storage group is automatically removed once the set maximum limit of virtual copies is reached.



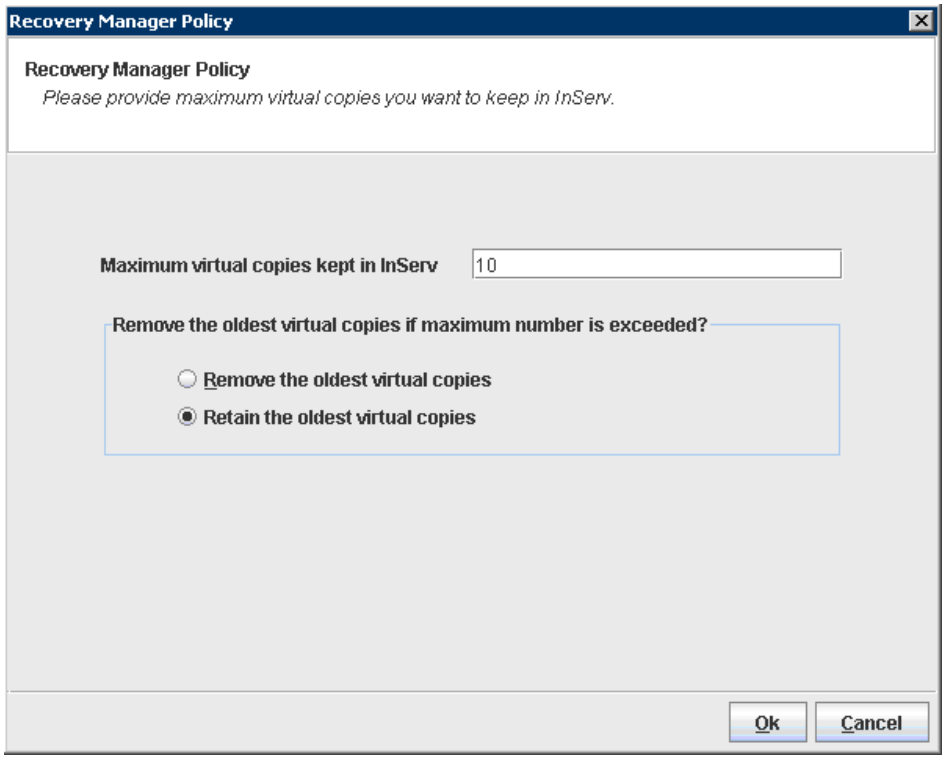
NOTE: If the oldest virtual copy is mounted, a snapshot will not be created until it is unmounted.

If the **Remove Old Virtual Copies** checkbox is unselected, once the set maximum limit is met, a new virtual copy cannot be created until you manually delete any old virtual copies.

To set Recovery Manager policies:

1. Start the Recovery Manager application (see *Starting the GUI* on page 6.6).
2. Select the storage group that is to be configured in the node tree pane.
3. Click on the policy icon that appears on the tool bar. Alternatively, you can right-click on the storage group and select policy, or select **Policy** from the **Actions** drop-down menu from the menu bar.

   Result: The Recovery Manager Policy dialog box appears.



4 Enter the **Maximum virtual copies kept in InServ** in the text field.

5 If you want to remove the oldest virtual copy, select **Remove the oldest virtual copy** option. If you want to keep the oldest virtual copy, select **Retain the oldest virtual copy** option.

6 Click **OK**.

NOTE: The virtual copy policy is effective immediately.

6.6 Creating a Virtual Copy

Virtual copies are created at the storage group level for Microsoft Exchange Server, since this is the recoverable unit defined by Microsoft. The log files for all the mailbox data stores in a storage group are managed at the storage group level. Therefore, when Recovery Manager creates a virtual copy for a Microsoft Exchange storage group, it creates a virtual copy of all virtual volumes where the information store, log, and system files reside to preserve the data for consistency. A virtual copy can also be created and saved in a remote server which is called create remote virtual copy.

6.6.1 To create a virtual copy of a storage group:

1. Navigate through the node tree view on the left pane and locate the storage group for which a virtual copy is to be created.
2. Click the storage group name and the **Create Virtual Copy** icon appears on the toolbar. You can initiate the creation of a virtual copy in several ways:
   a. Clicking on the **Create Virtual Copy** icon on the toolbar.
   b. Right-clicking on the storage group node and selecting **Create->Virtual Copy** from the pop-up menu.
   c. Selecting **Create> Virtual Copy** from the **Actions** drop-down menu on the menu bar.



NOTE: A virtual copy can only be taken of a storage group that is online.



NOTE: Creating a virtual copy of a storage group creates a virtual copy of all the volumes where the storage group data (logs, stm and edb files) resides. Therefore, it is recommended that volumes storing exchange data files are not used to store any other data.

Once a virtual copy is created, it appears under the **Virtual Copy Management** node under the relevant storage group name. The virtual copy is given a timestamp that is used as its name.

6.6.2 Create a Remote Virtual Copy

To create a remote virtual copy of a storage group:

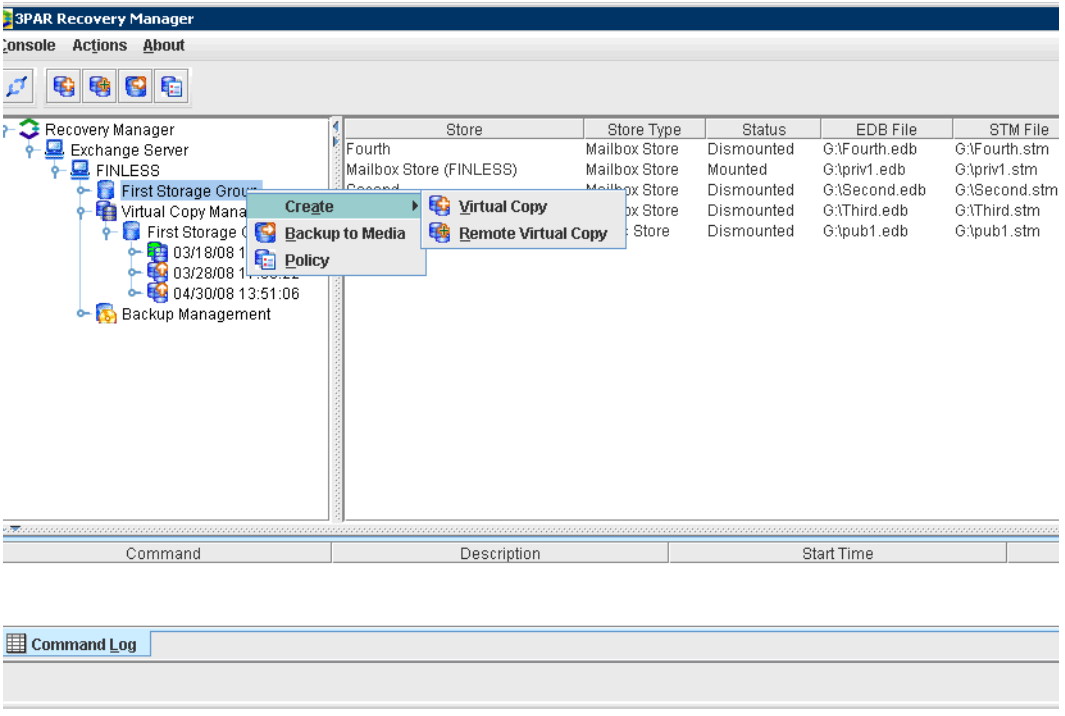
1. Navigate through the node tree view on the left pane and locate the storage group for which a virtual copy is to be created.
2. Click the storage group name and the **Create->Remote Virtual Copy** icon appears on the toolbar.

You can initiate the creation of a virtual copy in several ways:

a. Clicking on the **Create->Remote Virtual Copy** icon on the toolbar.

b. Right-clicking on the storage group node and selecting **Create->Remote Virtual Copy** from the pop-up menu.

c. Selecting **Create->Remote Virtual Copy** from the **Actions** drop-down menu on the menu bar.



6.6.3 LCR Virtual Copy

For Microsoft Exchange Server 2007, a Local continuous replication (LCR) can be created to replicate the storage group. Creating a LCR Virtual Copy will use the LCR as source to create the Virtual Copy. Similar to regular Virtual Copy, the log files for all the mailbox data stores in a storage group are managed at the storage group level. Therefore, when Recovery Manager creates a virtual copy for a Microsoft Exchange storage group, it creates a virtual copy of all virtual volumes where the information store, log, and system files reside to preserve the data for consistency.

To create a LCR virtual copy of a storage group:

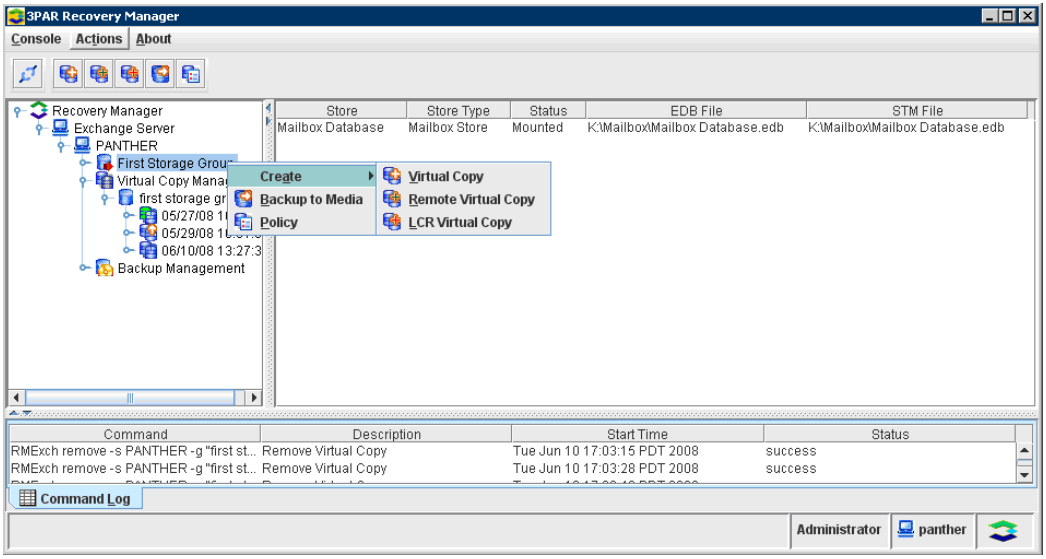
1. Navigate through the node tree view on the left pane and locate the LCR enabled storage group for which a virtual copy is to be created.
2. Click the storage group name and the **Create->LCR Virtual Copy** icon appears on the toolbar.

You can initiate the creation of a LCR virtual copy in several ways:

a. Click on the **Create->LCR Virtual Copy** icon on the toolbar.

b. Right-click on the storage group node and selecting **Create->LCR Virtual Copy** from the pop-up menu.

c. Select **Create->LCR Virtual Copy** from the **Actions** drop-down menu on the menu bar.



NOTE: The Production Server VSS will wait for up to 10 seconds for the writers to freeze I/O; this interval is not configurable. In most cases 10 seconds is a sufficient window to successfully create a virtual copy. However, in some circumstances under very heavy load, 10 seconds may not be enough and the virtual copy will fail on this attempt, which is "by design". VSS does not automatically retry the shadow copy creation, users must retry the virtual copy creation using the Recovery Manager GUI or the command line.

NOTE: On the Production Server during virtual copy creation, Recovery Manager dismounts and unmasks the virtual copy device from the Windows server, and breaks the virtual copy away from VSS control. During this process a "delayed write error" may show up, or the message "the system failed to flush data to the transaction log" may appear in the System Event Log. This is normal.

NOTE: Recovery Manager checks the integrity of the Exchange files after creating a virtual copy. A manual check may be performed as well.

6.7 Mounting a Virtual Copy

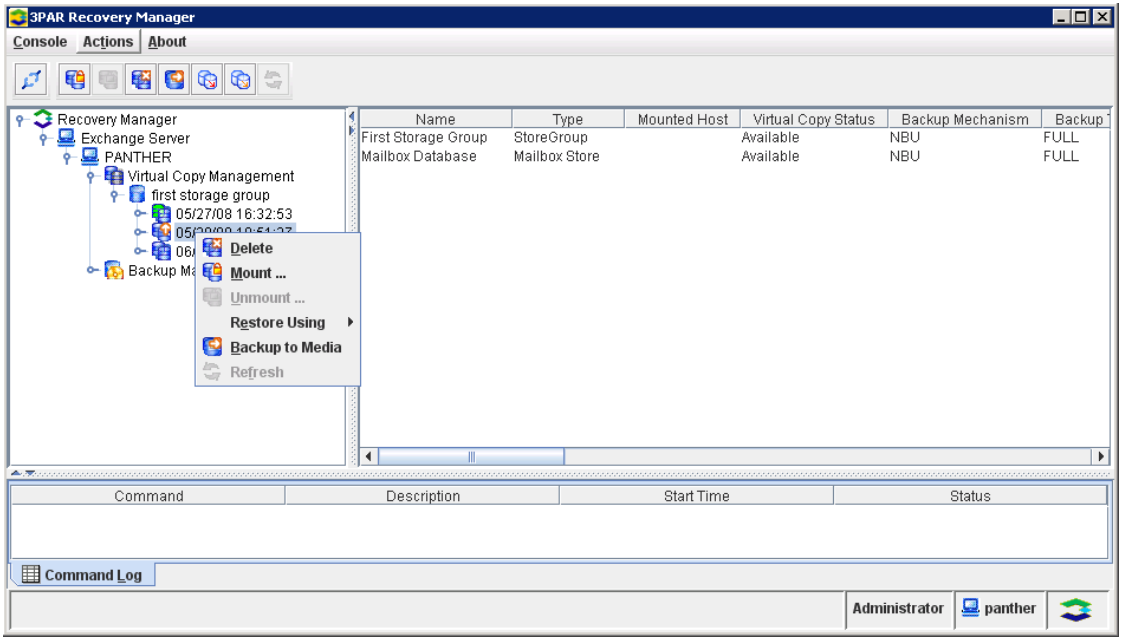


NOTE: A virtual copy may only be mounted to one host at a time.

A virtual copy can be mounted at the timestamp level. Once a timestamp is mounted, all stores (mailbox, public store, logs) under the timestamp are mounted.

To mount an individual store:

1. Click on the timestamp in the left pane node tree view, then either:
   a. Right-click on the store name and select **Mount ...** .
   b. Click on the **Mount** icon in the tool bar.
   c. Select **Mount ...** from the **Actions** drop-down menu on the menu bar.

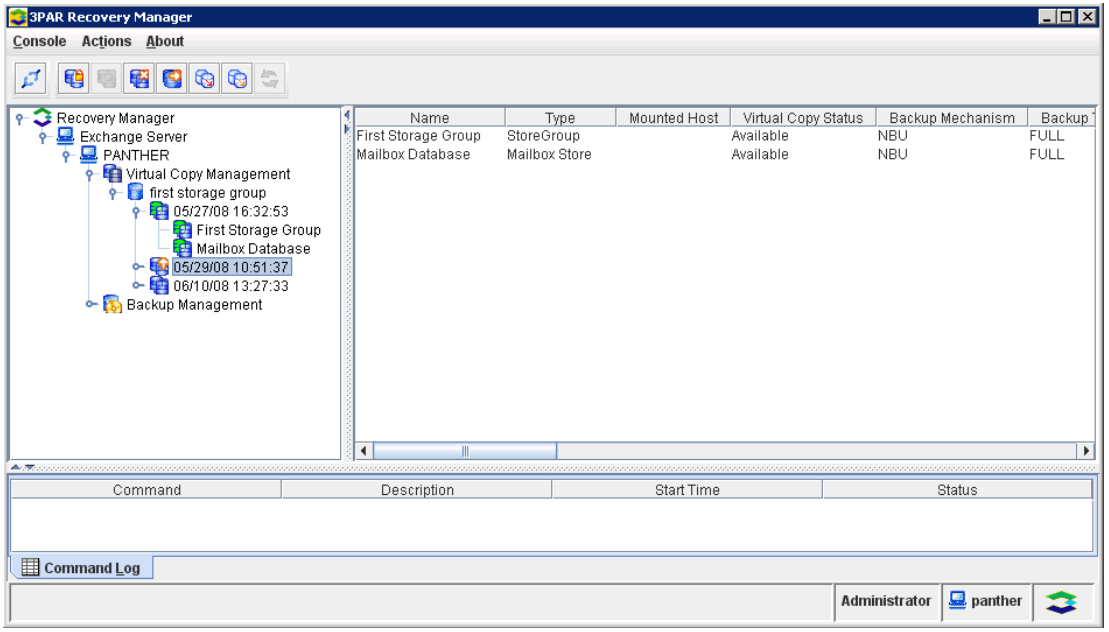


Result: The select host dialog, listing the available host names identified to the associated InServ appears.

2 Select the host to mount the virtual copy (store) to, from the host name drop down box.

3 Click **OK**.

Result: The virtual copy is available to the selected host server. The list view in the right pane is updated for the mounted virtual copy (store). The virtual copy status shows **Mounted** and the mounted host column shows the host server to which the virtual copy was mounted.



6.8 Unmounting a Virtual Copy

A virtual copy can be un-mounted at the timestamp level. Once a timestamp is unmounted, all stores (mailbox, public store, logs) under the timestamp are unmounted.

To unmount a virtual copy at the timestamp level:

1 Click on the mounted store name in the left pane node tree view, then either:

   a Right-click on the store name and select **Unmount ...**

   b Click on the **Unmount** icon in the tool bar.

   c Select **Unmount ...** from the **Actions** drop-down menu on the menu bar.

   Result: The right pane list view is updated for the unmounted virtual copy it's status now shows **Unmounted** and the **Mounted Host** column is blank.

6.9 Refreshing Virtual Copy Information

Recovery Manager provides both GUI and CLI utilities. If both are used interchangeably without stopping and restarting the GUI, the virtual copy information needs to be updated. This can be done at several levels.

6.9.1 Refreshing all Virtual Copies

To refresh all virtual copies:

1. Select the **Virtual Copy Management** node in the left pane node tree, then either:
   a. Right-click on the **Virtual Copy Management** node and select **Refresh**.
   b. Click the **Refresh** icon in the tool bar.
   c. Select **Refresh** from the **Actions** drop-down menu on the menu bar.

