Tivoli® Storage Manager for Mail
Version 6.1.2

Data Protection for Microsoft Exchange Server Installation and User's Guide

IBM

SC23-9796-01

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Version 6.1.2

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Note
Before using this information and the product it supports, read the information in "Notices" on page 307.

This edition applies to version 6, release 1, modification 2 of IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server (product numbers 5608-E06 and 5608-E11) and to all subsequent releases and modifications until otherwise indicated in new editions. This edition replaces SC23-9796-00.

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Preface

The subject of this publication is Data Protection for Exchange, a component of the IBM Tivoli Storage Manager for Mail product.

Data Protection for Exchange performs online backups of Microsoft® Exchange Server databases to Tivoli Storage Manager storage. This integration with the Microsoft Exchange Server application programming interface (API) maximizes the protection of data, thus providing a comprehensive storage management solution.

Tivoli Storage Manager is a client-server licensed product that provides storage management services in a multi-platform computer environment.

Throughout this document, the term *Windows*® (unless otherwise specified) refers to the following operating systems:

- Windows Server 2003
- Windows Server 2008
- Windows Server 2008 R2

Throughout this document, the term *Exchange Server* (unless otherwise specified) refers to the following products:

- Exchange Server 2003
- Exchange Server 2007
- Exchange Server 2010

Throughout this document, the term *Windows VSS System Provider* (unless otherwise specified) refers to the standard Windows System provider.

Changes since the previous edition are marked with a vertical bar (|) in the left margin.

Who should read this publication

This publication is intended for system installers, system users, Tivoli Storage Manager administrators, and system administrators.

In this publication, it is assumed that you have an understanding of the following applications:

- Microsoft Exchange Server
- Tivoli Storage Manager server
- Tivoli Storage Manager backup-archive client
- Tivoli Storage Manager Application Programming Interface
- Microsoft Volume Shadow Copy Service (VSS) technology (knowledge of this application is only assumed if you plan to perform VSS operations)

It is also assumed that you have an understanding of the following operating systems:

- Windows Server 2003 (knowledge of this operating system is only assumed if you plan to use this platform)

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- Windows Server 2008 (knowledge of this operating system is only assumed if you plan to use this platform)

Product documentation formats

Data Protection for Exchange provides product documentation in these formats.

Installation and User's Guide

The *IBM Tivoli Storage Manager for Mail Data Protection for Microsoft Exchange Server Installation and User's Guide 6.1* provides detailed information regarding how to install, configure, and use Data Protection for Exchange 6.1 in a Windows 2003 environment and a Windows 2008 environment. This publication is provided in the following location in PDF and XHTML format:

- Online at the Tivoli® Information Center: `http://publib.boulder.ibm.com/infocenter/tsminfo/v6/index.jsp`

GUI online help

GUI online help is provided for specific information related to tasks that are performed in the Data Protection for Exchange GUI. After launching the GUI, go to **Help->Data Protection for Microsoft Exchange Server**. The online help displays.

See Chapter 4, "Graphical user interface functions," on page 85 for additional information.

Command-line help

Command-line help is also provided for specific information related to tasks that are performed on the Data Protection for Exchange command line. Enter `tdpexcc help` on the Data Protection for Exchange command-line interface for a list of available help topics. See "Help command" on page 195 for additional information.

Publications

Tivoli Storage Manager publications and other related publications are available online.

You can search all publications in the Tivoli Storage Manager Information Center: http://publib.boulder.ibm.com/infocenter/tsminfo/v6.

You can download PDF versions of publications from the Tivoli Storage Manager Information Center or from the IBM® Publications Center at http://www.ibm.com/shop/publications/order/.

You can also order some related publications from the IBM Publications Center Web site. The Web site provides information for ordering publications from countries other than the United States. In the United States, you can order publications by calling 800-879-2755.

Tivoli Storage Manager publications

Publications are available for the server, storage agent, client, and Data Protection.

Table 1. Tivoli Storage Manager server publications

Publication title	Order number
IBM Tivoli Storage Manager Messages	GC23-9787
IBM Tivoli Storage Manager Performance Tuning Guide	GC23-9788
IBM Tivoli Storage Manager Problem Determination Guide	GC23-9789
IBM Tivoli Storage Manager for AIX Installation Guide	GC23-9781
IBM Tivoli Storage Manager for AIX Administrator's Guide	SC23-9769
IBM Tivoli Storage Manager for AIX Administrator's Reference	SC23-9775
IBM Tivoli Storage Manager for HP-UX Installation Guide	GC23-9782
IBM Tivoli Storage Manager for HP-UX Administrator's Guide	SC23-9770
IBM Tivoli Storage Manager for HP-UX Administrator's Reference	SC23-9776
IBM Tivoli Storage Manager for Linux Installation Guide	GC23-9783
IBM Tivoli Storage Manager for Linux Administrator's Guide	SC23-9771
IBM Tivoli Storage Manager for Linux Administrator's Reference	SC23-9777
IBM Tivoli Storage Manager for Sun Solaris Installation Guide	GC23-9784
IBM Tivoli Storage Manager for Sun Solaris Administrator's Guide	SC23-9772
IBM Tivoli Storage Manager for Sun Solaris Administrator's Reference	SC23-9778
IBM Tivoli Storage Manager for Windows Installation Guide	GC23-9785
IBM Tivoli Storage Manager for Windows Administrator's Guide	SC23-9773
IBM Tivoli Storage Manager for Windows Administrator's Reference	SC23-9779
IBM Tivoli Storage Manager Server Upgrade Guide	SC23-9554
IBM Tivoli Storage Manager for System Backup and Recovery Installation and User's Guide	SC32-6543

Table 2. Tivoli Storage Manager storage agent publications

Publication title	Order number
IBM Tivoli Storage Manager for SAN for AIX Storage Agent User's Guide	SC23-9797
IBM Tivoli Storage Manager for SAN for HP-UX Storage Agent User's Guide	SC23-9798
IBM Tivoli Storage Manager for SAN for Linux Storage Agent User's Guide	SC23-9799
IBM Tivoli Storage Manager for SAN for Sun Solaris Storage Agent User's Guide	SC23-9800
IBM Tivoli Storage Manager for SAN for Windows Storage Agent User's Guide	SC23-9553

Table 3. Tivoli Storage Manager client publications

Publication title	Order number
IBM Tivoli Storage Manager for UNIX and Linux: Backup-Archive Clients Installation and User's Guide	SC23-9791

Table 3. Tivoli Storage Manager client publications (continued)

Publication title	Order number
IBM Tivoli Storage Manager for Windows: Backup-Archive Clients Installation and User's Guide	SC23-9792
IBM Tivoli Storage Manager for Space Management for UNIX and Linux: User's Guide	SC23-9794
IBM Tivoli Storage Manager for HSM for Windows Administration Guide	SC23-9795
IBM Tivoli Storage Manager Using the Application Program Interface	SC23-9793
Program Directory for IBM Tivoli Storage Manager z/OS Edition Backup-Archive Client	GI11-8912
Program Directory for IBM Tivoli Storage Manager z/OS Edition Application Program Interface	GI11-8911

Table 4. Tivoli Storage Manager Data Protection publications

Publication title	Order number
IBM Tivoli Storage Manager for Advanced Copy Services: Data Protection for Snapshot Devices Installation and User's Guide	SC33-8331
IBM Tivoli Storage Manager for Databases: Data Protection for Microsoft SQL Server Installation and User's Guide	SC32-9059
IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for UNIX and Linux Installation and User's Guide	SC32-9064
IBM Tivoli Storage Manager for Databases: Data Protection for Oracle for Windows Installation and User's Guide	SC32-9065
IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Installation and User's Guide for DB2	SC33-6341
IBM Tivoli Storage Manager for Enterprise Resource Planning: Data Protection for SAP Installation and User's Guide for Oracle	SC33-6340
IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino® for UNIX, Linux, and OS/400® Installation and User's Guide	SC32-9056
IBM Tivoli Storage Manager for Mail: Data Protection for Lotus Domino for Windows Installation and User's Guide	SC32-9057
IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server Installation and User's Guide	SC23-9796
Program Directory for IBM Tivoli Storage Manager for Mail (Data Protection for Lotus Domino)	GI11-8909

Support information

You can find support information for IBM products from various sources.

Start at the IBM Support Portal: http://www.ibm.com/support/entry/portal/. You can select the products that you are interested in, and search for a wide variety of relevant information.

Getting technical training

Information about Tivoli technical training courses is available online.

Go to these Web sites for training information:

Tivoli software training and certification
Choose from instructor led, online classroom training, self-paced Web classes, Tivoli certification preparation, and other training options at this site: http://www.ibm.com/software/tivoli/education/

Tivoli Support Technical Exchange
Technical experts share their knowledge and answer your questions in these webcasts: http://www.ibm.com/software/sysmgmt/products/support/supp_tech_exch.html

Searching knowledge bases

If you have a problem with IBM Tivoli Storage Manager, there are several knowledge bases that you can search.

Begin by searching the Tivoli Storage Manager Information Center at http://publib.boulder.ibm.com/infocenter/tsminfo/v6. From this Web site, you can search the current Tivoli Storage Manager documentation.

Searching the Internet

If you cannot find an answer to your question in the Tivoli Storage Manager Information Center, search the Internet for the information that might help you resolve your problem.

To search multiple Internet resources, go to the support Web site for Tivoli Storage Manager at http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html.

You can search for information without signing in. Sign in using your IBM ID and password, if you want to customize the site based on your product usage and information needs. If you do not already have an IBM ID and password, click **Sign in** at the top of the page and follow the instructions to register.

From the Support Web site, you can search various resources including:

- IBM technotes
- IBM downloads
- IBM Redbooks® publications
- IBM Authorized Program Analysis Reports (APARs)

Select the product and click **Downloads** to search the APAR list.

If you still cannot find a solution to the problem, you can search forums and newsgroups on the Internet for the latest information that might help you resolve your problem.

An independent user discussion list, ADSM-L, is hosted by Marist College. You can subscribe by sending an e-mail to listserv@vm.marist.edu. The body of the message must contain the following text: `SUBSCRIBE ADSM-L` *your_first_name your_family_name*.

To share your experiences and learn from others in the Tivoli Storage Manager user community, go to the Tivoli Storage Manager wiki at http://www.ibm.com/

developerworks/wikis/display/tivolistoragemanager.

Using IBM Support Assistant

IBM Support Assistant is a complimentary software product that helps you with problem determination. You can install the stand-alone IBM Support Assistant application on any workstation. You can then enhance the application by installing product-specific plug-in modules for the IBM products that you use.

IBM Support Assistant helps you gather support information when you need to open a problem management record (PMR), which you can then use to track the problem. For more information, see the IBM Support Assistant Web site at http://www.ibm.com/software/support/isa/.

The product-specific plug-in modules provide you with the following resources:

- Support links
- Education links
- Ability to submit problem management reports

Find add-ons for specific products here: http://www.ibm.com/support/docview.wss?&uid=swg27012689.

Finding product fixes

A product fix to resolve your problem might be available from the IBM Software Support Web site.

You can determine what fixes are available by checking the IBM Software Support Web site at http://www.ibm.com/support/entry/portal/.

- If you previously customized the site based on your product usage:
  1. Click the link for your Tivoli Storage Manager product, or one of the other Tivoli Storage Manager components that you want to find a fix for.
  2. Click **Downloads**, and then click **Fixes by version**.
- If you have not customized the site based on your product usage, click **Downloads** and search for your product.

Receiving notification of product fixes

You can receive notifications about fixes, flashes, upgrades, and other news about IBM products.

To sign up to receive notifications about IBM products, follow these steps:

1. From the support page at http://www.ibm.com/support/entry/portal/, click **My notifications** in the notifications module.
2. Sign in using your IBM ID and password. If you do not have an ID and password, click **register now** above the IBM ID and password.
3. Click the **Subscribe** tab to select your product family and click **Continue**.
4. Select the type of information that you want to receive, and add your personal preferences. You can specify how you want to be notified, how often, and you can also optionally select a folder for the notifications.
5. Click **Submit**.
6. For notifications for other products, repeat steps 4 and 5.

Tip: You can also pick a product first, from the main support portal site, and then click in the **Notifications** section to create or update your subscription for that product.

Contacting IBM Software Support

You can contact IBM Software Support if you have an active IBM subscription and support contract and if you are authorized to submit problems to IBM.

Before you contact IBM Software Support, follow these steps:

1. Set up a subscription and support contract.
2. Determine the business impact of your problem.
3. Describe your problem and gather background information.

Then see "Submitting the problem to IBM Software Support" on page xiv for information on contacting IBM Software Support.

Setting up a subscription and support contract

Set up a subscription and support contract. The type of contract that you need depends on the type of product you have.

For IBM distributed software products (including, but not limited to, IBM Tivoli, Lotus®, and Rational® products, as well as IBM DB2® and IBM WebSphere® products that run on Microsoft Windows or UNIX® operating systems), enroll in IBM Passport Advantage® in one of the following ways:

- **Online:** Go to the Passport Advantage Web page at http://www.ibm.com/software/lotus/passportadvantage/, click **How to enroll**, and follow the instructions.
- **By Phone:** You can call 1-800-IBMSERV (1-800-426-7378) in the United States, or for the phone number to call in your country, go to the IBM Software Support Handbook Web page at http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html and click **Contacts**.

Determining the business impact

When you report a problem to IBM, you are asked to supply a severity level. Therefore, you must understand and assess the business impact of the problem you are reporting.

Severity 1	**Critical** business impact: You are unable to use the program, resulting in a critical impact on operations. This condition requires an immediate solution.
Severity 2	**Significant** business impact: The program is usable but is severely limited.
Severity 3	**Some** business impact: The program is usable with less significant features (not critical to operations) unavailable.
Severity 4	**Minimal** business impact: The problem causes little impact on operations, or a reasonable circumvention to the problem has been implemented.

Describing the problem and gather background information

When explaining a problem to IBM, it is helpful to be as specific as possible. Include all relevant background information so that IBM Software Support specialists can help you solve the problem efficiently.

To save time, know the answers to these questions:

- What software versions were you running when the problem occurred?
- Do you have logs, traces, and messages that are related to the problem symptoms? IBM Software Support is likely to ask for this information.
- Can the problem be recreated? If so, what steps led to the failure?
- Have any changes been made to the system? For example, hardware, operating system, networking software, and so on.
- Are you using a workaround for this problem? If so, be prepared to explain it when you report the problem.

Submitting the problem to IBM Software Support

You can submit the problem to IBM Software Support online or by phone.

Online

Go to the IBM Software Support Web site at http://www.ibm.com/support/entry/portal/Open_service_request/Software/Software_support_(general). Sign in to access IBM Service Requests, and enter your information into the problem submission tool.

By phone

For the phone number to call in your country, go to the contacts page of the IBM Software Support Handbook at http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html.

What to do when you encounter a problem

You can resolve some problems by yourself that you may encounter during Data Protection for Exchange processing.

If you encounter a problem during Data Protection for Exchange processing, follow these steps as your first attempt to resolve the problem:

1. Retry the operation that failed.
2. If the problem occurred during an incremental, differential, or database copy backup, run a full backup. If the full backup completes successfully, retry the operation that failed.
3. If the problem still exists, close other applications, especially those applications that interact with Exchange (antivirus applications, for example). Retry the operation that failed.
4. If the problem still exists:
   a. Shut down the Exchange server.
   b. Start the Exchange server again.
   c. Run the operation that failed.
5. If the problem still exists:
   a. Shut down the entire machine.
   b. Start the machine again.
   c. Run the operation that failed.
6. If the problem still exists, determine if it is occurring on other Exchange servers.

Determining if the problem resides on Tivoli Storage Manager or Exchange

You can help determine whether a problem is a Data Protection for Exchange issue or an Exchange server issue.

Legacy operations and VSS operations have different sets of steps to follow to help determine the source of the problem.

For Legacy operations, perform the following steps to help identify the source of the problem:

- Try recreating the problem with the Microsoft NTBACKUP utility. This utility uses a call sequence similar to Data Protection for Exchange to run an online backup. If the problem is recreatable with NTBACKUP then the problem most likely exists within the Exchange server.
- Try recreating the problem with the Microsoft BACKREST application. This application can run backups using the Microsoft Exchange APIs. If the problem is recreatable with BACKREST, then the problem most likely exists within the Exchange server. Microsoft includes BACKREST with the Exchange Software Developer's Kit (SDK). IBM Service can provide a copy of BACKREST if you encounter problems obtaining or building this application.
- Check whether the error message "`ACN5350E An unknown Exchange API error has occurred`" is displayed. If this message is displayed, the Exchange server encountered an unexpected situation. Microsoft assistance may be needed if the problem continues.
- Data Protection for Exchange error messages occasionally contain an HRESULT code. Use this code to search Microsoft documentation and the Microsoft Knowledge Base for resolution information. The Exchange SDK file ESEBKMSG.H contains these messages.

For VSS operations, perform the following steps to help identify the source of the problem: Try recreating the problem with the Microsoft VSHADOW or DISKSHADOW applications. These applications can run backups using the Microsoft Exchange VSS APIs. If the problem is recreatable with VSHADOW or DISKSHADOW, the problem probably exists within the VSS provider or the Exchange server.

Microsoft includes VSHADOW with the Volume Shadow Copy Services (VSS) Software Developer's Kit (SDK). IBM Service can provide a copy of VSHADOW if you encounter problems obtaining or building this application.

DISKSHADOW is included with Windows Server 2008 and later.

You can also search the *IBM Tivoli Storage Manager: Problem Determination Guide* for diagnostic information at this Web site: `http://publib.boulder.ibm.com/infocenter/tsminfo/v6r2/index.jsp`

Installation Problems: Creating an installation-log file

In the event of an installation failure, gather the installation information details to assist IBM Software Support when evaluating your situation. You can create a detailed log file of the failed installation that can facilitate analysis of your situation.

The following installation information details should be gathered for IBM Software Support:

- Operating system level
- Service pack
- Hardware description
- Installation package (from the CD or downloaded) and level
- Any Windows event log that is relevant to the failed installation
- Windows services that were active during the failed installation (for example, antivirus software)
- Whether you are logged on to the local system console (not through a terminal server)
- Whether you are logged on as a local administrator, not a domain administrator (Tivoli does not support cross-domain installs)

You can create a detailed log file (setup.log) of the failed installation. Run the setup program (setup.exe) in the following manner:

```
setup /v"l*v setup.log"
```

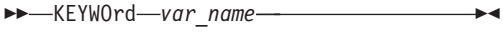
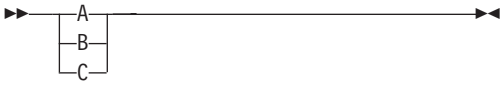
Reading syntax diagrams

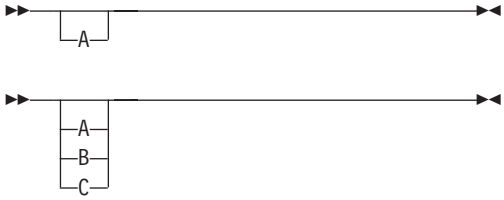
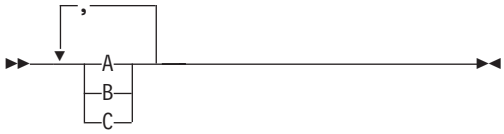
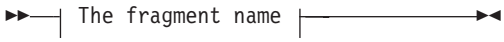
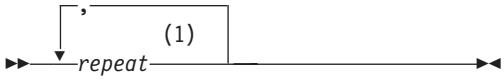
This section describes how to read the syntax diagrams that are used in this publication. To read a syntax diagram, follow the path of the line. Read from left to right, and top to bottom.

- The ►►—— symbol indicates the beginning of a syntax diagram.
- The ——► symbol at the end of a line indicates the syntax diagram continues on the next line.
- The ►—— symbol at the beginning of a line indicates a syntax diagram continues from the previous line.
- The ——►◄ symbol indicates the end of a syntax diagram.

Syntax items, such as a keyword or variable, can be:

- On the line (required element)
- Above the line (default element)
- Below the line (optional element)

Syntax diagram description	Example
Abbreviations: Uppercase letters denote the shortest acceptable truncation. If an item appears entirely in uppercase letters, it cannot be truncated. You can type the item in any combination of uppercase or lowercase letters. In this example, you can enter KEYWO, KEYWORD, or KEYWOrd.	
Symbols: Enter these symbols exactly as they appear in the syntax diagram.	* Asterisk { } Braces : Colon , Comma = Equal Sign - Hyphen () Parentheses . Period ' Single quotation mark Space " Quotation mark
Variables: Italicized lowercase items (*var_name*) denote variables. In this example, you can specify a *var_name* when you enter the KEYWORD command.	
Repetition: An arrow returning to the left means you can repeat the item. A character or space within an arrow means you must separate the repeated items with that character or space.	
Required Choices: When two or more items are in a stack and one of them is on the line, you *must* specify one item. In this example, you *must* choose A, B, or C.	

Syntax diagram description	Example
Optional Choice: When an item is below the line, that item is optional. In the first example, you can choose A or nothing at all. When two or more items are in a stack below the line, all of them are optional. In the second example, you can choose A, B, C, or nothing at all.	
Defaults: Defaults are above the line. The default is selected unless you override it. You can override the default by including an option from the stack below the line. In this example, A is the default. You can override A by choosing B or C. You can also specify the default explicitly.	
Repeatable Choices: A stack of items followed by an arrow returning to the left means you can select more than one item or, in some cases, repeat a single item. In this example, you can choose any combination of A, B, or C.	
Syntax Fragments: Some diagrams, because of their length, must fragment the syntax. The fragment name appears between vertical bars in the diagram. The expanded fragment appears between vertical bars in the diagram after a heading with the same fragment name.	 **The fragment name:**
Footnote: A footnote in the diagram references specific details about the syntax containing the footnote. In this example, the footnote by the arrow references the number of times you can repeat the item.	 **Notes:** 1 Specify *repeat* as many as 5 times.

New for Data Protection for Microsoft Exchange Server Version 6.1.2

Version 6.1.2 provides several new features.

Exchange Server 2010 support

Data Protection for Exchange provides a single, easy to use, and well-integrated interface to perform the back up and restore of mailbox databases, individual mailbox-level recovery, and item-level recovery for Microsoft Exchange Server 2010.

In Microsoft Exchange Server 2010, several significant architectural constructs have been changed, a number of which affect backup and restore operations. The key changes are as follows:

- Legacy style backups (also known as "streaming" backups) are not supported.
- VSS-style backups are the only supported online backup method.
- Exchange storage groups are replaced by databases.
- The Recovery Storage Group (RSG) is replaced by Recovery Databases.
- LCR, CCR, and SCR replication is replaced by Database Availability Groups (DAGs).
- Single Copy Clustering (SCC) is no longer available.
- The number of databases allowed per Exchange server has increased from 50 to 100.

SAN Volume Controller 5.1 Space-Efficient Target Volumes

Data Protection for Exchange supports VSS Instant Restore operations when multiple backup versions exist on SAN Volume Controller 5.1 space-efficient target volumes (SEV). For detailed information, see "Guidelines for SAN Volume Controller 5.1 environments" on page 33.

Integration with Tivoli Storage FlashCopy Manager

Data Protection for Exchange expands snapshot backup capabilities by supporting Tivoli Storage FlashCopy Manager local backup technology.

Improved mailbox history performance

Performance of backups and mailbox restore operations is improved when the number of mailboxes in the Exchange organization is greater than about 50,000.

Related concepts

"Exchange Server 2010: Features overview" on page 3

"SAN Volume Controller 5.1 FlashCopy support" on page 28

Related tasks

Appendix D, "Transitioning Exchange Server backups from Tivoli Storage FlashCopy Manager to Tivoli Storage Manager," on page 227

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Chapter 1. Data Protection for Exchange overview

This section provides introductory information about Data Protection for Exchange.

Data Protection for Exchange performs online backups and restores of Microsoft Exchange Server storage groups (Exchange Server 2003 and Exchange Server 2007) or databases (Exchange Server 2010) to Tivoli Storage Manager storage or local shadow volumes. You can perform backups and restores using a command-line or graphical user interface (GUI) on Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, and Windows Server 2008 R2. Refer to your Exchange Server documentation for complete, detailed information regarding the backup and restore of Microsoft Exchange Servers.

Microsoft Exchange Server 2010 does not support the Microsoft Legacy API for backups, but only the use of VSS backups.

Data Protection for Exchange operations use the Tivoli Storage Manager application programming interface (API) to communicate with the Tivoli Storage Manager server, and use the Exchange API to communicate with Exchange Server. In addition to using these APIs, In addition to using these APIs, Data Protection for Exchange VSS operations use the Tivoli Storage Manager backup-archive client and Microsoft Volume Shadow Copy Service technology to produce an online snapshot (point-in-time consistent copy) of Exchange data that can be stored on local shadow volumes or on Tivoli Storage Manager server storage.

You must install Data Protection for Exchange on the same machine as the Exchange Server. Data Protection for Exchange must be able to connect to a Tivoli Storage Manager server running on any supported operating system. See "Software and operating system requirements" on page 39 for the required level of Tivoli Storage Manager server. Optionally, the Tivoli Storage Manager server can be on the same machine as the Exchange Server. Data Protection for Exchange also supports operations in a Microsoft Cluster Server (MSCS) or Veritas Cluster Server (VCS) environment.

Data Protection for Exchange product features

Data Protection for Exchange helps protect and manage Exchange Server environments by facilitating the backup, restore, and recovery of Exchange Server data.