6.9.2 Refreshing all Virtual Copies for a Specific Storage Group

To refresh all virtual copies for a specific storage group:

1. Select the storage group under the **Virtual Copy Management** node and click **Refresh** using one of the methods described in *Refreshing all Virtual Copies* on page 6.18.

6.9.3 Refreshing a Specific Virtual Copy

To refresh a specific virtual copy:

1. Select the virtual copy timestamp and click **Refresh** using one of the methods described in *Refreshing all Virtual Copies* on page 6.18.

6.10 Backing up a Virtual Copy Using Veritas NetBackup

Recovery Manager allows backup of the virtual copies to media using Veritas NetBackup.

To backup a virtual copy using NetBackup, you must first configure Veritas NetBackup as described in Chapter 5, *Configuring NetBackup for Recovery Manager*.

A backup can be performed on the storage group level or the timestamp level.

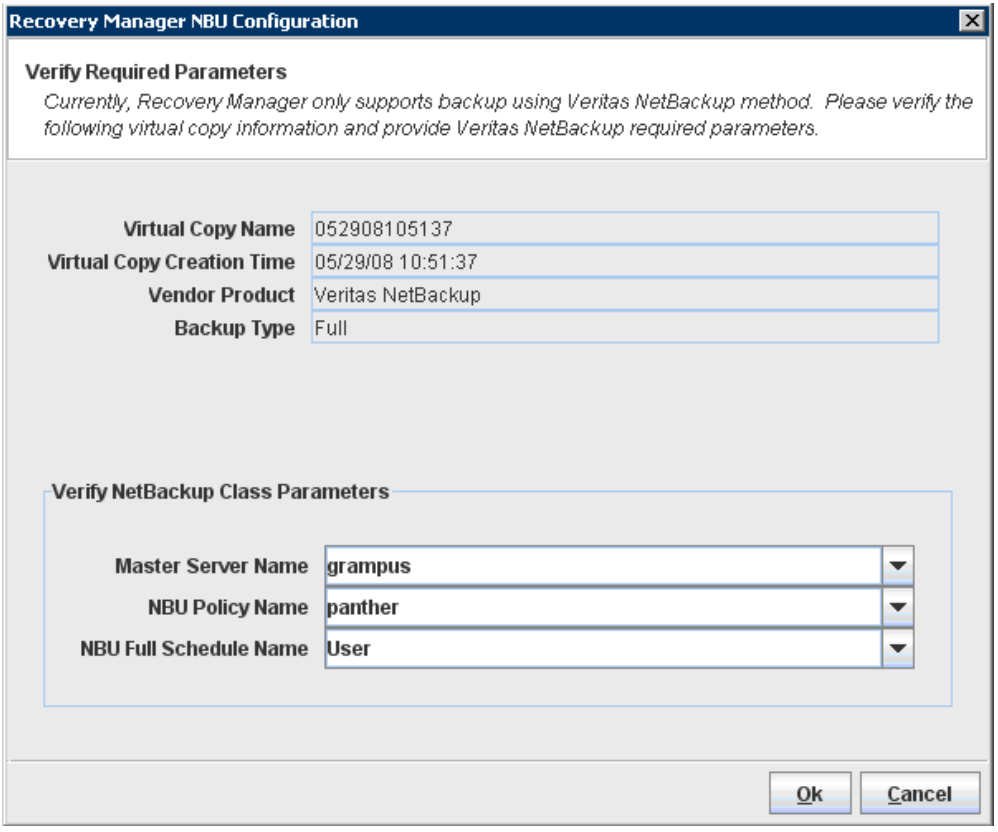
6.10.1 Backup at the Storage Level

This backup is a fully automatic backup that creates a virtual copy for the storage group, mounts it, backs it up to media, unmounts it, and removes it automatically.

To backup a virtual copy at the storage group level:

1. Locate the storage group node you wish to backup in the left pane node tree, then select **Backup to Media**.
   a. Right-click on the **Storage Group Node** and select **Backup to Media**.
   b. Click on the **Backup** icon in the tool bar.
   c. Select **Backup to Media** from the **Actions** drop-down menu on the menu bar.

   Result: The following dialog appears:



Enter the **Master Server Name**, the **NBU** policy name and **NBU Full Schedule Name** in the text boxes provided. The policy and schedule names should be the names of the policy and schedule that were set up for use with Recovery Manager in Chapter 5, *Configuring NetBackup for Recovery Manager*.

You can choose to remove the virtual copy from InServ storage server if the backup completes successfully by checking the check box labeled **Remove virtual copy from InServ after NBU backup**.

2 Click **OK**.

Tip: You can monitor the NetBackup progress using the progress log, which reside at the following location:

```
VCDBA_Exchange Install
Location\log\nbulog\exchserver_storagegroup_timestamp.log
```

The GUI is updated to show that the virtual copy has been backed up (see table 6.2)

Column	Value
Virtual Copy Status	If the option to remove the virtual copy from the InServ storage server after successful backup is selected, the status is **Removed**. If the virtual copy is not removed, the status shows **Mounted**. See 6.14 Virtual Copy Status**6.29**.
Backup Mechanism	NBU
Backup Type	FULL
Backup Keyword	Recovery Manager generated keyword for the NBU backup, format: exchange `server_storagegroup_timestamp`



NOTE: If the backup fails, refresh the GUI to reset the above columns back to their previous values.

6.11 Restoring from Virtual Copy Timestamp

Recovery Manager allows restore of the virtual copy to its source storage group. A Virtual Copy Timestamp can be restored by using File Copy or Volume restore. The restore operation will restore from a mounted and un-mounted Virtual Copy Timestamp. A mounted timestamp  or non-Promotable timestamp  can only perform File Copy restore. A promotable timestamp  can perform both File Copy and Volume restore.

6.11.1 File Copy Restore

To restore a virtual copy timestamp using File Copy:

1 Navigate through the node tree view on the left pane and locate the timestamp of the corresponding storage group.

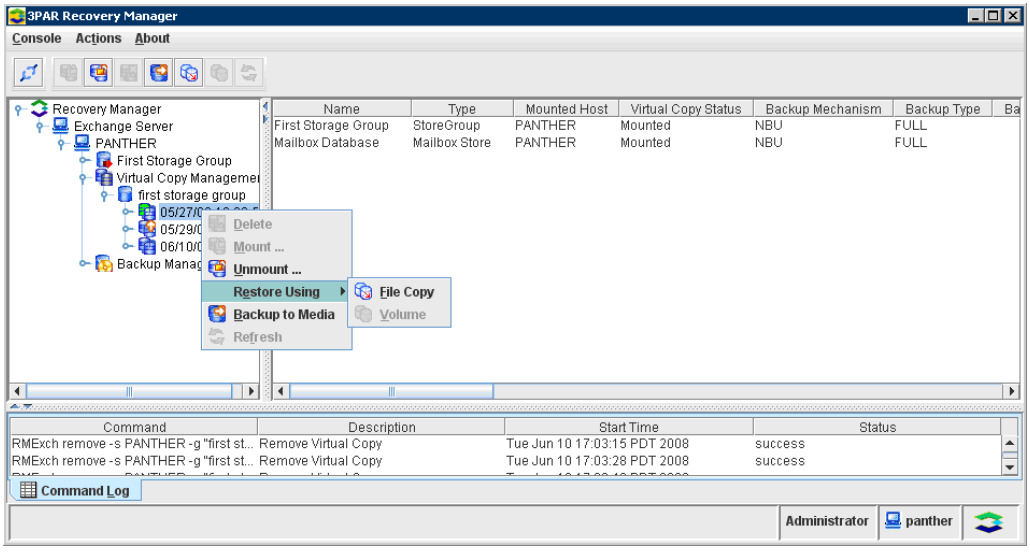
2 Click the timestamp and the Restore Using->File Copy icon appears on the toolbar.

You can initiate the restore using file copy in several ways:

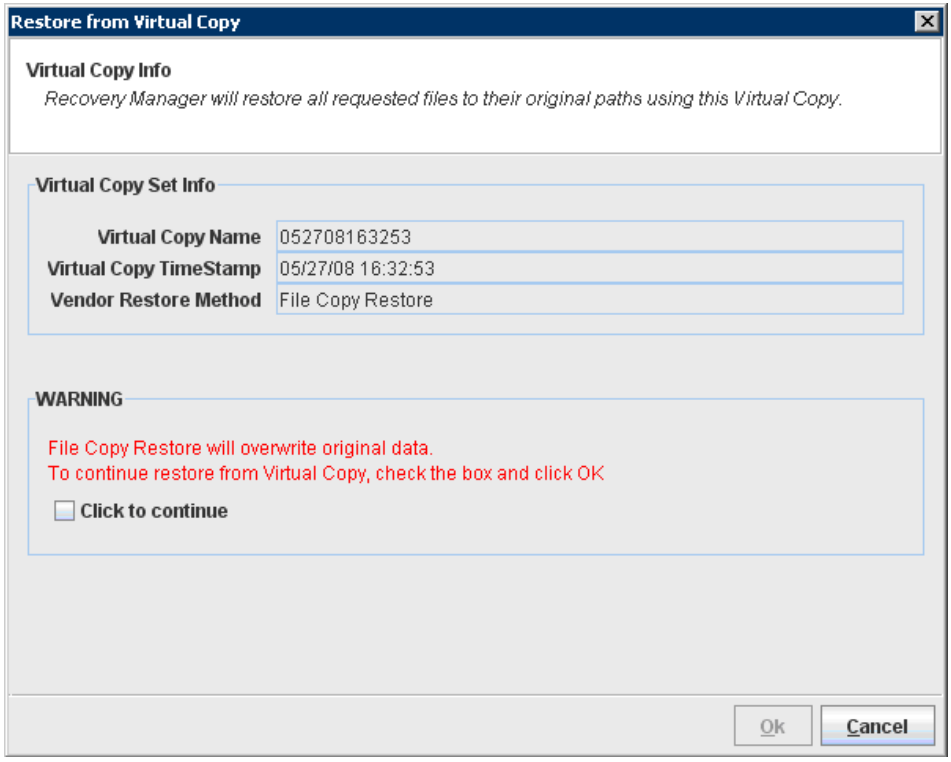
a Clicking on the **Restore Using->File Copy** icon on the toolbar.

b Right-clicking on the timestamp node and selecting **Restore Using->File Copy** from the pop-up menu.

c Selecting **Restore Using->File Copy** from the **Actions** drop-down menu on the menu bar.



Result: The following dialog appears:



Check the checkbox "**Click to continue**" to confirm you understand the warning. Then the "OK" button will be enabled.

Result: Only the modified data will be replaced with the data in the selected virtual copy.

6.11.2 Volume Restore

To restore a virtual copy timestamp using Volume:

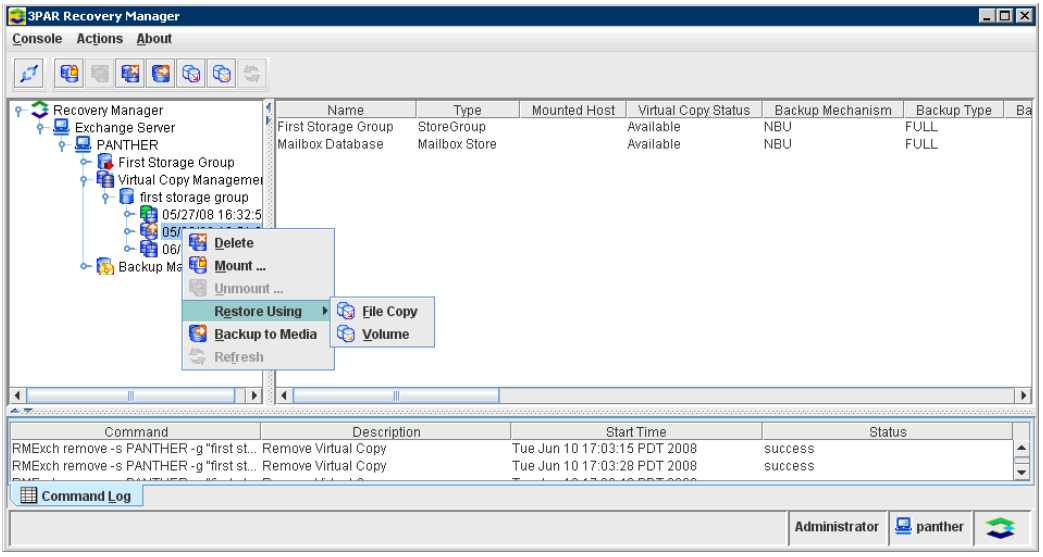
1. Navigate through the node tree view on the left pane and locate the timestamp of the corresponding storage group.
2. Click the timestamp and the **Restore Using->Volume** icon appears on the toolbar.

   You can initiate the restore using Volume in several ways:

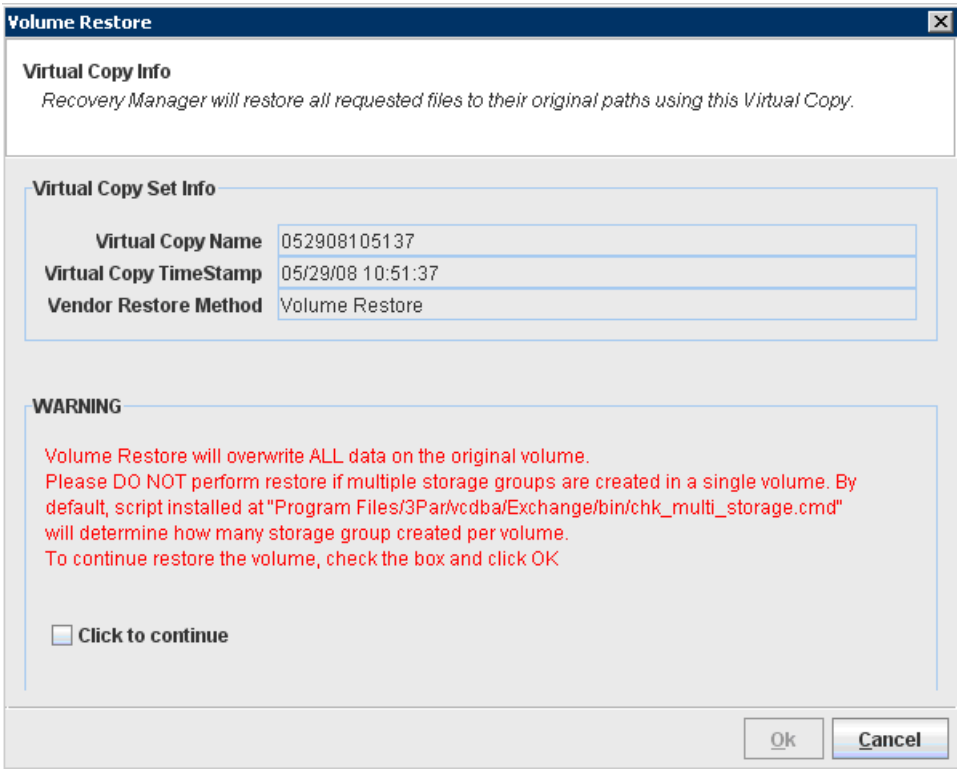
   a. Clicking on the **Restore Using->Volume** icon on the toolbar.

b Right-clicking on the timestamp node and selecting **Restore Using->Volume** from the pop-up menu.

c Selecting **Restore Using->Volume** from the **Actions** drop-down menu on the menu bar.



Result: The following dialog appears:



Check the checkbox **Click to continue** to confirm you understand the warning. Then the "Ok" button will be enabled.

Result: The whole volume of the storage group will be restored with the data in the selected virtual copy.

WARNING: Please DO NOT perform a volume promote restore if multiple storage groups share any volumes. This includes all data files .LOG, .EDB, .CHK (and .STM for Exchange 2003). If you are not sure how or if your storage groups share volumes, please execute the script "chk_multi_storage.cmd" by default installed at "Program Files/3Par/vcdba/Exchange/bin" to determine how any storage groups may be sharing volumes.

6.12 Restoring a Virtual Copy Using Veritas NetBackup

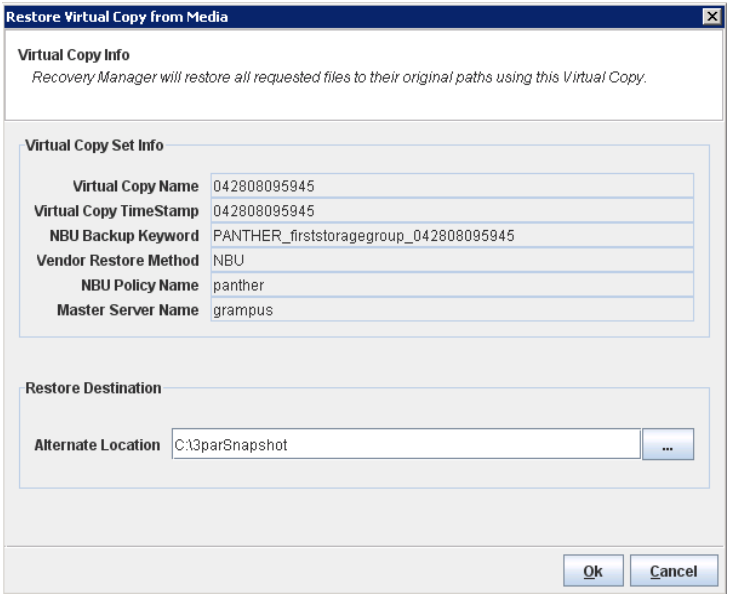
Once a virtual copy is backed up to media, the **Restore** menu option is enabled.

Backups can be restored back to their original location (the volume(s) or directory locations of the virtual copies that were backed up, not original exchange data locations), or an alternate location can be specified.

To restore a virtual copy that has been backed up using NetBackup:

1. Locate the timestamp under Backup Management you wish to restore in the left pane node tree, then select **Restore** using one of the following methods:
   a. Right-click on the virtual copy timestamp under Backup Management and select **Restore**.
   b. Click on the **Restore** icon in the tool bar.
   c. Select **Restore** from the **Actions** drop-down menu on the menu bar.

   Result: The restore dialog appears.



2. To restore to an alternate location, enter the location in the text box provided. To restore back to the original location, leave the text box blank.

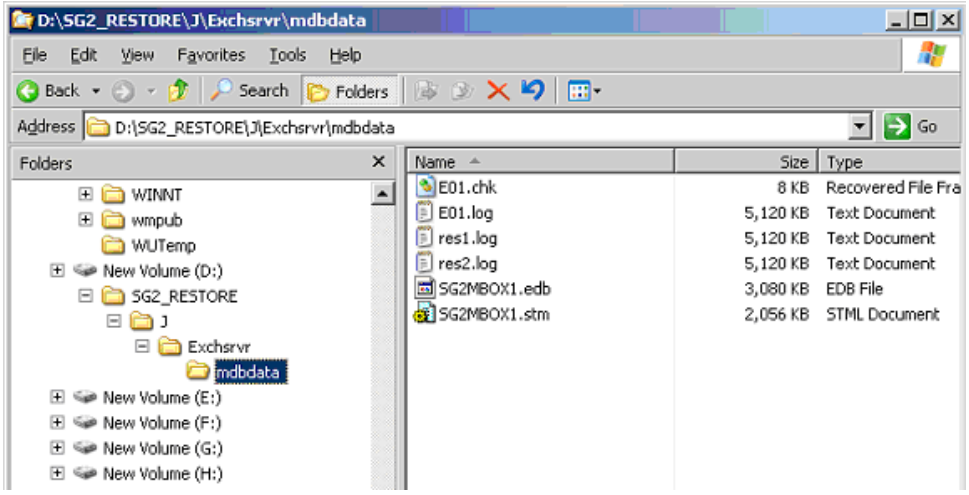
NOTE: To restore back to the original location, make sure the original location is still valid.

The following figure shows a backup of volume `j:\`. If choosing to restore back to the original location, a volume labeled `j:\` must exist on the system.

3 Click **OK**. The GUI assumes a successful restore. The NetBackup restore progress can be monitored using the progress log, at the following location:

```
VCDBA_Exchange Install
Location\log\nbulog\exchserver_storagegroup_timestamp.log
```

If an alternate restore location was given as shown in the following figure, the restored data appears in the alternate location as shown.



6.13 Deleting a Virtual Copy



NOTE: A virtual copy cannot be removed if it is mounted to a host server.

To delete a virtual copy from the InServ storage server and the Recovery Manager repository, the virtual copy timestamp must have a status of **Available**. To delete a virtual copy, use one of the methods described below:

1. Right-click on the virtual copy timestamp node and select **Delete**.
2. Click on the **Delete** icon in the tool bar.
3. Select **Delete** from the **Actions** drop-down menu on the menu bar.

Result: The virtual copy is deleted from both InServ storage server and the Recovery Manager repository.

If when backing up a virtual copy, the **Remove virtual copy from InServ after NBU backup** option was selected, the virtual copy only exists in the Recovery Manager repository for restore purposes. In this case the virtual copy will have a status of **Removed**. To remove the virtual copy from the Recovery Manager repository, use one of the methods described below:

1. Right-click on the virtual copy timestamp node and select **Remove Backup**.
2. Click on the **Remove Backup** icon in the tool bar.
3. Select **Remove Backup** from the **Actions** drop down menu on the menu bar.

Result: The virtual copy is removed from the Recovery Manager repository.



WARNING: If a virtual copy is removed from the InServ Storage Server during a backup operation, then deleted from the Recovery Manager repository before a restore operation has taken place, all data is lost and will be unable to recover the storage group.

6.14 Virtual Copy Status

The table below describes each virtual copy status.

Table 6-1. Virtual Copy Status Descriptions

Virtual Copy Status	Description
Available	A virtual copy has this status when it exists in InServ Storage Server and in the Recovery Manager repository, and it is currently not mounted to a host.
Mounted	A virtual copy has this status when it is mounted to a host. The virtual copy exist in both InServ Storage Server and the Recovery Manager repository.
Removed	A virtual copy has this status if the option to remove the virtual copy after a NetBackup operation is selected. The virtual copy will no longer exist in InServ Storage Server, it will however still be available in the Recovery Manager repository for restore purposes.

7 Using the Recovery Manager CLI

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7.3 Running Recovery Manager as a Scheduled Job 7.33

7.1 Recovery Manager for Exchange Command Line Interface (CLI)

The Recovery Manager provides a CLI (Command Line Interface). The CLI allows users to:

- Create virtual copies
- Remove virtual copies
- Validate virtual mounted copies with eseutil.exe tool
- Reset mounting status in repository or release operation lock status
- Compare current repository list for the specified storage group with the virtual copies on InServ to detect any out-of-sync snapshots
- Mount virtual copies
- Unmount virtual copies
- Backup virtual copies to media using Veritas NetBackup
- List available backups to restore from
- Delete a backup entry from the repository (**Note:** This does not remove the backup entry from NetBackup)
- Restore backed up virtual copies using Veritas NetBackup
- Restore a storage group through filecopy from a mounted virtual copy
- Restore a storage group through volume restore from an unmounted virtual copy
- Display virtual copies currently in the repository and their status
- Set/Display maximum number of virtual copies to maintain Recovery Manager communication port

- Set/Display maximum number of virtual copies to maintain
- Set/Display Recovery Manager communication port
- Set/Display advanced configuration for backup timeout and remote copy monitoring interval.
- Set/Display remote copy history
- Gather system configuration for troubleshooting purpose

The following sections describe how to administer Recovery Manager from the command line utilities.

7.2 Recovery Manager Commands

The following commands can be run from the command line interface:

- `RMExch create`
- `RMExch remove`
- `RMExch validate`
- `RMExch reset`
- `RMExch analyze`
- `RMExch backup`
- `RMExch listbackup`
- `RMExch deletebackup`
- `RMExch restore`
- `RMExch display`
- `RMExch mount`
- `RMExch unmount`
- `RMExch policy`
- `RMExch portconfig`
- `RMExch repository`

- `RMExch config`
- `RMExch rcstatus`
- `RMExch report`

COMMAND

`RMExch create`

SYNTAX

```
RMExch create -s <ExchangeServer> -g <StorageGroup> [-nc [-truncate]]
[-rc <TargetServer> [-defer]]
```

Exchange 2007 only

`[-lcr]`

DESCRIPTION

The RMExch create command creates a virtual copy of a storage group on the primary host, where the Exchange instance is running. As part of virtual copy create process, virtual copy will be exposed to the backup host for data integrity checking as default options. Once virtual copy validated successfully, the Exchange transaction log will be truncated as default setting.

- This command only supports online backup of an entire storage group; therefore, you must make sure the storage group is online before continuing with the virtual copy creation.

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - Exchange server for which storage group belongs. This parameter is case sensitive.
- `-g <StorageGroup>` - The storage group to shadow copy. This parameter is case sensitive.
- `-nc` - Optional - Skip the integrity check. Not recommended.
- `-truncate` - Optional - Force truncation of log upon successful VC creation when -nc is used.
- `-rc <TargetServer>` - Optional - Indicates the virtual copy creation is for remote copy. Specify target server to create virtual copy once remote copy completes.
- `-defer` - Optional - Defer the log truncation decision after the remote copy completes.

Exchange 2007 only

- -lcr - Optional - Take the snapshot from the local continuous replication copy



NOTE: Use quotes ("") for names that include spaces.

EXAMPLES

The following command will create a snapshot for the storage group sg2 on exchange server bottlenosed.

```
RMExch create -s bottlenosed -g sg2
```

Exchange 2007 only

The following command will create a snapshot for the storage group sg2 on exchange server bottlenosed off the locally replicated copy.

```
RMExch create -s bottlenosed -g sg2 -lcr
```



NOTE: The target server to create snapshots upon the completion of remote copy process has to have the same version of Recovery Manager Backup Server component installed. Refer to Remote Copy Integration for more information on the Remote Copy setup.



NOTE: It is the user's responsibility to perform data integrity checking and transaction log truncation to the virtual copy created with the "-nc" option. Skipping data integrity checking is not recommend.



NOTE: VSS will wait for up to 10 seconds for the writers to freeze I/O, and this interval is not configurable. In most cases 10 seconds is a sufficient window to successfully create a virtual copy. However, in some circumstances under very heavy load, 10 seconds may not be enough and the virtual copy will fail on this attempt, which is "by design". VSS does not automatically retry the shadow copy creation, users must retry the virtual copy creation using the Recovery Manager GUI or the command line.



NOTE: During virtual copy creation, Recovery Manager dismounts and unmasks the virtual copy device from the Windows server, and breaks the virtual copy away from VSS control. During this process a "delayed write error" message may show up, or the message "the system failed to flush data to the transaction log" may appear in the System Event Log. This is normal.

COMMAND

`RMExch remove`

SYNTAX

```
RMExch remove -s <ExchangeServer> -g <StorageGroup>
-t <Timestamp>
```

DESCRIPTION

The `RMExch remove` command removes the virtual copy from the InServ Storage Server and the repository. The virtual copy must have an "Available" status; if the virtual copy is mounted it will not be removed.

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server to which the storage group belongs.
- `-g <StorageGroup>` - The name of the storage group to which the virtual copy timestamp belongs.
- `–t <Timestamp>` - The timestamp of the virtual copy to remove.



NOTE: Use quotes (" ") for names that include spaces.

EXAMPLE

The following command will remove the virtual copy with timestamp 020405162103.

```
RMExch remove -s bottlenosed -g sg2 -t 020405162103
```

COMMAND

`RMExch validate`

SYNTAX

```
RMExch validate -s <ExchangeServer> -g <StorageGroup>
-t <Timestamp>
```

DESCRIPTION

The `RMExch validate` command verifies the exchange database files in the specified virtual copy that is already mounted on the system.

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.
- `-g <StorageGroup>` - The name of the storage group for which the virtual copy timestamp belongs.
- `–t <Timestamp>` - The already mounted timestamp for validation.



NOTE: Use quotes ("") for names that include spaces.



WARNING: If the validation operation failed on the virtual copy, the failed virtual copy cannot be used for backup and restoration purposes. It is the user's responsibility to manually remove the failed virtual copy.

EXAMPLE

The following command validates the specified exchange database.

`RMExch validate -s bottlenosed -g sg2 -t 020405162103`

COMMAND

`RMExch reset`

SYNTAX

To reset the Recovery Manager locking on remote Windows host:

```
RMExch reset <-s exchange server> <-g storage group> <-opt lock>
```

To reset the mount status of a particular timestamp record:

```
RMExch reset <-s exchange server> <-g storage group>
<-t timestamp> <-opt status>
```

DESCRIPTION

The `RMExch reset` command resets a virtual copy mounting status in the repository record and internal process locking status on any designated Recovery Manager for Exchange installed system with only the "status" option being supported. Executing this command with 'status' option will force the removal of currently exposed VLUNs and set the mounting status to "Available".

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.
- `-g <StorageGroup>` - The name of the storage group for which the virtual copy timestamp belongs.
- `–t <Timestamp>` - Optional - The timestamp of the virtual copy. Requires <-opt status> option.
- `-opt <Option>` - Specifies whether to reset the locking or mounting status. Currently supported options are 'lock' and 'status'. The 'lock' option is only used to unlock Recovery Manager from previous VC creation failure caused by unexpected termination.



NOTE: Reset status of a specific timestamp will force the removal of currently exposed VLUNs.



NOTE: Use quotes ("") for names that include spaces.



NOTE: When Recovery Manager is processing user requests, it will activate an internal locking mechanism. Any incoming request will get "Server <ServerName> has a Recovery Manager command running already" message. Please wait until it finishes before continuing. However, in the case of unexpected termination, the locking status might not get deactivated properly. You need to use this command to release the lock for the operation to go back to normal status.

EXAMPLES

The following commands will reset the existing mount status to available.

```
RMExch reset -s bottlenosed -g sg2 -t 050106113456 -opt status

RMExch reset -s bottlenosed -g "First storage group" -t 050106113456 -opt
status
```

COMMAND

`RMExch analyze`

SYNTAX

```
RMExch analyze -s <ExchangeServer> -g <StorageGroup>
```

DESCRIPTION

The `RMExch analyze` command analyzes existing repository and lists any out-of-sync information.

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.
- `-g <StorageGroup>` - The name of the storage group for which the virtual copy timestamp belongs.



NOTE: Use quotes ("") for names that include spaces.

EXAMPLES

The following commands will analyze existing repository and output any out-of-sync information.

```
RMExch analyze -s bottlenosed -g sg2
RMExch analyze -s bottlenosed -g "First storage group"
```

COMMAND

`RMExch backup`

SYNTAX

```
RMExch backup -s <ExchangeServer> -g <storagegroup>
[-t <Timestamp>] -p <policyName> [-remove]
-d <fullScheduleName> -m <masterServer>
```

DESCRIPTION

The `RMExch backup` command backs up a virtual copy to media, or creates a virtual copy and backs up to media (also known as a quick backup). For the latter case, no timestamp is needed.

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.
- `-g <Storage_group>` - The name of the storage group for which the timestamp belongs.
- `–t <Timestamp>` - This is optional. The timestamp of the virtual copy to backup. Use if the virtual copy has already been created. Do not use to create a virtual copy and then perform a backup.
- `–p <policyName>` - Name of the NBU policy set up for virtual copy DBA.
- `-remove` - This is optional and used with quick backups. Specify this option to remove the virtual copy after a quick backup. By default the virtual copy will be retained.
- `–d <fullScheduleName>` - Name of NBU full schedule set up for virtual copy DBA.
- `–m <masterServer>` - Name of the NBU master server.
- `-defer` - This is optional. To defer the Exchange log truncation after the successful backup is confirmed in automatic creation.



NOTE: Use quotes (" ") where spaces are included.



NOTE: Veritas NetBackup software is case sensitive. Make sure all information entered pertaining to the policy is supplied with the proper case.



NOTE: Make sure Veritas NetBackup software's bin directory is in the system search path for this command to run.

EXAMPLE

The following command will perform a backup of virtual copy 020405162103 whose data has currently been mounted.

```
RMExch backup -s bottlenosed -g sg2 -t 020405162103 -p test -d full -m
bottlenosed
```

COMMAND

`RMExch listbackup`

SYNTAX

```
RMExch listbackup -s <ExchangeServer>
```

DESCRIPTION

The `RMExch listbackup` command prints a list of the backups that have been created by RMExch backup.

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.

EXAMPLE

The following command will list the backups performed through Recovery Manager for host bottlenosed.

```
RMExch listbackup -s bottlenosed
```

COMMAND

`RMExch deletebackup`

SYNTAX

```
RMExch deletebackup -s <ExchangeServer>
-g <storagegroup> -t <backuptimestamp>
```

DESCRIPTION

The `RMExch deletebackup` command removes a backup entry in the backup repository. It will not communicate to Netbackup to delete the actual backup.

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.
- `-g <StorageGroup>` - The name of the storage group of the virtual copy that was backed up to belongs.
- `-t <BackupTimestamp>` - The timestamp of the virtual copy that was backed up.



NOTE: Use quotes ("") where spaces are included.

EXAMPLE

The following command will delete a backup with the timestamp 020405162103

```
RMExch deletebackup -s bottlenosed -g sg2 -t 020405162103
```

COMMAND

```
RMExch restore
```

SYNTAX

For MEDIA RESTORES

```
RMExch restore -s <ExchangeServer> -g <storagegroup> -t <Timestamp> -p
<policyName> -m <masterServer> [-a <altLocation>] [-src
<OrignalClientWithBackups>]
```

For FILECOPY and VOLUME RESTORES

```
RMExch restore -s <ExchangeServer> -g <storagegroup> -t <Timestamp> <-filecopy
| -promote>
```

DESCRIPTION

The RMExch restore command can perform one of three functions. It can restore a previously backed up virtual copy from media, perform a filecopy restore from a mounted virtual copy, or perform a volume restore from an unmounted virtual copy.

Media backups can be restored to their original location (the volume(s) or directory locations of the virtual copies that were backed up. Note: not original exchange data locations, or an alternate location can be specified.

Filecopy restores will copy the virtual copy's files to the original database location and overwrite the current database files. The virtual copy to be restored from must be mounted to the production server hosting the storage group. See Chapter 8 *Recovery Procedures* on page 8.4.

Volume promote restores will overwrite all data on the original database volume. This will overwrite ALL data on the original volume and should only be performed with this understanding. See Chapter 8 *Recovery Procedures* on page 8.4.



WARNING: Please DO NOT perform a volume promote restore if multiple storage groups share any volumes. This includes all data files .LOG, .EDB, .CHK (and .STM for Exchange 2003). If you are not sure how or if your storage groups share volumes, please execute the script "chk_multi_storage.cmd" by default installed at "Program Files/3Par/vcdba/Exchange/bin/" to determine how any storage groups may be sharing volumes.

PARAMETERS

For MEDIA RESTORES

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.
- `-g <storagegroup>` - The name of the storage group for which the timestamp belongs.
- `-t <Timestamp>` - The timestamp of the virtual copy to restore.
- `-p <policyName>` - Name of the NBU policy set up for Recovery Manager.
- `-m <masterServer>` - Name of the NBU master server.
- `-a <altLocation>` - This is optional. Alternate restore location.
- `-src <OrignalClientWithBackups>` - This is optional. Specifies the client name to use for finding backups or archives from which to restore files. The default is the current client name.



NOTE: Use quotes ("") where spaces are included.



NOTE: If the restore is directed to the original location, ensure the original location is still valid.



NOTE: Veritas NetBackup software is case sensitive. Make sure all information entered pertaining to the policy is with the exact case.



NOTE: Make sure the Veritas NetBackup software's bin directory is in the system search path for this command to run.

EXAMPLE

The following command will perform a restore of a virtual copy with the timestamp 020405162103 to drive J:\.

```
RMExch restore -s bottlenosed -g sg2 -t 020405162103 -p test -m bottlenosed -a
J:\
```

PARAMETERS

For FILECOPY and VOLUME RESTORES

The following options are supported:

`-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.

`-g <storagegroup>` - The name of the storage group for which the timestamp belongs.

`-t <Timestamp>` - The timestamp of the virtual copy to restore.

`<-filecopy | -promote>` - Specify whether you'd like to perform a filecopy restore or a volume promote restore.



NOTE: Use quotes (" ") where spaces are included.

EXAMPLES

The following command will perform a restore of a virtual copy with the timestamp020405162103 to original database location:

```
RMExch restore -s bottlenosed -g sg2 -t 020405162103 -filecopy
```

The following command will perform a volume restore of an unmounted virtual copy with the timestamp 020405162103 to the original database volumes:

```
RMExch restore -s bottlenosed -g sg2 -t 020405162103 -promote
```

COMMAND

`RMExch display`

SYNTAX

```
RMExch display <-s Exchangeserver> <-g storagegroup> [-h WindowsHost]
[-xml SaveToXMLFile]
```

DESCRIPTION

The `RMExch display` command displays all virtual copies in the repository.