Data Protection for Exchange provides the following key features:

Table 5. Data Protection for Exchange key features

Feature	Referred to as:	For more information see:
Perform individual mailbox recovery and item-level recovery from Data Protection for Exchange backups	Mailbox restore	"Restoring individual mailbox and mailbox item-level data" on page 100
Back up Exchange Server 2003 and 2007 databases using the Exchange server streaming backup and restore API	Legacy backup	"Legacy backup processing: Overview" on page 4

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Table 5. Data Protection for Exchange key features (continued)

Feature	Referred to as:	For more information see:
Back up Exchange Server 2003, 2007, and 2010 databases using Microsoft Volume Shadow Copy Service (VSS) technology	VSS Backup	"VSS Backup" on page 8
Back up Exchange Server 2007 continuous replica copies (CCR or LCR) using VSS technology	Backup from replica	"Replication on Exchange Server 2007" on page 11
Back up Exchange Server 2010 Database Availability Group (DAG) databases	Backup from replica	"Replication on Exchange Server 2010" on page 11
Perform a VSS Backup to the Tivoli Storage Manager server using an alternate machine instead of a production machine	Offloaded Backup	"Offloaded Backup" on page 11
Restore VSS Backups that reside on Tivoli Storage Manager server storage to their original location	VSS Restore	"VSS Restore" on page 15
Restore VSS Backups that reside on local shadow volumes using file-level copy mechanisms	VSS Fast Restore	"VSS Fast Restore" on page 16
Restore VSS Backups that reside on local shadow volumes using hardware-assisted volume-level copy mechanisms	VSS Instant Restore	"VSS Instant Restore" on page 16
Restore a VSS Backup of Exchange Server 2007 data into a Recovery Storage Group, alternate storage group, or relocated storage group	Restore into	"Restoring VSS Backups into alternate locations" on page 19
Restore a VSS Backup of Exchange Server 2010 data into a Recovery database, alternate database, or relocated database	Restore into	"Restoring VSS Backups into alternate locations" on page 19
Manage capacity for VSS backups that reside on local shadow volumes	**query managedcapacity** command	"Query Managedcapacity command" on page 118
Delete a VSS Backup of an Exchange Server storage group or database	**delete backup** command	"Delete Backup command" on page 181
Manage policy for VSS backups that reside on local shadow volumes	**policy** commands	"Policy commands for Data Protection for Exchange" on page 108
Integrate with Tivoli Storage FlashCopy Manager	Advanced VSS support	Appendix D, "Transitioning Exchange Server backups from Tivoli Storage FlashCopy Manager to Tivoli Storage Manager," on page 227
Restore a VSS Backup to an alternate machine	Alternate server restore	Appendix C, "Advanced restore procedures," on page 219
Tivoli Storage Manager policy-based management of VSS snapshot backups	Server policy	"How Tivoli Storage Manager server policy affects Data Protection for Exchange" on page 26
Restore the .edb, .stm, and .log files from a legacy backup that resides on Tivoli Storage Manager server storage to an alternate path for use with products acquired from another vendor, such as individual mailbox recovery utilities (Exchange Server 2003 and Exchange Server 2007 only)	**restorefiles** command	"Restorefiles command" on page 153
Use a single graphical-user interface for performing legacy and VSS backup, restore, restoremailbox, and query operations	GUI	Chapter 4, "Graphical user interface functions," on page 85
Use a single command-line interface for performing legacy and VSS backup, restore, restoremailbox, and query operations	CLI	Chapter 5, "Using the command-line interface," on page 107

Table 5. Data Protection for Exchange key features (continued)

Feature	Referred to as:	For more information see:
Requirement: To use VSS features, you must also install the following software applications: • Basic VSS operations require one of the following applications: – IBM Tivoli Storage Manager Microsoft Exchange VSS Integration Module Version 5.5.2 or later – IBM Tivoli Storage FlashCopy Manager Version 2.1 or later These applications are not required when you perform VSS backups with Exchange Server 2010, if the backups are stored on the Tivoli Storage Manager Server. • One of the following applications must be installed forVSS Instant Restore operations: – IBM Tivoli Storage Manager for Copy Services Hardware Devices Snapshot Integration Module Version 5.5.1 or later. If you are using the Tivoli Storage Manager backup-archive client Version 5.5.1, you must manually install the Hardware Devices Snapshot Integration Module Version 5.5.1 to perform VSS Instant Restore operations. If you are using the Tivoli Storage Manager backup-archive client Version 6.1 (or later), the Hardware Devices Snapshot Integration Module is automatically installed with the Tivoli Storage Manager backup-archive client. As a result, you do not need to manually install this module. – IBM Tivoli Storage FlashCopy Manager Version 2.1 or later These applications are not required when you perform VSS backups with Exchange Server 2010, if the backups are stored on the Tivoli Storage Manager Server.		

The term *local shadow volumes* is used throughout this document to describe data that is stored on shadow volumes localized to a disk storage subsystem.

Exchange Server 2010: Features overview

Certain Data Protection for Exchange functions vary based upon the version of Exchange Server in your environment.

Exchange Server 2010 introduces functions that differ from functions available with Exchange Server 2003 and Exchange Server 2007:

- Exchange Server 2010 provides Database Availability Groups (DAG). A DAG consists of mailbox servers that provide recovery from database, server, or network failures. They provide continuous replication and continuous mailbox availability (replaces Exchange Server 2007 LCR, CCR, and SCR replication).
- Exchange databases replace Exchange storage groups.
- Exchange Management Shell commands have been changed to support the new Exchange features and storage configuration.
- The Recovery Database (RDB) replaces the Recovery Storage Group (RSG).
- The number of databases allowed for each Exchange server increases from 50 to 100.
- Single Copy Clustering (SCC) is not available with Exchange Server 2010.
- Only VSS-style backups are supported. Legacy-style backups are not supported with Exchange Server 2010.

Legacy backup processing: Overview

A backup performed by Data Protection for Exchange creates a copy of an Exchange Server 2003 or Exchange Server 2007 storage group on Tivoli Storage Manager server storage. The backup includes any associated transaction logs.

Legacy backups, also referred to as traditional "streaming" backups, are not supported for Exchange Server 2010 databases. Instead, VSS Backups are available.

Tip: Data Protection for Exchange tracks and stores mailbox location history, which is used to automate mailbox restore operations. This causes a slight delay before each backup.

When a Legacy backup operation is initiated, Data Protection for Exchange performs the following actions:

1. Begins a session with a Tivoli Storage Manager server.
2. Informs the Exchange Server that a backup is ready to begin.
3. Forwards data from the Exchange Server to the Tivoli Storage Manager server.
4. Informs the Exchange Server that the backup is complete.
5. Ends the Tivoli Storage Manager server session.

Data Protection for Exchange provides backup and restore functions for the Exchange storage groups and associated transaction logs. Data Protection for Exchange does not provide a complete disaster recovery solution for an Exchange Server. In a disaster recovery situation, Data Protection for Exchange only restores storage groups. Other files need to be restored in a disaster recovery situation. Refer to your Microsoft Exchange Server documentation for disaster recovery considerations.

Personal folders and personal address books that are stored on Microsoft Outlook clients are not protected by Data Protection for Exchange. The Tivoli Storage Manager Backup-Archive client can be used on the Outlook client platform to back up and restore these files. Because the Outlook client normally keeps these files locked when running, you should stop the Outlook client before backing up or restoring these files. Because Tivoli Storage Manager Backup-Archive client provides open file support, you might be able to back up and restore these files while the Outlook client is running.

VSS Backup processing: Overview

Data Protection for Exchange VSS Backup operations are implemented through the Tivoli Storage Manager backup-archive client.

The Tivoli Storage Manager backup-archive client serves as the VSS Requestor that communicates with VSS to access the Exchange data to create shadow copies of Exchange storage groups. Thus, Data Protection for Exchange serves as a front end for VSS Backup operations and performs the following actions when a VSS Backup operation is initiated:

1. Data Protection for Exchange validates the state of Exchange server objects.
2. It begins a session with a Tivoli Storage Manager server.
3. It verifies that the VSS service is running and that the Exchange writer is available.
4. The Tivoli Storage Manager VSS Requestor lists the backup components through the VSS Writer.

5. The Tivoli Storage Manager VSS Requestor performs the VSS snapshot backup preparation stage.
6. The Tivoli Storage Manager VSS Requestor performs the actual VSS Backup.
7. The Tivoli Storage Manager VSS Requestor performs an integrity check on the VSS Backup.
8. The Tivoli Storage Manager VSS Requestor backs up the data (and metadata) to a Tivoli Storage Manager server. Optionally, the movement of data to a Tivoli Storage Manager server can be offloaded to an alternate machine that has the Tivoli Storage Manager VSS Requestor installed and configured.
9. The Tivoli Storage Manager VSS Requestor marks the backup as complete in VSS.
10. Data Protection for Exchange ends the Tivoli Storage Manager server session.

Because of the role that the backup-archive client performs as the VSS Requestor, features such as LAN-free backup, database encryption, and data compression require that options related to these features be specified in the backup-archive client options file (and not the Data Protection for Exchange options file) for VSS operations. The *IBM Tivoli Storage Manager for Copy Services Microsoft Exchange VSS Integration Module* or Tivoli Storage FlashCopy Manager enables the backup-archive client to serve as the VSS Requestor.

VSS Service

The VSS Service manages and directs VSS software applications.

These are the VSS software applications that the VSS Service manages and directs:

VSS writer
The VSS writer is the Microsoft Exchange Server. It is installed with the Exchange Server software and requires no configuration.

VSS requestor
The VSS requestor is the Tivoli Storage Manager backup-archive client.

VSS provider
The VSS provider manages the volumes where the Exchange data resides. Configuration requirements are based upon the type of VSS provider used in your environment. For example:

- If you are using the Windows VSS System Provider, no configuration is required.
- If your Exchange storage is configured on a disk storage subsystem and you plan to perform offloaded backups or full-copy snapshot backups (versus copy-on-write (COW) snapshot backups as described in "VSS Backup" on page 8), you must install a VSS hardware provider.
- If you plan to perform VSS Instant Restores, be aware that XIV Gen 2, IBM System Storage SAN Volume Controller, DS6000, and DS8000 are the only storage subsystems that support VSS Instant Restores and require a VSS provider. Therefore, you *must* install and configure the following components as your hardware providers to perform VSS Instant Restores for Microsoft Virtual Disk and Volume Shadow Copy Services:
  - For XIV Gen 2: IBM XIV VSS Hardware Provider (xProv)
  - For SAN Volume Controller, DS6000, and DS8000: IBM System Storage Support for Microsoft Virtual Disk and Volume Shadow Copy Services

provider support and documentation for IBM System Storage disk storage subsystems is available at the following Web site: http://www-01.ibm.com/support/docview.wss?rs=1114&context=HW2C2&dc=D400&q1=ssg1*&uid=ssg1S4000372

- If you are using a different VSS provider, consult the documentation provided with your VSS provider.

For more information about VSS technology, see the Microsoft Technical Reference document "How Volume Shadow Copy Service Works" at the following Web site: http://technet2.microsoft.com/windowsserver/en/library/2b0d2457-b7d8-42c3-b6c9-59c145b7765f1033.mspx?mfr=true

Backup types

Data Protection for Exchange provides five types of backup. The full backup, copy backup, incremental backup, and differential backup types can be performed with legacy (Exchange Server 2003 and Exchange Server 2007 only) and VSS operations. The database copy backup type can be performed with legacy operations only.

Data Protection for Exchange backup types have the following characteristics:

Full Backup (Legacy and VSS)
A full backup backs up the specified storage group, as well as associated transaction logs. The Exchange Server deletes the committed log files after the storage group and logs are *successfully* checked for integrity and backed up. The log files are *not* deleted if storage groups are not mounted.

Incremental Backup (Legacy and VSS)
An incremental backup backs up only transaction logs. The Exchange Server deletes the committed log files after they are *successfully* backed up. These log files are not deleted if the backup fails. Restoration of an Exchange Server storage group from an incremental backup requires the following tasks:

- Restore of the last full backup
- Restore of any other incremental backups performed between the full backup and this incremental backup
- Restore of this incremental backup

The log files are *not* deleted if storage groups are not mounted.

Differential Backup (Legacy and VSS)
A differential backup only backs up transaction logs, but does not delete them. If you perform a full backup, and then perform only differential backups, the last full backup plus the latest differential backup has all data needed to bring the storage group back to the most recent state. This type of backup is also called a *cumulative incremental* backup.

Restoring an Exchange Server storage group from a differential backup requires the following tasks:

- Restore of the last full backup
- Restore of *this* differential backup, but *no other* differential backups

Copy Backup (Legacy and VSS)
A copy backup is similar to a full backup except that transaction log files are not deleted after the backup. A copy backup is used to make a full backup of the Exchange Server storage group without disrupting any backup procedures that use incremental or differential backups.

Database Copy Backup (Legacy only)

A database copy backup backs up *only the specified database* as well as its associated transaction logs. The transaction log files are not deleted after the backup. A database copy backup is used to make a special full backup of the database without disrupting any backup procedures that use incremental or differential backups.

Restriction: When circular logging is enabled, you cannot use differential or incremental backups. This is because data loss might occur if the log wrapped before an incremental or differential backup is done. If you choose a backup strategy that involves incremental or differential backups, you must disable circular logging for the Exchange storage group from the Exchange Administrator program. See your Microsoft Exchange Server documentation for more information on circular logging.

Backup methods

Data Protection for Exchange provides a Legacy method (Exchange 2003 and 2007) and a VSS method for backing up data.

Legacy Backup

A legacy backup is a specialized API backup that functions with the Exchange server storage engine. It is occasionally referred to as the Exchange-server streaming backup and restore API.

The following characteristics are true of Legacy backups:

- You can use full, copy, incremental, differential, and database copy backup types.
- Backup granularity is at the database and storage-group level.
- Backups are stored on Tivoli Storage Manager server storage.
- Backups are managed through the Tivoli Storage Manager server policy.
- Backups can be performed in a Microsoft Cluster Server (MSCS) or Veritas Cluster Server (VCS) environment.
- Backups provide Exchange Server database zeroing function.
- Backups provide Exchange Server database integrity check function.
- You can back up and restore SRS databases.
- Exchange Server 2010 does not support Legacy backups.

Restriction: Microsoft does not support performing legacy backups on cluster continuous replication (CCR) or local continuous replication (LCR). Microsoft does not support performing legacy (or VSS) backups on standby continuous replication (SCR) databases. Therefore, you cannot perform legacy backups on CCR, LCR, or SCR databases. (You can perform VSS Backups on CCR and LCR databases). You can still use legacy backups to back up databases that have CCR, LCR, or SCR replicas, but you must back up the primary database, not the replica.

VSS Backup

A VSS Backup uses Microsoft Volume Shadow Copy Service technology to produce an online snapshot (point-in-time consistent copy) of Exchange data that can be stored on local shadow volumes or on Tivoli Storage Manager server storage. Both of these storage destinations require that sufficient space be available for the snapshot.

A VSS Backup means the Exchange server is not in "backup mode" for an extended period of time because the length of time to perform the snapshot is usually measured in seconds and not hours. In addition, a VSS Backup allows a snapshot of large amounts of data at one time since the snapshot works at the volume level.

Optionally, VSS Backups can be stored locally on VSS shadow volumes that are directly accessible by the Exchange system, as long as sufficient space is available for the snapshot. These types of backups are fast because data is not placed into Tivoli Storage Manager server storage. Restoring these backups is also fast because the Exchange data is not transferred from Tivoli Storage Manager server storage over the network.

When performing VSS Backups and moving data to Tivoli Storage Manager server storage, sufficient space on local snapshot volumes is still required to hold the snapshot. For Exchange data backed up to Tivoli Storage Manager server storage, the Exchange data on the snapshot volume is sent to the Tivoli Storage Manager server. When the data transfer to the server is complete, the snapshot volume is made available for reuse. If you are storing VSS Backups locally and the maximum number of local backup versions to be maintained (as specified by the Tivoli Storage Manager policy) is reached, the oldest backup version is expired in order to create the snapshot for the backup to Tivoli Storage Manager server storage. See "How Tivoli Storage Manager server policy affects Data Protection for Exchange" on page 26 for details regarding how Tivoli Storage Manager proceeds in this situation.

For Exchange data backed up to local shadow volumes, the snapshot backup resides on the shadow copy volume.

For Exchange data backed up to both destinations, a local snapshot backup is performed and the Exchange data on the local snapshot volume is sent to the Tivoli Storage Manager server. The local snapshot volume is retained as a local backup.

VSS Backup characteristics

Some VSS Backup characteristics are different from Legacy backup characteristics. Examples of these differences are the backup characteristics for types supported, the backup granularity, and the backup storage location options.

The following characteristics are true of VSS Backup:

- Full, copy, incremental, and differential backup types are supported. Database copy backup types are not supported.
- Backup granularity is at the storage group level only.
- Backups are managed through Tivoli Storage Manager server policy.
- Backups can be stored on local shadow volumes, Tivoli Storage Manager server storage, or both locations.
- Different policy settings can be defined for each storage location and backup method.

- Backups to Tivoli Storage Manager server storage can be offloaded to an alternate machine as resource relief for production servers.
- Backups can be performed in a Microsoft Cluster Server (MSCS) or Veritas Cluster Server (VCS) environment.
- Backups do not provide Exchange Server database zeroing function.
- Backups provide Exchange Server database integrity check function.
- Backup and restore of SRS is not supported.
- Backup and restore into a Recovery Storage Group are supported on Exchange Server 2007.
- There is no automatic retry for Data Protection for Exchange VSS operations like there is for legacy operations.
- On Exchange Server 2010, VSS is the only available backup method.

VSS Backup planning requirements

Plan a VSS Backup strategy to optimize your backup operations performance and avoid potential problems.

Consider the following requirements when planning for VSS Backups:

- When running VSS operations, make sure you have at least 200 megabytes of free disk space on your Windows System Drive. This space is used to hold the metadata files for Data Protection for Exchange.
- Make sure to review best practice recommendations by Microsoft for your level of Exchange Server. For example, Microsoft recommends one database per storage group with Exchange Server 2007.
- If you are using Exchange Server 2007, consider using Exchange Server LCR, CCR, or SCR replication technology to help protect your Exchange Server and possibly reduce the frequency of backup operations. Refer to your Microsoft documentation for details regarding this technology.
- If you are using Exchange Server 2010, consider using DAG database replication technologies. Refer to your Microsoft documentation for details regarding this technology.
- Make sure you have a well-defined and tested recovery plan that meets your service level objectives.
- Use single hardware LUNs for log and system files.
- Use single hardware LUNs for the database files.
- Use basic disks.
- If you plan to keep some VSS snapshot backups on local shadow volumes only, make sure to consider the VSS provider-specific implementation and configuration options when setting up your strategy. For example, if your VSS hardware provider supports a full-copy snapshot versus a copy-on-write (COW) snapshot mechanism, be aware that full-copy type implementations have greater disk storage requirements but are less risky because they do not rely on the original volume to restore the data. COW implementations require much less disk storage but rely completely on the original volume to perform a restore. Since these implementations are entirely controlled by the VSS provider and not Data Protection for Exchange, make sure to consult your VSS provider documentation for a complete understanding of your VSS implementation.
- If you schedule parallel VSS Backups, ensure that snapshots of the same volume do not occur at the same time. This will cause operations to fail.

- Do not enable circular logging since it has severe limitations and possible negative impacts.
- Do not place multiple volumes on the same LUN. Microsoft recommends that you configure a single volume/single partition/single LUN as 1 to 1 to 1.

System Provider:

A system provider assists with creating and maintaining copies on local shadow volumes.

Be aware that if you are using the Windows VSS System Provider, no configuration is required. However, you can make some configuration changes using the VSSADMIN commands. See Microsoft documentation on the VSSADMIN commands for details.

Software or Hardware Provider:

A software or hardware provider acts as an interface during VSS processing at the software or hardware level respectively.

If you use a software or hardware provider, consider the following requirements when planning for VSS Backups:

- Place databases files for each storage group on their own dedicated logical volume.
- Place logs for each storage group on their own logical volume.
- Do not place non-Exchange data on storage volumes that are dedicated to Exchange.
- When using hardware snapshot providers, do not share storage group LUNs with other storage groups or applications.
- Make sure to read and follow specific installation and configuration instructions in the documentation provided by your VSS provider vendor.

In addition, if a hardware provider is used, it is recommended that the disks that contain Exchange data be configured as basic.

XIV, DS6000, DS8000, and SAN Volume Controller requirements:

These storage subsystems require specific database, log, file, and LUN settings.

When using any of these storage subsystems, consider the following requirements when planning for VSS Backups:

- Place databases files for each storage group on their own dedicated logical volume.
- Place logs for each storage group on their own logical volume.
- Do not place non-Exchange data on storage volumes that are dedicated to Exchange.
- When using hardware snapshot providers, do not share storage group LUNs with other storage groups or applications.
- (SAN Volume Controller only) If you use multiple target FlashCopy mappings, a mapping can stay in the copying state after all the source data is copied to the target. This situation can occur if mappings that were started earlier and use the same source disk are not yet fully copied. Because of this, you should initiate local backups for SAN Volume Controller storage subsystems at intervals greater than the time required for the background copy process to complete.

Offloaded Backup

An offloaded backup uses an alternate machine to move the data to the Tivoli Storage Manager server.

This type of backup shifts the backup load from the production machine to another machine. This frees the production system to serve the Exchange server. This requires that a VSS hardware provider that supports transportable shadow copy volumes is installed on the production and secondary machines.

Continuous replication backups

Important:

- If you are using Exchange Server 2007, consider using Exchange Server Local Continuous Replication (LCR) or Cluster Continuous Replication (CCR) technology to help protect your Exchange Server and possibly reduce the frequency of backup operations.
- If you are using Exchange Server 2010, consider using Database Mobility and Availability Group (DAG) technology to help protect your Exchange Server and possibly reduce the frequency of backup operations.

This replication technology does not apply to Exchange Server 2003.

Replication on Exchange Server 2007

Make sure to review your Microsoft documentation for important details regarding this replication technology. If you are operating Data Protection for Exchange in an Exchange Server LCR or CCR environment and you want to back up from the replica copy as opposed to the primary database to reduce the impact of backups, select the ***From replica, if available*** option in the GUI Backup window or specify the ***/fromreplica*** parameter with the **tdpexcc backup** command. Note that for CCR copies, you must run the backup while logged in to the secondary node of the cluster that currently contains the replica copy. In addition, if you are restoring a CCR database, after the restore completes successfully, the cluster database is mounted. However, due to a Microsoft Exchange Server 2007 limitation, the database resources are not brought online. You must bring the database resources online using the Microsoft Cluster Administrator interface. See the following Microsoft Knowledge Base article for details regarding this limitation:http://support.microsoft.com/kb/938442/en-us. In an LCR or CCR environment, the production copy of the database can still be backed up using the Legacy or VSS Backup method.

When performing a VSS Instant Restore in a CCR environment, stop the Microsoft Exchange Replication Service on both the active node and the passive node before running the restore operation.

Microsoft does not support VSS (or Legacy) backups of Standby Continuous Replication (SCR) replicas. If your Exchange Server 2007 environment is configured to use SCR replicas, you must back up the original database in the SCR scenario.

Replication on Exchange Server 2010

Database Availability Groups (DAG) are the new Exchange Server high availability feature for Exchange 2010. Database Mobility and Availability Groups replace LCR, CCR, and SCR replication features. They provide for enhanced data and service availability and automatic recovery from failures. DAG implementations are similar to the Exchange Server 2007 CCR structure, but with some differences.

Database copies are mirrored on any node within the DAG. The active copy can also be moved to other nodes. You can create a backup from the active copy or from any passive copy within the DAG that contains a database copy.

Data Protection for Exchange includes the following functions for Exchange Server 2010 DAGs:

- Querying of DAG database copies and their status
- Full, copy, incremental, and differential backups of active and passive databases managed within a DAG
- Querying of all DAG database copy backups
- Restoring of all DAG database copy backups
- Restoring into an active database, from either active or passive database copy backups
- Restoring into a Recovery (or alternate) database
- Mailbox restore (IMR) from a DAG database copy backup
- Deletion of DAG database copy backups

Consider these requirements when using Data Protection for Exchange with Exchange Server 2010 DAGs:

- Backups for a given database should be performed from the same Exchange server, if possible. Backups performed from different Exchange servers are managed separately.
- You cannot create incremental or differential backups from different Exchange servers.
- Restores must be performed on an active database copy.

Review your Microsoft documentation for important details regarding this new replication technology.

Database Availability Group backup best practices

Perform backups for replicated database copies from the same Exchange Server, to avoid the alternate server restore scenario described in Appendix C, "Advanced restore procedures," on page 219. Additionally, perform backups on the passive database copies, so as not to increase the load on the production Exchange server.

Following are the recommended best practices for backup:

- Perform backups from a passive database copy, to avoid increasing the load on the active databases.
- Perform backups for DAG databases from the same server, to simplify restore procedures and scheduling.
- Optionally, use the command line backup options **/EXCLUDEDAGPASSIVE**, **/EXCLUDEDAGACTIVE**, or **/EXCLUDEDAGDBS** to exclude the databases that are not part of the DAG.

Database Availability Group restore best practices

Microsoft requires that you perform restores for databases in (DAG) environments on the active database copy. If you want to restore to a passive database copy, the copy must first be moved to the active state. When the restore is complete, you can move the active database copy back to the passive state.

Following are the recommended best practices for restore:

- Perform restores to the active database copy.
- For recovering DAG database backups to alternate Exchange servers, follow the specialized steps that are documented in "Restoring VSS Backups into alternate locations" on page 19.

For detailed instructions on performing a recovery of a DAG database, see "Restoring a Database Availability Group database copy" on page 223.

Restore processing: Overview

A restore obtains backup copies of Exchange storage groups and transaction logs and returns them to the Exchange Server.

Restore of a Legacy backup is not available for Exchange Server 2010 databases. Instead, restore of VSS backups is available.

Restore processing: Actions

Attention: To perform restore processing, Data Protection for Exchange requires that the Exchange Information Store service must be running but the databases being restored within the storage group must be demounted.

When a Legacy restore operation is initiated, Data Protection for Exchange performs the following actions:

1. Data Protection for Exchange prompts the user to dismount the databases or cancel the restore operation entirely. This prompt occurs in the GUI only. Command-line interface users must dismount necessary databases.
2. Starts a session with a Tivoli Storage Manager server.
3. Informs the Exchange Server that a restore is about to begin.
4. Restores the specified storage group(s) and logs from the Tivoli Storage Manager server. The logs are restored to a temporary location as specified by the user.