PARAMETERS

The following options are supported:

`-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs. If this is not given then the machine name will be used.

`-g <StorageGroup>` - The name of the storage group for which to retrieve virtual copy information for.

`-h <WindowsHost>` - This is optional. Specifies a Recovery Manager installed Windows host to query repository information.

`-xml <XMLFilePath>` - This is optional. Saves output to the specified XML file path. The full path is required.



NOTE: Use quotes ("") where spaces are included.



NOTE: If a storage group name is given, the Exchange Server name must also be provided. If both the Exchange Server and storage group names are not given, then the Exchange Server defaults to the machine name.

EXAMPLES

The following commands will display the virtual copies for Exchange server Alpha and storage group Zeta.

```
RMExch display -s Alpha -g Zeta
```

```
RMExch display -s Alpha -g Zeta -xml "c:\My Output.xml"
```

COMMAND

`RMExch mount`

SYNTAX

```
RMExch mount -s <ExchangeServer> -g <StorageGroup> -t <Timestamp> <-h
<Hostname> [-mp MountPoint]> | <-expose InServHost>
```

DESCRIPTION

The `RMExch mount` command mounts a virtual copy created by the `RMExch create` command. When performing a `RMExch mount` to mount a virtual copy, the program will check to see if the virtual copy is already mounted to a host machine. The virtual copy must have an "Available" status, before it can be mounted

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.
- `-g <StorageGroup>` - The name of the storage group for which the virtual copy timestamp belongs.
- `-t <Timestamp>` - The timestamp of the virtual copy to mount.
- `-h <host>` - Windows host name to mount the virtual copy. The target host must have recovery manager installed.
- `-expose <InServHost>` - This is required if the -h option is not used. Specify this argument to expose virtual copy to the volume manager of the target system without assigning a mount point. This cannot be used in conjunction with the `-h` argument. The target host does not need to have Recovery Manager installed.
- `-mp "mountpoint"` Optional - Quotation enclosed mount point, if you prefer to mount the volume(s) elsewhere besides default directory. Full path is required. Default is to mount to '<System Drive>:\3parsnapshot'.



NOTE: : Use quotes (" ") where spaces are included.



NOTE: The <InServHost> is the host name defined in the InServ Storage system. Available host name defined in InServ Storage system can be listed by executing the Inform CLI `showhost` command.



NOTE: The `-expose` host name is case-sensitive and must be the same as how it is defined on the InServ storage server.

EXAMPLES

The following command will mount the virtual copy 020405162103 to the directory d:\Rmmount.

```
RMExch mount -s bottlenosed -g sg2 -t 020405162103 -h bottlenosed -mp
"d:\RMmount"
```

COMMAND

`RMExch unmount`

SYNTAX

```
RMExch unmount -s <ExchangeServer> -g <StorageGroup> -t <Timestamp> -h
<hostname>
```

DESCRIPTION

The `RMExch unmount` command unmounts a currently mounted virtual copy. When performing `RMExch mount` to mount a virtual copy, the program will check to see if the virtual copy is mounted to a host machine. The virtual copy must have a status of "Mounted" or "Exposed" before it can be unmounted.

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the exchange server for which the storage group belongs.
- `-g <StorageGroup>` - The name of the storage group for which the virtual copy timestamp belongs.
- `-t <Timestamp>` - The timestamp of the virtual copy to unmount.
- `-h <hostname>` - The windows hostname to unmount the virtual copy from. Host has to have Recovery Manager installed.



NOTE: Unmount the exposed volume, specify the local Windows host name in -h option.



NOTE: Use quotes (" ") where spaces are included.

EXAMPLES

The following command will unmount the virtual copy 020405162103.

```
RMExch unmount -s bottlenosed -g sg2 -t 020405162103 -h bottlenosed
```

COMMAND

`RMExch policy`

SYNTAX

```
RMExch policy -s <ExchangeServer> -g <StorageGroup> [-i <MaxVCAllowed>
[-r]]
```

DESCRIPTION

The `RMExch policy` command will display or update the policy for the specified Exchange server. When only the `-s` argument is supplied, this command will list the current policy for the specified Exchange server. When `-i` is supplied, the policy will be updated to the argument followed by `-i`. If the optional `-r` argument is supplied, Recovery Manager will not automatically remove the oldest virtual copy if the maximum number is exceeded. If it is not supplied, Recovery Manager will automatically remove the oldest virtual copy when the maximum number is exceeded. The maximum value allowed for policy setting is 512.

PARAMETERS

The following options are supported:

- `-s <ExchangeServer>` - The name of the Exchange server to display/update the policy configuration.
- `-g <StorageGroup>` - The name of the storage group.
- `-i <MaxVCAllowed>` - This is optional. Set the maximum number of virtual copies allowed for every storage group under the specified server.
- `-r` - This is optional. If specified, Recovery Manager will not create additional virtual copies once the maximum number of virtual copies has been created. To unset this option, set the policy without this option.



NOTE: Use quotes (" ") where spaces are included.

EXAMPLES

The following command will display current number of virtual copies allowed for any storage group under the specified server.

```
RMExch policy -s bottlenosed -g storageGroup
```

The following command will change the maximum virtual copies allowed for any storage group under bottlenosed to 10 with retention of the oldest virtual copy.

```
RMExch policy -s bottlenosed -g "first storage group" -i 10 -r
```

COMMAND

`RMExch portconfig`

SYNTAX

```
RMExch portconfig -h <WindowsServer> [-p <portnumber>]
```

DESCRIPTION

The `RMExch portconfig` command will display or update the current port configuration for the Recovery Manager service and RMExch CLI for the specified windows server. When only the -h argument is supplied, this command will list the current port number used by Recovery Manager for the Windows server. When -p is supplied, the port will be updated to the argument followed by -p. The default port used by Recovery Manager is 9933. This should be run against all of the production servers and backup servers. If you update the port setting on a windows server, you will need to restart the Recovery Manager for Exchange Agent Service before connecting through that port.

PARAMETERS

The following options are supported:

- `-h <WindowsServer>` - The name of the windows server to display/update the port configuration.
- `-p <portnumber>` - This is optional. If specified, the command will update the port used. If unspecified, the command will show the current configuration.

EXAMPLES

The following command will display the current port configuration for server Alpha.

```
RMExch portconfig -h Alpha
```

The following command will update the port configuration for server Alpha to 9950.

```
RMExch portconfig -h Alpha -p 9950
```

COMMAND

`RMExch repository`

SYNTAX

```
RMExch repository [-a <newRepositoryLocation>]
```

DESCRIPTION

The `RMExch repository` command will display or move the current repository locations for Recovery Manager. If no arguments are specified, then the current location is displayed. If `-a` is specified along with a directory, then the repository will be moved to the new location.

PARAMETERS

The following options are supported:

- `-a <newRepositorylocation>` - The target directory to move the repository to.

EXAMPLE

The following command will change the repository location to "e:\3PAR Storage"

```
RMExch repository -a "e:\3PAR Storage"
```

COMMAND

`RMExch config`

SYNTAX

To change/query the timeout value for NetBackup initialization process detection:

```
RMExch config -h <WindowsHost> -bktmout [-min Minutes]
```

To change/query the monitoring interval for remote copy progress on target server:

```
RMExch config -h <WindowsHost> -rcintvl [-min Minutes]
```

DESCRIPTION

The `RMExch config` command will display or change the timeout value for NetBackup initialization process detection for backup operation and the monitoring interval for remote copy progress on target server.

PARAMETERS

The following options are supported:

`-h <WindowsHost>` - Specify the Recovery Manager installed Windows host to change or query settings.

`-bktmout` - Setup or inquiry for Backup process timeout value to confirm that NetBackup has received the backup request. Default is 5 minutes.

`-min` Minutes Optional - Number of minutes.

`-rcintvl` - Setup or inquery for remote copy process monitoring interval. Default is 3 minutes.

EXAMPLE

The following command will change remote copy monitoring interval to 10 minutes.

```
RMExch config -h Grampus -rcintvl -min 10
```

COMMAND

`RMExch rcstatus`

SYNTAX

```
RMExch rcstatus -s <ExchangeServer> -g <StorageGroup> <[-query]|[<-
update> [-t <timestamp> -ts <RecordKeeper> -status <RCStatus>]]>
```

DESCRIPTION

The `RMExch rcstatus` command will display or update status of the remote copy operation history.

PARAMETERS

The following options are supported:

`-s <ExchangeServer>` - Exchange server for which storage group belongs.

`-g <StorageGroup>` - The storage group of the virtual copy.

`-update` - Update the status of RC history for a specific timestamp.

`-query` - Query RC history for specified storage group.

`-t <Timestamp>` - The timestamp of the virtual copy.

`-ts <Record Keeper>` - The target host to update the RC status record.

`-status` - The status to save in record.



NOTE: The -update option without timestamp and host will update all RC records from the original target server.



NOTE: Use quotes (" ") where spaces are included.

EXAMPLES

The following command updates the status of an existing rcstatus history for the specified host.

```
RMExch rcstatus -s bottlenosed -g sg2 -t 050106113456 -ts Grampus -status
Success
```

The following command will update the existing rcstatus history in specified host by re-querying information from target server.

```
RMExch rcstatus -s bottlenosed -g "First storage group" -update -t 050106113456
-ts Grampus -status Success
```

COMMAND

`RMExch report`

SYNTAX

```
RMExch report -h <WindowsHost> -output <OutputDirectory>
```

DESCRIPTION

The `RMExch report` command will execute RMReport batch script under <InstallationPath>\Exchange\goodies folder and gather needed information on specified Windows host for troubleshooting purpose.

PARAMETERS

The following options are supported:

`-h <WindowHost>` - Specify a Recovery Manager installed Windows host to run RMREPORT utility.

`-output <OutputFolder>` - The full path folder to receive the generated report.



NOTE: Use quotes ("") where spaces are included.

EXAMPLE

The following command will collect remote information related to RM activities.

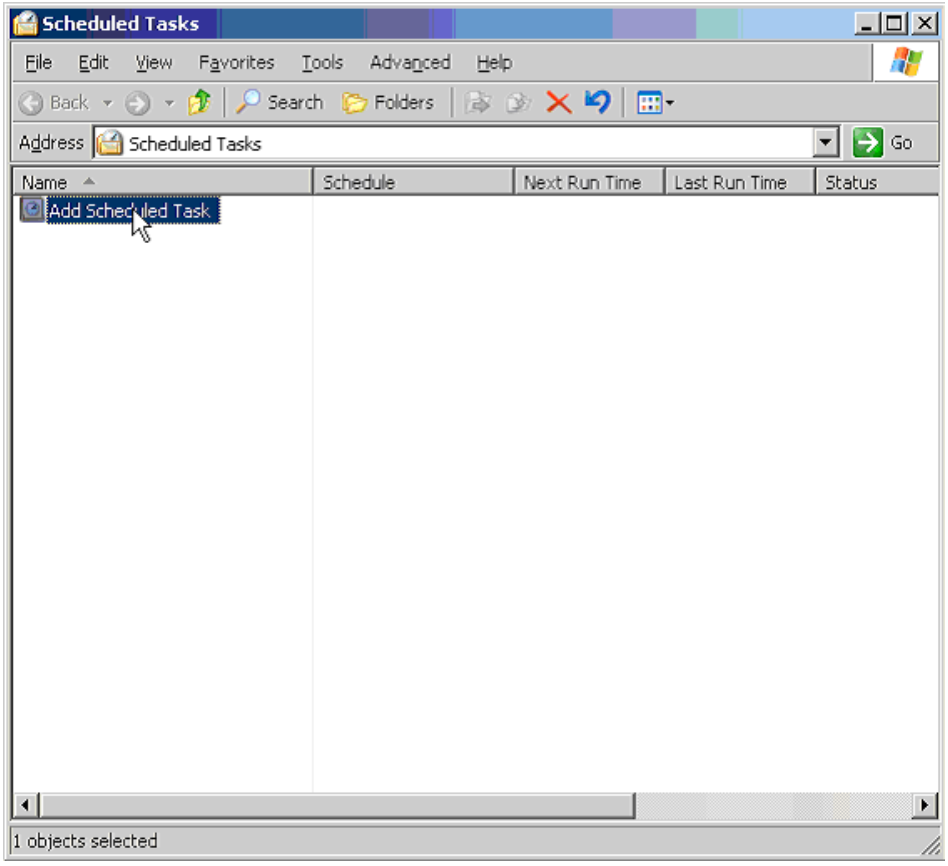
```
RMExch report -h Grampus -output c:\MyReport
```

7.3 Running Recovery Manager as a Scheduled Job

In addition to creating virtual copies using the command line, you can also schedule virtual copies to be created for a specific storage group using Windows Scheduled Tasks.

To create virtual copies using Windows Scheduled Tasks

1. Click **Start** > **Programs** > **Accessories**. The click **System Tools** > **Scheduled Tasks**.
2. Double-click **Add Scheduled Tasks**.

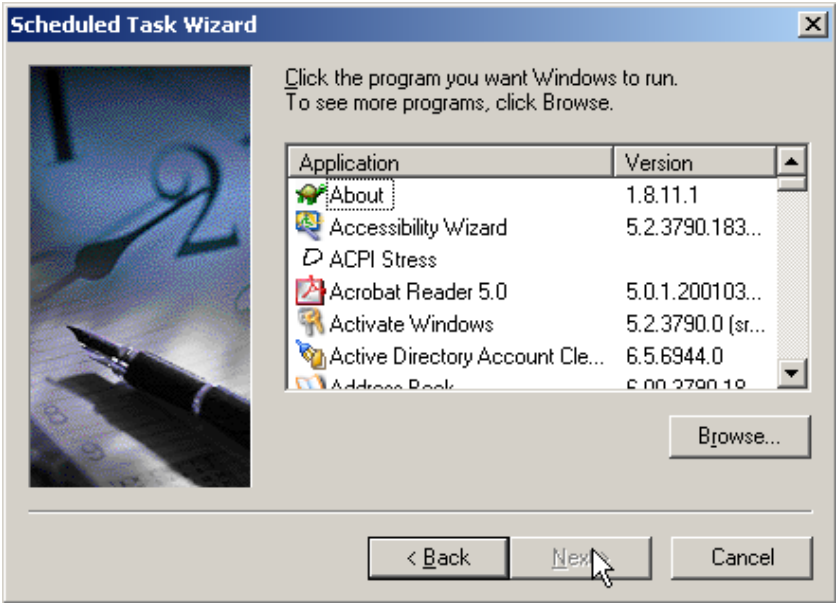


Result: The **Scheduled Task Wizard** appears.

3 Click **Next** to continue.



4 Click **Browse** and navigate to the Recovery Manager install location. The default location is `C:\Program Files\3PAR\VCDBA\Exchange\bin`

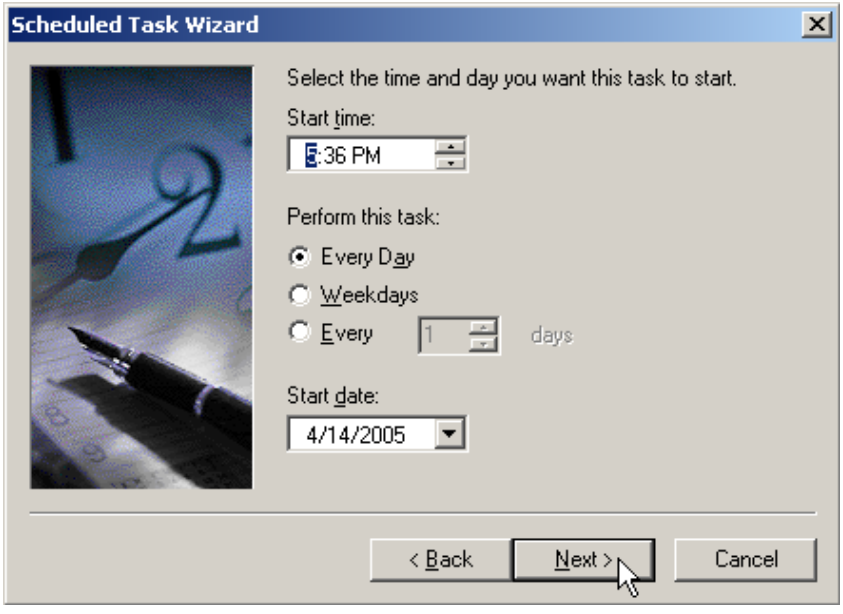


5 Click **RMExch.bat**.

6 Select the frequency of this task. Click **Next** to continue.



7 Select time and date that this task will start and click **Next**.



8 Enter the user name, password, and password confirmation, and then click **Next**.



NOTE: Since the command `RMExch create` communicates with Exchange via the file `CDOEXM.dll`, access privilege should be granted to a user such as Exchange administrator.

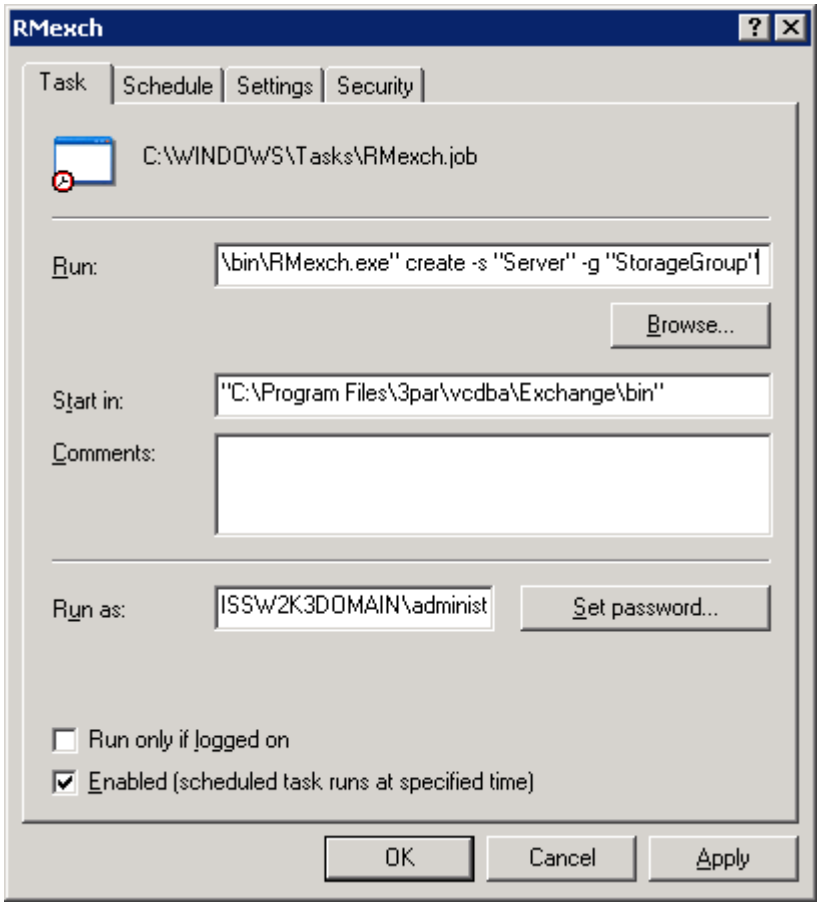
9 Select the **Open advanced properties...** checkbox and click **Finish** to access advanced setup for the scheduled task.



10 On the **Task** tab, at the end of the path displayed in the **Run** field, add `-s` <exchange server name> `-g` <*storage group name*>. If the storage group name has spaces, use double-quotes "`text`" around the name.

For example:

```
From -> C:\Program Files\3par\vcdba\Exchange\bin\
Type -> RMExch create -s MyExchangeServ -g "First storage group"
```



11 On the **Schedule** tab, further refine the scheduled task by selecting the frequency and start time of the task. Click **Apply** and **OK** when finished.

NOTE: Alternatively, a quick backup can be scheduled with the retain option (`-r`).

- Virtual copies are created as you have scheduled. Depending on the policy set with the Recovery Manager GUI, older virtual copies on the system may automatically be removed if the number of virtual copies exceeds your specified maximum threshold (see *Setting Recovery Manager Policy Configuration* on page 6.8).

8 Rapid Backup and Recovery for Exchange

In this chapter

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8.2 Backup **8.3**

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8.4.4 Single Mailbox Recovery **8.19**

8.4.5 Using the Recovery Storage Group Feature **8.22**

8.5 Additional Documentation **8.27**

The following chapter applies to both Exchange 2003 and 2007.

8.1 Key Microsoft Exchange File Types

Before discussing backup and recovery for Microsoft Exchange, it is important to understand the elements of Exchange.

Microsoft Exchange uses five key file types for all operations:

- Log file (*.LOG). A 5 MB file in which transaction log records are stored.
- Patch file (*.PAT). Used during backup, restore, and recovery operations, it contains database pages that were split during online backup
- Checkpoint file (*.CHK). Maintains information about the location in the transaction logs that was last committed to the database.
- Database file (*.EDB). Properties data file to store all user data.
- Streaming file (*.STM). Stores native MIME content.

There are three key files within Microsoft Exchange storage groups: EDB, STM, and LOG files. LOG files are accessed in a sequential order; EDB and STM files are accessed with random I/O patterns. For optimal performance and to facilitate database management, transaction logs should be placed on a volume that performs sequential I/O in an optimal manner such as a RAID 1 volume. The `EDB` (and `STM`) files should be placed on a separate volume that is optimized for random I/O such as a RAID 5 volume. For additional information on creating volumes, see the `createvv` command in the *3PAR InForm OS CLI Administrator's Manual*.

From the performance and management point of view, a dedicated volume should be created for every log file group on each storage group and another data volume should be created for combined EDB (and STM) files for each data store on every storage group. For example, if you have two storage groups, each with a log and five mailbox stores, create two RAID 1 volumes for the logs and ten RAID 5 volumes for the EDB and STM files.

When a change is made to the Exchange database, Exchange updates the data in the memory (4K pages) and synchronously writes a record of the transaction to the log in sequential order. This record allows Exchange to re-create the transaction in the event of a failure. The database engine then writes the data to the disk in large I/O operations. Exchange supports *circular logging* to save disk space on the volume containing log files. However, circular logging makes hard recovery (restoring from backup) impossible. It is recommended that the circular logging feature be disabled. Circular logging is disabled by default from Microsoft Exchange.

8.2 Backup

An online backup of Exchange runs while the data store is mounted.
A full backup backs up the entire information store and transaction log.
It also truncates the log after the log has been backed up to reduce disk space usage.

8.3 Virtual Copies

A virtual copy is a copy of another virtual volume (EDB, LOG, or STM) created using copy-on-write techniques. Unlike a physical copy, which is a duplicate of the entire virtual volume, a virtual copy, or snapshot, only records the changes to the original virtual volume. Therefore, minimal storage space is used. This allows an earlier state of the original virtual volume to be recreated by starting with its current state and rolling back all the changes that have been made since the virtual copy was created. The system allows you to make up to 500 virtual copies of each virtual volume, assuming that sufficient storage space was allocated when the base virtual volume was created.

8.3.1 Advantages of Using Recovery Manager

Traditionally, databases are backed up to tape. Backing up to tape is a time consuming task, especially if the database is growing rapidly. Recovery Manager offers the following advantages over traditional tape backup:

- Creating virtual copies of databases using Recovery Manager requires only seconds and can be accomplished via the click of the mouse through the Recovery Manager GUI, or by even scheduling virtual copies via Windows' automatic scheduled task application. For details on using the GUI and scheduling tasks in Windows, see *Creating a Virtual Copy* on page 6.11 and *Running Recovery Manager as a Scheduled Job* on page 7.33, respectively.
- With Recovery Manager's optional policy settings, you can maintain a specified number of the latest virtual copies to stay online. These online virtual copies can then be mounted to the staging Exchange server for point-in-time recovery, thus eliminating the need to restore from tape, which can take hours.
- After the virtual copy has been mounted to the backup server, you can then perform a backup to tape of the virtual copy using Recovery Manager.
- Easy recovery through filecopy and volume promote restores.



NOTE: Backup to tape can be performed in one easy command with a quick backup. See *RMExch backup* on page 7.13.

8.4 Recovery Procedures

In many cases, the Exchange server is able to quietly recover when a server crashes and the contents of the database buffer in the memory are lost. Exchange automatically recovers when you start the information store after the failure using the checkpoint file to identify the oldest transaction not flushed to disk and then replaying log files forward. If the checkpoint file is missing, all the log files are scanned to determine if any committed transactions have not been written to the database. At the end, the database is consistent and can start normally.

Recovery Manager provides several options for database recovery, including

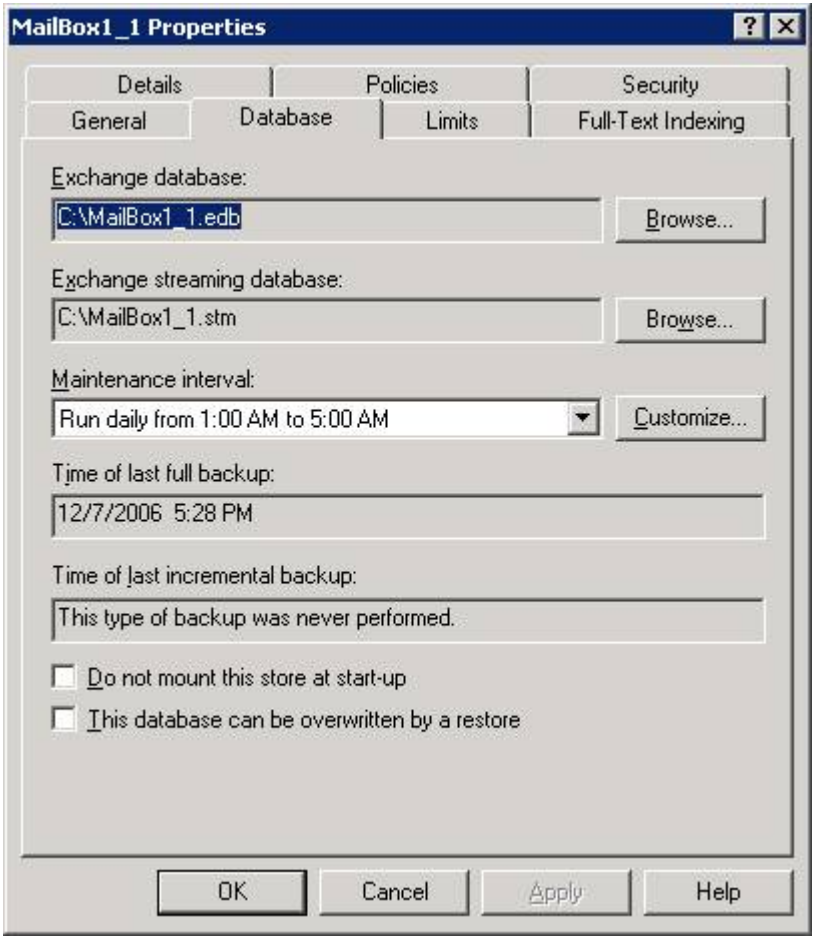
- point-in-time recovery
- point-of-failure recovery
- single mailbox recovery

8.4.1 Point-In-Time Recovery for 2003

To perform a point-in-time recovery for Exchange 2003:

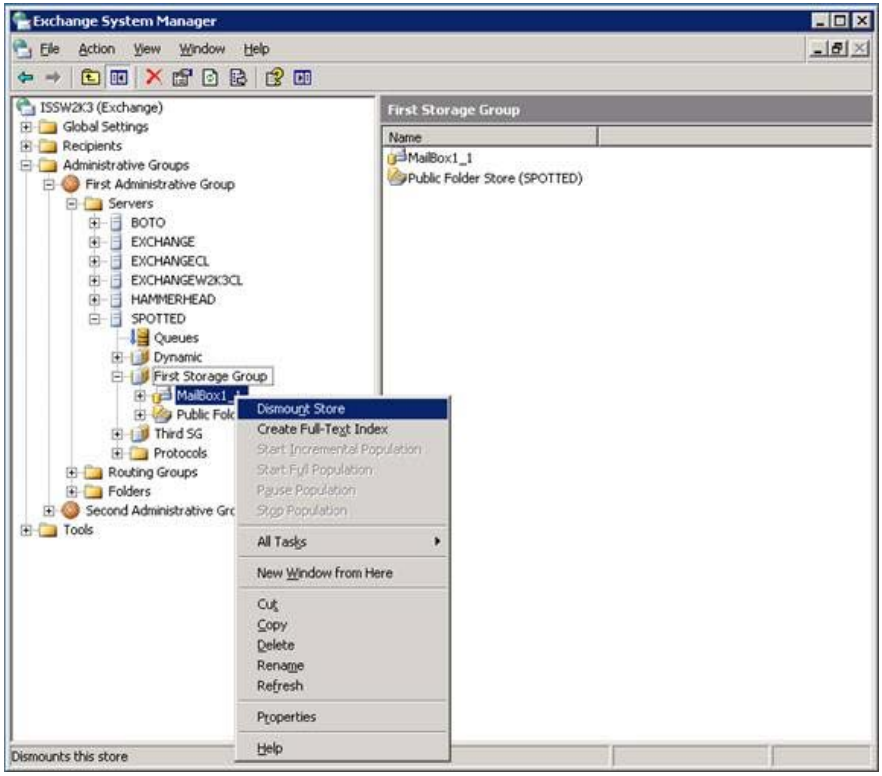
1 In the **Exchange System Manager**, right-click the desired store you want to recover and select **Properties.**

Result: The **Properties** dialog box appears.



2 Under the **Database** tab in the server's **Properties** window, check the box –"This database can be overwritten by a restore."

3 Click **OK**.



4 Dismount all the database(s) within the storage group you want to recover

5 Perform a point-in-time recovery as follows:

a To perform a **filecopy** point-in-time recovery:

- Mount the desired virtual copy to the staging Exchange server either from the Recovery Manager GUI or from the command line using the RMExch mount command. Refer to Chapter 6, Using the Recovery Manager GUI and Chapter 7, Using the Recovery Manager CLI for details on running Recovery Manager from the GUI and command line.
- Delete the original EDB, LOG, STM and CHK files for a clean restore. Please ONLY remove the files, NOT their parent/intermediate folders as the original database path and its structures must be kept the same. The files may be moved to new locations instead of completely deleted.
- From the mount-point folder of the virtual copy that you've just mounted (the default mount-point folder is C:\3parSnapshot), copy over all the .LOG, .CHK, .STM

and .EDB files to their corresponding Exchange transaction log location, system path location, streaming database location, and exchange database location.

- The database files are now successfully recovered, and Exchange database(s) can now be re-mounted to continue its operation.

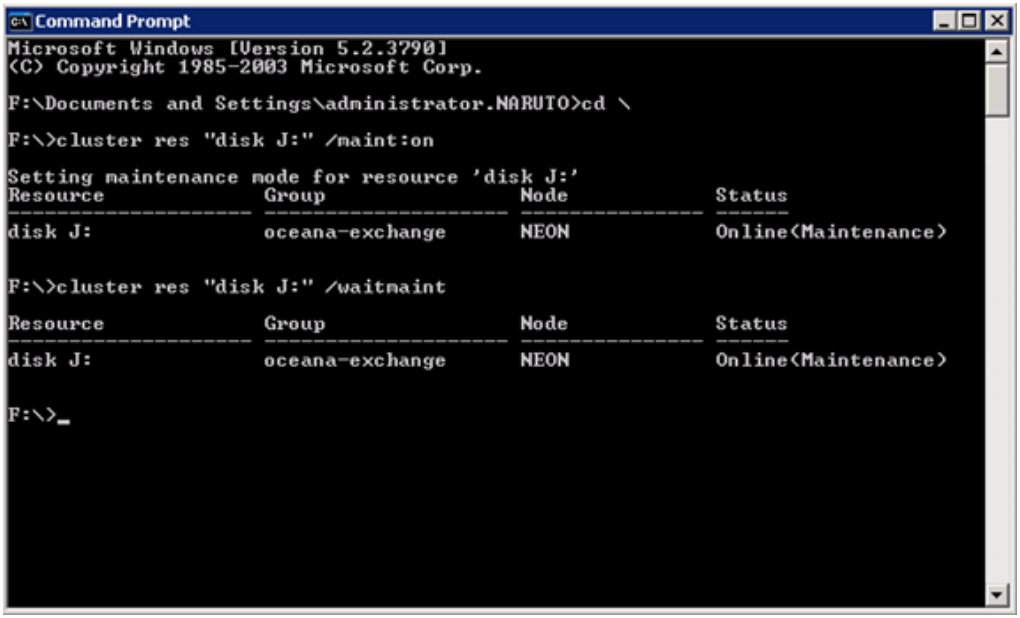
The filecopy point-in-time recover has been completed. Please skip step 6 and beyond as those are the required steps for volume restore.

b To perform a **volume promote** point-in-time recovery:

Make sure the virtual copy you would like to promote has the status "Available". If it is "Mounted", unmount it. If you are not performing this restore in a cluster, the steps involving "cluster" can be ignored.

For cluster volume promote restores, the following steps need to be performed:

6 ALL of the disk resources that the storage group uses, including the disk(s) for the storage group's EDB, LOG, STM and CHK files, need to be put in extended maintenance mode.



From the command line, issue the following command for all disks the storage group uses:

```
cluster res "resourcename" /maint:on
```

```
cluster res "resourcename" /waitmaint
```

- From "Cluster Administrator," take the Disk(s) offline.

7 From the backup server, execute the Recovery Manager command for volume promote restore. For details please refer to previous section "Using the Recovery Manager CLI" regarding information on executing the restore promote command. Alternatively, refer to section "Using the Recovery Manager GUI" regarding information on using the GUI to execute a volume restore.

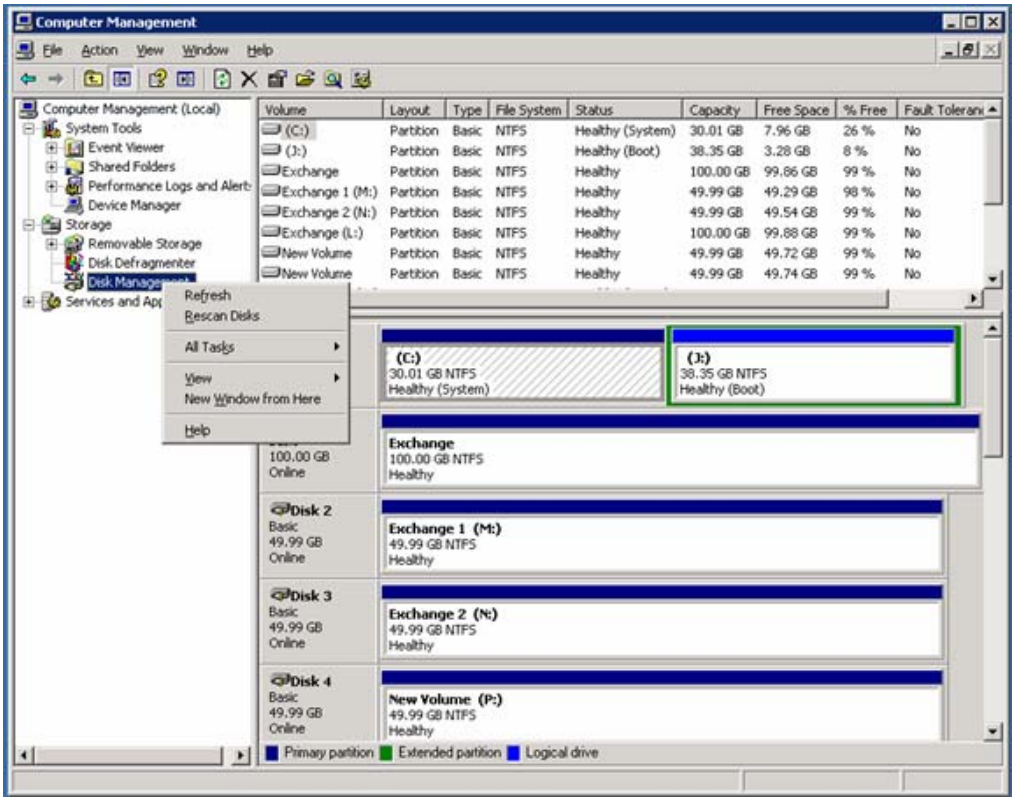


WARNING: Please DO NOT perform a volume promote restore if multiple storage groups share any volumes. This includes all data files .LOG, .EDB, .CHK (and .STM for Exchange 2003). If you are not sure how or if your storage groups share volumes, please execute the script "chk_multi_storage.cmd" by default installed at "Program Files/3Par/vcdba/Exchange/bin" to determine how any storage groups may be sharing volumes.