   When performing a Legacy restore of a mailbox database, if a Recovery Storage Group exists, the mailbox database will be restored to the Recovery Storage Group instead of to the original storage group. Also, when restoring a mailbox database to a Recovery Storage Group, you must specify the option to replay restored logs only or the restore operation may fail. Select ***Replay Restored Logs ONLY*** in the GUI Restore Window or specify ***/recover***=*applyrestoredlogs* on the command line. This note ONLY applies to Legacy restores. VSS Restores into the Recovery Storage Group are supported by Microsoft with Exchange Server 2007 only.
5. Informs the Exchange Server that the restore has completed. At this point you have the option of:
   - Starting recovery
   - Mounting the databases (when recovery completes)
6. Ends the Tivoli Storage Manager server session.

Depending on the backup strategy you choose, restoring an Exchange storage group can involve restoring multiple backup objects from the Tivoli Storage Manager server. See "Backup strategies" on page 20.

You can use Data Protection for Exchange to restore mailbox databases to a Recovery Storage Group (Exchange Server 2003 and Exchange Server 2007) or a Recovery Database (Exchange Server 2010). See "Restoring the Recovery Storage Group and the Recovery Database" on page 221 for details on performing this procedure. With Microsoft Exchange Server, you can also use the item Recovery feature of the Exchange Client to recover messages and folders which are accidentally deleted. Exchange Server also provides a "deleted mailbox" feature to recover deleted mailboxes. For more information, see your Microsoft Exchange Server documentation.

In some situations, you may want to restore an individual item such as a message, mailbox, or folder to an alternate Exchange Server. See Appendix C, "Advanced restore procedures," on page 219 for details on performing this procedure.

The **restorefiles** command restores the .edb, .stm, and .log files from a specified Data Protection for Exchange Legacy backup into a specified directory. (The Data Protection for Exchange Legacy backup resides on Tivoli Storage Manager server storage). It also enables individual mailbox recovery products acquired from another vendor. See "Restorefiles command" on page 153 for more information about this command (Exchange Server 2003 and Exchange Server 2007 only).

When a VSS restore operation is initiated, Data Protection for Exchange performs the following actions:

1. Validates the state of Exchange server objects.
2. When using the Data Protection for Exchange GUI, you are prompted whether to dismount the databases within the selected storage group you are restoring into.
3. Begins a session with a Tivoli Storage Manager server.
4. Verifies that the VSS service is running and that the Exchange writer is available.
5. The Tivoli Storage Manager VSS Requestor performs the VSS snapshot restore preparation stage.
6. The Tivoli Storage Manager VSS Requestor restores the backup data.
7. The Tivoli Storage Manager VSS Requestor marks the restore as complete in VSS.
8. Optionally, mounts databases to run recovery.

Mailbox restore processing: Actions

When a mailbox restore operation is initiated, Data Protection for Exchange performs the following actions:

1. Starts a session with the Tivoli Storage Manager server.
2. Queries the Tivoli Storage Manager server for a list of available backups.
3. Selects an appropriate backup based on user input.
4. For Exchange Server 2007 environments only, creates an Exchange Recovery Storage Group.
5. For Exchange Server 2010 environments only, creates an Exchange Recovery Database.
6. For Exchange Server 2003 environments only, presents the user with the names of the storage groups and the databases that must be used to manually prepare an Exchange Server Recovery Storage Group.
7. Restores the selected backup into the Exchange Recovery Storage Group.

Note: Data Protection for Exchange will restore the databases necessary for the mailbox restore operation only, not the entire storage group. When restoring from multiple mailboxes with the same mailbox restore operation, each database to be restored will be restored only once, even if the mailboxes to be restored are on different databases or storage groups, or both.

8. Copies individual mailboxes or individual mailbox items from the Exchange Recovery Storage Group or Recovery Database into the original mailbox or other location.
9. For Exchange Server 2007 environments only, removes the Exchange Recovery Storage Group and the associated files.
10. For Exchange Server 2010 environments only, removes the Exchange Recovery Database and the associated files.

Restore methods

Data Protection for Exchange provides a Legacy method and a VSS method for restoring your data.

Legacy Restore

A legacy restore refers to restoring Exchange Server 2003 and Exchange Server 2007 "traditional streaming" backups.

It restores legacy backups (Exchange database files and log files) from Tivoli Storage Manager server storage to their original location. Like a legacy backup, it uses a specialized API restore that functions with the Exchange server storage engine. It is occasionally referred to as the Exchange server streaming backup and restore API.

Legacy backups, also referred to as traditional "streaming" backups, cannot be restored using Exchange Server 2010. Instead, VSS Backups (and VSS restores) are available.

VSS Restore

A VSS Restore restores VSS Backups (Exchange database files and log files) that reside on Tivoli Storage Manager server storage to their original location.

The following characteristics are true of VSS Restores:

- Full, copy, incremental, and differential backup types can be restored. Database copy backup types are not supported by VSS, and therefore cannot be restored.
- VSS Restore granularity is at the database level.
- Supports restoring one or more storage groups (Exchange Server 2003 or Exchange Server 2007) or databases (Exchange Server 2010) from a VSS snapshot backup located on Tivoli Storage Manager server storage.
- Restores can be performed in a Microsoft Cluster Server (MSCS) or Veritas Cluster Server (VCS) environment.
- Supports restoring a VSS Backup (directly from Tivoli Storage Manager server storage) to an alternate machine.
- Supports restoring a VSS Backup to an alternate storage group (Exchange Server 2007) or database (Exchange Server 2010).
- Supports restoring a Exchange Server 2007 backup taken from an LCR or CCR replica into the production server.
- Supports restoring a Exchange Server 2010 backup taken from a DAG replica into the production server.

- Supports restoring a backup taken from a relocated storage group (Exchange Server 2007) or database (Exchange Server 2010) into the production server.

VSS Fast Restore

A VSS Fast Restore restores VSS Backups that reside on local shadow volumes.

In general, restore processing can conclude within minutes instead of hours in this situation. The following characteristics are true of VSS Fast Restore restores:

- Full, copy, incremental, and differential backup types can be restored. Database copy backup types are not supported by VSS and therefore, cannot be restored.
- Restore granularity is at the database level.
- The key component of producing a VSS Fast Restore is the speed with which the application can become operational with the data that resides on local shadow volumes. Be aware that even though the data is restored relatively quickly, the transaction logs must still be replayed after the restore and therefore, the time of recovery for the application can increase.
- Supports restoring an Exchange Server 2007 VSS Backup to an alternate storage group.
- Supports restoring an Exchange Server 2010 VSS Backup to an alternate database.
- Supports restoring an Exchange Server 2007 backup taken from an LCR or CCR replica into the production server.
- Supports restoring an Exchange Server 2010 backup taken from a DAG replica into the production server.
- Supports restoring an Exchange Server 2007 backup taken from a relocated storage group into the production server.
- Supports restoring an Exchange Server 2010 backup taken from a relocated database into the production server.

VSS Instant Restore

A VSS Instant Restore occurs when a set of target volumes that contain a valid snapshot are copied back to the original source volumes using hardware-assisted volume-level copy mechanisms. The application can return to normal operations as soon as the hardware-assisted volume-level copy has been started and the log replay is complete.

The key component of producing a VSS Instant Restore is the speed with which the application can become operational with the data that resides on local shadow volumes. Even though the data is restored relatively quickly, the transaction logs must still be replayed after the restore and therefore, the time of recovery for the application can increase.

A VSS Instant Restore is only possible when all of the data (from the storage group or database specified for restore) resides on storage subsystems supported by the VSS Instant Restore. If part of the data being restored (including the log files) resides on a local disk, a VSS Fast Restore is performed. When performing VSS Instant Restores, a best practice is to make sure that any previous background copies (that involve the volumes being restored) are completed prior to initiating the VSS Instant Restore. However, this check is not necessary for XIV or SAN Volume Controller with space-efficient target volumes.

When performing a VSS Instant Restore, you must restore *all* databases within the specified storage group. You cannot perform a partial restore (***/partial***) while using VSS Instant Restore. Although Data Protection for Exchange allows this operation

to begin, it will either fail or complete incorrectly. If you need to restore just one database from a VSS Backup that resides on local VSS shadow volumes on DS6000, DS8000, SAN Volume Controller, or XIV, select the ***Disable VSS Instant Restore*** option in the Data Protection for Exchange GUI Restore Window or specify ***/instantrestore***=*no* on the command-line interface. If VSS Instant Restore capability is needed for single databases, place these databases in their own storage group.

VSS Instant Restore capability is automatically disabled during any of these VSS restore scenarios:

- A VSS restore into the Recovery Storage Group (Exchange Server 2007) or Recovery Database (Exchange Server 2010).
- A VSS restore into a relocated or alternate storage group.
- A VSS restore from an Exchange Server 2007 LCR replica backup.

Although VSS Instant Restore is the default restore method when all Exchange data specified for a restore resides on storage subsystems supported by the VSS Instant Restore, a failover to VSS Fast Restore can occur when an error is detected early enough in the VSS Instant Restore process to trigger the failover. In this situation, an error is logged in the dsmerror.log file that is used by the DSMAGENT. However, a failover to VSS Fast Restore might not always be possible. For example, if an error occurs later in the restore process (such as a pending background copy on the storage subsystem, a failure to start the FlashCopy® operation on the snapshot provider system, or other hardware error), VSS Instant Restore processing fails without a failover to VSS Fast Restore.

Preparing for VSS Instant Restore in DS6000, DS8000, and SVC environments:

When preparing for VSS Instant Restore, you must make changes to the CIMOM service settings, and take into account VSS Instant Restore considerations such as the restore granularity and the requirements for where backups reside.

These preparations are only applicable to the DS6000, DS8000, and SVC disk subsystems.

If you are using SVC 5.1 with a version of the Tivoli Storage Client earlier than 6.1.1.0, or with an IBM VSS provider earlier than 4.0, you must make changes to the CIMOM service settings. Also, in such a scenario, when planning for VSS Instant Restore operations, you must ensure that any special requirements have been met. This is because these configurations do not allow Secure Sockets Layer (SSL) to be used for Common Information Model Object Manager (CIMOM) communication with VSS Instant Restore operations. If you are using the Tivoli Storage Manager Client version 6.1.1.0 or later, and the IBM VSS provider version 4.0 or later, you can use SSL.

Because you cannot use Secure Sockets Layer (SSL) for Common Information Model Object Manager (CIMOM) communication with VSS Instant Restore operations, you must make changes to the CIMOM service settings. Also, when planning for VSS Instant Restore operations, you must ensure that any special requirements have been met.

Perform the following tasks before using VSS Instant Restore:

1. Configure the CIMOM server to accept communication without SSL by specifying these values for the following options in the CIMOM cimom.properties file:

```
Port=5988
ServerCommunication=HTTP
DigestAuthentication=false
SslEnabled=false (SVC only)
```

2. Restart the CIMOM service after making these changes.
3. If you are using SAN Volume Controller, change WebSphere files so that they use the new CIMOM settings. The CIMOM is located in the svcconsole directory.

```
C:\Program Files\IBM\svcconsole\console\embeddedWAS\installedApps\DefaultNode
 \ICAConsole.ear\ICAConsole.war\WEB-INF
C:\Program Files\IBM\svcconsole\console\embeddedWAS\installedApps\DefaultNode
 \SVCConsole.ear\SVCConsole.war\WEB-INF
C:\Program Files\IBM\svcconsole\console\embeddedWAS\config\cells\DefaultNode
 \applications\ICAConsole.ear\deployments\ICAConsole\ICAConsole.war\WEB-INF
C:\Program Files\IBM\svcconsole\console\embeddedWAS\config\cells\DefaultNode
 \applications\SVCConsole.ear\deployments\SVCConsole\SVCConsole.war\WEB-INF
```

4. Restart the WebSphere service after making these changes.

Consider the following points when planning for VSS Instant Restore:

- Restore granularity is at the storage group level for Exchange Server 2003 and Exchange Server 2007, and at the database level for Exchange Server 2010.
- VSS requires that data must always be restored to the same drive letters and paths as existed during the original backup.
- VSS requires IBM System Storage Support for Microsoft Volume Shadow Copy Service software if using a DS6000, DS8000, or SAN Volume Controller disk subsystem.
- VSS requires IBM XIV VSS Hardware Provider if you are using an XIV disk subsystem.
- Backups must reside on the same XIV Gen 2, DS6000, DS8000, or SAN Volume Controller storage subsystem to which they are restored.
- In a CCR environment, stop the Microsoft Exchange Replication Service on both the active node and the passive node before running the VSS Instant Restore operation.
- In a DAG environment, stop the Microsoft Exchange Replication Service on the active node and the passive node before running the VSS Instant Restore operation.
- Microsoft hotfix KB 919117 is required when performing VSS Instant Restore operations in a Windows Server 2003 cluster environment.
- Microsoft hotfix KB 952790 is required when performing VSS Instant Restore operations in a Windows Server 2008 non-cluster environment.
- All Microsoft hotfixes must be installed that are required by the VSS hardware provider.
- Do not use version 2.2.2 of the IBM XIV VSS Hardware Provider with Tivoli Storage Manager. There are defects in this version of the Hardware Provider that prevent VSS Instant Restore from working properly.

Compatibility with earlier versions:

Backups that are created on local shadow volumes with earlier versions of IBM Tivoli Storage Manager for Copy Services have different compatibility, depending on whether the backups reside on **DS** storage or on **SAN Volume Controller** storage.

On **DS** storage:

- Backups that are created with IBM Tivoli Storage Manager for Copy Services Version 5.3.3 on local shadow volumes that reside on DS storage *cannot* be restored using VSS Instant Restore using IBM Tivoli Storage Manager for Copy Services Version 5.5.1 or later. You must create backups on local shadow volumes (residing on DS storage) using IBM Tivoli Storage Manager for Copy Services Version 5.5.1 or later in order to restore them using VSS Instant Restore.
- Backups that are created with IBM Tivoli Storage Manager for Copy Services Version 5.3.3 on local shadow volumes (residing on DS storage) can be restored using VSS Fast Restore using IBM Tivoli Storage Manager for Copy Services Version 5.5.1 or later.

On **SAN Volume Controller** storage:

Backups that are created with IBM Tivoli Storage Manager for Copy Services Version 5.3.3 on local shadow volumes that reside on SAN Volume Controller storage *can* be restored using VSS Instant Restore (and VSS Fast Restore) using IBM Tivoli Storage Manager for Copy Services Version 5.5.1 or later.

Restoring VSS Backups into alternate locations

Data Protection for Exchange allows an Exchange Server 2007 storage group, CCR replica, or LCR replica (that has been backed up using VSS) to be restored into the Recovery Storage Group or into an alternate (or relocated) storage group. An Exchange Server 2010 database backup or DAG active or passive database copy backup can be restored into a Recovery Database or into an alternate (or relocated) database.

This restore capability is referred to as a "restore into" scenario and requires the following:

- This feature is only available with Exchange Server 2007 or Exchange Server 2010.
- If you are performing a VSS Restore of a relocated storage group (Exchange Server 2007) or relocated database (Exchange Server 2010), you must use the ***Restore Into*** function and specify the same storage group name (Exchange Server 2007) or database name (Exchange Server 2010) as the one you are restoring. The restore will fail if you do not specify the same name.
- Performing any type of restore into function will automatically disable VSS Instant Restore.
- An attempt to perform a VSS Restore into a Recovery Storage Group on Exchange Server 2003 will ignore the Recovery Storage Group and be placed directly into the production database.

Backup strategies

Depending on your specific requirements regarding network traffic, backup window, and acceptable restore times, you might choose to follow different backup strategies. It is important to understand all aspects of Exchange Server disaster recovery, as well as backup considerations recommended by Microsoft. Refer to your Exchange Server documentation for this information.

The following list includes some of the commonly used backup strategies:

- If you choose a strategy that involves incremental or differential backups, circular logging must be disabled on the storage groups of the Exchange Server.
- You should not mix incremental and differential backups. Differential backups will only back up changes made since the last incremental backup. Incremental backups performed after differential backups contain all changes since the last incremental or full backup. Restores are more complicated when using a mixed strategy. You need to determine on an individual basis which transaction log backups (differential or incremental) to restore along with the full backup.
- When scheduling Legacy and VSS Backups, make sure they do not overlap.
- Incremental and differential legacy backups cannot be restored with full or copy VSS Backups.
- If you are using Exchange Server 2007, consider using Exchange Server LCR, CCR, or SCR replication technology to help protect your Exchange Server and possibly reduce the frequency of backup operations. Refer to your Microsoft documentation for details regarding this technology.
- If you are using Exchange Server 2010, consider using DAG database replication technologies. Refer to your Microsoft documentation for details regarding this technology.

Full backups only

Only full backups are performed with this strategy.

This approach is best for Exchange Servers that are relatively small because each backup contains enough data to restore the entire storage group. Each backup takes longer to perform, but the restore process is the most efficient because only the most recent (or other appropriate) full backup needs to be restored.

Full backup plus incremental backups

This strategy is commonly used when the normal backup window or network capacity cannot support a full backup each time.

In such cases, a periodic full backup followed by a series of incremental backups allows the backup window and network traffic to be minimized during peak usage times. For example, you can perform full backups on the weekend and incremental backups during the week. The full backups can be done during low usage times when a larger backup window and increased network traffic can be tolerated. The restore process becomes more complex, however, because a full backup, as well as subsequent incremental backups, must be restored. In addition, transactions within the logs must be applied which increases process time. As a result, the more transactions applied, the longer the recovery process.

If you use this backup strategy, you must decide whether the Tivoli Storage Manager storage management policies are modified, to ensure all incremental backups are stored together on the Tivoli Storage Manager server (collocated). This

helps improve restore performance by reducing the number of media mounts necessary for restoring a series of incremental backups. See "How Tivoli Storage Manager server policy affects Data Protection for Exchange" on page 26 for more information.

Full backup plus differentials

This strategy provides an easier restore than the full plus incremental backup strategy.

This approach might be useful if your backup window and network capacity can process the backup of all transaction logs that accumulate between full backups. This is because it requires the transfer of only one differential plus the last full backup to accomplish a restore. However, the same amount of data must be transferred in the differential image, as in the series of incremental backups.

Therefore, a full backup plus differential backup policy increases network traffic and Tivoli Storage Manager storage usage. This assumes that the differential backups are performed with the same frequency as the incremental backups.

You should carefully consider whether there is sufficient advantage to justify the additional resource necessary to resend all prior transaction logs with each subsequent differential backup.

Using VSS and Legacy Backups together (Exchange Server 2003 and Exchange Server 2007)

With Exchange Server 2003 and Exchange Server 2007, you can use both VSS and Legacy Backups in your complete backup strategy, but you cannot mix the two types of backups.

Microsoft supports and recommends using both VSS and Legacy Backups in your complete backup strategy. However, Microsoft also states that you cannot mix the two types of backups. For example, a Legacy incremental or differential backup cannot be applied to a VSS full or copy backup. This is noted in the Microsoft Exchange Server SDK documentation. The Exchange store will prevent you from mixing backup types.

Also, be aware of the following best practices:

- Legacy and VSS Backups to Tivoli Storage Manager server storage are usually dictated by time, not versions.
- Backups to local shadow volumes are usually dictated by versions because of space limitations and provisioning of VSS storage.

Tip: When running a backup operation under Exchange Server 2003, if a VSS incremental or differential backup is attempted when a full backup is required (for example, if the storage group is new or a new database was added to an existing storage group), the VSS backup will fail. When this situation is detected, immediately run a full backup on the storage group to resolve the situation.

Table 6. Backup strategy characteristics

Strategy characteristics	**Legacy backup only**	**Legacy backup plus VSS backup**
Available backup types:	COPY 1+ per month	Legacy COPY 1+ per month
	FULL 1+ per week	Legacy FULL 1+ per week
	INCR 1+ per day	VSS FULL 1+ per day
		VSS FULL CCR or LCR copies 1+ per week[1]

Table 6. Backup strategy characteristics (continued)

Strategy characteristics	Legacy backup only	Legacy backup plus VSS backup
Available restore types:	Restore to the production Exchange Server	VSS: • VSS Restore[2] • VSS Fast Restore[3] • VSS Instant Restore[4] Legacy: • Restore to the production Exchange Server
	Mailbox restore to the production Exchange Server (restore data to its original location or to an alternate mailbox or folder) Mailbox restore to Exchange Server personal folders (.pst) file	Exchange Server 2003 • Mailbox restore from Legacy backup only: – Mailbox restore to the production Exchange Server (restore data to its original location or to an alternate mailbox or folder) – Mailbox restore to Exchange Server personal folders (.pst) file
		Exchange Server 2007 • Mailbox restore from Legacy and VSS Backups – Mailbox restore to the production Exchange Server (restore data to its original location or to an alternate mailbox or folder) – Mailbox restore to Exchange Server personal folders (.pst) file
		Exchange Server 2010 • Mailbox restore from VSS Backups – Mailbox restore to the production Exchange Server (restore data to its original location or to an alternate mailbox or folder) – Mailbox restore to Exchange Server personal folders (.pst) file

Table 6. Backup strategy characteristics (continued)

Strategy characteristics	Legacy backup only	Legacy backup plus VSS backup
Restore attributes:	FULL, COPY, INCR, DIFF, DBCOPY Server and storage group level restore granularity Point-in-time recovery Roll-forward recovery Restore to alternate machine Recovery Storage Group	FULL, COPY Server and storage group level restore granularity Point-in-time recovery Roll-forward recovery Restore to alternate machine Restore to relocated or alternate storage group[5] Recovery Storage Group[6]

1 VSS Backups of CCR and LCR copies are available on Exchange Server 2007 only.

2 Files are copied from the Tivoli Storage Manager server directly to the production source volumes.

3 Files are copied from local shadow volumes directly to the production source volumes.

4 Snapshot volumes are copied to the production source volumes. SAN Volume Controller, DS6000, DS8000, or XIV is required to perform this type of restore.

5 VSS Backups of Exchange Server 2007 data can be restored to a relocated storage group or to an alternate storage group. VSS Backups of Exchange Server 2010 databases can be restored to a Recovery Database or to an alternate database.

6 Legacy backups can be restored to the Recovery Storage Group on Exchange Server 2003 and Exchange Server 2007. VSS Backups can be restored to the Recovery Storage Group on Exchange Server 2007 or to the Recovery Database on Exchange Server 2010.

Using VSS operations in a cluster

Data Protection for Exchange supports VSS operations in an Exchange Server cluster environment. Review these requirements and limitations before attempting operations in a VSS cluster.

Cluster requirements for VSS

VSS operations in a cluster environment have special requirements, which include dsm.opt files options and parameter settings for node registration.

Restriction: SCC clustering is not supported by Microsoft with Exchange Server 2010.

The following requirements must be met for VSS operations to perform successfully in a cluster environment:

- The ***vssaltstagingdir*** option must be specified when the following circumstances are true of your cluster environment:
  - Tivoli Storage Manager performs the VSS operations.
  - VSS Backups are stored on local shadow volumes.

– Make sure you have at least 200 megabytes of free disk space on the drive that the ***vssaltstagingdir*** option specifies. This space is used to hold the metadata files for Data Protection for Exchange.

This option must be specified in the dsm.opt file for all potential ***localdsmagentnode*** nodes that could be running the Tivoli Storage Manager Remote Client Agent Service (DSMAGENT):

```
vssaltstagingdir d:\dir
```

`d:` represents a shared drive that is accessible by all nodes in the cluster. It can also be a disk that follows the Virtual Exchange Server. `\dir` represents a directory located on the shared drive. This option must be specified on all nodes that are used in the cluster. For example:

```
vssaltstagingdir Q:\TSMVSS
```

- When registering nodes to the Tivoli Storage Manager server specifically for VSS operations, do not specify the Tivoli Storage Manager ***USerid***=NONE parameter. VSS operations will fail when this parameter is specified.
- Make sure to specify the following options in each of the dsm.opt files that are used for the LOCALDSMAGENT, REMOTEDSMAGENT, and OFFLOAD machines:

```
CLUSTERNODE NO
CLUSTERDISKSONLY NO
```

Cluster limitations for VSS

VSS operations in a cluster environment have certain limitations, for example, failover considerations and restrictions on the node to be restored to.

Be aware of these limitations when performing VSS operations in a cluster environment:

- All servers within the cluster must use the same levels of Tivoli Storage Manager, Windows, and other applicable software.
- Microsoft KB 919117 is required to perform VSS Instant Restore in a Windows Server 2003 cluster environment.
- Dynamic disks are not supported.
- Data Protection for Exchange supports MSCS cluster failover and failback with the following limitations, which are consequences of the Microsoft VSS service not being cluster-aware:
  - Target volumes used for snapshot backups on one node in the cluster cannot be reused for a subsequent backup from another node in the cluster. To continue normal snapshot backup activity after a failover, ensure that additional target volumes or snapshot space are available in the VSS provider free pool to create new snapshots. To be able to continue to maintain the number of backup versions defined in the backup policy in failover scenarios, you must allocate that number of target LUNs times the number of cluster nodes in the VSS free pool so that the version limit number of snapshots can be created on each node in the cluster. For a typical two-node cluster, allocating twice the version limit of target LUNs is recommended. Note that XIV does not require that target LUNs are predefined. Therefore, allocating extra target LUNs does not apply to XIV storage devices
  - Instant restore from snapshot backups is possible on any node in the cluster, regardless of where the snapshot was created, provided that the backup version has not been expired by Tivoli Storage FlashCopy Manager. However, file copy restore from snapshot backups is only possible on the cluster node

where the snapshot was created. This assumes that the VSSALTSTAGINGDIR option is set to the same value in the DSM.OPT files on all possible nodes in the cluster, and that the directory that it points to is accessible from the active node.

  - Snapshot backups deleted because of policy enforcement on a node other than where the snapshot was created are not returned to the VSS free pool until failover or failback occurs to the node where the snapshot was created and reconciliation is run (for example, a new backup is run).