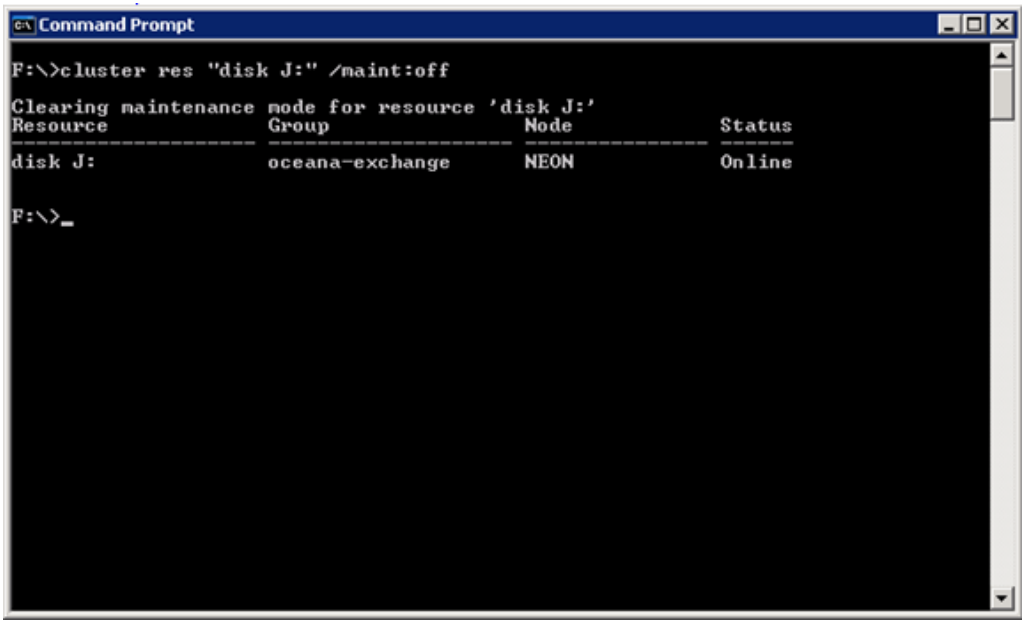
NOTE: If the volumes are Remote-Copy bound, promote restore will not work.

8 Perform a "Rescan Disks" using Disk Management.



- From "Cluster Administrator," put the Disk(s) back online.

9 For all the disk(s) previously put in maintenance mode, take ALL of them out of maintenance mode.



From the command line, issue the following command for all disks the storage group uses:

```
Cluster res "resourcename" /maint:off
```

10 Verify the EDB, LOG, CHK and STM files are correctly appearing in the original database locations.

11 Mount the databases within the storage group.

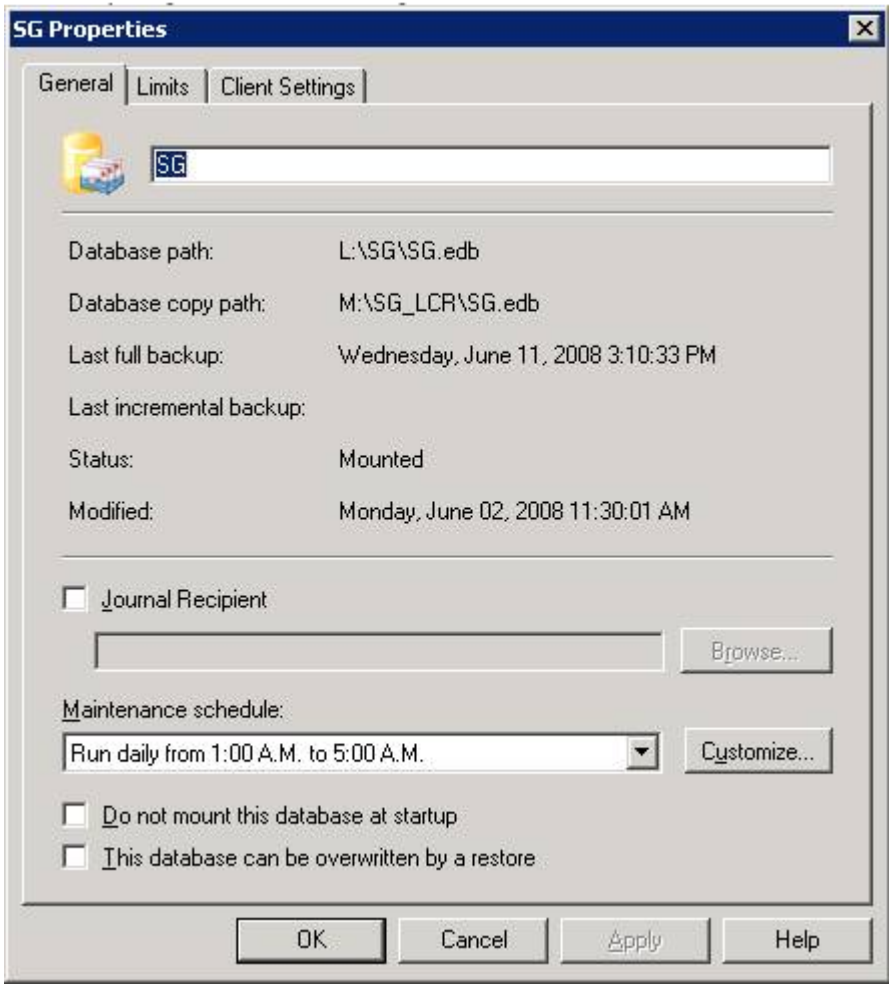
Result: The database is recovered to the point-in-time when the virtual copy was taken.

8.4.2 Point-In-Time Recovery for 2007

To perform a point-in-time recovery for Exchange 2007:

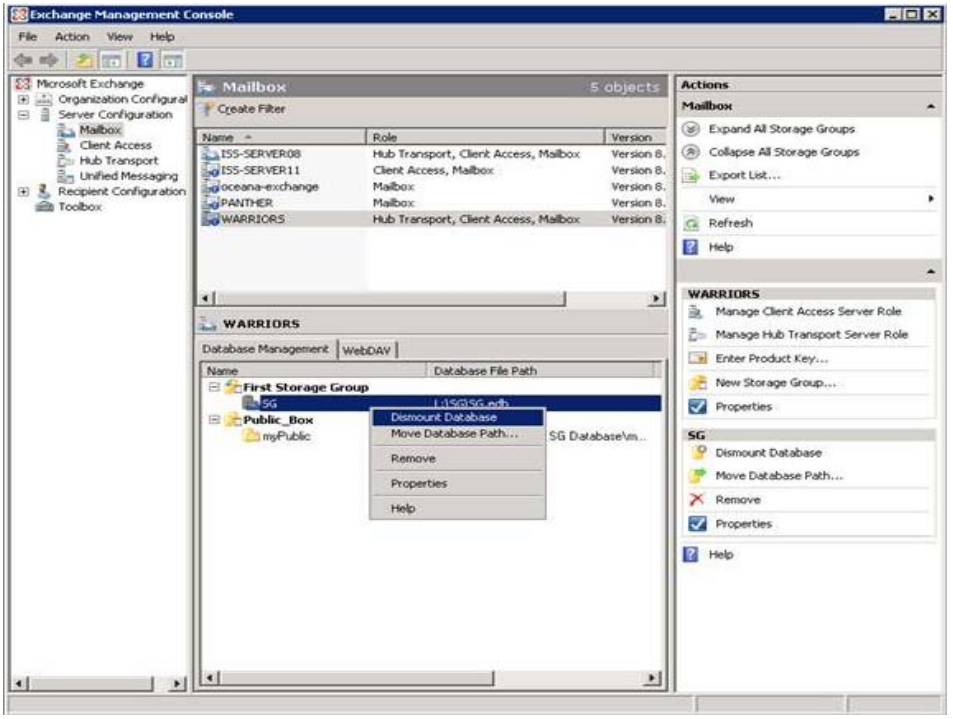
1 In the **Exchange Management Console**, right-click the desired database you want to recover and select **Properties.**

Result: The **Properties** dialog box appears.



2 Under the **General** tab in the server's **Properties** window, check the box -- "This database can be overwritten by a restore.".

3 Click **OK**.



4 Dismount all the database(s) within the storage group you want to recover

5 Perform a point-in-time recovery as follows:

a To perform a **filecopy** point-in-time recovery:

- Mount the desired virtual copy to the staging Exchange server either from the Recovery Manager GUI or from the command line using the RMExch mount command. Refer to Chapter 6, Using the Recovery Manager GUI and Chapter 7, Using the Recovery Manager CLI for details on running Recovery Manager from the GUI and command line.
- Delete the original .edb, .log, and .chk files for a clean restore. Please ONLY remove the files, NOT their parent/intermediate folders as the original database path and its structures must be kept the same. The files may be moved to new locations instead of completely removed.
- From the backup server, execute a RM filecopy restore command: rmexch restore -s "exchangeServer" -g "storageGroup" -t "timestamp" -filecopy. (Or please feel free

to trigger a filecopy restore by using the GUI; refer to Chapter 6 for detailed instructions on performing a filecopy restore.)

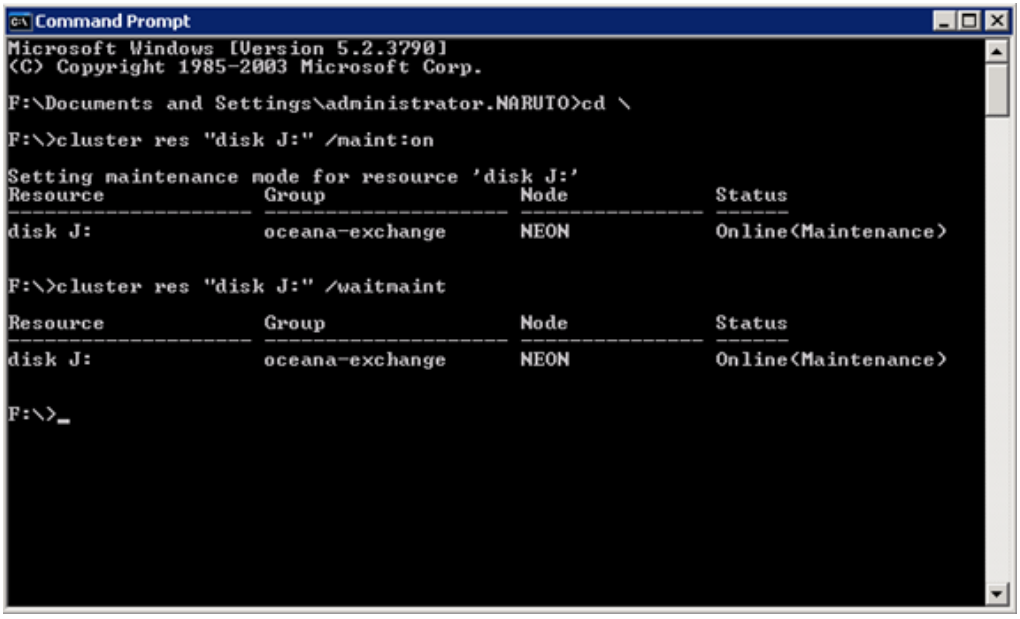
- After filecopy restore completes, the database files are successfully recovered, and database(s) can now be re-mounted to continue its operation. (Please skip step 6 and beyond as those are the required steps for volume restore.)

b. To perform a **volume promote** point-in-time recovery:

Make sure the virtual copy you would like to promote has the status "Available". If it is "Mounted", unmount it. If you are not performing this restore in a cluster, the steps involving "cluster" can be ignored.

For cluster volume promote restores, the following extra steps need to be performed:

6. All of the resources the storage group uses, including the disk(s) for the storage group's Log path, System path, and its mailbox(es)' database(s), need to be put in extended maintenance mode.

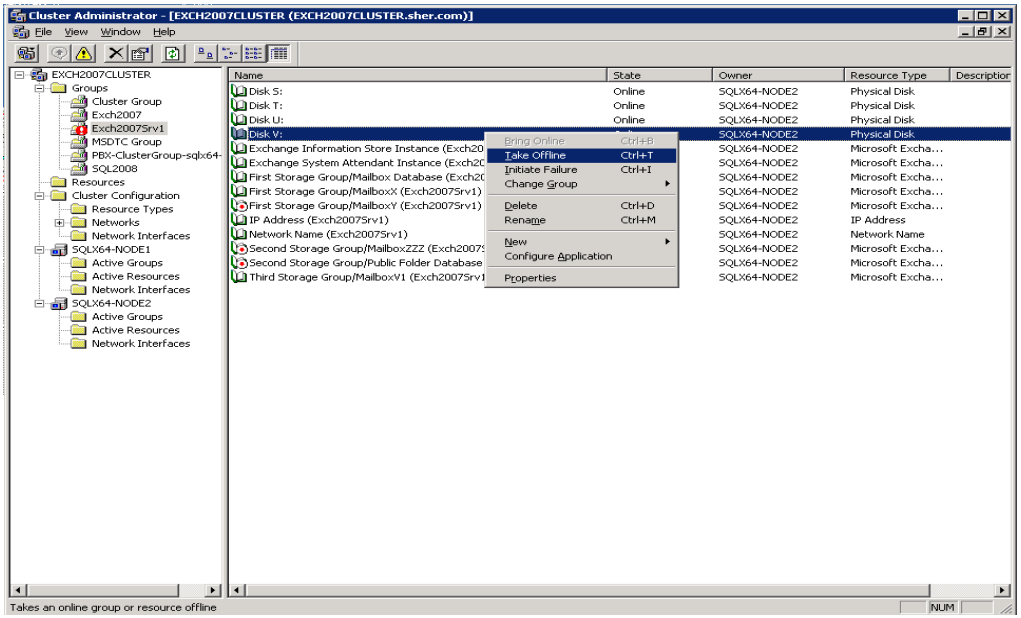


- From the command line, issue the following command for all disks the storage group uses:

```
cluster res "resourcename" /maint:on
cluster res "resourcename" /waitmaint
```

- From "Cluster Administrator," take the Disk(s) offline

.



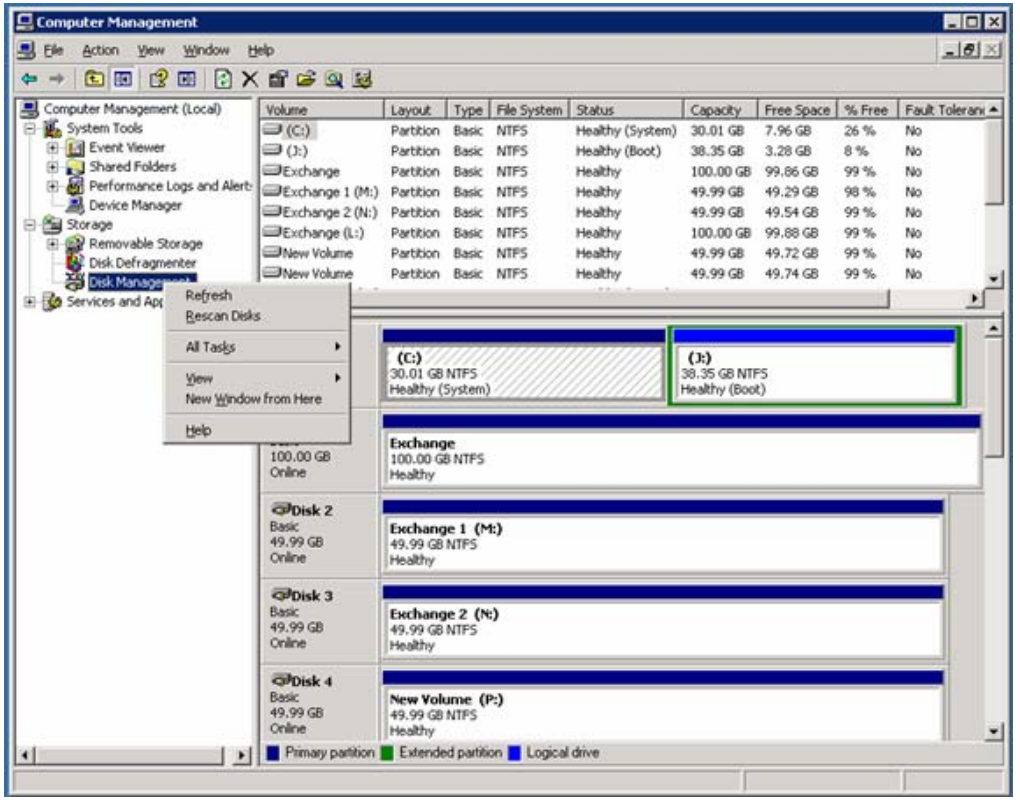
7 From the backup server, execute the Recovery Manager command for volume promote restore. For details please refer to previous section "Using the Recovery Manager CLI" regarding information on executing the restore-promote command. Alternatively, refer to the section "Using the Recovery Manager GUI" for information on using the GUI to execute a volume restore.



WARNING: Please DO NOT perform a volume promote restore if multiple storage groups share any volumes. This includes all data files .LOG, .EDB, .CHK (and .STM for Exchange 2003). If you are not sure how or if your storage groups share volumes, please execute the script "chk_multi_storage.cmd" by default installed at "Program Files/3Par/vcdba/Exchange/bin" to determine how any storage groups may be sharing volumes.

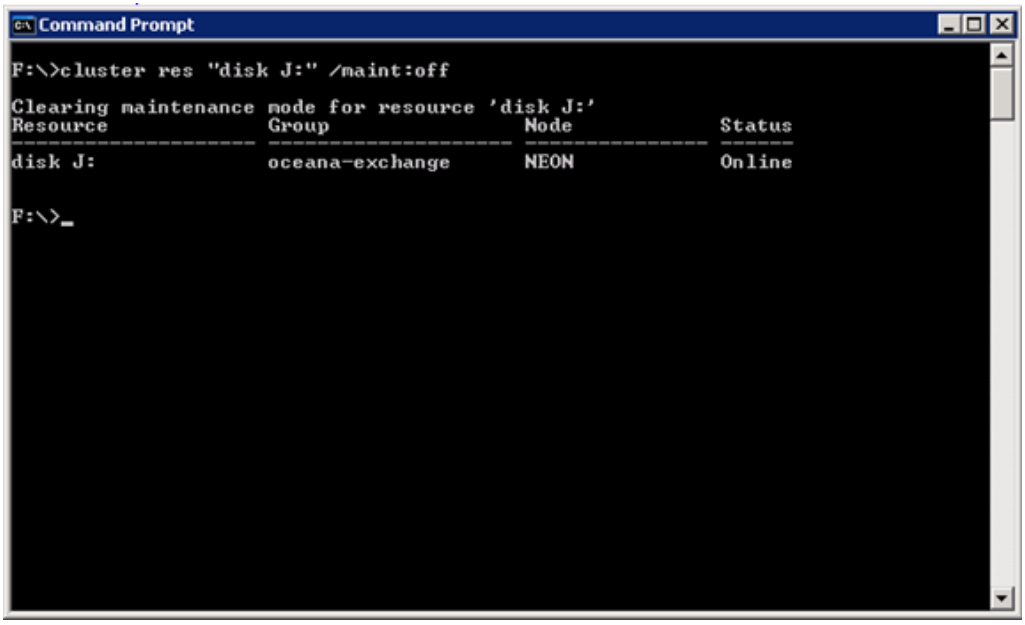
NOTE: If the volumes are Remote-Copy Bound, promote restore will not work.

8 For volume promote restores, perform a "Rescan Disks" using Disk Management.



- From "Cluster Administrator," put the Disk(s) back online.

9 For the disk(s) previously put in maintenance mode, take ALL of them out of maintenance mode.



From the command line, issue the following command for all disks the storage group uses:

```
Cluster res "resourcename" /maint:off
```

10 Verify the EDB, LOG, CHK files are correctly appearing in the original database locations.

11 Mount the databases within the storage group.

Result: The database is recovered to the point-in-time when the virtual copy was taken.

NOTE: For Exchange 2007 virtual copies created off the LCR copy, a volume promote restore is not supported.

8.4.3 Point-Of-Failure Recovery

To perform a point-of-failure recovery for **filecopy restore**:

1. Move the currently existing log files on your storage group volumes that you want to roll forward.



NOTE: If Windows won't allow you to move, or even copy, exchange .LOG files because "it is being used by another program," part of Exchange is still "live".If this is the case, move on to step 2

2. Repeat the point-in-time recovery for **filecopy restore:** steps 1 to 4.
3. Now with Exchange database(s) dismounted, preserve the current log files on your Storage group volumes if you were not able to do so from step 1.
4. Now perform the following:
   - Mount the desired virtual copy for the staging Exchange server either from the Recovery Manager GUI or from the command line using the RMExch mount command. Refer to Chapter 6, Using the Recovery Manager GUI and Chapter 7, Using the Recovery Manager CLI for details on running Recovery Manager from the GUI and command line.
   - Delete the original .EDB, .LOG, and .CHK files (delete .STM for Exchange 2003) for a clean restore. Please ONLY remove the files, NOT their parent/intermediate folders as the original database path and its structures must be kept the same. The files may be moved to new locations instead of completely removed.
   - For **Exchange 2003**, you will go to the mount-point folder of the virtual copy that you've just mounted (the default mount-point folder is C:\3ParSnapshot), copy over all the .LOG, .CHK, .STM and .EDB files to their corresponding Exchange transaction log location, system path location, streaming database location, and exchange database location.

     For **Exchange 2007**, you will go to the backup server and execute a RM filecopy restore command: rmexch restore -s "exchangeServer" -g "storageGroup" -t "timestamp" -filecopy. (Alternatively, you can trigger a filecopy restore by using the GUI; usage in Chapter 6.)
   - Copy the .LOG files that you preserved (from steps 1 or 3) and overwrite the logs recovered. This includes the extra logs not "covered" by the virtual copy, making the recovery more "forward-in-time."

- Delete the checkpoint file. (.chk)
- Now you are ready to re-mount the database(s) to continue.

Result: The Exchange server performs a soft recovery and automatically replays the log. Once the store is mounted, a confirmation is displayed.



NOTE: In some situations Exchange may display a warning message indicating one or more log(s) are out of sync. In such cases no confirmation is displayed. For Exchange 2007, usually no confirmation is displayed.

To perform a point-of-failure recovery for **volume restore**:

1. Move the currently existing log files on your storage group volumes that you want to roll forward.



NOTE: If Windows won't allow you to move, or even copy, exchange .LOG files because "it is being used by another program," part of Exchange is still "live." If this is the case, move on to step 2.

2. Repeat the point-in-time recovery for **volume restore**: steps 1 to 4.
3. Now with Exchange database(s) dismounted, preserve the current log files on your Storage group volumes if you were not able to do so from step 1.
4. Continue following the point-in time recovery for **volume restore**: start from step 5**b**, execute up to step 9.
5. After you have put all the disk(s) out of maintenance mode, perform the following:
   - Copy the .LOG files that you preserved (from steps 1 or 3) and overwrite the logs recovered. This includes the extra logs not "covered" by the virtual copy, making the recovery more "forward-in-time."
   - Delete the checkpoint file. (.chk)
   - Now you are ready to re-mount the database(s) to continue.

Result: The Exchange server performs a soft recovery and automatically replays the log. Once the store is mounted, a confirmation is displayed.



NOTE: In some situations Exchange may display a warning message indicating one or more log(s) are out of sync. In such cases no confirmation is displayed. For Exchange 2007, usually no confirmation is displayed.

8.4.4 Single Mailbox Recovery

There are several methods for single mailbox recovery with Exchange, this document will describe two methods:

1. Restore a Mailbox from Backup to a Recovery Server.
2. Use the Recovery Storage Group feature of Exchange to recover a Mailbox.

8.4.4.1 Restoring a Mailbox from a Backup to a Recovery Server

To restore a mailbox from backup, you must have a recovery server that has sufficient storage capacity to install Exchange Server and to restore the private information store database. This server can be on the same physical network as your production Exchange Server computer.

To restore a mailbox from a backup to a recovery server:

1. Take note of the following information that is on the production Exchange Server computer:

- Organization Name
- Administrative Group Name
- Storage Group Name

2. On the recovery server, install Windows Server operating system, and then create a new Active Directory forest.
3. Run Exchange Server Setup, and create a new organization that uses the same name as your existing Exchange organization.
4. Next, do one of the following,

   a. If the name of your administrative group is *First Administrative Group*, go to step 6.

   or:

b To install Exchange Server to an administrative group other than the *First Administrative Group*:

1) Run Exchange Server Setup, and then install Microsoft Exchange System Management Tools.



NOTE: At this point, do not install Microsoft Exchange Messaging and Collaboration Services. Type the name of your administrative group (the same name as the administrative group on your production server).

2) Start Exchange System Manager.

3) Right-click your organization, and then click **Properties**.

4) Click the **General** tab, click to select the **Display administrative groups** check box, and then click **OK**.

5) Quit and then restart Exchange System Manager.

6) Right-click **Administrative Groups**, point to **New**, and then click **Administrative Group**.

7) In the **Name** box, type the name of the administrative group, and then click **OK**.



NOTE: You must use the same name that you used to name the administrative group on your production Exchange Server computer.

8) Quit Exchange System Manager.

5 Run Exchange Server Setup, and install Microsoft Exchange Messaging and Collaboration Service and Microsoft Exchange System Management Tools (if the Exchange System Management Tools are not already installed on the server).

6 Configure the storage group name to use the same name as the production Exchange Server computer.

a Start Exchange System Manager.

b Expand Administrative Groups, and then expand AdministrativeGroupName.

c Expand Servers, and then expand YourServerName.



NOTE: If the name of the storage group on the production server uses a name other than First Storage Group, configure the storage group name to use the same name as the storage group on the production Exchange Server computer.

7 Dismount the database:

a Right-click on the **Mailbox Store**, and click **Dismount Store**.

b Click **Yes** when you are prompted to continue.

c Right-click on the **Mailbox Store**, and select **Properties**.

d Select the **Database** tab, and check the **This database can be overwritten by a restore** check box.

e Click **OK**.

f Quit Exchange System Manager.

8 Delete the existing database and log files that are on the recovery server.

9 Restore the database files from backup.

10 To repair the database, run the following repair utility:

```
eseutil /r E0n /d<database file directory location> /l<log file
directory> /s<system file directory>
```

n should be replaced by the storage group number, e.g. E01, E02, E03.

11 Mount the database.

a Start Exchange System Manager.

b Expand **Administrative Groups**, and then expand ***AdministrativeGroupName***.

c Expand **Servers**, expand ***YourServerName***, and then expand ***YourStorageGroupName***.

d Right-click on the **Mailbox Store**, and click **Mount Store**.

e Click **OK** when you receive the message that indicates that the store successfully mounted.

12 Create a new user in Active Directory Users and Computers. Make sure that you do not make the new user account mailbox-enabled. To create the new user:

   a Start Active Directory Users and Computers.

   b Right-click Users, point to New, and then click User.

   c Specify the user name and the user logon name in the appropriate boxes, and click Next.

   d Specify the password information for the user, and click Next.

   e Click to clear the **Create an Exchange mailbox** check box, and click **Next**.

   f Click **Finish**.

13 In Exchange System Manager, expand the **Mailbox Store**, right-click **Mailboxes**, and click **Run Cleanup Agent**.

14 Recover the mailbox.

   a Right-click the mailbox that you want to recover, and click **Reconnect**.

   b In the list of Active Directory accounts, click the user account that you created in step 12, and click **OK**.

15 Use Microsoft Outlook to export the mailbox data to a .pst file or use the Exmerge.exe tool to extract data from multiple mailboxes.

   To download Exmerge.exe, visit the following Microsoft Web site:

   http://www.microsoft.com/downloads/details.aspx?displaylang=en&familyid=429163EC-DCDF-47DC-96DA-1C12D67327D5

8.4.5 Using the Recovery Storage Group Feature

The recovery storage group is a specialized storage group in Exchange. After you restore a mailbox store to the recovery storage group, use the Exmerge.exe tool to move the recovered mailbox data from the recovery storage group to the regular storage group.

8.4.5.1 How Recovery Storage Groups Operate

In versions of Exchange Server prior to Exchange Server, a separate Microsoft Active Directory directory service forest needs to be configured on a recovery server if you want to mount another copy of a production Exchange database or to mount a different version of a production Exchange database. With the Recovery Storage Group feature in Exchange Server,

a separate recovery computer is not always needed when you want to recover data from a mailbox store. After you create a Recovery Storage Group, and one or more databases have been added to it, you can either restore online backup sets or you can copy offline database files to the Recovery Storage Group. To extract or to merge data from recovered databases in the Recovery Storage Group to a mailbox in a regular storage group, use the Exchange Server version of Microsoft Exchange Mailbox Merge Wizard (Exmerge.exe).

To use a Recovery Storage Group, the Active Directory topology of the Exchange Server computer must be intact and must be in the same state as when the copy of the database was made. This means that the mailbox or the mailboxes that you want to recover must not be deleted or purged from the system, or moved to a different database or to a different server.

The Recovery Storage Group feature is not intended for use in disaster recovery operations that involve multiple servers or multiple storage groups. It is intended as a substitute in situations where previously, an alternative forest recovery server was required. Use the Recovery Storage Group feature in recovery situations where both the following conditions are true:

- The logical information in Active Directory about the storage group and its mailboxes is intact and unchanged.
- You want to recover data from a single mailbox, a single database, or a group of databases that are in a single storage group. For example, you can use a Recovery Storage Group to recover items that were deleted and purged from a user's mailbox, or you can use a Recovery Storage Group to restore or to repair a copy of an alternative database while another copy of the database remains in production.

8.4.5.2 Creating a Recovery Storage Group in Exchange 2007

To create a Recovery Storage Group

1. Start Exchange Management Console
2. Select **Toolbox** on bottom of the left panel.
3. Double-click **Database Recovery Management** in the middle panel.
4. The **Troubleshooting Assistant** window will pop up.
5. Select **Create a recovery storage group**.
6. For the storage group or mailbox database names, select the same name as the storage group and mailbox database names you'd like to recover.

7 Select locations you'd like the recovery storage group files and mailbox database file(s) to reside.

8 Create your recovery storage group.

9 Mount the virtual copy you would like to restore from to the production server.

10 Copy the EDB, CHK, and LOG files to the locations you selected for the recovery storage group.

11 Rename all the CHK and LOG files to have the same header as the Recovery Storage Group. For example if your Recovery Storage Group has a header of R00, then rename all your E00 headers to R00.

12 Mount the Mailbox Database from the **Troubleshooting Assistant**.

13 Select **Merge or copy mailbox contents** and select the specific actions you would like to perform.

8.4.5.3 Creating a Recovery Storage Group in Exchange 2003

To create a Recovery Storage Group:

1 Start Exchange System Manager.

2 Expand **Administrative Groups** (if appropriate), expand **AdministrativeGroupName** (if appropriate), and then expand **Servers**.

3 Right-click ***ServerName***, point to **New**, and click **Recovery Storage Group**.

4 In the **Name** box, type a name for the Recovery Storage Group.

Try to use the same name that you used for the original storage group when you specify a name for the Recovery Storage Group. If you receive an error message that is similar to the one below, use a different name for the Recovery Storage Group:

The object StorageGroupName already exists. Enter a unique directory name for this object.

5 In the **Transaction log location** and in the **System path location** boxes, specify a location for the transaction log files and for the system path. Make sure that the location that you specify for the transaction log files for the Recovery Storage Group is different from the location that is specified for the transaction log for the original storage group.

6 Click **OK**.

7 Right-click on the Recovery Storage Group that you created, and click **Add Database to Server**

8 In the **Select database to recover** dialog box, click the mailbox store that you want to add to the Recovery Storage Group, and then click **OK**.

9 In the **Mailbox Store Properties** dialog box, review the properties of the mailbox store, and then click **OK**.

8.4.5.4 Restoring a Mailbox Store to the Recovery Storage Group

You can restore a mailbox store to a Recovery Storage Group by manually copying the database files to the appropriate folder on the server.



NOTE: Keep the original backup file in case there is a need to start over.

1 Verify that the database that you want to restore is consistent and that it is in a "clean shutdown" state. To do so, open a command prompt, switch to the ExchSrvr\Bin folder, type the following line, and then press **ENTER**:

```
Eseutil /mh YourDatabaseName.edb
```

In the output that appears in the Command Prompt window, note whether the **State** line shows as **State: Clean Shutdown** or **State: Dirty Shutdown**.



NOTE: The following step should have been done after the virtual copy for the storage group was created.

2 Do one of the following, as appropriate to your situation:

a If the database is consistent, go to step 3.

b If the database is not consistent and if the database log files exist, use the Eseutil.exe tool to perform a soft recovery on the database. When you perform a soft recovery, uncommitted logs are committed to the database. To perform a soft recovery, switch to the ExchSrvr\Bin folder at a command prompt, type the following line, where *rnn* is the

log file prefix and *database_folder_path* is the name of the folder where the database files (`.edb`, `.stm`) are located, and then press **ENTER**:

```
eseutil /r rnn /ddatabase_folder_path
```

For example, you might type the following:

```
eseutil /r r00 /d"c:\Program Files\Exchsrvr\Recovery Storage Group"
```



NOTE: There is no space after the `/d` switch.



NOTE: The following step should have been done after the virtual copy for the storage group was created.

3 Immediately after the successful completion of a repair, perform an offline defragmentation of the repaired database. To perform an offline defragmentation, open a command prompt, switch to the ExchSrvr\Bin folder, type the following line, and then press **ENTER**:

```
eseutil /d <YourDatabaseName.edb>
```

4 Copy the `.edb` and the `.stm` database files from the virtual copy to the appropriate folders that you specified earlier when you created the Recovery Storage Group.

5 If databases are currently mounted in the Recovery Storage Group, do the following:

a Dismount the databases.

b Use the Eseutil.exe tool to verify that the databases are in a "clean shutdown" state. To do so, open a command prompt, switch to the ExchSrvr\Bin folder, type the following line, and then press **ENTER**:

```
Eseutil /mh YourDatabaseName.edb
```

In the output that appears in the **Command Prompt** window, note whether the **State** line shows as **State: Clean Shutdown** or **State: Dirty Shutdown**. If the databases are consistent, delete all transaction log files (.log) and checkpoint files (.chk) for the Recovery Storage Group.

6 Start Exchange System Manager, and then view the properties of the database that you restored. On the **Database** tab of the **Mailbox Store Properties** dialog box, verify that the **This database can be overwritten by a restore** check box is selected.

7 Mount the database.

To merge data from the recovered databases in the Recovery Storage Group to a mailbox in a regular storage group, use the Exchange Server version of Microsoft Exchange Mailbox Merge Wizard (Exmerge.exe).

To download Exmerge.exe, visit the following Microsoft Web site: http://www.microsoft.com/downloads/details.aspx?displaylang=en&familyid=429163EC-DCDF-47DC-96DA-1C12D67327D5

8.5 Additional Documentation

Refer to "*Using Recovery Storage Groups in Exchange Server 2003*" for detailed information and procedures for recovery of a single mailbox using the Recovery Storage group feature of Exchange 2003. This document can be found here:

http://technet.microsoft.com/en-us/library/aa998782.aspx

See "*Recovery Storage Groups*" for detailed information that applies to Exchange 2007:

http://technet.microsoft.com/en-us/library/aa997260.aspx

A Server Virtualization Environments

A.1 VMWare and Egenera

Support for VMWare and Egenera environments is provided under certain specific conditions. New volumes presented to VMWare and Egenera servers are not surfaced automatically, so the `RMExch mount` command is limited to being executed on the backup host. Figure A-1 on page A.2 shows the relationships between the InServ and VMWare and Egenera in a virtualization environment:

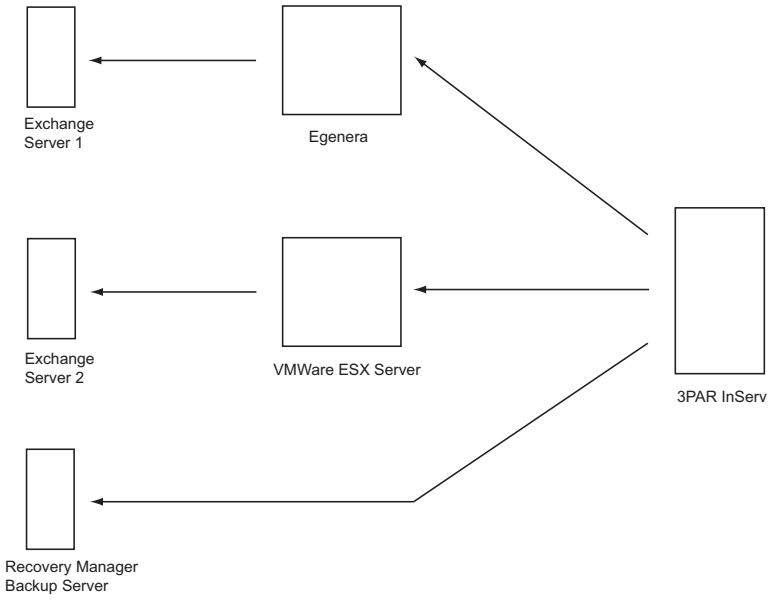


Figure A-1. Sever Virtualization Environment

The following requirements need to be met for VMWare and Egenera to be supported:

1. The disks presented to the Exchange Servers need to be raw devices.
2. The backup server needs to be connected directly to the InServ and not through VMWare or Egenera.