- The Tivoli Storage Manager Client Acceptor Daemon (CAD) must be installed on each cluster node so that it can continue operations in the event of a failover. Make sure the CAD service name is the same on all cluster nodes so that it can be started by a generic cluster service.
- It is recommended that the Local DSMAgent client node be a separate node from your normal backup-archive client, as this CAD service will need to be made a non cluster option.
- The Remote DSMAgent client node does not require you to register a separate node for each server within the cluster as this server only acts as a secondary server.
- Use the Microsoft **vssadmin** and **vshadow** commands to verify the environment. You can use the DISKSHADOW tool on Windows 2008 or later.
- A Data Protection for Exchange configuration file should be configured for each node in the cluster. These files are almost identical, except that the ***localdsmagentnode*** parameter points to the corresponding local DSMAgent on each node.

If you plan to perform scheduled VSS operations in a cluster environment, be aware of these considerations:

- Install the Tivoli Storage Manager scheduler as a Windows service on both cluster nodes.
- If the command file resides on a local drive, you must make sure that it remains consistent on all cluster nodes. Optionally, you can create the command file on a shared drive. Make sure the ***objects*** parameter (specified with the **define schedule** command on the Tivoli Storage Manager server) points to this command file.

Additional useful cluster information is available in the Redbooks publication, *Using IBM Tivoli Storage Manager FlashCopy Manager to Back Up Microsoft Exchange with VSS*. This document is available online at http://www.redbooks.ibm.com/redpieces/abstracts/sg247373.html.

How Tivoli Storage Manager server policy affects Data Protection for Exchange

Tivoli Storage Manager policy determines how Data Protection for Exchange backups are managed on Tivoli Storage Manager storage.

The Tivoli Storage Manager server recognizes Data Protection for Exchange as a node. Data that is backed up to Tivoli Storage Manager storage from this Data Protection for Exchange node is stored and managed according to settings specified for Tivoli Storage Manager server policy items.

Tivoli Storage Manager policy can manage the VSS Backups that are placed on local shadow volumes as well as in Tivoli Storage Manager server storage pools. The Tivoli Storage Manager server is responsible for managing VSS Backups,

whether the backup is stored on local shadow volumes or on the Tivoli Storage Manager server. Be aware that while a VSS snapshot (created for backup to Tivoli Storage Manager server storage) is deleted after the backup completes, a VSS snapshot (created for backup to local shadow volumes) remains active until the backup version is expired according to the policy settings for VSS Backups on local shadow volumes.

The number of local backup versions maintained by the Tivoli Storage Manager server is determined by the value that is specified by the Tivoli Storage Manager server ***verexists*** parameter (defined in the copy group of the management class to which the local backup belongs). The number of Target Volume sets allocated for local backups should be equal to the ***verexists*** parameter. For example, if ***verexists***=*3*, then at least three sets of Target Volumes must be allocated for the backup to complete successfully. If only two sets of Target Volumes are allocated, the third and subsequent backup attempt will fail. If more sets of Target Volumes exist than the number specified by the ***verexists*** parameter, these sets are ignored by the Tivoli Storage Manager server.

The policy management of local backups is responsible for reconciling the local backup repository with the information stored on the Tivoli Storage Manager server. For example, if Target Volume LUNs that were used for a local backup are removed from the storage subsystem, the information representing the backup on the Tivoli Storage Manager server must be reconciled. Likewise if the Tivoli Storage Manager server policy has determined that a local backup copy is no longer needed, the local backup manager must free the Target Volume LUNs to the storage subsystem so that these LUNs can be used for future backup operations. Tivoli Storage Manager automatically detects these situations and performs the reconciliation.

Storage space considerations for local shadow volumes

Tivoli Storage Manager requires that sufficient storage space be available to create shadow volumes required for VSS Backup processing. Even when the VSS Backup destination is the Tivoli Storage Manager server, storage space to create a shadow volume is still required (though on a temporary basis).

Since the value of the ***verexists*** parameter (specified for your local backup policy) determines the number of backup versions to retain on local shadow volumes, a ***verexists***=*1* setting will cause the deletion of an existing backup on local shadow volumes (during a VSS Backup to Tivoli Storage Manager server storage) in order to create enough temporary space for the new snapshot. Therefore, if you want to keep *N* backups on local shadow volumes and also perform VSS Backups to Tivoli Storage Manager server storage, make sure you provision enough storage space on local shadow volumes and specify ***verexists***=*N+1*.

Make sure to specify a ***verexists*** value that accommodates your VSS Backup goals. If you have limited storage space for VSS operations and are restricted to a ***verexists***=*1* setting, you can take advantage of the ***Backup Destination*** *BOTH* option. This stores the backup on local shadow volumes as well as sends a copy to Tivoli Storage Manager server storage.

It is possible for VSS Backups (that Data Protection for Exchange creates and stores on local shadow volumes) to be modified and deleted from outside of Tivoli Storage Manager control. For example, the Microsoft VSSADMIN DELETE SHADOWS command can remove a VSS Backup managed by Tivoli Storage Manager without Tivoli Storage Manager being able to prevent such a removal. In

such a situation, Tivoli Storage Manager recognizes the backup removal and reconciles its index of available backups with what resides on local shadow volumes. It is important to be aware of this potential for removal and establish a strategy that protects VSS Backup data stored on local shadow volumes from being compromised.

Be aware that the following issues impact your Tivoli Storage Manager policy for managing VSS Backups:

- Overall backup strategy.
- Length of time that VSS Backups will reside on Tivoli Storage Manager server storage.
- Number of VSS Backup versions to reside on Tivoli Storage Manager server storage.
- Types of VSS Backups to reside on Tivoli Storage Manager server storage.
- Number of VSS Backup versions to reside on local shadow volumes.
- Types of VSS Backups to reside on local shadow volumes.
- The amount of available target volume storage provisioned for VSS operations.

SAN Volume Controller 5.1 FlashCopy support

Thin provisioning or the ability to allocate less physical storage than the declared size of a logical storage volume has been available in the SAN Volume Controller since the 4.3 release. A thinly provisioned volume is referred to as a space-efficient (SE) volume.

SAN Volume Controller Version 5.1 introduces an important new capability in its copy services related to use of SE volumes as FlashCopy targets. Although prior releases of SAN Volume Controller supported use of SE target volumes, it was not possible until version 5.1 to do a FlashCopy restore from SE target volumes, or from fully allocated target volumes, when a background copy of all blocks from source to target had not completed. The enhanced copy services in SAN Volume Controller 5.1 allow FlashCopy restore from SE target volumes as well as from fully allocated target volumes for which the background copy of the VSS backup has not yet completed. It is now possible to retain multiple FlashCopy images of a source volume as backup generations at a much reduced storage cost, since it is not necessary to allocate the full size of the source volume for each backup generation, while still maintaining the ability to do instant restore using FlashCopy from the SE target volumes.

SAN Volume Controller minimizes the demands required to maintain multiple snapshots of the same source volume by putting the target volumes into a cascade where each target is dependent on changes recorded in target volumes of subsequent snapshots. For example, if four VSS snapshots are created of a source volume, where S is the source and T1 through T4 are the targets, with T1 being the first chronologically and T4 the last, the following cascade occurs:

```
S -> T4 -> T3 -> T2 -> T1
```

With this type of cascade relationship, a copy-on-write process is needed only between the source volume and the latest FlashCopy target. Any blocks that remain unchanged on the source volume are not copied at all. However, the cascaded relationship, where multiple SE target volumes have the same FlashCopy source, requires some special considerations when you use the target volumes as backup versions managed by Data Protection for Exchange.

The following sections provide guidance and recommendations for effective use of Data Protection for Exchange with SAN Volume Controller 5.1.

Use of Data Protection for Exchange with SAN Volume Controller

Data Protection for Exchange exploitation of SAN Volume Controller FlashCopy capabilities on Windows is dependent on the Volume Shadow Copy Service (VSS) hardware provider for SAN Volume Controller. Configuration of the VSS provider for SAN Volume Controller controls what type of FlashCopy is performed when a VSS snapshot is requested, and the resultant behavior when you use VSS snapshots.

Version 4.1.x of the VSS provider for SAN Volume Controller 5.1 has the following characteristics:

- If the VSS provider is configured to use Incremental FlashCopy, then only one backup version is allowed, because each VSS snapshot request for a given source volume causes an incremental refresh of the same target volume.

  In this case, deletion of the VSS snapshot removes the snapshot from the VSS inventory, but the FlashCopy relationship remains on the SAN Volume Controller, so that a subsequent VSS snapshot of the same source volume will result in an incremental refresh of the target volume.
- When the VSS provider is configured to use SE target volumes - specifically, when the background copy rate is set to zero - the following is true:
  –

  Deletion of a VSS snapshot represented by a target volume in a cascade causes all target volumes dependent on the volume being deleted (in other words, the target volumes that were created earlier) also to be deleted. For example, deletion of a snapshot represented by target volume *T2* in the sample cascade *S -> T4 -> T3 -> T2 -> T1* causes *T2* and *T1* to be deleted, and the cascade *S -> T4 -> T3* to remain after the deletion.

  Important: When you manually delete backups on SAN Volume Controller 5.1 space-efficient target volumes, and multiple backup versions exist, the backup being deleted as well as any older backups that contain the same volumes are deleted. Please take note that the deletion might not be performed until the next snapshot operation.

  –

  A FlashCopy restore of the source volume from a target volume in a cascade of multiple target volumes is destructive to the target volume being restored, as well as to all newer targets in the cascade. For example, restore of a snapshot represented by target volume *T3* in the sample cascade *S -> T4 -> T3 -> T2 -> T1* causes *T4* and *T3* to be deleted, and the cascade *S -> T2 -> T1* to remain after the restore.

  One exception to this pattern is that a FlashCopy restore from an SE target that is the only target in the cascade is not destructive.
  – If an SE target volume runs out of space to hold the data from changed blocks on the source volume, that target volume and all target volumes dependent on that target volume go offline and render those backup versions unusable.

Note: An *SE backup version* is defined by a FlashCopy to an SE target volume that has a background copy rate of zero. Use of SE target volumes with "autoexpand" enabled and a background copy rate greater than zero does not create *SE backup*

versions, because the target volumes grow to the allocated size of the source volumes when the background copy completes.

Given these characteristics, the following requirements and recommendations apply to Data Protection for Exchange support of SAN Volume Controller 5.1:

- Using a mix of SE and fully allocated target volumes is not supported. You must choose to use either SE or fully allocated volumes for FlashCopy targets, and set the VSS provider background copy rate parameter accordingly.

  A transition from fully allocated targets to SE targets is accommodated by treating fully allocated targets as if they were SE when the background copy rate is set to 0.
- When using SE backup versions:
  - Do not mix persistent and nonpersistent VSS snapshots. Use of a nonpersistent VSS snapshot following one or more persistent snapshots causes the older persistent snapshots to be deleted when the nonpersistent snapshot is deleted.

    A VSS backup with *backupdestination* set to `TSM` creates a nonpersistent VSS snapshot. Therefore, do not follow a series of backups to local with *backupdestination* set to `TSM`. Instead, set *backupdestination* to `both` to send data to Tivoli Storage Manager while preserving local snapshot backup versions. Put another way, `backupdestination=LOCAL` and `backupdestination=TSM` are mutually exclusive settings. Do not use both in a backup strategy.
  - Enable *autoexpand* for the SE target volumes, to avoid out-of-space conditions.
  - Allocate enough space for SE target volumes to hold 120% of the data expected to change on the source volume in the time between snapshots. For example, if a database changes at a rate of 20% per day, VSS backups are done every 6 hours, and a steady rate of change throughout the day is assumed, the expected change rate between snapshots is 5% of the source volume (20/4). Therefore, the space allocated to the SE target volumes should be 1.2 x 5% = 6% of the source volume size. If the rate of change is not consistent throughout the day, allocate enough space to the target volumes to accommodate the highest expected change rate for the period between snapshots.
  - Do not delete snapshots manually. Allow Data Protection for Exchange to delete backup versions based on the defined policy, to ensure that deletion is done in the proper order. This avoids deletion of more backup versions than expected.

Data Protection for Exchange and SAN Volume Controller configurations

This table provides recommended configurations for typical use case scenarios and objectives for the backup and recovery solution.

Table 7. Snapshot restore and delete behavior on 5.1 space-efficient target volumes

Use Cases / Objectives	SVC Settings	VSS Provider Settings	Data Protection for Exchange Settings	Comments
- production application data resides on standard volumes - keep 14 snapshot backup versions - use minimum storage space for snapshot backup versions. Full physical copy not required - perform 2 VSS backups per day	- create 14 SE target volumes for each source volume to be protected - enable autoexpand for the SE target volumes - Add the SE target volumes to the VSS free pool	- set background copy rate = 0	- set policy to retain 14 local backup versions - schedule snapshot backups as wanted using backup destination =local	- once 14 VSS backups have been done, the 15th VSS backup will cause the oldest backup to be deleted and will reuse that target set.
- production application data resides on standard volumes - keep 1 snapshot backup version - use minimum storage space for snapshot backup versions. Full physical copy not required - perform 1 VSS backup per day and also send the backup to Tivoli Storage Manager	- create 2 SE target volumes for each source volume to be protected - enable autoexpand for the SE target volumes - Add the SE target volumes to the VSS free pool	- set background copy rate = 0	- set policy to retain 2 local backup versions - schedule snapshot backups as wanted using backup destination =both	- set policy for local snapshot backups to retain N+1 backup versions so that N snapshot backups are available for restore. Otherwise, a local backup version may not be available should a VSS backup fail after the prior backup was deleted
- production application data resides on standard volumes - keep 1 snapshot backup version - full physical copy is required - minimize overhead of background copies - perform 1 VSS backup per day and also send the backup to Tivoli Storage Manager	- create one standard target vol for each source vol to be protected - add standard target volumes to the VSS free pool	- use default background copy rate (50) - configure to use Incremental FC	- set policy to retain 1 local backup version - schedule snapshot backups as wanted using backup destination =both	- When using INCR FC, the VSS provider will not delete the single snapshot target set even though FlashCopy Manager will delete the prior VSS snapshot before creating a new one
- production application data resides on standard volumes - keep 2 snapshot backup versions - full physical copies are required for local backup versions - perform VSS backups every 12 hours with one backup daily sent to Tivoli Storage Manager	- create 3 standard target vols for each source vol to be protected - add standard target volumes to the VSS free pool	- use default background copy rate (50)	- set policy to retain 3 local backup versions - schedule VSS backups as follows: - backup destination = local at 11:00 - backup destination = both at 23:00	- set policy for local snapshot backups to retain N+1 backup versions so that N snapshot backups are available for restore.

Table 7. Snapshot restore and delete behavior on 5.1 space-efficient target volumes (continued)

Use Cases / Objectives	SVC Settings	VSS Provider Settings	Data Protection for Exchange Settings	Comments
- production application data resides on standard volumes - keep 4 snapshot backup versions - use minimum storage space for snapshot backup versions. Full physical copy not required - perform VSS backups every 6 hours with one backup daily sent to Tivoli Storage Manager	- create 5 SE target vols for each source vol to be protected - enable autoexpand for the SE target volumes - add SE target volumes to the VSS free pool	- set background copy rate = 0	- set policy for local snapshot backups to retain 5 local backup versions - schedule VSS backups as follows: - backup destination = local at 06:00, 12:00 and 18:00 - backup destination = both at 00:00	- set policy to retain N+1 backup versions so that N snapshot backups are available for restore
- production application data resides on SE volumes - keep 2 snapshot backup versions - full physical copies are required for local backup versions - perform VSS backups every 6 hours with one backup daily sent to Tivoli Storage Manager	- create 3 SE target vols for each source vol to be protected - allocate same percentage of real storage as for source volumes - add SE target volumes to the VSS free pool	- use default background copy rate (50)	- set policy to retain 3 local backup versions - schedule VSS backups as follows: - backup destination = local at 06:00, 12:00 and 18:00 - backup destination = both at 00:00	- set policy for local snapshot backups to retain N+1 backup versions so that N snapshot backups are available for restore - allows thin provisioning for both source and target vols and lets them grow together

Using space-efficient target volumes with SAN Volume Controller 5.1

SAN Volume Controller 5.1 requires special considerations when using space-efficient target volumes.

Data Protection for Exchange supports VSS Instant Restore operations when multiple backup versions exist on SAN Volume Controller 5.1 space-efficient target volumes. However, in this situation, VSS Instant Restore accesses snapshot volumes that contain dependent FlashCopy relationships. The snapshot volumes that create the dependency are typically backups that are created after the snapshot that is being restored. These snapshot volumes are removed in order for the VSS Instant Restore operation to complete successfully. As a result, the backups that included the deleted snapshots are deleted from storage. This destructive restore operation only occurs when VSS Instant Restore operations occur in an environment where Data Protection for Exchange manages multiple backup versions on SAN Volume Controller 5.1 space-efficient target volumes.

When multiple backup versions exist, all snapshots that are newer than the snapshot being restored are deleted during the VSS Instant Restore operation. The snapshot being restored is also deleted. When only one snapshot backup version exists, the snapshot being restored is not deleted.

Important: When manually deleting backups on SAN Volume Controller 5.1 space-efficient target volumes and multiple backup versions exist, delete the backups in the same order that they were created. Otherwise, the FlashCopy mappings remain because of cascaded dependencies. This is a known limitation.

Table 8. Snapshot restore and delete behavior on SAN Volume Controller 5.1 space-efficient target volumes

Snapshots on space-efficient volumes	Snapshot to be restored	Snapshot deleted
s1, s2, s3, s4	s1	s1, s2, s3, s4
s1, s2, s3, s4	s4	s4
s1, s2, s3, s4	s2	s2, s3, s4
s1	s1	None

Note: The order of creation of backups in the table is s1, s2, s3, s4.

Verifying snapshot creation

Use the IBM VSS provider `ibmvcfg` command to verify whether snapshots are created on SAN Volume Controller 5.1 space-efficient target volumes:

1. In a Windows command prompt, issue `ibmvcfg list infc -l` to display the FlashCopy mapping attributes. The `Tgt Type` column displays the FlashCopy mappings for the volumes attached to the current host.
2. Verify that the IBM VSS provider type states `SVC Pegasus`.

```
C:\Program Files\IBM\Hardware Provider for VSS-VDS>ibmvcfg list infc -l
Provider Type is SVC Pegasus.
Listing flashcopy relationship(s)...
                                                                                                    &ltPlease use the target volume name or the target unique ID
 to del flashcopy relationship>

FC Name         Src ID  Src Name          Unique ID                          Src Type        Tgt ID  Tgt Name          Unique ID
    Tgt Type        System            InFC    Cp.Rate Cl.Rate Start Time     %    Status
-------------------------------------------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------
FCMG4N1PZ8Y0000 80      KalaF00           600507680181800148000000000052      Standard        48      KalaS01           600507680181800148000000000031
    Space Efficient 0000020060600052  false   0       0       N/A             0    Quiesced
FCMG4N1PZ8Y0001 38      KalaF01           600507680181800148000000000027      Standard        49      KalaS02           600507680181800148000000000032
    Space Efficient 0000020060600052  false   0       0       N/A             0    Quiesced
FCMG4N1TU5S0000 80      KalaF00           600507680181800148000000000052      Standard        50      KalaS03           600507680181800148000000000033
    Space Efficient 0000020060600052  false   0       0       N/A             0    Quiesced
FCMG4N1TU5S0001 38      KalaF01           600507680181800148000000000027      Standard        51      KalaS04           600507680181800148000000000034
    Space Efficient 0000020060600052  false   0       0       N/A             0    Quiesced
FCMG4N1VQYU0000 80      KalaF00           600507680181800148000000000052      Standard        39      KalaF02           600507680181800148000000000028
    Standard        0000020060600052  false   100     0       100119150943    100  Idle or Copied
FCMG4N1VQYU0001 38      KalaF01           600507680181800148000000000027      Standard        40      KalaF03           600507680181800148000000000029
    Standard        0000020060600052  false   100     0       100119150943    100  Idle or Copied
fcmap6          33      tahiti1_log_01    600507680181800148000000000021      Standard        36      vss_1G_0003       600507680181800148000000000025
    Space Efficient 0000020060600052  false   0       0       100203082800    0    ResyncInProgress
fcmap7          28      tahiti1_data_01   60050768018180014800000000001C      Standard        91      vss_4G_0007       60050768018180014800000000005F
    Space Efficient 0000020060600052  false   0       0       100203082800    0    ResyncInProgress
```

Migration considerations

If upgrading to Data Protection for Exchange 6.1.2 and IBM VSS hardware provider 4.1, existing snapshots on SAN Volume Controller 5.1 space-efficient target volumes that were created with a background copy rate of zero are not considered space efficient. Delete these snapshots and create new snapshots using a copy rate value of zero according to instructions provided in the IBM VSS hardware provider 4.1 documentation. Also, if an IBM VSS hardware provider is installed that is earlier that version 4.1, uninstall that previous version before installing version 4.1.

Guidelines for SAN Volume Controller 5.1 environments

Review the guidelines that follow before attempting backup operations. Further information is available at http://publib.boulder.ibm.com/infocenter/svcic/v3r1m0/index.jsp:

- Determine whether to use space-efficient or fully-allocated backup targets before issuing a backup operation.
- If space-efficient virtual disks (VDisks) are used for backup targets, set the IBM VSS provider background copy value to zero by issuing the `ibmvcfg set backgroundCopy 0` command. To make the changes effective, restart the IBM VSS system service after issuing the command. For more details about configuring SAN Volume Controller 5.1 and the IBM VSS Hardware Provider for space-efficient target volumes, read the SAN Volume Controller 5.1 documentation.
- Do not mix FlashCopy COPY and NOCOPY backups in FlashCopy mappings.
- Do not mix fully-allocated and space-efficient VDisks (used for backup targets) in the VSS_FREE pool.
- If the protected data resides on SAN Volume Controller 5.1 volumes, and the VDisks in the VSS_FREE pool are space efficient, then VSS Instant Restore from multiple backups is possible. However, the VSS Instant Restore operation in this environment is destructive.
- The Windows host must be attached to an SAN Volume Controller 5.1 cluster. The volumes assigned to the Windows host must be participating in the SAN Volume Controller 5.1 cluster.
- Make sure that IBM VSS hardware provider version 4.1 (or later) is installed. This provider must be configured to accommodate multiple backup versions on SAN Volume Controller 5.1 space-efficient target volumes.
- Multiple snapshots on SAN Volume Controller 5.1 space-efficient VDisks are not supported for Single-Copy Cluster (SCC) environments. These SCC environments include Microsoft Cluster Server (MSCS) and Veritas Cluster Server (VCS) environments. Multiple snapshots are not supported because VSS snapshots are not automatically identified as "cluster aware".

These guidelines apply specifically to NOCOPY FlashCopy backups on SAN Volume Controller 5.1:

- You can remotely mount NOCOPY FlashCopy backups. However, SAN Volume Controller 5.1 is required to restore a NOCOPY FlashCopy backup.
- You can create a NOCOPY FlashCopy to a space-efficient target. However, protection from physical failures to the source volume is not provided.

Make sure to review your IBM VSS hardware provider 4.1 documentation for important information regarding these two issues:

- IBM VSS hardware provider prerequisites (for example, Microsoft test fixes).
- Configuration instructions for creating FlashCopy mappings of NOCOPY backups on SAN Volume Controller 5.1.

Tip: Space-efficient target volumes go offline when their capacity limit is exceeded. As a result, the current backup and all older backups (which have not reached FULL_COPY status) are lost. To avoid this situation, use the AUTOEXPAND option when creating space-efficient targets. This option allocates additional physical storage in order to prevent space-efficient target volumes going offline.

Restriction: When using VSS Instant Restore operations with multiple backup versions existing on SAN Volume Controller 5.1 space-efficient target volumes, only use full or copy type backups when the backup destination specifies local. A local backup (including any local backups created after the one being restored) is deleted by SAN Volume Controller because of the destructive restore behavior. As a result, any full, copy, incremental, or differential local backup is removed and unavailable for restore operations. If you want to use incremental or differential

local backups with SAN Volume Controller 5.1 space-efficient target volumes, disable VSS Instant Restore during any restore operations to avoid this situation.

Additional considerations when using SAN Volume Controller

The default background copy rate is 50. This value minimizes impact to response time for host system i/o, but it may not complete background copies as quickly as desired. Increasing the background copy rate used by the VSS provider to a value greater than 50 causes the background copies to complete more quickly. Do not set the background copy rate higher than 85, because this can significantly lengthen response times to I/O from host systems.

Security

Data Protection for Exchange must be registered to the Tivoli Storage Manager server and use the appropriate node name and password when connecting to the Tivoli Storage Manager server. Standard Tivoli Storage Manager security requirements apply to Data Protection for Exchange.

Security requirements for Data Protection for Exchange backup and restore tasks on Exchange Server 2010

To perform backup and restore tasks on Exchange Server 2010, Data Protection for Exchange must be operating in an account with membership in the Organization Management group.

For additional mailbox restore task requirements, see:

- "Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2010" on page 36
- "Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2010" on page 163

Security requirements for Data Protection for Exchange backup and restore tasks on Exchange Server 2007

To perform backup and restore tasks on Exchange Server 2007, Data Protection for Exchange must be operating in an account with membership in the Exchange Organization Administrators group.

By default, Windows adds the Exchange Organization Administrators group to other security groups, such as the local Administrators group and the Exchange Recipient Administrators group. If these default settings change, you must manually add the account to these other groups.

For additional mailbox restore task requirements, see:

- "Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2007" on page 36
- "Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2007" on page 163

Security requirements for Data Protection for Exchange backup and restore tasks on Exchange Server 2003

To perform backup and restore tasks on Exchange Server 2003, Data Protection for Exchange must be operating in an account with the following privileges:

- Exchange Administrator role
- Membership in the local Administrators group

For additional mailbox restore task requirements, see:

- "Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2003"
- "Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2003" on page 162

Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2010

To perform mailbox restore tasks on Exchange Server 2010, Data Protection for Exchange must be operating in an account with membership in the Organization Management group.

The account must have a live Exchange mailbox in the domain.

Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2007

To perform mailbox restore tasks on Exchange Server 2007, Data Protection for Exchange must be operating in an account with membership in the Exchange Organization Administrators group.

The account must have an Exchange mailbox in the domain.

By default, Windows adds the Exchange Organization Administrators group to other security groups, such as the local Administrators group and the Exchange Recipient Administrators group. If these default settings change, the account must be manually added to these other groups.

Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2003

To perform mailbox restore tasks on Exchange Server 2003, Data Protection for Exchange must be operating in an account with the following privileges:

- Exchange Administrator role
- Membership in the local Administrators group

The account must have an Exchange mailbox in the domain.

Data Protection for Exchange performance overview

You can optimize the performance of your Exchange Server by tuning options that are related to Data Protection for Exchange, and by considering how certain issues affect performance.

Many factors can affect the backup and restore performance of your Exchange Server. Some of these, such as hardware configuration, network type, and capacity, are beyond the control of Data Protection for Exchange. These factors are not within the scope of this document. However, some options that are related to Data Protection for Exchange can be tuned for optimum performance. See "Specifying Data Protection for Exchange options" on page 69 for details regarding these options.

In addition, be aware of how the following issues affect performance:

- Backups to local shadow volumes eliminates the transfer of data to the Tivoli Storage Manager server.
- During VSS Backup processing, integrated Exchange integrity checking reads every page in the files to be backed up. As a result, backup processing time can be significant. You can specify the ***/skipintegritycheck*** parameter to bypass integrity checking. However, this parameter is only valid for copy-type VSS Backups as Microsoft requires integrity checking be performed for full-type VSS Backups.
- The time required to perform a snapshot ranges from seconds to minutes, depending on the type of VSS provider used.
- Backup-archive client settings can affect performance when backing up data to the Tivoli Storage Manager server. Therefore, make sure to review information provided in the "VSS Backup processing: Overview" on page 4 and "How Tivoli Storage Manager server policy affects Data Protection for Exchange" on page 26 sections.

Buffering (Legacy only)

Data Protection for Exchange is a multithread application that uses asynchronous execution threads to transfer data between the Exchange servers and Tivoli Storage Manager servers. To accomplish this, multiple data buffers are used to allow one thread to receive data from one side, while another thread sends data to the other side.

For example, one thread reads data from an Exchange Server while another thread sends data to the Tivoli Storage Manager server. As a result, the Exchange Server continues sending data to available buffers regardless of the ability of the Tivoli Storage Manager server to receive the data. The number and size of buffers that are allocated for this can be configured through the **Settings** dialog in the Data Protection for Exchange GUI. The number and size of buffers can also be specified in the ***buffers*** and ***buffersize*** parameters on the command-line interface. For more information, see Chapter 5, "Using the command-line interface," on page 107.

LAN-free data movement

Running Data Protection for Exchange in a LAN-free environment allows data to be sent directly to storage devices.

As a result of implementing a LAN-free environment, data bypasses potential network congestion. However, you must be properly equipped to operate in a LAN-free environment. The *Tivoli Storage Manager Managed System for SAN Storage Agent User's Guide* provides detailed information about setting up a LAN-free environment.

In addition to specific LAN-free requirements, you must specify the ***enablelanfree*** option for Data Protection for Exchange to activate this LAN-free feature.

- For Legacy backups, specify ***enablelanfree*** *yes* in the Data Protection for Exchange options file.
- For VSS Backups, specify ***enablelanfree*** *yes* in the backup-archive client options file.

Microsoft Cluster Server and Veritas Cluster Server Support

Data Protection for Exchange supports Exchange Server 2003 and Exchange Server 2007 servers running in Microsoft Cluster Server (MSCS) and Veritas Cluster Server (VCS) configurations.

Attention: References to the Exchange Server in this section pertain to the virtual Exchange Server name in an MSCS or VCS environment.
The following list provides information you should consider when running Data Protection for Exchange in an MSCS or VCS environment:

- Data Protection for Exchange must be installed on all nodes of the cluster. In addition, when installing Data Protection for Exchange, it must be installed on a disk local to each node (not a shared cluster disk).
- Use identical configurations in the Tivoli Storage Manager options file when configuring Data Protection for Exchange on each node of the cluster. You must specify ***clusternode*** *yes* in the Data Protection for Exchange options file.
- When using the Tivoli Storage Manager scheduler for automating backups, you must install the scheduler service on all nodes of the cluster to enable failover support. See Chapter 6, "Using the Tivoli Storage Manager scheduler," on page 201 for more information.
- The Tivoli Storage Manager server treats backups as coming from a single server (the virtual Exchange server) regardless of the cluster node on which the backup was performed.
- When running in an MSCS or VCS environment, Data Protection for Exchange *must* be invoked from the command line with the ***/excserver*** parameter. For example, if the Exchange virtual server name on the Microsoft Cluster or VCS is *excvs1*, the GUI invocation is

  ```
  tdpexc /excserver=excvs1
  ```

  and an example command-line interface invocation is

  ```
  tdpexcc backup "First Storage Group" full /excserver=excvs1
  ```

Globalization

Data Protection for Exchange supports the following languages:

- American English
- Brazilian Portuguese
- French
- German
- Italian
- Japanese
- Korean
- Simplified Chinese
- Spanish
- Traditional Chinese

If you want to use a language other than English, you must install the Language Pack for the desired language. See the description of "Installing and activating the language packs" on page 51 for detailed information.

Chapter 2. Installing Data Protection for Microsoft Exchange Server 6.1.2

Information needed to install Data Protection for Microsoft Exchange Server is provided.

Review the appropriate prerequisite information before attempting to perform any installation tasks.

Software and operating system requirements

The minimum software and operating system requirements are dependent upon the Data Protection for Exchange operations you want to perform.

Data Protection for Exchange requires the following levels of Tivoli Storage Manager software:

- Tivoli Storage Manager API Version 6.1 or later.

  Note: Tivoli Storage Manager API Version 6.1 is included and automatically installed with Data Protection for Exchange 6.1.2.
- Tivoli Storage Manager server Version 6.1.0 or later

Tivoli Storage Manager backup-archive client Version 6.2.1 is required when running in an Exchange Server 2010 environment.

Details of the software and operating system requirements for Data Protection for Exchange can change over time. For the most up-to-date requirements, please visit the Hardware and Software Requirements Web page at http://www.ibm.com/support/docview.wss?uid=swg21430691.

Available features listed by Exchange Server version

Table 9. Available features listed by Exchange Server version. This table lists the available features on Exchange Server 2003, Exchange Server 2007, and Exchange Server 2010.

Feature	Exchange Server 2003	Exchange Server 2007	Exchange Server 2010
Legacy backup and restore	√	√	
Legacy restore into a Recovery Storage Group	√	√	
VSS Backup	√	√	√
VSS Restore	√	√	√
VSS Fast Restore	√	√	√
VSS Instant Restore	√	√	√
Mailbox restore and item-level restore	√	√	√
VSS Restore into a Recovery Storage Group or Recovery Database		√	
VSS restore into an alternate storage group or database		√	

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Table 9. Available features listed by Exchange Server version (continued). This table lists the available features on Exchange Server 2003, Exchange Server 2007, and Exchange Server 2010.

Feature	Exchange Server 2003	Exchange Server 2007	Exchange Server 2010
VSS restore into a relocated storage group or database		√	
VSS backup and restore of LCR copies		√	
VSS backup and restore of CCR copies		√	
VSS Restore into a Recovery Database			√
VSS restore into an alternate database			√
VSS restore into a relocated database			√
VSS backup and restore of with Database Mobility and Availability Groups (DAG)			√

Legacy Backup and Restore software and operating system requirements

Table 10. Minimum software and operating system requirements for Legacy Backup and Restore operations. This table lists the minimum software and operating system requirements for Legacy Backup and Restore operations.

Operating System	Exchange Server	VSS Provider	Tivoli Storage FlashCopy Manager or Tivoli Storage Manager for Copy Services
MicrosoftWindows 2003 (32-bit)[1]	Exchange Server 2003[2]	None	None
MicrosoftWindows 2003 (x64)[3]	Exchange Server 2007[4]	None	None
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2007	None	None
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2010	None	None
MicrosoftWindows 2008 R2 (x64)[8]	Exchange Server 2010	None	None
Table notes: See "Table notes for VSS operations software and operating system requirements" on page 45 for the notes that are referenced in this table.			

Basic VSS software and operating system requirements

Table 11. Minimum software and operating system requirements for basic VSS operations. This table lists the minimum software and operating system requirements for VSS operations.

Operating System	Exchange Server	VSS Provider[10]	Tivoli Storage FlashCopy Manager or Tivoli Storage Manager for Copy Services
MicrosoftWindows 2003 (32-bit)[1]	Exchange Server 2003[2]	Any VSS provider that is supported by Microsoft rules for VSS providers and that supports your storage subsystem.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2003 (x64)[3]	Exchange Server 2007[4]	Any VSS provider that is supported by Microsoft rules for VSS providers and that supports your storage subsystem.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2007	Any VSS provider that is supported by Microsoft rules for VSS providers and that supports your storage subsystem.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2010	Any VSS provider that is supported by Microsoft rules for VSS providers and that supports your storage subsystem.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 R2 (x64)[8]	Exchange Server 2010	Any VSS provider that is supported by Microsoft rules for VSS providers and that supports your storage subsystem.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
Table notes: See "Table notes for VSS operations software and operating system requirements" on page 45 for the notes that are referenced in this table.			

VSS offloaded backup software and operating system requirements

Table 12. Minimum software and operating system requirements for VSS offloaded backup. This table lists the minimum software and operating system requirements for VSS offloaded backup operations.

Operating System	Exchange Server	VSS Provider[10]	Tivoli Storage FlashCopy Manager or Tivoli Storage Manager for Copy Services
MicrosoftWindows 2003 (32-bit)[1]	Exchange Server 2003[2]	Any VSS provider that supports transportable shadow copies, is supported by Microsoft rules for VSS providers, and that supports your storage subsystem.[6]	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]

Table 12. Minimum software and operating system requirements for VSS offloaded backup (continued). This table lists the minimum software and operating system requirements for VSS offloaded backup operations.

Operating System	Exchange Server	VSS Provider[10]	Tivoli Storage FlashCopy Manager or Tivoli Storage Manager for Copy Services
MicrosoftWindows 2003 (x64)[3]	Exchange Server 2007[4]	Any VSS provider that supports transportable shadow copies, is supported by Microsoft rules for VSS providers, and that supports your storage subsystem.[6]	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2007[4]	Any VSS provider that supports transportable shadow copies, is supported by Microsoft rules for VSS providers, and that supports your storage subsystem.[6]	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 (x64)[3]	Exchange Server 2010	Any VSS provider that supports transportable shadow copies, is supported by Microsoft rules for VSS providers, and that supports your storage subsystem.[6]	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 R2 (x64)[8]	Exchange Server 2010	Any VSS provider that supports transportable shadow copies, is supported by Microsoft rules for VSS providers, and that supports your storage subsystem.[6]	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
Table notes: See "Table notes for VSS operations software and operating system requirements" on page 45 for the notes that are referenced in this table.			

VSS Instant Restore software and operating system requirements

Table 13. Minimum software and operating system requirements for VSS Instant Restore

Operating System	Exchange Server	VSS Provider[10]	Tivoli Storage FlashCopy Manager or Tivoli Storage Manager for Copy Services
MicrosoftWindows 2003 (32-bit)[1]	Exchange Server 2003[2]	On DS storage subsystems: • IBMSystem StorageVSS Hardware Provider 4.1.0.x On SAN Volume Controller storage subsystems: • IBMSystem StorageSAN Volume ControllerVersion 5.x • IBMSystem StorageVSS Hardware Provider 4.1.0.x On XIV Gen 2 storage subsystems: • IBM XIV VSS Hardware Provider (xProv) 2.2.3	On DS storage subsystems: Tivoli Storage FlashCopy Manager 2.1 (or later) *or* the following Tivoli Storage Manager for Copy Services modules: • Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5] • The Tivoli Storage Manager backup-archive client Version 5.5.1 requires Hardware Devices Snapshot Integration Module Version 5.5.1[7] On SAN Volume Controller storage subsystems: Tivoli Storage FlashCopy Manager 2.1 (or later) *or* the following Tivoli Storage Manager for Copy Services modules: • Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5] • The Tivoli Storage Manager backup-archive client Version 5.5.1 requires Hardware Devices Snapshot Integration Module Version 5.5.1[7] On XIV Gen 2 storage subsystems:
MicrosoftWindows 2003 (x64)[3]	Exchange Server 2007[4]		
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2007[4]		
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2010		
MicrosoftWindows 2008 R2 (x64)	Exchange Server 2010		

VSS Restore into the Recovery Storage Group or Recovery Database software and operating system requirements

Table 14. Minimum software and operating system requirements for VSS Restore into the Recovery Storage Group or Recovery Database. This table lists the minimum software and operating system requirements for VSS Restore into the Recovery Storage Group or Recovery Database.

Operating System	Exchange Server	VSS Provider[10]	Tivoli Storage FlashCopy Manager or Tivoli Storage Manager for Copy Services
MicrosoftWindows 2003 (x64)[3]	Exchange Server 2007[4]	Any VSS provider that is supported by Microsoft rules for VSS providers.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2007[4]	Any VSS provider that is supported by Microsoft rules for VSS providers.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2010	Any VSS provider that is supported by Microsoft rules for VSS providers.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 R2 (x64)[8]	Exchange Server 2010	Any VSS provider that is supported by Microsoft rules for VSS providers.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
Table notes: See "Table notes for VSS operations software and operating system requirements" on page 45 for the notes that are referenced in this table.			

VSS Backup of CCR and LCR copies software and operating system requirements

Table 15. Minimum software and operating system requirements for VSS Backup of CCR and LCR copies. This table lists the minimum software and operating system requirements for VSS Backup of CCR and LCR copies.

Operating System	Exchange Server	VSS Provider[10]	Tivoli Storage FlashCopy Manager or Tivoli Storage Manager for Copy Services[9]
MicrosoftWindows 2003 (x64)[3]	Exchange Server 2007[4]	Any VSS provider that is supported by Microsoft rules for VSS providers.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2007[4]	Any VSS provider that is supported by Microsoft rules for VSS providers.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
Table notes: See "Table notes for VSS operations software and operating system requirements" on page 45 for the notes that are referenced in this table.			

VSS Backup of Database Availability Group (DAG) copies software and operating system requirements

Table 16. Minimum software and operating system requirements for VSS Backup of DAG copies. This table lists the minimum software and operating system requirements for VSS Backup of DAG copies.

Operating System	Exchange Server	VSS Provider[10]	Tivoli Storage FlashCopy Manager or Tivoli Storage Manager for Copy Services[9]
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2010	Any VSS provider that is supported by Microsoft rules for VSS providers.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2008 R2 (x64)[8]	Exchange Server 2010	Any VSS provider that is supported by Microsoft rules for VSS providers.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
Table notes: See "Table notes for VSS operations software and operating system requirements" for the notes that are referenced in this table.			

Mailbox restore software and operating system requirements

Table 17. Minimum software and operating system requirements for mailbox restore operations. This table lists the minimum software and operating system requirements for mailbox restore operations.

Operating System	Exchange Server	VSS Provider[10]	Tivoli Storage FlashCopy Manager or Tivoli Storage Manager for Copy Services
MicrosoftWindows 2003 (32-bit)[1]	Exchange Server 2003[2]	Any VSS provider that is supported by Microsoft rules for VSS providers and that supports your storage subsystem.	Tivoli Storage FlashCopy Manager 2.1 (or later) or Microsoft Exchange VSS Integration Module Version 5.5.2 (or later)[5]
MicrosoftWindows 2003 (x64)[3]	Exchange Server 2007[4]		
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2007[4]		
MicrosoftWindows 2008 (x64)[8]	Exchange Server 2010		
MicrosoftWindows 2008 R2 (x64)	Exchange Server 2010		
Table notes: See "Table notes for VSS operations software and operating system requirements" for the notes that are referenced in this table.			

Table notes for VSS operations software and operating system requirements

These notes are referenced in the following software requirements tables:

- "Legacy Backup and Restore software and operating system requirements" on page 40
- "Basic VSS software and operating system requirements" on page 41
- "VSS offloaded backup software and operating system requirements" on page 41
- "VSS Instant Restore software and operating system requirements" on page 43

- "VSS Restore into the Recovery Storage Group or Recovery Database software and operating system requirements" on page 44
- "VSS Backup of CCR and LCR copies software and operating system requirements" on page 44
- "Mailbox restore software and operating system requirements" on page 45

1 **Windows Server 2003 (32-bit)**: Standard, Enterprise, or DataCenter Edition. All versions must be at Service Pack 2 or later. **Windows Server 2003 R2**: Standard, Enterprise, or DataCenter Edition. All versions must be at Service Pack 2 or later. Running under Microsoft Virtual Server 2005 R2 guests is also supported.

Microsoft hotfix KB 919117 is required when performing VSS Instant Restore operations in a Windows Server 2003 cluster environment.

2 Exchange Server 2003 Standard or Enterprise Edition. All versions must be at Service Pack 2 or later. MSCS or VCS support is available.

When backing up Exchange Server 2003, Microsoft .NET Framework V2.0, or later, is required.

3 **Windows Server 2003**: Standard, Enterprise, or DataCenter x64 Edition. All versions must be at Service Pack 2 or later. **Windows Server 2003 R2**: Standard, Enterprise, or DataCenter x64 Edition. All versions must be at Service Pack 2 or later. Running under Microsoft Virtual Server 2005 R2 guests is also supported.

Microsoft hotfix KB 919117 is required when performing VSS Instant Restore operations in a Windows Server 2003 cluster environment.

4 Exchange Server 2007 Standard or Enterprise Edition. Exchange Server 2007 Service Pack 1 (or later) is required when running on Windows Server 2008. Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 (MAPI) version 6.5.8147.0 or later is required for mailbox restore operations.

5 The Microsoft Exchange VSS Integration Module is dependent upon the base Data Protection for Exchange product and must be installed to perform any VSS operations. Tivoli Storage FlashCopy Manager 2.1 (or later) is not dependent on the base Data Protection for Exchange product.

6 The VSS hardware provider must be installed on both machines that are involved in an offloaded backup and must support transportable shadow copies.

7 Whether the IBMTivoli Storage Manager for Copy Services Hardware Devices Snapshot Integration Module must be installed is dependent upon the base Tivoli Storage Manager backup-archive client product:

- If you are using the Tivoli Storage Manager backup-archive client Version 5.5.1, you must manually install the Hardware Devices Snapshot Integration Module Version 5.5.1 to perform VSS Instant Restore operations.
- If you are using the Tivoli Storage Manager backup-archive client Version 6.1 (or later), the Hardware Devices Snapshot Integration Module is automatically installed with the backup-archive client. As a result, you do not need to manually install this module.

Tivoli Storage FlashCopy Manager 2.1 (or later) is not dependent on the base Data Protection for Exchange product.

8 **Windows Server 2008**: Any of the following editions are supported with or without Hyper-V technology:

- Standard (x64)
- Enterprise (x64)
- Datacenter (x64)

9 If you are performing VSS Backups of CCR and LCR copies, the Exchange Server that is managing the replica copy of the database must have Data Protection for Exchange and Tivoli Storage FlashCopy Manager 2.1 (or later) or Tivoli Storage Manager for Copy Services installed.

10 When running VSS operations using VSS Hardware Providers, make sure the following hot fixes are applied:

- Windows 2003: KB972623
- Windows 2008: KB975831
- Windows 2008 R2: KB977096

Hardware requirements

The minimum architecture, hardware, disk space and RAM requirements are dependent upon the Data Protection for Exchange operations you want to perform.

Legacy or VSS Backup and Restore hardware requirements

Table 18. Minimum hardware requirements for Legacy or VSS Backup and Restore operations

Architecture	Hardware	Disk Space	RAM
32-bit	One Intel® Pentium® or equivalent 166 (or later) processor.	Make sure you have at least 200 megabytes of free disk space on your Windows System Drive. This space is used to hold the metadata files for Data Protection for Exchange.	48 MB (96 MB or greater recommended)
x64	One of the following processors: • A processor that supports Intel Extended Memory 64 Technology • A processor that supports AMD64 technology	Make sure you have at least 200 megabytes of free disk space on your Windows System Drive. This space is used to hold the metadata files for Data Protection for Exchange.	48 MB (96 MB or greater recommended)
Table notes: Refer to note **1** in "Table notes for VSS operations hardware requirements" on page 48 for further information.			

VSS offloaded backup hardware requirements

Table 19. Minimum hardware requirements for VSS offloaded backup operations

Architecture	Hardware	Disk Space	RAM
32-bit or x64	A storage subsystem with a VSS hardware provider.	Make sure you have at least 200 megabytes of free disk space on your Windows System Drive. This space is used to hold the metadata files for Data Protection for Exchange.	See Provider documentation
Table notes: Refer to notes **1** and **2** in "Table notes for VSS operations hardware requirements" for further information.			

VSS Instant Restore hardware requirements

Table 20. Minimum hardware requirements for VSS Instant Restore operations

Architecture	Hardware	Disk Space	RAM
32-bit or x64	One of the following: • IBM System Storage XIV disk storage subsystem • IBM System Storage DS6000 disk storage subsystem • IBM System Storage DS8000 disk storage subsystem • IBM System Storage SAN Volume Controller Version 4.x	Make sure you have at least 200 megabytes of free disk space on your Windows System Drive. This space is used to hold the metadata files for Data Protection for Exchange.	See disk storage subsystem documentation
Table notes: Refer to notes **1** and **3** in "Table notes for VSS operations hardware requirements" for further information.			

Table notes for VSS operations hardware requirements

The notes that follow are referenced in the following hardware requirements tables:

- "Legacy or VSS Backup and Restore hardware requirements" on page 47
- "VSS offloaded backup hardware requirements"
- "VSS Instant Restore hardware requirements"

1 Data Protection for Exchange VSS operations are available on any hardware that supports Microsoft VSS requirements. Refer to your VSS provider documentation for required levels. VSS Instant Restore operations have additional hardware requirements. See "VSS Instant Restore hardware requirements." The following list identifies some hardware storage subsystems that were tested with Data Protection for Exchange VSS operations:

- IBM System Storage DS4000 and a machine with a processor supported by DS4000 with IBM Common Interface Model (CIM) Agent for DS Open API. VSS Instant Restore is not supported on DS4000.
- IBM System Storage DS6000 and a machine with a processor supported by DS6000 with IBM Common Interface Model (CIM) Agent for DS Open API.

- IBM System Storage DS8000 and a machine with a processor supported by DS8000 with IBM Common Interface Model (CIM) Agent for DS Open API.
- IBM System Storage N3700 with Network Appliance (NetApp) SnapDrive Version 4.2 or later. Make sure to see important NetApp requirement and configuration information in "VSS limitations for NetApp FAS series or IBM N-series" on page 63.
- NetApp fabric-attached storage (FAS) system with NetApp SnapDrive Version 4.2 or later.
- IBM System Storage SAN Volume Controller Version 4.x or Version 5.1.

Contact your hardware storage subsystem vendor for exact details of their support of VSS operations.

2 You must have a hardware storage subsystem that supports transportable shadow copies and delivers a VSS hardware provider for the hardware storage subsystem that adheres to Microsoft VSS Provider API standards.

3 For hardware requirements for IBM System Storage DS6000, DS8000, XIV, and SAN Volume Controller, see the documentation for the IBM VSS hardware provider.

Hardware product compatibility requirements

For detailed information regarding current hardware product compatibility requirements, see the IBM System Storage Web site: `http://www.ibm.com/servers/storage`

Installing Data Protection for Exchange

These instructions step you through the installation of the Paid in Full Data Protection for Exchange base product.

Installation considerations:

- Data Protection for Exchange is available in the following packages:
  - Paid in Full

    This package contains a license component and is a complete stand-alone release of the product. This procedure documents how to install the Paid in Full package.
  - Program Temporary Fix (PTF)

    This package does not contain a license component. It is created to install over a previously installed version of Data Protection for Exchange. See the README.FTP file for instructions regarding how to install the PTF package.
- Install Data Protection for Exchange from an account that is a member of the local Administrators group for the machine on which the Exchange server is running.
- The default installation directory is `Program Files\Tivoli\TSM\TDPExchange`. If a Tivoli Storage Manager product exists, the path to that product becomes the Data Protection for Exchange default installation directory. You can override the default installation directory and specify a different installation directory. However, for best results, install all Tivoli Storage Manager products and components into the same base directory. The base directory is `Program Files\Tivoli\TSM`. You cannot override subdirectory names.

- To uninstall a previous Data Protection for Exchange version, open the **Control Panel** on your Windows workstation and select the **Add/Remove Programs** item.
- See the release notes file on the Tivoli Information Center for the latest information regarding Data Protection for Exchange: `http://publib.boulder.ibm.com/infocenter/tsminfo/v6/index.jsp`

Follow these steps to install Data Protection for Exchange:

1. Insert the IBM Tivoli Storage Manager for Mail Data Protection for Microsoft Exchange Server product DVD into the DVD drive and select **Run** from the Start menu.
2. Navigate to the appropriate directory (where *x* is your DVD drive letter):
   - (32-bit): `x:\TDPExchange\x32\client`
   - (x64): `x:\TDPExchange\x64\client`
3. Click the setup.exe file and click **OK**, and follow the installation instructions.
4. Click **Finish** to complete the installation of the Data Protection for Exchange base product.

- When you upgrade Data Protection for Exchange the system might need to be restarted. The circumstances in which a restart is required vary but might include a Data Protection for Exchange instance being open or files being shared with the Tivoli Storage Manager API, or Tivoli Storage Manager backup-archive client being modified.
- If you plan to use the product in a language other than English, see "Installing and activating the language packs" on page 51 for additional installation tasks.
- If you are installing Data Protection for Exchange in a Microsoft Cluster Server or Veritas Cluster server environment, repeat the installation procedure on all nodes of your cluster.
- If you plan to perform VSS operations, perform the tasks described in "Installing Tivoli Storage Manager for Copy Services." If not, see Chapter 3, "Configuring Data Protection for Exchange," on page 59 for important configuration information.