- The `RMExch mount` command can not be run against a VMWare or Egenera server with the `-h` option.
- The `RMExch mount` command with the `-expose` option, can be used in this case.
- If `RMExch mount` with the `-expose` option is not used, the storage administrator needs to perform the actions to expose the volumes to the server manually.

Due to these restrictions restores performed in these virtualized environments require a different set of steps than shown in section 8. Filecopy and volume promote restores are not supported for virtualized environments. Here are the steps to perform a restore:

1. Follow steps 1 to 4 in section 8.4.1. (or 8.4.2 for Exchange 2007).
2. Mount the virtual copy to the backup server or restore it from backup media to the production server.
3. On the production server, move the .edb, .log, .chk, (and .stm for Exchange 2003) files from the original locations to another location. The original locations can be determined from either the Exchange Management Console (Exchange 2007) or the Exchange System Manager (Exchange 2003).
4. Copy the .edb, .log, .chk (and .stm for Exchange 2003) file(s) from the mounted or restored virtual copy location to the actual database location.
5. Continue at step 10 in section 8.4.1 (or 8.4.2 for Exchange 2007).

B
Troubleshooting

B.1 Troubleshooting

This appendix is designed to be used like a Frequently Asked Questions section. It will help find solutions to some of the common issues that may arise when running the Recovery Manager for Exchange.

Problem:

The virtual copy creation always fails on storage group integrity checking.

Suggestion:

Make sure that the exchange management tool on all Recovery Manager for Exchange installed hosts have the same service pack installed.

Problem:

Recovery Manager is running on both backup and server production server but the Recovery Manager always fails to issue a command to the remote system.

Suggestion:

Make sure the communication port for Recovery Manager is set to be the same on all Recovery Manager installed systems. The user needs to restart Recovery Manager for Exchange Agent service on every system followed by the port change command. If the firewall or security monitoring software is installed, verify that the communication port and remote registry service ports (139 and 445) are allowed for access.

Problem:

Recovery Manager cannot locate the Exchange Server.

Suggestion:

Recovery Manager uses the Active Directory structure to locate Exchange server information within the same domain. Recovery Manager will not be able to access the Exchange information if it is not in the same domain.

Problem:

Recovery Manager cannot detect the storage group.

Suggestion:

The Recovery Manager user has to have Exchange Administrator privilege to access Exchange active directory objects.

Problem:

Virtual copy creation always fails on the storage group.

Suggestion:

There are a few things to check on your system.

1. Make sure both the data and log files of your storage group are installed on 3PAR volume.
2. Make sure your 3PAR volume is formatted as Basic Disk type.
3. Make sure you have allocated snapshot space for your 3PAR volumes.
4. Make sure your system configuration conforms to the 3PAR support matrix.

Problem:

Recovery Manager interface takes a long time to start or to bring up the server registration dialog.

Suggestion:

When Recovery Manager is started for the first time, or when the user clicks on the server registration, Recovery Manager will try to scan the entire network for available Exchange servers. Exchange object querying might cause the latency.

Problem:

Recovery Manager always fails to issue a command from the user interface and command line right after the installation.

Suggestion:

If the software is installed through a remote desktop session, the newly added environment variables will not become effective until the user logs off the session. If the software is installed directly from system console, these variables should be available immediately.

Problem:

NetBackup takes a substantial amount of time to start a backup process. However, Recovery Manager claims backup has failed.

Suggestion:

Timeout for backup initialization detection can be modified to accommodate the timing issue. Please refer the `RMExch config` command for more information.

Problem:

NetBackup takes a substantial amount of time to complete a backup process.

Suggestion:

Make sure you have the latest maintenance package installed for your NetBackup application.

Problem:

`RMExch` cannot connect to the specified server.

Suggestion:

Make sure the Recovery Manager for Exchange Agent service is started and the port settings on all Recovery Manager installed systems are the same. If you changed the port setting, remember you will need to restart the Recovery Manager for Exchange Agent service before running any command.

Problem:

`RMExch create` is not creating a virtual copy.

Suggestion:

Check to see if you have reached the number of virtual copies allowed by your policy for this Exchange server. Also check if the oldest virtual copy is mounted, as this will not allow a create if the maximum number of virtual copies has been reached.

Problem:

The mounted virtual copies always showed up as read-only.

Suggestion:

Make sure Virtual Disk Service is not disabled on your system. If this service is disabled, Recovery Manager will not be able to make the virtual copy writable.

Problem:

Recovery Manager fails to create a virtual copy for a storage group on the 3PAR volume which is also a system drive.

Suggestion:

Snapshot of a storage group on the system volume is currently not supported by Recovery Manager for Exchange.

Problem:

Recovery Manger keeps showing the "Error - VSS Asynchronous operation failed. It is recommended to wait 10 minutes and then to try the operation again" message when the `create` command is executed.

Suggestion:

When you encounter this error message, run the `vssadmin list writers` command to list out all the available writers on the system that are taking the snapshot of the Exchange storage group. Make sure the Microsoft Exchange Writer status is stable. If the status is other than stable, you need to restart the Exchange server service to reset the writer status.

Problem:

Recovery Manager keeps showing the "ERROR: Failed - Virtual Copy creation failed for storage group <StorageGroup>" message after an unexpected termination of the virtual copy create process.

Suggestion:

When Recovery Manager unexpectedly terminates, an internal locking file might still exist on your Exchange server system. You need to remove the locking file manually for the create process to run through. The locking file can be located under: <InstallationPath>\Exchange\vclock.

Problem:

The event viewer shows the "Volume Shadow Copy Service error: Unexpected error IOCTL_STORAGE_QUERY_PROPERTY(\\.\PHYSICALDRIVE2, StorageDeviceProperty) - BuildLunInfoForDrive. hr = 0x80070002." error when a Virtual Copy creation is in progress.

Suggestion:

When this message is logged by Volume Shadow Copy service, it notifies the user that the initial search on the imported volume is not complete. It will try again to make sure the snapshot can be imported successfully. If the snapshot process still fails and this error is logged, please contact 3PAR.

C
Event Messages

C.1 Description of Events

This appendix provides information for all of the events generated by 3PAR Recovery Manager 3.0.0 for Microsoft Exchange 2003/2007.

Please refer to Chapter 5, Diagnostics in the 3PAR VSS Provider for Microsoft Windows 1.5 User's Guide for details on accessing the event codes.

Table C-1. Recovery Manager for Microsoft Exchange Event Messages

Event ID	Description	Action
5101	The shadow copy contains only a subset of the volumes needed by the writer to correctly backup the application component.	None
5102	The writer ran out of memory or other system resources. The recommended way to handle this error code is to wait ten minutes and then repeat the operation, up to three times.	None

Event ID	Description	Action
5103	The writer operation failed because of a time-out between the Freeze and Thaw events.	None
5104	The writer failed due to an error that would likely not occur if the entire backup, restore, or shadow copy creation process was restarted. If the server is busy, try again when the load has gone down.	If the status for 'Microsoft Exchange Writer' is not Stable, restart Microsoft Exchange Service.
5105	The writer operation failed because of an error that might recur if another shadow copy is created.	If the status for 'Microsoft Exchange Writer' is not Stable, restart Microsoft Exchange Service.
5106	The writer is not responding.	If the status for 'Microsoft Exchange Writer' is not Stable, restart Microsoft Exchange Service.
5107	The backup components object is not initialized, this method has not been called within the correct sequence.	None
5108	The writer infrastructure is not operating properly. Check that the Event Service and VSS have been started, and check for errors associated with those services in the error log	None

Event ID	Description	Action
5109	The writer has previously called this method.	None
5110	The provider has already been registered on this computer.	None
5111	The provider is not registered.	None
5112	An unexpected provider error occurred.	Restart Volume Shadow Copy Service and 3PAR VSS Provider Service.
5113	The provider is in use.	None
5114	The specified item was not found.	None
5115	No VSS provider indicates that it supports the specified volume.	None
5116	The volume is not supported by the 3PAR Provider.	None
5117	A component with the same logical path and component name already exists.	None
5118	An unexpected provider error has occurred.	None
5119	The XML document is invalid or has become corrupted.	None
5120	The XML document is not valid-that is, either it is not a correctly formed XML string or it does not match the schema.	None

Event ID	Description	Action
5121	Error - Could not bind to the domain for Exchange Server Information.	Check Active Directory connection.
5122	The system was unable to flush I/O writes. This can be a transient problem. It is recommended to wait ten minutes and try again, up to three times.	None
5123	The system was unable to hold I/O writes. This can be a transient problem. It is recommended to wait ten minutes and try again, up to three times.	None
5125	An unexpected error occurred during communication with the writer.	None
5126	The creation of a shadow copy is in progress, and only one shadow copy creation operation can be in progress at one time.	None
5127	An NBU operation is already in progress, Recovery Manager for Exchange currently only supports one nbu backup/restore at a time.	None
5128	Cannot find the Virtual Copy in the Repository.	None

Event ID	Description	Action
5129	Please check you have entered the correct Exchange Server <Server Name>, Storage Group <Storage Group Name> and Timestamp <Timestamp>.	None
5130	No Virtual Copies exist for this exchange server <Server Name>.	None
5131	Could not retrieve repository location from registry.	None
5132	Could not open Recovery Manager for Exchange registry key.	None
5133	ERROR: <Error Message>.	None
5134	ERROR: `removevlun` failed.	Check InFormCLI communication.
5135	ERROR: `createvlun` failed.	Check InFormCLI communication.
5136	ERROR: `removevv` failed. Check InFormCLI communication.	None
5137	ERROR: `showvv` failed.	Check InFormCLI communication.
5138	ERROR: `createsv` failed.	Check InFormCLI communication.
5139	ERROR: `promotesv` failed.	Check InFormCLI communication.

Event ID	Description	Action
5140	ERROR: NBU backup process has failed.	None
5141	System error code - <Error Code>.	None
5142	ERROR: showhost failed.	Check InFormCLI communication.
5143	ERROR: showhost failed.	Check InFormCLI communication.
5144	ERROR: 3PAR Recovery Manager for Exchange license has expired. Contact 3PAR representatives to acquire a new license.	Check InFormCLI communication and already registered Recovery Manager License on InServ.
5145	ERROR: Could not retrieve Recovery Manager for Exchange license. Contact 3PAR representatives to acquire a valid license.	Check InFormCLI communication and already registered Recovery Manager License on InServ.
5146	ERROR: Datastore <Datastore Name> is already mounted to host <Host Name>.	The selected Virtual Copy has been mounted already.
5147	ERROR: Cannot remove a mounted Virtual Copy.	Unmount the Virtual Copy first before deletion.
5148	Unmount the Virtual Copy and try again.	None.
5149	ERROR: Datastore <Datastore Name> is already unmounted.	If the mounting status still shows "Mounted", user can use reset command to reset the mount status.

Event ID	Description	Action
5150	ERROR: The Virtual Copy is not mounted. The virtual copy must be mounted to a host in order to do a backup.	None
5151	ERROR: The VSS Provider does not appear to be installed. You cannot create a Virtual Copy without the provider. Please Check the VSS provider installation.	None
5152	ERROR: Creating this Virtual Copy will exceed the maximum number of Virtual Copies allowed by the Policy. Maximum number of Virtual Copies is set to <Policy Number>.	Check the policy setting for the particular storage group. If retaining the oldest Virtual Copy option is set, subsequent Virtual Copy creation will not be allowed after it reaches the maximum limit.
5153	ERROR: Failed - Virtual Copy creation failed for storage group 'Storage Group'.	None
5155	ERROR: NBU restore process has failed.	Check NetBackup server for more information.
5156	ERROR: Could not retrieve the Recovery Manager for Exchange install location from the registry. Check the Recovery Manager for Exchange installation.	Check InFormCLI communication.

Event ID	Description	Action
5157	ERROR: Could not open the Recovery Manager for Exchange registry key. Check the Recovery Manager for Exchange installation.	Check InFormCLI communication.
5158	ERROR: Could not retrieve the repository location from registry. Check the Recovery Manager for Exchange installation.	Check if you have access to the registry location of Recovery Manager product and ensure the registry value for repository location exists.
5159	Maximum number of volumes exceeded.	None
5160	Memory allocation error.	None
5161	Error Messages.	None
5162	Unable to get NBU install information from registry.	Check if NetBackup is properly installed and you have access to the registry entry.
5163	Could not open NBU path registry key <Registry Key Path>.	Check if NetBackup is properly installed and you have access to the registry entry.
5164	Could not retrieve Timestamp value.	None
5165	Unable to get Virtual copy information. Could not open registry key for snapshot <Timestamp>.	None

Event ID	Description	Action
5166	Could not retrieve Exchange server information from the active directory.	Check Active Directory connection.
5167	Unable to open registry key <Registry Key Path>.	None
5168	Unable to open subkey <Registry Key Path>.	None
5169	A VSS unknown error has occurred. It is recommended to wait ten minutes and try again, up to three times.	None
5170	Error trying to create temporary registry entry. Try the backup operation again.	None
5171	ERROR - The Exchange recovery process failed, you will need to do a manual repair of the Exchange databases.	Exchange database verification has failed. Make sure both system has the same level of Exchange server package installed.
5172	ERROR - The Exchange recovery process failed <Storage Group> - You will need to do a manual repair of the Exchange databases.	Exchange database verification has failed. Make sure both system has the same level of Exchange server package installed.
5173	ERROR - Failed to identify VCDBA agents...	Recovery Manager for Exchange Agent service fails to function. Try to restart the service and try again.

Event ID	Description	Action
5174	ERROR - The mount point you have provided does not exist.	Make sure the mount point provided already exists on the system.
5176	ERROR - Failed to verify virtual copy for exchange server <Server Name> with storage group <Storage Group> at timestamp <Timestamp>.	None
5177	ERROR: NBU backup process has failed. <Error Code>.	None
5178	ERROR: NBU backup failed - see nbu progress log <Log Path> for details.	None
5179	Error trying to create temporary registry entry. Try the backup operation again.	None
5180	An NBU operation is already in progress, vcdba currently only supports one nbu backup/restore at a time.	None
5181	Could not find file <File Path>. Check Recovery Manager Installation.	None
5182	Could not open includes file <File Path>. Check to see if your policy name is correct.	Check NetBackup policy setting. It is case sensitive.
5183	Failed to set registry information for backup.	None

Event ID	Description	Action
5184	Fail to unmount from specified mount point.	If the mounting status still shows "Mounted", user can use reset command to reset the mount status.
5185	Unable to locate snapshot information from provider: <Snapshot Info Path>.	Check 3PAR VSS Provider log for more information.
5186	Could not retrieve value from provider's XML to set SV.	Check 3PAR VSS Provider log for more information.
5187	Failed to get location of Exchsrvr install from registry.	Make sure the Exchange Server or Exchange Management tool package is installed on the system.
5188	Failed to find specified host name in InServ.	None
5189	Fail to mount to specified mount point.	None
5190	The virtual copy <Timestamp> did not pass the integrity check. Try performing repair procedures to fix.	None
5191	Vv <VV Name> is currently exposed to host(s).	Make sure the Virtual Copy is not exposed to other host from InServ.
5192	ERROR: The backup you would like to restore is not found.	None

Event ID	Description	Action
5193	ERROR: Could not open progress log to examine for successful completion.	None
5194	ERROR: Invalid backup component document path to import Virtual Copies.	The backup document generated during Virtual Copy creation is corrupted.
5195	Failed to perform remote copy command for group <RC Group Name>.	Check Remote Copy connection and setup in InServ.
5196	Failed to query remote copy registered Vv information.	Check Remote Copy connection and setup in InServ.
5198	Unexpected remote copy status: <Status Code> for group <RC Group Name>.	Check Remote Copy connection and setup in InServ.
5199	Remote copy group <RC Group Name> is not found.	Check Remote Copy connection and setup in InServ.
5200	Unable to locate buffer for temporary path for remote copy process.	None
5211	Failed to import repository information for remote copy.	None
5212	Failed to cleanup previously created snapshot for remote copy.	Manually remove the snapshot from InServ.
5213	Failed to send notification command for remote copy.	Check the communication between your system and the target system.

Event ID	Description	Action
5214	Failed to create VC for remote copy group.	None
5215	Exception occurs during remote copy process.	Check Recovery Manager Log for more information.
5216	Unable to load backup repository information.	None
5217	Could not add backup to backup repository.	None
5218	Could not delete backup record from backup repository.	None
5219	Failed to set mount point for volume.	Make sure the mount point exists and is not being used by other application.
5220	<Error Message>	None
5221	Failed to build repository information.	None
5222	Failed to lock VC create process.	None
5223	Failed to wait on VC create process.	None
5224	Specified virtual copy is already mounted or exposed.	None
5225	Failed to import snapshot. Removing previously created Snapshot.	None

Event ID	Description	Action
5226	Single command backup failed at Mount, removing previously created Snapshot.	None
5227	Single command backup failed at Backup, unmounting and removing previously created Snapshot.	None
5228	Can not locate provider xml.	Check 3PAR VSS Provider installation.
5229	The oldest Virtual Copy is currently mounted. Please unmount it to create another Virtual Copy.	None
5230	Can not change repository path.	None

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Revision History

Release level	Revision summary
320-1329-01 July 2005	Original release of this manual released to support product release 2.2.
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