Installing Tivoli Storage Manager for Copy Services

These instructions step you through the installation of the Tivoli Storage Manager for Copy Services Microsoft Exchange VSS Integration Module and Hardware Devices Snapshot Integration Module.

Make sure the Data Protection for Exchange product has been installed. See "Installing Data Protection for Exchange" on page 49 for detailed instructions.

To perform basic VSS operations, the IBM Tivoli Storage Manager for Copy Services Microsoft Exchange VSS Integration Module is required. Follow these steps to install this module:

1. Insert the IBM Tivoli Storage Manager for Copy Services product DVD into the DVD drive and click **Run** from the Start menu.
2. Navigate to the appropriate directory (where *x* is your DVD drive letter):
   - (32-bit):`x:\TDPExchange\x32\plugin`
   - (x64): `x:\TDPExchange\x64\plugin`
3. Click the setup.exe file and click **OK**, and follow the installation instructions.

4. Click **Finish** to complete the installation of the Microsoft Exchange VSS Integration Module. This module installs a license file in the `Program Files\Tivoli\TSM\TDPExchange` directory.

After installing Data Protection for Exchange and Tivoli Storage Manager for Copy Services, see Chapter 3, "Configuring Data Protection for Exchange," on page 59 for important configuration information.

Installing and activating the language packs

Each language pack contains language-specific information for the Data Protection for Exchange GUI, command-line output, and messages.

Installing the language packs

To view the Data Protection for Exchange GUI, command-line output, and messages in a language other than English, install the desired Language Pack provided on the product CD.

Follow these steps to install the Language Pack:

1. Insert the IBM Tivoli Storage Manager for Mail Data Protection for Microsoft Exchange Server product CD into the CD drive and select **Run** from the Start menu.
2. Navigate to the appropriate directory (where x is your CD drive letter):
   - (32-bit):`x:\TDPExchange\x32\languages\<lang>`
   - (x64): `x:\TDPExchange\x64\languages\<lang>`

   The `<lang>` directory represents the three-letter country code associated with that language.
3. Select *setup.exe* and click **OK**. Follow the installation instructions contained in the prompt windows.
4. Click **Finish** to complete the installation.

Activating the language packs

After installing the Language Pack, update the Data Protection for Exchange configuration file to activate the language.

Activate the language by updating the Data Protection for Exchange configuration file (tdpexc.cfg by default) by either of these two methods:

- Use the **set** command with the *language* parameter to specify the desired language. For example:

  ```
  tdpexcc set lang=fra
  ```

  See "Set positional parameters" on page 190 for a description of the ***language*** parameter and a list of available languages with their three-letter country codes.
- Use the Configuration Editor in the Data Protection for Exchange GUI by selecting **Edit–>Configuration–>Regional–>Language**. The GUI Configuration Editor will show the installed languages in their long form. For example:

  ```
  English (United States)
  ```

Silent installation

Administrators can install Data Protection for Exchange using silent installation. A silent installation runs on its own without any intervention so that administrators are freed from the task of monitoring the installation and providing input to dialog boxes.

This method is especially useful when Data Protection for Exchange must be installed on a number of different computers with identical hardware. For example, a company may have 25 Exchange Servers spread out across 25 different sites. To ensure a consistent configuration and to avoid having 25 different people enter Data Protection for Exchange parameters, an administrator may choose to produce an unattended install and make it available to the 25 sites by cutting and sending out 25 CDs or by placing the unattended install package on a file server.

Windows 2008 systems: The User Account Control feature in Windows 2008 does not support silent installations. To install the product silently with the **Setup Program** or **Microsoft Installer (MSI)**, use one of these three methods:

- Run from a manageability tool such as Tivoli.
- Run from an elevated command line. To do this:
  1. Navigate to **Start > All Programs > Accessories > Command Prompt**.
  2. Right click the **Command Prompt** icon to display the properties.
  3. Select **Run as administrator**.
  4. Select **Continue** in the permission window.
  5. Launch the product installation in the resulting command prompt window.

You can perform a silent installation on Windows 2003 and Windows 2008 systems using one of the following methods:

Setup Program
Use the **setup** command with the command-line invocation and special silent installation options.

Microsoft Installer (MSI)
Use **msiexec.exe** to install the MSI package.

The following options can be used with both silent installation methods.

Table 21. Silent installation options

Option	Description
/i	Specifies the program is to install the product.
*/l*v*	Specifies verbose logging.
/qn	Runs the installation without running the external user interface sequence.
/s	Specifies silent mode.

Table 21. Silent installation options (continued)

Option	Description
/v	Specifies the Setup Program to pass the parameter string to the call it makes to the MSI executable file (msiexec.exe). The following syntax requirements apply when invoking the */v* option: • A backslash (\) must be placed in front of any quotation marks (" ") that reside within existing quotation marks. • Do not include a space between the */v* command-line option and its arguments. • Multiple parameters entered with the */v* command line option must be separated with a space. • You can create a log file by specifying the directory and filename at the end of the command. The directory must already exist at the time a silent installation is performed.
/x	Specifies the program is to uninstall the product.
addlocal	Specifies features to install.
allusers	Specifies which users can use the installation package.
installdir	Specifies the directory where Data Protection for Exchange is to be installed.
reboot	Specifies whether or not to prompt the user to reboot the system after silent installation. • *Force* Always prompts user to reboot after silent installation. • *Suppress* Suppress prompt to reboot after silent installation. • *ReallySuppress* Suppress all reboots and prompts to reboot after silent installation.
rebootyesno	Specifies whether or not to reboot the system after silent installation. Specify *Yes* to reboot the system after silent installation. Specify *No* not to reboot the system after silent installation.
transform	Specifies language to install.

The following features are used in this procedure and are case sensitive.

Table 22. Silent installation features (base client only)

Feature	Description
Client	Data Protection for Exchange code
License_Paid	License file (Used when PAID versions of Data Protection for Exchange are installed)
License_TryBuy	License file (Used when TryBuy versions of Data Protection for Exchange are installed)

Table 23. Silent installation features (Language Packages only)

Feature	Description
LanguageFiles	Language specific files

Table 24. Silent installation features (IBM Tivoli Storage Manager for Copy Services Microsoft Exchange VSS Integration Module only)

Feature	Description
Plug-in	IBM Tivoli Storage Manager for Copy Services Microsoft Exchange VSS Integration Module (enables basic VSS operations)

The following transforms are used in this procedure.

Table 25. Silent installation transforms

Transform	Language
1028.mst	CHT Chinese (Traditional)
1029.mst	CSY Czech[1]
1031.mst	DEU German
1033.mst	ENG English
1034.mst	ESP Spanish
1036.mst	FRA French
1038.mst	HUN Hungarian[1]
1040.mst	ITA Italian
1041.mst	JPN Japanese
1042.mst	KOR Korean
1045.mst	PLK Polish[1]
1046.mst	PTB Portuguese
1049.mst	RUS Russian[1]
2052.mst	CHS Chinese (Simplified)

[1] This language support does not apply to Data Protection for Exchange. Language support is for the following components only:

- IBM Tivoli Storage Manager for Copy Services Microsoft Exchange VSS Integration Module
- IBM Tivoli Storage Manager for Copy Services Hardware Devices Snapshot Integration Module

Installing with the setup program (setup.exe)

An example of silently installing Data Protection for Exchange with setup.exe is provided.

Data Protection for Exchange must be installed from an account that is a member of the local Administrators group for the machine on which the Exchange server is running.

You must substitute the appropriate feature when installing a language other than English. See Table 23 on page 53.

Run the following command to silently install Data Protection for Exchange to the default installation directory:

```
setup /s /v/qn
```

This example silently installs Data Protection for Exchange to a directory other than the default installation directory and includes custom features:

```
setup /s /v"INSTALLDIR=\"c:\program files\tivoli\tsm\"
ADDLOCAL=\"Client,License_Paid\"
TRANSFORMS=1033.mst /qn /l*v \"c:\temp\log.txt\"
```

Note:

1. You must place a backslash (\) before each quotation mark that is within an outer set of quotation marks (").
2. You must place quotation marks (") around the following:
   - A directory path that contains spaces.
   - An argument that specifies multiple features. Although quotation marks are needed around the complete argument, you must still place a backslash before each internal quotation mark.
3. All features listed in a custom installation must be listed after the ***addlocal*** option.

Creating batch files:

A batch file can be created to begin silent install with specified parameters.

This is a sample script (c:\setup.bat) to demonstrate unattended installation:

```
@echo off
 rem ==================================
 rem sample silent install script
 rem
 setup /s /v"INSTALLDIR=\"X:\Desired Install Path\" /qn"
 rem ====================================
 rem code could be added after the
 rem installation completes to
 rem customize the dsm.opt files
 rem if desired
 rem ==================================
```

Installing with MSI (msiexec.exe)

An example of silently installing Data Protection for Exchange with msiexec.exe is provided.

Data Protection for Exchange must be installed from an account that is a member of the local Administrators group for the machine on which the Exchange server is running.

You must substitute the appropriate .msi package filename and Language Package feature when installing a language other than English. See Table 23 on page 53.

This example silently installs Data Protection for Exchange to a directory other than the default installation directory and includes custom features:

```
msiexec /i
"IBM Tivoli Storage Manager for Mail - MS Exchange.msi"
RebootYesNo="No" Reboot="Suppress" ALLUSERS=1
INSTALLDIR="c:\program files\tivoli\tsm"
ADDLOCAL="Client,License_Paid"
TRANSFORMS=1033.mst /qn /l*v "c:\temp\log.txt"
```

Note:

- You must place quotation marks (") around the following:
  - A directory path that contains spaces.

– An argument that specifies multiple features. Although quotation marks are needed around the complete argument, you must still place a backslash before each internal quotation mark.

- All features listed in a custom installation must be specified after the ***addlocal*** option.

Installation problems: capturing a log of the installation

In the event of a silent installation failure, gather the installation information details to assist IBM Software Support when evaluating your situation. You can create a detailed log file of the failed installation that can facilitate analysis of your situation.

The following installation information details should be gathered for IBM Software Support:

- Operating system level
- Service pack
- Hardware description
- Installation package (from the CD or downloaded) and level
- Any Windows event log that is relevant to the failed installation
- Windows services that were active during the failed installation (for example, antivirus software)
- Whether you are logged on to the local system console (not through a terminal server)
- Whether you are logged on as a local administrator, not a domain administrator (Tivoli does not support cross-domain installs)

You can create a detailed log file (setup.log) of the failed installation. Run the setup program (setup.exe) in the following manner:

```
setup /v"l*v setup.log"
```

Creating the package on a cd or a file server

Refer to this information when creating a silent install package on a cd or a file server.

The administrator has a choice of making the package available in different ways including burning a CD or placing the package in a shared directory on a file server. Typically, the package contains the Data Protection for Exchange code distribution files and a batch file for silent install.

Creating a silent installation package:

Refer to these command examples when creating a silent installation package.

First you will need to choose a location for the package. If you are burning a CD it is convenient to use a staging directory. If you are placing the package on a file server you can use a staging directory or you can build the package directly on the file server. The following example uses *c:\tdpdpkg* as a staging directory. It is recommended you have a minimum of 14 MB of free space in the staging directory. The following commands can be issued to create the package.

Command	Description
`mkdir c:\tdpdpkg`	– Create a staging directory for the silent install package
`cd /d c:\tdpdpkg`	– Go to the staging directory

Command	Description
`xcopy g:\*.* . /s`	– Copy the Data Protection for Exchange CD distribution files to the staging directory
`copy c:\setup.bat`	– Replace the existing setup.bat with the one created in the previous step

At this point the silent install should be tested. When testing is complete the package can be placed on CD or it can be made available from a shared directory.

Playing back the silent installation

After the package is available on CD or from a shared directory it can be played back (run) on another machine. No visual cues exist to inform you when the installation has finished, although this could be added in the batch file.

Allow enough time for the unattended setup to complete.

From a silent install package on CD: If autostart is enabled, the silent install begins as soon as the CD is inserted into the drive. If autostart is not enabled, the silent install can be run by issuing the setup.bat file from the root of the CD.

```
cd /d g:\
setup.bat
```

From a distribution directory: If the package was placed in a shared directory called `tdpdpkg` located at `\\machine1\d$`, another computer could execute the command: `net use x \\machine1\d$` to share the drive as drive x. The following command could then be issued:

```
cd /d x:\tdpdpkg
setup.bat
```

In either case the silent install begins.

Setup error messages

The setup.exe program may produce error messages if it cannot start properly. In most cases you will encounter these messages when a severe error occurs. Rarely will your users see these messages. When you get an error message, it appears in a message box.

Every error message has a number. These are system error messages and there is no way to suppress them in your script.

If you encounter an error you can go to the InstallShield support Web site at URL: `http://support.installshield.com/default.asp`, and use the Search facility to obtain information on the error.

Chapter 3. Configuring Data Protection for Exchange

Configuration requirements for Data Protection for Exchange, Tivoli Storage Manager, and other applications will vary, depending on which Data Protection for Exchange features you want to use.

This chapter is divided into two major sections:

- **"Part I: Configuration overview" on page 61**

  This section provides detailed information about setting Data Protection for Exchange and Tivoli Storage Manager options, policies, and preferences. For best results, it is recommended that you read this information carefully before performing any configuration tasks.

- **"Part II: Configuration procedure" on page 74**

  This section provides detailed step-by-step instructions on how to configure Data Protection for Exchange for both Legacy and VSS Backups. Instructions on how to verify that Data Protection for Exchange is installed and configured properly, including those components required for VSS Backups, are also provided. Data Protection for Exchange should be ready for backup and restore processing upon successful verification.

What applications must I configure? This table identifies the software applications that must be configured to perform certain features.

Table 26. List of applications to configure

To use these features:	You must configure these applications:
• Legacy backup • Legacy restore	• Data Protection for Exchange • Tivoli Storage Manager server
• VSS Backup • VSS Restore	• Data Protection for Exchange • Tivoli Storage Manager server • Tivoli Storage Manager backup-archive client local client acceptor daemon (CAD) on the local machine • VSS software provider, VSS hardware provider, or both

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Table 26. List of applications to configure (continued)

To use these features:		You must configure these applications:
• VSS Backup • VSS Restore • VSS Instant Restore • Offloaded backup		• Data Protection for Exchange • Tivoli Storage Manager server • Tivoli Storage Manager backup-archive client local client acceptor daemon (CAD) on the local machine • Tivoli Storage Manager backup-archive client local client acceptor daemon (CAD) on the machine designated to perform the offloaded backup • VSS software provider, VSS hardware provider, or both
Mailbox restore on Exchange Server 2003	• Mailbox restore from legacy backup only	• Configure the applications that are required for legacy backup.
Mailbox restore on Exchange Server 2007	• Mailbox restore from legacy backup	• Configure the applications that are required for legacy backup. • Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 (MAPI) version 6.5.8147.0 on the Exchange server that you will use to perform the mailbox restore operations.
	• Mailbox restore from VSS Backup	• Configure the applications that are required for VSS Backup. • Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 (MAPI) version 6.5.8147.0 on the Exchange server that you will use to perform the mailbox restore operations.

Table 26. List of applications to configure (continued)

To use these features:		You must configure these applications:
Mailbox restore on Exchange Server 2010	• Mailbox restore from VSS Backup only	• Configure the applications that are required for VSS Backup. • Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 (MAPI) version 6.5.8147.0 on the Exchange server that you will use to perform the mailbox restore operations.

Note: If you plan to automate your backup operations, the Tivoli Storage Manager backup-archive client scheduler must also be installed and configured.

Part I: Configuration overview

This section provides guidelines about available options, recommended settings, and other useful information needed to configure Data Protection for Exchange. It is recommended that you review this information before performing the configuration tasks described in "Part II: Configuration procedure" on page 74. For an overview of the various VSS components, see "VSS Service" on page 5.

Back up to Tivoli Storage Manager storage versus back up to local shadow volumes

When creating policy for your backups, consider these differences between backing up data to Tivoli Storage Manager storage versus VSS disks.

Tivoli Storage Manager storage

A Tivoli Storage Manager backup operation stores the backed up data on Tivoli Storage Manager server storage. Although this type of backup typically takes longer to process than a backup to local shadow volumes, a Tivoli Storage Manager backup is necessary when long term storage is needed such as saving Exchange data on tape for archival purposes. Tivoli Storage Manager backups are also necessary for disaster recovery situations when the disks that are used for local backups are unavailable. By maintaining multiple backup copies on Tivoli Storage Manager server storage, a point in time copy is available should backups on the local shadow volumes become corrupted or deleted.

Local shadow volumes

Backups to local shadow volumes can be managed by both time and versions. However, because most backup strategies involving local snapshots include a higher frequency of local snapshot creation, IBM recommends that you set up policy for local backups to be based on version limits.

Sufficient local storage space must be available on local shadow volumes for a VSS backup strategy to be successful. Make sure there is enough available storage space assigned to the volumes to accommodate your Data Protection for Exchange backup operations. Environment and storage resources also impact how many

backup versions are maintained on local shadow volumes (for VSS Fast Restore and VSS Instant Restore) and how many backup versions are maintained on Tivoli Storage Manager server (VSS Restore and longer term storage). It is recommended that different sets of policies be created for backups to both local shadow volumes and to Tivoli Storage Manager server storage. If you are using a VSS provider other than the Windows VSS System Provider, make sure to review the documentation for that specific VSS provider.

VSS operations in DS and SAN Volume Controller environments

Be aware of these storage space guidelines when performing VSS operations in DS and SAN Volume Controller environments.

In order to determine how much storage space is required for each local backup, be aware that the backup LUNs require the same amount of storage space as the original LUNs. For example, if you have a 100GB database residing on a 200GB LUN, you will need a 200GB LUN for each backup version.

VSS limitations for SAN Volume Controller: When performing a Data Protection for Exchange VSS backup (non-offloaded) with backup destination as Tivoli Storage Manager Server, and the Exchange Server data resides on SAN Volume Controller disks, and the IBM TotalStorage® VSS Hardware Provider is being used, in some isolated cases the SAN Volume Controller LUNs remain mapped to the Windows host even though the VSS backup is complete. To work around this issue, you can use a backup destination other than TSM (BOTH or LOCAL). You can also manually unmap the volumes attached to the Windows host to work around this issue.

When performing two Data Protection for Exchange VSS backups, back to back, and the Exchange Server data resides on SAN Volume Controller disks, if the volumes are large, the SVC background copy rate is set a low number, or both, it might appear that the second VSS backup is hanging. In fact, it is waiting for the SAN Volume Controller background copy of the first backup to complete before proceeding with the second backup. SAN Volume Controller will not allow two background copies of the same volume to occur at the same time. There is no indication that the second backup is waiting for the first SAN Volume Controller background copy to complete. You might also see timeouts errors if the previous SAN Volume Controller background copy takes too long. To work around this issue, schedule your VSS backups far enough apart to accommodate this situation. You can also increase the copy rate of the SAN Volume Controller background copy.

See also “Using space-efficient target volumes with SAN Volume Controller 5.1” on page 32.

VSS operations in IBM N-series and NetApp environments

Be aware of these storage space guidelines when performing VSS operations in IBM N-series and NetApp environments.

Be aware that in environments that contain IBM N-series and NetApp systems, snapshots created using the IBM N-series and NetApp snapshot provider are stored on the same volume where the LUN resides. Disk space consumed by a local backup consists only of the blocks that have changed since the last local backup was created. The following formula can be used to help determine how much space is required for each local backup:

```
Amount of data changed per hour * number of hours before a local backup expires
```

In addition, Write Anywhere File Layout (WAFL) reserves blocks equal to two times the specified size of the LUN to be used. This space reservation ensures writes for virtual disks. The following example demonstrates how to calculate the size of these volumes:

```
Database size of an Exchange storage group:  100GB
Number of  local backups to be kept:   3
Snapshot for TSM backup:   1
duration for TSM backup:   2hr
Backup  frequency:   3hrs
The duration  before a local backup is expired:   9 hrs
Amount  of data changed/added/deleted per hr:   50MB
Space required  for each  local backup:    50*9= 450 MB
Space  required for  3 local backups + 1 TSM backup:  450*3 + 50*2 = 1450 MB
The volume size required for the storage group: 100*2 (space reservation) + 1.5 =  201.5 GB
```

VSS limitations for NetApp FAS series or IBM N-series: Due to the limitations in SnapDrive 4.2 and any supported prior versions, the VSS Provider for NetApp FAS series and IBM N-series, VSS based operations using Data Protection for Exchange with backup destination set to LOCAL, must be performed in specific ways. Failure to comply with the following configuration and operational recommendations can lead to serious conditions such as premature deletion of snapshots representing VSS backups to LOCAL, backup failure, and out of space conditions on the production volumes. When the limitations in the SnapDrive are addressed by NetApp, Data Protection for Microsoft Exchange VSS operations can be fully used. However, this situation is not applicable when FlexVols are used.

Exchange Server storage configuration for NetApp FAS series or IBM N-series VSS operations

If you plan to perform VSS backups with backup destination set to LOCAL, please check your setup to ensure that following requirements are met.

- The NAS filers LUNs used by a storage group must be fully dedicated to the storage group. The Microsoft Exchange Server storage groups can not share LUNs.
- A NAS filer LUN used by the Exchange storage groups must be the only LUN on the filer volume. For example, if Exchange uses four LUNs, there must be four corresponding filer volumes, each volume containing one LUN.

Guidelines for VSS Backup operations for NetApp FAS series or IBM N-series

If you plan to perform VSS backups with backup destination set to LOCAL, these backups must adhere to the following guidelines.

- If the NetApp volume type is Traditional, VSS backups with backup destination set to Local must be bound to a management class that has verExists=1. This setting is not required if flexible volumes are used.
- VSS backups with backup destination set to Local can either be of type full or copy. You can not mix local backups of type full and copy.
- VSS backups with backup destination set to TSM can be full or copy. There are no restrictions on Tivoli Storage Manager backups.
- When performing VSS backups, you must ensure that previous backup has finished completely before starting a new backup. Any overlap of backups can result in undesirable side-effects on the Microsoft Exchange Server, the VSS service, and, the NAS filer.

Sample VSS Backup procedure for NetApp FAS series or IBM N-series

Taking above considerations into account, the following section describes a sample backup procedure that could be used to perform VSS backups using both Tivoli Storage Manager and LOCAL backup destinations in an optimal manner. Note that the following assumptions apply to this sample backup procedure:

- The configuration requirements stated above are met.
- The VSS backup to Tivoli Storage Manager takes one hour to complete.
- The VSS backup to LOCAL takes five minutes to complete.

Your backup procedure could consist of the following backups:

- Daily VSS full backups to LOCAL every four hours - 12am, 4am, 8am, 12pm, 4pm, 8pm
- Daily VSS full backups to Tivoli Storage Manager storage by one of the following two methods:
  - Specify backupdestination set to BOTH at 12am. Note that this will create a 12am backup to local. Therefore, no separate 12am backup to local is required.
  - Full offloaded-backup at 1am. Note that no VSS local backup will be available to restore from between 1am and 4am when next VSS backup to local will take place.
- Perform weekly VSS-copy backups to Tivoli Storage Manager (offloaded backup) 5am
- Perform weekly legacy full backups (or as needed).

Recommended Tivoli Storage Manager policy settings

Make sure the following policy items are defined with the recommended settings.

Consult your Tivoli Storage Manager administrator or see the *IBM Tivoli Storage Manager for Windows Administrator's Guide* and the *IBM Tivoli Storage Manager for Windows Administrator's Reference* for complete information on defining or updating these Tivoli Storage Manager policy items.

Domain

A policy domain contains policy sets, management classes, and copy groups.

Create a policy domain on the Tivoli Storage Manager server to be used exclusively for Data Protection for Exchange backups.

Policy sets

Policy sets contain management classes (which contain copy groups) that determine the rules by which Data Protection for Exchange backups are performed and managed.

Define the policy set to the policy domain to which Data Protection for Exchange backups belong. Note that the policy set must be activated and only one policy set can be active in the policy domain.

Management class

A management class is a policy object that users can bind to each file to specify how the file is managed.

Define a management class for backups residing on local shadow volumes and a management class for backups residing on Tivoli Storage Manager server storage. Different management classes provide the opportunity for specialized policies for each storage destination. For example, you can maintain six versions of local VSS Backups of a given storage group (***VERExists***=*6*) while maintaining only two versions of the same storage group on Tivoli Storage Manager server storage (***VERExists***=*2*). In addition, you can create a separate management class for copy backup types for use in long term storage. Such policies can maximize storage resources and provide more control over your storage strategy.

Note that since VSS Backup processing requires sufficient storage space to create shadow volumes, make sure you specify ***verexists***=*N+1* in order to keep *N* backups on local shadow volumes. See "Storage space considerations for local shadow volumes" in “How Tivoli Storage Manager server policy affects Data Protection for Exchange” on page 26 for further recommendations.

Be aware that since Legacy backups on Tivoli Storage Manager server storage, VSS Backups on Tivoli Storage Manager server storage (COPY and FULL), and VSS Backups on local shadow volumes (COPY and FULL) all have different Tivoli Storage Manager server naming and therefore, can each have their own management class, it is possible to have five active backups of the same storage group. Make sure your backup strategy is planned and well-defined before defining management classes.

Copy group

A copy group controls how backup versions are generated, located, and expired.

Define the copy group as a backup copy group and not an archive copy group. Since Data Protection for Exchange stores all objects as backup objects on Tivoli Storage Manager in backup storage pools, an archive copy group is not required, although an archive copy group can exist. The following backup copy group parameters significantly influence your backup policy:

VERExists
: Determines the maximum number of Exchange Server database backup versions to retain for databases that exist on the Data Protection for Exchange client system.

VERDeleted
: Determines the maximum number of Exchange Server database backup versions to retain for databases that have been deleted from the Data Protection for Exchange client system after being backed up by Tivoli Storage Manager.

RETExtra
: Determines the number of days to retain an Exchange Server database backup version after that version becomes inactive.

RETOnly
: Determines the number of days to retain the last Exchange Server database backup version of a database that has been deleted from the Data Protection for Exchange client system. Be aware that incremental backups do not participate in expirations (due to version limit) because there is never more than one version of an incremental backup object. This is

because incremental backups are always uniquely named. However, all Legacy backup objects for an Exchange Server storage group are deactivated when a new full backup of that Exchange Server storage group is performed (VSS backup objects remain active). Therefore, the retention period set in the ***RETOnly*** parameter controls the expiration of incremental backup objects.

When setting the value of the ***RETOnly*** parameter for incremental backups, the value must be (at a minimum) as long as the value set for the full backup objects to which the incremental backups are associated. You can use the same management class for incremental backups and the full backup objects (that are retained the longest) to be sure an adequate value is used. However, all Legacy backup objects for an Exchange Server storage group are inactivated when a new Legacy full backup of that Exchange Server storage group is performed (VSS backup objects remain active).

MODE, SERialization, FREQuency
You can accept default values for these backup copy group parameters as they are not applicable to Data Protection for Exchange.

It is recommended that you discuss these parameters with your Tivoli Storage Manager server administrator in order to accomplish your backup strategy.

Storage pool

A storage pool is a named set of storage volumes that is the destination used by the Tivoli Storage Manager server to store data.

A single restore can require a full backup, a differential backup, and multiple incremental backups. It is recommended to use collocation if these backups are stored on removable media. Use collocation by file space (**define stgpool** ***COLlocate***=*FILespace*) if you plan to restore multiple storage groups in parallel. This is recommended because all data for any one storage group is stored within one Tivoli Storage Manager server file space.

Data Protection for Exchange node name: Recommended settings

Review these recommended settings when registering your Data Protection for Exchange node name.

The machine where Data Protection for Exchange is installed must be registered to the Tivoli Storage Manager server with a node name. This node name owns and manages all Data Protection for Exchange data that is backed up to the Tivoli Storage Manager server. Specify this node name with the ***nodename*** option in the dsm.opt options file located (by default) in the Data Protection for Exchange installation directory. Note that in order to perform VSS operations, you may need to register node names for additional machines. See “Proxy node definitions (VSS Backups)” on page 67 for details about this task.

Be aware of the following Tivoli Storage Manager parameter conditions when registering your Data Protection for Exchange node name (machine) to the Tivoli Storage Manager server:

- ***MAXNUMMP*** This parameter determines the maximum number of mount points a client node is allowed to use on the Tivoli Storage Manager server during a backup operation.

- ***TXNGroupmax*** This parameter determines the number of files transferred as a group between the client and server between transaction commit points. This parameter must have a value of *12* or greater.
- ***COMPression*** This parameter determines whether the Data Protection for Exchange node compresses data before sending it to the Tivoli Storage Manager server during a backup operation. For Legacy operations, specify ***COMPRESSIon***=*Yes* to allow the Data Protection for Exchange node to make the decision whether to compress data using the value of the client ***COMPRESSIon*** option specified in the options file (dsm.opt) located in the Data Protection for Exchange directory. For VSS operations, specify ***COMPRESSIon***=*Yes* in the backup-archive client options file (dsm.opt) located in the backup-archive client directory.

Note: If you are running Data Protection for Exchange on a Microsoft Cluster Server or Veritas Cluster Server, it is recommended that the node name match the Exchange virtual server name.
See the *IBM Tivoli Storage Manager for Windows Administrator's Reference* for complete information regarding these parameters.

Proxy node definitions (VSS Backups)

Since Data Protection for Exchange VSS Backup operations are implemented through the Tivoli Storage Manager backup-archive client, you must use node names specifically for VSS operations in addition to using a node name for where Data Protection for Exchange is installed.

As part of the configuration procedure, a proxy relationship is defined for these various node names. This proxy relationship allows node names to perform operations on behalf of another node name. When registering these nodes to the Tivoli Storage Manager server for VSS operations, do not specify the Tivoli Storage Manager ***USerid***=NONE parameter. VSS operations will fail when this parameter is specified.

There are two types of node names defined in proxy node relationships:

- **Target node**: A node name that controls backup and restore operations and that also owns the data on the Tivoli Storage Manager server.
- **Agent node**: A node name that performs operations *on behalf* of a target node.

Required node names for basic VSS operations

VSS operations require specific node name settings.

To perform basic VSS operations, you must have one target node and one agent node:

Table 27. Required node names for basic VSS operations

Proxy node type	Nodename	Where to specify
Target node	Data Protection for Exchange node name	Use the ***nodename*** option in the Data Protection for Exchange options file (dsm.opt)
Agent node	Local DSMAGENT Node (this name must match the backup-archive client node name)	Use the ***localdsmagentnode*** parameter in the Data Protection for Exchange configuration file (tdpexc.cfg)

Target node
This is the node name where Data Protection for Exchange is installed. This node name (specified with the ***nodename*** option in the dsm.opt file) is referred to as the Data Protection for Exchange node name.

Agent node
This is the node name where the backup-archive client and VSS provider are installed. This node is responsible for performing the VSS operations as Data Protection for Exchange itself does not perform any direct VSS operations. This node name is referred to as the Local DSMAGENT Node and is specified with the ***localdsmagentnode*** parameter in the Data Protection for Exchange configuration file (tdpexc.cfg by default). You can use the **Configuration** task in the **Edit** menu of the GUI or the **tdpexcc set** command to specify this parameter.

Note: The agent node and target node will be on the same machine for basic VSS operations.

Required node names for VSS offloaded backups

VSS offloaded backups require specific node name settings.

To perform VSS offloaded backups, you must have one target node and two agent nodes:

Table 28. Required node names for VSS offloaded backups

Proxy node type	Nodename	Where to specify
Target node	Data Protection for Exchange node name	Use the ***nodename*** option in the Data Protection for Exchange options file (dsm.opt)
Agent node	Local DSMAGENT Node	Use the ***localdsmagentnode*** parameter in the Data Protection for Exchange configuration file (tdpexc.cfg)
Agent node	Remote DSMAGENT Node	Use the ***remotedsmagentnode*** parameter in the Data Protection for Exchange configuration file (tdpexc.cfg)

Target node
This is the node name where Data Protection for Exchange is installed. This node name (specified with the ***nodename*** option in the dsm.opt file) is referred to as the Data Protection for Exchange node name.

Agent node
This is the node name where the backup-archive client and VSS provider are installed. This node is responsible for performing the VSS operations as Data Protection for Exchange itself does not perform any direct VSS operations. This node name is referred to as the Local DSMAGENT Node and is specified with the ***localdsmagentnode*** parameter in the Data Protection for Exchange configuration file (tdpexc.cfg by default). You can use the **Configuration** task in the **Edit Menu** of the GUI or the **tdpexcc set** command to specify this parameter.

Agent node
The node name of a separate machine that must also have the backup-archive client, VSS provider, and the Exchange System Management Tools installed (make sure you install the same level of the

Exchange System Management Tools that is installed on your Exchange production server). This machine is responsible for performing the movement of VSS snapshot data from local shadow volumes to the Tivoli Storage Manager server. It is also responsible for performing the Exchange Integrity Check. This node name is referred to as the Remote DSMAGENT Node and is specified with the ***remotedsmagentnode*** parameter in the Data Protection for Exchange configuration file (tdpexc.cfg by default). You can use the **Configuration** task in the **Edit Menu** of the GUI or the **tdpexcc set** command to specify this parameter. The choice of available machines depends on whether the machines have access to the local shadow volumes that contain the VSS snapshot backups. This node name is only valid for VSS environments that support transportable shadow copies. It is not supported if you are using the default VSS system provider. Refer to your VSS provider documentation for details.

Make sure that the ***localdsmagentnode*** and ***remotedsmagentnode*** are registered to the same Tivoli Storage Manager server that is specified in the Data Protection for Exchange options file (dsm.opt) and the backup-archive client options file (also dsm.opt).

Specifying Data Protection for Exchange options

Once Data Protection for Exchange is registered to Tivoli Storage Manager, several Data Protection for Exchange parameters need to be configured.

The Tivoli Storage Manager administrator should have provided you with the node name, password, and the communications method with the appropriate parameters to connect to the Tivoli Storage Manager server. These values, together with other parameters, are stored in an options file located (by default) in the Data Protection for Exchange installation directory. The default options file name is dsm.opt. To modify the initial dsm.opt file, open dsm.opt using a text editor.

Attention: Make sure that the Data Protection for Exchange options file (dsm.opt) and the backup-archive client options file (also dsm.opt) specify the same Tivoli Storage Manager server.

The options file includes the following parameters, which are required for initial configuration:

NODename

The Tivoli Storage Manager node name is the unique name by which Tivoli Storage Manager recognizes the machine running Data Protection for Exchange.

When an environment contains Exchange Server 2003 and Exchange Server 2007 installed on separate machines, the node name used for each machine must be different.

COMMMethod

This option specifies the communication protocol to use between the Data Protection for Exchange node with the Tivoli Storage Manager server. Data Protection for Exchange supports the same set of communication protocols supported by other Tivoli Storage Manager clients on Win 32 platforms. Depending on the chosen ***commmethod***, the connectivity parameters for that ***commmethod*** need to be specified as well.

- For Legacy backups, specify the ***commmethod*** option in the Data Protection for Exchange options file.

- For VSS Backups, specify the ***commmethod*** option in the backup-archive client options file that is used as the Local DSMAGENT Node. If the environment is configured for VSS offloaded backups, you must also specify the ***commmethod*** option in the backup-archive client options file that is used as the Remote DSMAGENT Node.

The following additional options are not required for initial configuration. By default they are not specified, but you can modify the default settings:

PASSWORDAccess

This option instructs the Tivoli Storage Manager API to store the current password (encrypted) in the Windows registry and automatically generates a new one when the current one expires. This method of password management is recommended when running scheduled, unattended backups since it ensures that the backup never fails because of an expired password. The default is *prompt*.

A utility program named dsmcutil.exe allows you to manage (update or display) the password as stored in the registry. This utility program is distributed with the Tivoli Storage Manager backup-archive client package. For more information on using the dsmcutil program, see the dsmcutil.hlp file or the dsmcutil.txt file which are distributed with the Tivoli Storage Manager backup-archive client package.

CLUSTERnode

This option directs the Tivoli Storage Manager API and Data Protection for Exchange to be cluster-aware when running in a MSCS or VCS environment. This option *must* be specified for Data Protection for Exchange to function properly on a MSCS or VCS.

ENABLELANFree

This option allows Data Protection for Exchange to run in a LAN-free environment (if you are equipped to do so). To perform a LAN-free Legacy backup with Data Protection for Exchange, a Tivoli Storage Manager Storage Agent must be installed on the same machine and ***enablelanfree*** *yes* must be specified in the Data Protection for Exchange options file. To perform a LAN-free VSS Backup with Data Protection for Exchange, specify ***enablelanfree*** *yes* in the DSMAGENT (VSS Requestor) options file. See *Managed System for SAN Storage Agent User's Guide* for detailed information about LAN-free environments.

ENABLECLIENTENCRYPTKEY

This option encrypts Exchange databases during backup and restore processing. One random encryption key is generated per session and is stored on the Tivoli Storage Manager server with the object in the server database. Although Tivoli Storage Manager manages the key, a valid database must be available in order to restore an encrypted object. Specify ***enableclientencryptkey*** *yes* in the options file. In addition, assign the type of encryption to use by specifying the ***encryptiontype*** option in this same options file. You can specify *DES56* (56-bit) or *AES128* (128bit). The default is *AES128*. In this same file, you must also specify the databases you want encrypted by adding an include statement with the ***include.encrypt*** option.

- For Legacy backups, specify these encryption options in the Data Protection for Exchange options file.
- For VSS Backups, specify the encryption options in the backup-archive client options file that is used as the Local DSMAGENT Node. If the environment is configured for VSS offloaded backups, you must also specify the encryption options in the backup-archive client options file

that is used as the Remote DSMAGENT Node. Review the encryption information available in the client documentation before attempting to encrypt your databases.

Perform the following tasks to encrypt your Exchange database Legacy backups:

1. Verify that you are running version 5.3.0 or later of the Tivoli Storage Manager server and Tivoli Storage Manager API.
2. Edit the options file for Data Protection for Exchange and add the following three options:
   a. Add the ***enableclientencryptkey*** *yes* option.
   b. Add the ***encryptiontype*** option with the type of encryption to use.
   c. Add your include statements with the ***include.encrypt*** option. For example, to encrypt all Exchange data, specify the following:

      ```
      include.encrypt *\...\*
      ```

      To encrypt all the data in Storage Group 1, specify the following:

      ```
      include.encrypt "SERVER_NAME\Storage Group 1\...\*"
      ```

COMPRESSIon

This option instructs the Tivoli Storage Manager API to compress data before sending it to the Tivoli Storage Manager server; this reduces traffic and storage requirements. If you enable compression, it affects performance in two ways:

- CPU utilization is higher on the machine on which Data Protection for Exchange is running.
- Network bandwidth utilization is lower because fewer bytes are sent.
- Storage usage on the Tivoli Storage Manager server is reduced.

You may want to specify ***compression*** *yes* if any of the following conditions exist:

- The network adapter has a data overload.
- Communications between the Data Protection for Exchange and Tivoli Storage Manager server are over a low bandwidth connection.
- There is heavy network traffic.
- You can also use the ***compressalways*** *yes* option (with the ***compression*** *yes* setting) to specify that file compression continues even if the file grows as a result of compression.

It may be better to specify ***compression*** *no* in the following cases:

- The computer running Data Protection for Exchange has a CPU overload; the added CPU usage can impact other applications including the Exchange Server. You can monitor CPU and network resource utilization using the Performance Monitor program included with Windows.
- You are not constrained by network bandwidth; in this case, you can achieve the best performance by leaving compression NO and enabling hardware compaction on the tape drive, which also reduces storage requirements.

The Tivoli Storage Manager administrator can override the compression option setting for the Data Protection for Exchange node when registering or updating the node by specifying, on the Tivoli Storage Manager server side, that a particular node:

- Always uses compression.
- Never uses compression.
- Leaves the decision up to the client (default value).

Considerations:

- For Legacy backups, specify the ***compression*** option in the Data Protection for Exchange options file.
- For VSS Backups, specify the ***compression*** option in the backup-archive client options file that is used as the Local DSMAGENT Node. If the environment is configured for VSS offloaded backups, you must also specify the ***compression*** option in the backup-archive client options file that is used as the Remote DSMAGENT Node. Review the compression information available in the client documentation before attempting to compress your data.

INCLUDE* and *EXCLUDE

Only use include and exclude statements to set policy for Legacy backups. Use the VSSPOLICY statement in the Data Protection for Exchange configuration file to set policy for VSS backups. See "Specifying Data Protection for Exchange preferences" on page 74 for more information.

A Data Protection for Exchange Legacy backup object name is composed of a series of qualifiers, each either an Exchange name or a Data Protection for Exchange constant, where the qualifiers are separated by a backslash (\). The general include and exclude syntax is:

```
include "objectNameSpecification" [ManagementClassName]
exclude "objectNameSpecification"
```

where `objectNameSpecification` is:

```
ExchangeServerName\ExchangeStorageGroupName\...\backupType
```

where `backupType` is one of the following:

```
full, copy, incr, diff, dbcopy
```

Note: Important! The Tivoli Storage Manager API does not allow sending any of the three data types (meta, data, logs) that comprise an Exchange database backup to different storage destinations on the Tivoli Storage Manager server.

This example excludes `Storage Group 1` from a backup:

```
EXCLUDE "SERVER1\Storage Group 1\...\*"
```

This example binds all objects for storage group `SG2` to management class `CLASS1`:

```
INCLUDE "SERVER1\SG2\...\*" CLASS1
```

This example binds all `Directory` backups to management class `CLASS2`:

```
INCLUDE "SERVER2\Directory\...\*" CLASS2
```

This example binds all `incremental` objects to management class `CLASS3`:

```
INCLUDE "SERVER3\...\incr" CLASS3
```

Consider the following behavior when setting ***include*** and ***exclude*** statements:

- The wildcard character (*) matches zero or more characters.
- The wildcard character (?) matches any one character.

- The wildcard character (*) within a qualifier replaces zero or more characters only within that qualifier. The qualifier itself must exist in the matching object name. To match zero or more qualifiers, use ellipses (\...\).
- Incremental object names are always unique. These names contain qualifiers whose values make them unique. Incremental object names are generated at the time of the backup and therefore are not predictable and cannot be specified.
- Include/exclude lists are processed from the bottom up and processing stops at the first match. To ensure that more specific specifications are processed at all, the more general specification should be listed before the more specific ones, so as to be processed after the more specific specifications. Otherwise, the more general specification will match the target before the more specific specifications are seen.
- When a match is found, processing of the list stops and the statement that matches is examined.
  - If it is an **exclude** statement, the matching object name is not backed up.
  - If it is an **include** statement, the matching object name is backed up.

  If the **include** statement contains a MangementClassName, that management class is associated with the object name, for this backup and for all backups of the same name on the current node.
- If a match is not found, the object is backed up using the default management class for the current node.
- If a match is found for an **include** statement that specifies a management class but the specified management class is not valid for the current node, the default management class for the current node is used.
- Exchange storage group names must be of the correct case, as shown by the displayed results from the **query exchange** or **query tsm**. Data Protection for Exchange constants must be lower case: `meta, data, logs`. However, at this time the Windows Tivoli Storage Manager API assumes the specifications are for a Windows file system and ignores case. Because they may be honored in the future, the correct case should always be used.

Note:

1. If you are running Data Protection for Exchange on a Microsoft Cluster Server or Veritas Cluster Server, the options file on all nodes of the cluster must be identical.
2. You can create additional Data Protection for Exchange options files to point to other Tivoli Storage Manager servers. You can also create more than one options file, each with different parameters, to use with a single Tivoli Storage Manager server.

Specifying Data Protection for Exchange preferences

Data Protection for Exchange configuration parameters are defined in the Data Protection for Exchange configuration file (tdpexc.cfg by default). These configuration parameters determine such preferences as the location of your log file, how date and time stamps display, and the number of buffers to use.

You can set the values of the Data Protection for Exchange configuration parameters by using the Data Protection for Exchange GUI or the command-line interface:

- Use the **Configuration** task in the **Edit Menu** of the Data Protection for Exchange GUI. See "Edit menu" on page 86.
- Use the **tdpexcc set** command in the Data Protection for Exchange command-line interface. See "Set command" on page 189.

Bind VSS backups to Tivoli Storage Manager policy by selecting **Utilities -> TSM VSS Policy Binding** in the GUI, and then entering appropriate values in the fields.

Part II: Configuration procedure

This section provides step-by-step instructions on how to configure the required applications to perform Data Protection for Exchange backup and restore operations. Configuration tasks are presented in sequential order based on the location of where the tasks must be performed:

1. On the Tivoli Storage Manager server
2. On the machine running the Exchange Server
3. On the machine running the offloaded backups (VSS only)

If you plan to perform VSS operations in a MSCS or VCS environment, make sure to specify the following options in each of the dsm.opt files that are used for the LOCALDSMAGENT and REMOTEDSMAGENT machines:

```
CLUSTERNODE NO
CLUSTERDISKSONLY NO
```

1. Perform these tasks on the Tivoli Storage Manager server

Make sure the Tivoli Storage Manager server is available before performing this task.

Perform these steps on the Tivoli Storage Manager server:

1. Define the policy domains, policy sets, management classes, copy groups, and storage pools needed to meet your Data Protection for Exchange backup and restore requirements. For VSS operations, Tivoli Storage Manager server authentication must be on.
2. Register your Data Protection for Exchange node name and password with the Tivoli Storage Manager **register node** command. For example: For VSS operations, this node is the Target Node. Note that when registering nodes to the Tivoli Storage Manager server specifically for VSS operations, do not specify the Tivoli Storage Manager ***USerid***=NONE parameter. VSS operations will fail when this parameter is specified.
3. If not already defined, register your Tivoli Storage Manager backup-archive client node name and password for the machine where the Exchange Server installed. For example: For VSS operations, this agent node is the Local DSMAGENT Node.

4. (VSS only) If you plan to perform offloaded backups, register the Tivoli Storage Manager backup-archive client node name and password for the machine that will perform the VSS offloaded backups. For example: This agent node is the Remote DSMAGENT Node. Note that *BAOFF* is used in this example (and in Step 5) to differentiate between this Remote DSMAGENT Node and the Local DSMAGENT Node (Step 3). You can replace *BAOFF* with the node name of your backup-archive client. If you do not plan to perform offloaded backups, you can skip this step.
5. (VSS only) Define the proxy node relationship (for the Target Node and agent nodes) with the Tivoli Storage Manager **grant proxynode** command. For example:

   ```
   grant proxynode target=DP agent=BAnodename,BAOFF
   ```

Related concepts

"How Tivoli Storage Manager server policy affects Data Protection for Exchange" on page 26

"Data Protection for Exchange node name: Recommended settings" on page 66

Related information

"Recommended Tivoli Storage Manager policy settings" on page 64

"Proxy node definitions (VSS Backups)" on page 67

2. Perform these tasks on the machine running the Exchange Server

Make sure the Exchange Server is running before performing this task.

Perform these steps on the machine where the Exchange Server is installed and running:

1. Specify your Data Protection for Exchange node name and communication method in the dsm.opt file located (by default) in the Data Protection for Exchange installation directory. Additional options are also available.

   See "Specifying Data Protection for Exchange options" on page 69 for additional information.
2. Specify your Data Protection for Exchange preferences (such as language, date format, log file, etc.) in the tdpexc.cfg file located (by default) in the Data Protection for Exchange installation directory. Use the **set** command or the **Configuration** task in the **Edit Menu** of the Data Protection for Exchange GUI.

   See "Specifying Data Protection for Exchange preferences" on page 74 and "Set positional parameters" on page 190 for additional information.
3. **(VSS Only):** Specify your VSSPOLICY statement in your Data Protection for Exchange configuration file.

   See "Specifying Data Protection for Exchange preferences" on page 74 and "Set positional parameters" on page 190 for additional information.
4. **(VSS Only):** Configure the Tivoli Storage Manager backup-archive client (if it is not already configured). If the backup-archive client is already configured, you can use existing client services. The backup-archive client setup wizard can guide you through the configuration process (if needed). In the backup-archive client GUI menu, select **Utilities->Setup Wizard->Help me configure the TSM Backup Archive Client**. Note that the node name for this machine is referred to as the Local DSMAGENT Node and is specified with the ***localdsmagentnode*** parameter in the Data Protection for Exchange configuration file (tdpexc.cfg by default).

See *IBM Tivoli Storage Manager for Windows Backup-Archive Client Installation and User's Guide* and "Proxy node definitions (VSS Backups)" on page 67 for additional information.

5. **(VSS Only):** Install and configure the Tivoli Storage Manager Client Acceptor Daemon (CAD) Service (if not already installed and configured). You can use an existing client CAD Service if one is already installed and configured. The backup-archive client Setup Wizard can guide you through the CAD installation process (if needed). In the backup-archive client GUI menu, select **Utilities->Setup Wizard->Help me configure the TSM Web Client**. Make sure this CAD service is running before proceeding to Step 6.
6. **(VSS Only):** Install and configure the Tivoli Storage Manager Remote Client Agent Service (DSMAGENT) if it is not already installed and configured. The backup-archive client Setup Wizard can guide you through the configuration process. In the backup-archive client GUI menu, select **Utilities->Setup Wizard->Help me configure the TSM Web Client**. You can use the existing DSMAGENT if one is already installed and configured.
7. **(VSS Only):** Install the Tivoli Storage Manager Copy Services Exchange VSS Integration Module from the product (if it is not already installed).
8. **(VSS Only):** If you plan to perform VSS Instant Restores and you are using the Tivoli Storage Manager backup-archive client Version 5.5.1, you must manually install the IBM Tivoli Storage Manager for Copy Services Hardware Devices Snapshot Integration Module Version 5.5.1 (if it is not already installed).

   If you are using the Tivoli Storage Manager backup-archive client Version 6.1 (or later), the IBM Tivoli Storage Manager FlashCopy Manager Hardware Devices Snapshot Integration Module is automatically installed with the Tivoli Storage Manager backup-archive client. As a result, you do not need to manually install this module.A SAN Volume Controller, DS6000, DS8000, or XIV storage subsystem is also required to perform VSS Instant Restores.
9. **(VSS Only):** Add the Microsoft Exchange Server binary path to the PATH statement in the system environment variables. For example:

   ```
   "C:\Program files\Exchsrvr\bin"
   ```

   Verify that the "ESEUTIL.EXE" executable exists in this directory.
10. **(VSS Only):** Install and configure a VSS provider. Consult the VSS provider documentation for information regarding configuration of that software. Note that there is no installation or configuration required if you are using the default Windows VSS System Provider.
11. **(VSS Only):** Define storage space to hold VSS Backups that will reside on local shadow volumes. Make sure you define enough space to hold all copies of the VSS Backups as designated by your policies.

    See "Back up to Tivoli Storage Manager storage versus back up to local shadow volumes" on page 61 for recommendations regarding sufficient disk storage space.

3. Perform these tasks on the machine running the offloaded backups

This task is for VSS operations only.

Perform these steps on the machine running the offloaded backups:

1. Configure the Tivoli Storage Manager backup-archive client (if it is not already configured). If the backup-archive client is already configured, you can use existing client services. The backup-archive client Setup Wizard can guide you through the configuration process (if needed). In the backup-archive client GUI menu, select **Utilities->Setup Wizard->Help me configure the TSM Backup Archive Client**. Note that the node name for this machine is referred to as the Remote DSMAGENT Node and is specified with the ***remotedsmagentnode*** parameter in the Data Protection for Exchange configuration file (tdpexc.cfg by default).
2. Install and configure the Tivoli Storage Manager Client Acceptor Daemon (CAD) Service (if not already installed and configured). You can use an existing client CAD Service if one is already installed and configured. The backup-archive client Setup Wizard can guide you through the CAD installation process (if needed). In the backup-archive client GUI menu, select **Utilities->Setup Wizard->Help me configure the TSM Web Client**.
3. Install and configure the Tivoli Storage Manager Remote Client Agent Service (DSMAGENT). The backup-archive client Setup Wizard can guide you through the configuration process. In the backup-archive client GUI menu, select **Utilities->Setup Wizard->Help me configure the TSM Web Client**.
4. Install the Microsoft Exchange Server management tools from the Microsoft Exchange Server installation media. Take note of the Microsoft Exchange Server Management tools binary directory (for example: C:\Program files\Exchsrvr\bin). Verify that the "ESEUTIL.EXE" executable exists in this directory. Data Protection for Exchange uses this tool to run automatic integrity checking of the VSS backup.

   Note:

   a. The Exchange Server does not need to be installed or running on this machine. Only the Microsoft Exchange Server management tools are required to be installed on this machine.

   b. See your Microsoft Exchange Server documentation for necessary license requirements.
5. Add the Microsoft Exchange Server binary path to the PATH statement in the system environment variables. For example:

   ```
   "C:\Program files\Exchsrvr\bin"
   ```
6. Install and configure a VSS provider (if you are not using the default system VSS provider). Consult the VSS provider documentation for information regarding configuration of that software.

4. Perform these tasks to configure your system for mailbox-level and item-level restore operations

To use the Data Protection for Exchange mailbox restore feature, there are additional configuration requirements.

Exchange Server 2003 requirement

Exchange Server 2003 is provided with the Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 (MAPI) as a base product installation. However, for Exchange Server 2003 environments, you must update your local MAPI configuration file to perform mailbox restore operations to a .pst file.

If you are running Exchange Server 2003, use the Microsoft Exchange Server MAPI Editor (MFCMapi) to add the MAPI PST message service MSPST MS to your local MAPI configuration file, mapisvc.inf. Consult your Microsoft documentation for further details.

Exchange Server 2007 and Exchange Server 2010 requirement

Exchange Server 2007 and Exchange Server 2010 are not provided with the Microsoft Exchange Server MAPI.

If you are running Exchange Server 2007 or Exchange Server 2010, install the Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 (MAPI) version 6.5.8147.0 (or later) on the Exchange Server that you will use to perform the mailbox restore operations. The Client Access Server Role must also be configured to run Mailbox Restore operations on Exchange Server 2010. Consult your Microsoft documentation for further details.

Restriction: Do not install the Microsoft Outlook MAPI on any Exchange Server 2003 or Exchange Server 2007 machine that is used to perform Data Protection for Exchange mailbox restore tasks. Microsoft does not support installing the Microsoft Outlook MAPI with Exchange Server 2003, and does not recommend installing the Microsoft Outlook MAPI with Exchange Server 2007. Consult your Microsoft documentation for further details.

5. Perform these tasks to verify your configuration

Before attempting to perform a backup or restore operation, verify that Data Protection for Exchange is installed and configured correctly.

Verify the installation and configuration of Data Protection for Exchange with the query exchange command

Issue the **query exchange** command on the machine where the Exchange Server is installed and running to verify the installation and configuration. For example:

```
tdpexcc query exchange
```

This command returns information and status about the Exchange Server, storage groups (Exchange Server 2003 and Exchange Server 2007), databases (Exchange Server 2010), DAG status (Exchange Server 2010), circular logging, and VSS components (when configured for VSS operations). The following output example shows that the configuration is correct and ready for Legacy backups, VSS Backups (`Local DSMAgent Node`), and VSS offloaded backups (`Remote DSMAgent Node`). This example is for an environment using Exchange Server 2003 or Exchange Server 2007 data:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Querying Exchange Server to gather storage group information, please wait...

Microsoft Exchange Server Information
-------------------------------------

Server Name: SAGAN
Domain Name: sagan.cosmos.local
Exchange Server Version: 8.0.685.24 (Exchange Server 2007)

Storage Groups with Databases and Status
----------------------------------------

First Storage Group
Circular Logging - Disabled
Replica - None
Recovery - False
Mailbox Database Online
Mailbox Database Two Online

lcrsg1
Circular Logging - Disabled
Replica - Local
Recovery - False
Mailbox1 Online

myrsg
Circular Logging - Disabled
Replica - None
Recovery - True
MailboxDatabase1 Offline
```

```
STG100-rename
Circular Logging - Disabled
Replica - None
Recovery - False
Mail1 Online

STG101
Circular Logging - Disabled
Replica - None
Recovery - False
Mailbox1 Online

STG2
Circular Logging - Disabled
Replica - None
Recovery - False
Mail1 Online
Mail2 Online
Mailbox with a space in the name Online

STG3
Circular Logging - Disabled
Replica - None
Recovery - False
Mail3 Online
Maildb1 Online
PubFolder1 Online

Recovery Storage Group exists - All legacy backups of mailbox databases are
restored here.

Volume Shadow Copy Service (VSS) Information
-------------------------------------------

Writer Name : Microsoft Exchange Writer
Local DSMAgent Node : SAGAN
Remote DSMAgent Node : xyz
Writer Status : Online
Selectable Components : 7
```

```
STG101
Circular Logging - Disabled
Replica - None
Recovery - False
Mailbox1 Online

STG2
Circular Logging - Disabled
Replica - None
Recovery - False
Mail1 Online
Mail2 Online
Mailbox with a space in the name Online

STG3
Circular Logging - Disabled
Replica - None
Recovery - False
Mail3 Online
Maildb1 Online
PubFolder1 Online

Recovery Storage Group exists - All legacy backups of mailbox databases are
restored here.

Volume Shadow Copy Service (VSS) Information
-------------------------------------------

Writer Name : Microsoft Exchange Writer
Local DSMAgent Node : SAGAN
Remote DSMAgent Node : xyz
Writer Status : Online
Selectable Components : 7
```

Verify that an Exchange Server is ready to perform mailbox restore operations

Verify that your Exchange Server is ready to perform Data Protection for Exchange mailbox restore operations.

- Exchange Server 2003 provides the necessary Microsoft Exchange Server MAPI Client and Collaboration Data Objects (MAPI) client libraries as part of the base product installation.
- For Exchange Server 2007 and Exchange Server 2010 environments, MAPI 1.2.1 (MAPI) version 6.5.8147.0 (or later) must be installed on the Exchange Server that you will use to perform mailbox restore operations.

  Use MFCMapi to verify your MAPI configuration. Refer to your Microsoft documentation for further details.

Verify that an Exchange Server is ready to perform VSS operations

Perform the following tests to verify that your Exchange Server is ready to perform VSS operations. For best results, perform these tests prior to installing Tivoli Storage Manager.

After all of these tests complete without errors, you are ready for the Tivoli Storage Manager component installations.

Using the VSHADOW command

Review your Microsoft documentation for important details regarding the

Microsoft Windows VSHADOW command. VSHADOW is available for Windows Server 2003 and Windows Server 2003 R2.

1. Test the creation and the deletion of a non-persistent shadow copy:
   a. From the command line, issue the Microsoft Windows VSHADOW command:

      ```
      VSHADOW k: l:
      ```

      where the variable "*k:*" is the Exchange Server database volume and the variable "*l:*" is the Exchange Server log volume.
   b. Repeat the preceding step four times.
   c. Verify that the Windows Event Log contains no errors.
2. Test the creation and the deletion of a persistent shadow copy:
   a. From the command line, issue the Microsoft Windows VSHADOW command:

      ```
      VSHADOW -p k: l:
      ```

      where the variable "*k:*" is the Exchange Server database volume and the variable "*l:*" is the Exchange Server log volume.

      Important: If you do not have enough space to run the command, you might want to delete shadow copies on the server. To delete *all* shadow copies on a server, issue the Microsoft Windows VSHADOW command: `VSHADOW -da`
   b. Repeat the preceding step four times.
   c. Verify that the Windows Event Log contains no errors.
3. If you want to perform OFFLOAD VSS Backup operations, test the creation and the deletion of a non-persistent transportable shadow copy (VSS Hardware Provider environments only):
   a. From the command line, issue the Microsoft Windows VSHADOW command:

      ```
      VSHADOW -t=export.xml k: l:
      ```

      where the variable "*k:*" is the Exchange Server database volume and the variable "*l:*" is the Exchange Server log volume.
   b. On the server that you have designated for offloaded backup, from a command-line prompt, issue the Microsoft Windows VSHADOW command as follows:

      ```
      VSHADOW -i=export.xml
      ```
   c. Verify that the Windows Event Log contains no errors.

Using the DISKSHADOW command

Before installing IBM Tivoli Storage Manager for Mail - Data Protection for Exchange it is highly recommended that you test core VSS functionality first. VSS functionality can be validated with the Windows 2008 Server-embedded command DISKSHADOW. DISKSHADOW is available for Windows Server 2008 and Windows Server 2008 R2. The following are the DISKSHADOW tests that are recommended before any Tivoli Storage Manager components are installed.

1. Test non-persistent shadow copy creation and deletion.
   - Run "diskshadow" in a command window

- DISKSHADOW>add volume f: (Database volume)
- DISKSHADOW>add volume g: (Log volume)
- DISKSHADOW>create
- DISKSHADOW>list shadows all (this may take a few minutes)
- DISKSHADOW>delete shadows all

Note: Volumes f: and g: represent the Exchange Database and log volumes. Repeat this 4 times. Verify the Windows Event Log contains no errors.

2. Test Persistent shadow copy creation and deletion.
   - Run "diskshadow" on a command window
   - DISKSHADOW>set context persistent
   - DISKSHADOW>add volume f: (Database volume)
   - DISKSHADOW>add volume g: (Log volume)
   - DISKSHADOW>create
   - DISKSHADOW>list shadows all (This may take a few minutes)
   - DISKSHADOW>delete shadows all

   Note: Volumes f: and g: represent the Exchange Database and log volumes. Repeat this 4 times. Verify the Windows Event Log contains no errors.
3. Test Non-persistent transportable shadow copy creation and deletion
   - Run "diskshadow" on a command window
   - DISKSHADOW>set context persistent
   - DISKSHADOW>set option transportable
   - DISKSHADOW> add volume f: (Database volume)
   - DISKSHADOW> add volume g: (Log volume)
   - DISKSHADOW>set metadata c:\metadata\exchangemeta.cab (specify the path where you want the metadata stored)
   - DISKSHADOW> create
   - Manually copy the exchangemeta.cab file from the source server to the offload server and run these two commands:
     - DISKSHADOW>LOAD METADATA *path toexchangemeta.cab*
     - DISKSHADOW>IMPORT
     - DISKSHADOW>list shadows all (This may take a few minutes)
     - DISKSHADOW>delete shadows all

   Note: Volumes f: and g: represent the Exchange Database and log volumes. Repeat this 4 times. Verify the Windows Event Log contains no errors.

Diagnose the cause of common errors returned from VSS operations

Note that the following two errors are commonly returned when performing a VSS operation. Information is provided to help locate the cause of the error.

ANS1017E (RC-50) Session rejected: TCP/IP connection failure
This is displayed when the Tivoli Storage Manager backup-archive client CAD is either not running or is not configured properly.

ANS1532E (RC5722) Proxy Rejected: Proxy authority has not been granted to this node. This is displayed when the Tivoli Storage Manager server has not been configured for the proxy nodes correctly.

Chapter 4. Graphical user interface functions

Information about how to use the Data Protection for Exchange GUI to perform various tasks is provided.

Use the Data Protection for Exchange GUI to perform these tasks:

- Perform a Legacy backup of Exchange storage groups (Exchange Server 2003 and Exchange Server 2007) and transaction logs, including Exchange Site Replication Service (SRS) databases.
- Perform a VSS Backup of Exchange storage groups (Exchange Server 2003 and Exchange Server 2007) or Exchange databases (Exchange Server 2010), and transaction logs.
- Perform a VSS offloaded backup of Exchange storage groups (Exchange Server 2003 and Exchange Server 2007) or Exchange databases (Exchange Server 2010) and transaction logs.
- Perform a VSS Backup of Exchange Server 2007 LCR and CCR copies, or Exchange Server 2010 DAG copies.
- Restore Exchange storage groups (Exchange Server 2003 and Exchange Server 2007) or Exchange databases (Exchange Server 2010) and transaction logs.
- Restore a mailbox to recover mailbox-level data or mailbox item-level data from Data Protection for Exchange backups. For Exchange Server 2003 environments, mailbox restore applies to Data Protection for Exchange Legacy backups only. For Exchange Server 2007 environments, mailbox restore applies to any Data Protection for Exchange Legacy backups or VSS Backup. For Exchange Server 2010environments, mailbox restore applies to any Data Protection for Exchange VSS Backups only.
- Restore the SRS database.
- Restore VSS Backups from Exchange Server 2007 into the Recovery Storage Group, an alternate storage group, or relocated storage group.
- Restore VSS Backups from Exchange Server 2010 into the Recovery Database, an alternate database, or relocated database.
- Modify the Data Protection for Exchange configuration.
- Select short cuts from the Data Protection for Exchange toolbar.

Note: The term **Tree View** refers to the directory tree view in the left frame of a backup or restore window. The term **List View** refers to the scrollable list of objects in the right frame of a backup or restore window.

Menu bar

The Data Protection for Exchange GUI Menu Bar provides these items and menu list functions.

File Exit the program.

Edit Configure Data Protection for Exchange. The default configuration settings are contained in the ***tdpexc.cfg*** file.

View Refresh the Tree View.

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Utilities

Change the Tivoli Storage Manager password or display Tivoli Storage Manager server information.

Help Obtain Data Protection for Exchange help, Tivoli Storage Manager Web access, and information about Data Protection for Exchange.

Edit menu

Use this menu to edit your Data Protection for Exchange configuration settings.

Since Exchange Server 2010 supports VSS backup and restore operations only, the following parameters (used with Legacy operations) are not available for Exchange Server 2010:

- TDP Buffers
- TDP Buffer Size
- Legacy Backup
- Retries for Legacy Backups
- Wait for Tape Mounts for Backup or Restore
- Use VSS Backup as the default Backup method

Configuration

This allows you to modify the Data Protection for Exchange configuration file. If a configuration file is not specified, the ***tdpexc.cfg*** file is used. If no configuration file is found, a default file is created which contains all the default settings for the parameters. You can specify a different configuration file by invoking the GUI from the command line with the **/configfile** parameter.

Clicking this menu item displays the Data Protection for Exchange Settings dialog with the following five tabs and their settings:

- **General Tab**

  Temporary Log Restore Path

  Select the **Temporary Log Restore Path** field to set the **templogrestorepath** parameter. Enter the default temporary path to use when restoring logs and patch files.

  Attention:

  – Do not specify a value of **templogrestorepath** that is the same value as the current location for the storage group used for recovery. If the value is the same, the storage group might become corrupted.

  – Choose a temporary log-restore location that has enough space to hold all the log and patch files.

  Tip: For better performance, the current active-transaction logger should be on a different physical device from the paths specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting. The paths that are specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting can be on the same or separate physical devices from each other.

  Restriction: Do not specify double-byte characters (DBCS) within the temporary log-restore path.

Temporary DB Restore Path

For mailbox restore operations, you can select the **Temporary DB Restore Path** field to set the **tempdbrestorepath** parameter. Enter the default temporary path to use when restoring mailbox database files.

Attention:

- Do not specify a value of **/tempdbrestorepath** that is the same value as the location of the active database. If the value is the same, the database might become corrupted.
- Choose a temporary database-restore location that has enough space to hold the entire restore for the storage group.

Tip: For better performance, the current active-transaction logger should be on a different physical device from the paths specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting. The paths that are specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting can be on the same or separate physical devices from each other.

Restriction: Do not specify double-byte characters (DBCS) within the temporary database-restore path.

***Retries for Legacy Backups* (default value: 4)**

Specify the number of times (0 to 32) that Data Protection for Exchange will retry a failed Legacy backup.

Wait for Tape Mounts for Backup or Restore

Check this box when you want Data Protection for Exchange to wait for tape media to be mounted for backup and restore operations. This setting is applicable when the Tivoli Storage Manager server is configured to store the backup data on tape media. With backup data on removable media it is likely that during backup and restore operations a wait period will occur during storage volume mounts. If a wait occurs this setting specifies whether Data Protection for Exchange should wait for the media mount or stop the current operation. Wait for tape mounts is the default.

Use VSS Backup as the default Backup method

Check this box to set VSS Backups as the default backup method. Be aware of the following considerations when using this parameter:

- Make sure the ***Local DSMAGENT Node name*** parameter is specified.
- VSS Backups can only be restored using VSS.
- You cannot mix a VSS Backup with a Legacy backup.
- This parameter is unavailable if the Microsoft Exchange VSS Integration Module is not installed.

The default value is to use the Legacy backup method.

- **Performance Tab**

***TDP Buffers* (default value: 3)**

Select a number (2 to 8) that specifies the number of communication data buffers Data Protection for Exchange uses

when transferring data between Data Protection for Exchange and the Tivoli Storage Manager server. Each buffer is the size specified in the ***TDP Buffer Size*** parameter. Note that this parameter applies to Legacy backups only.

TDP Buffer Size **(default value: 1024)**
Select a number (64 to 8192) that specifies the size of the buffers used by Data Protection for Exchange to transfer data to the Tivoli Storage Manager server. The specified value must be a multiple of 8. For example, you can specify 312 (a multiple of 8) but you cannot specify 313. Note that this parameter applies to Legacy backups only.

- **Logging Tab**

  Log File Name **(default value: *tdpexc.log*)**
  Enter the name of the file into which you want Data Protection for Exchange to write activity log information.

  Prune Old Entries **(default value: selected)**
  Check this box to enable pruning of the activity log. Specify the number of days (0 to 9999) to keep old entries. Data Protection for Exchange prunes entries greater than this number when you initialize this application. The default value is to keep the entries for 60 days. Click on the Prune Now button to prune the activity log immediately.

- **Regional Tab**

  Language **(default value: American English)**
  Specify the language to use for displaying the GUI and Data Protection for Exchange messages. The following languages are available during installation:
  - English (United States) (This is the default).
  - Brazilian Portuguese
  - Chinese (Simplified)
  - Chinese (Traditional)
  - French
  - German
  - Italian
  - Japanese
  - Korean
  - Spanish

  The language you specify does not become effective until you exit and restart the GUI.

  Date Format **(default value: mm/dd/yyyy)**
  Specify the date format of your choice.
  - **dd** Day of the Month
  - **mm** Month of the Year
  - **yyyy** Year

  Time Format **(default value: hh:mm:ss)**
  Specify the format for displaying time.
  - **hh** Hours (24-hour day)
  - **mm** Minutes in an hour

– **ss** Seconds in a minute

Number Format **(default value: xxx,xxx.dd)**
Specify the format for displaying numbers. The choices on the display represent several ways to place the decimal, comma, and spaces.

- **VSS Backup Tab**

  Default Backup Destination **(default value: TSM Server)**
  Select the default storage location for your backups. You can select from the following storage locations:

  TSM Server
  The data is stored on Tivoli Storage Manager server storage only. This is the default.

  Local The backup is stored on local shadow volumes only.

  Both The backup is stored on both Tivoli Storage Manager server storage and local shadow volumes. Note that if this parameter is selected, the Tivoli Storage Manager server backup cannot be offloaded.

  Note that this parameter is only valid when using the VSS backup method.

  Local DSMAGENT Node name
  Specify the Tivoli Storage Manager node name (agent node) of the local client machine that performs VSS operations and moves the VSS data from local shadow volumes to Tivoli Storage Manager server storage during Tivoli Storage Manager server backups. This parameter must be specified for VSS operations to be performed.

  Remote DSMAGENT Node name
  Specify the Tivoli Storage Manager node name (agent node) of the remote client machine that moves the VSS data from local shadow volumes to Tivoli Storage Manager server storage during offloaded backups.

For specific considerations related to these configuration settings, see "Set command" on page 189.

View menu

Use this menu to adjust how information is displayed in the Data Protection for Exchange GUI.

Refresh tree view

When the tree is refreshed, the GUI will:

- clear all selections
- clear all List View information for all Storage Groups
- rebuild the directory tree
- completely expand the directory tree

If you simply move back and forth between the Backup and Restore tabs without refreshing, you do not lose the current selections or Tree View. If you switch from the Restore tab to the Backup tab, perform a new backup, then switch back to the Restore tab, you must refresh the Restore directory tree to see the new backup.

Show only Active objects
Select this option to display only active backup objects in the List View. This is the default value.

Show all objects
Select this option to display both active and inactive objects in the List View.

Auto Select
Select this option to quickly select the backup objects to restore. When ***Auto Select*** is off, you must click on all objects to be restored. When ***Auto Select*** is on (the default value), additional selections are automatically made as you click.

The following is characteristic of ***Auto Select***:

- Operates when you click on a full, differential, or incremental backup in the List View. ***Auto Select*** also operates when you click on a storage group or server name in the Tree View.
- Ignores copy and database copy backups.
- If you click on a full backup, the latest associated differential or all associated incremental backups are selected.
- If you click on a differential backup, the associated full backup is also selected.
- If you click on an incremental backup, the associated full backup and all associated earlier incremental backups are also selected.
- Operates when you clear a full, differential, incremental, storage group, or server name.

Auto Select will not make additional selections in the following two situations:

- If a combination of differential and incremental backups exist for a full backup. For example, if you clicked on a full backup that had associated incremental *and* differential backups, only the full backup is selected.
- If a differential or incremental backup is selected and no associated full backup can be found.

To override the characteristics of ***Auto Select***, clear the ***Auto Select*** option and manually select what you need.

Utilities menu

Use this menu to launch Data Protection for Exchange utilities.

Change TSM Password
This dialog prompts you to enter the old password, then enter the new password twice, in order to verify the new password. See "Changetsmpassword command" on page 186 for additional information.

TSM Server Information
This window displays the following Tivoli Storage Manager server connection information:

- Nodename
- Server Network Host Name
- Tivoli Storage Manager API Version
- Server Name
- Server Type

- Server Version
- Compression Mode
- Domain Name
- Active Policy Set
- Default Management Class

VSS Policy Binding
This dialog launches the VSS Policy Binding dialog box, in which you can configure VSS policy binding settings.

Mailbox Restore
This dialog launches the Mailbox Restore window. See "Restoring individual mailbox and mailbox item-level data" on page 100 for task information.

Help menu

Use this menu to start Data Protection for Exchange help information.

Data Protection for Microsoft Exchange Server
Launches Data Protection for Exchange online help.

TSM Web Access
Launches an online help panel that contains links to IBM, Tivoli Storage Manager, and Exchange Server Web site links.

About Data Protection for Microsoft Exchange Server
Launches a splash screen that contains product release information.

Toolbar

The toolbar provides short cuts to frequently used tasks.

Use the toolbar to perform these tasks:

- Refresh the Tree View
- Edit Data Protection for Exchange configuration
- Mailbox Restore
- Display IBM, Tivoli Storage Manager, and Exchange Server Web site links
- Display the Data Protection for Exchange GUI online help

GUI invocation

These parameters can be entered when the GUI is launched from the command-line interface.

/configfile
Specify this parameter to override the default Data Protection for Exchange configuration file (tdpexc.cfg).

For example, to specify the configuration file, file.cfg, located in the `\temp\test` directory during the GUI invocation, you would enter the following command in the Data Protection for Exchange command line interface:

```
tdpexc /CONFIGfile=c:\temp\test\file.cfg
```

/excserver
Specify this parameter to override the default Exchange server. The default Exchange server is the local Exchange server. IMPORTANT! If you are

running Data Protection for Exchange in an MSCS or VCS, you MUST invoke the GUI with the **/excserver** parameter from the Data Protection for Exchange command line.

For example, to specify the Exchange server *exc1* during the GUI invocation, you would enter the following command in the Data Protection for Exchange command line interface:

```
tdpexc /EXCSERVer=exc1
```

/tsmoptfile

Specify this parameter to override the default Tivoli Storage Manager option file (dsm.opt).

For example, to specify the file.opt option file located in the `\temp\test` directory during the GUI invocation, you would enter the following command in the Data Protection for Exchange command line interface:

```
tdpexc /TSMOPTFile=c:\temp\test\file.opt
```

Backup and Restore windows

Data Protection for Exchange provides separate windows for backup and restore operations. Each window contains its own directory tree, list, and tab controls.

Considerations

- Both Legacy and VSS operations are performed from the same tab.
- The backup window is the initial window visible upon startup of the GUI.
- You cannot close, minimize, or move the backup or restore window independently of the main GUI window.
- A VSS related feature is disabled out when IBM Tivoli Storage FlashCopy Manager or the IBM Tivoli Storage Manager for Copy Services Microsoft Exchange VSS Integration Module is not installed.

Highlighting and selecting

- On the Restore tab, right-mouse click on a selected item (that represents a VSS backup) to launch an additional menu containing ***Restore Into*** and ***Delete*** functions.
- When an item is highlighted in the Tree, information about all the items one level under the highlighted item is displayed in the List View. For example, if a Storage Group (Exchange Server 2003 or Exchange Server 2007) or database (Exchange Server 2010) is highlighted in the Restore Tree, all Tivoli Storage Manager backups for that Storage Group or database are displayed in the List View.
- The following list contains exceptions.
  - If the Site, Organization, or Domain name is highlighted in the Backup Tree, information about the Site, Organization, or Domain, Exchange server, and version level are displayed in the List View.
  - If the Information Store item is highlighted in the Backup Tree, the List View displays status for *all* Storage Groups (Exchange Server 2003 or Exchange Server 2007) or databases (Exchange Server 2010).
  - If the server name is highlighted in the Restore Tree, the List View displays *all* Storage Groups (Exchange Server 2003 or Exchange Server 2007) or databases (Exchange Server 2010) and their backups (indented under the Storage Group).
- Highlighting the List View has no effect.

- To select an item for backup or restore, click the square selection box to the left of the item name. Clicking a selection box in the Tree will also highlight that item, displaying associated information in the List View.
- Double-clicking on a selection box in the Tree will select that item and collapse or expand the Tree at that point. An item can be selected from both the Tree and the List View.
- If a selection box contains an "X", the selection is disabled for that item. You may still be able to back up or restore the item. For example, if a Storage Group item (Exchange Server 2003 or Exchange Server 2007) or database (Exchange Server 2010) has a disabled selection box in the Tree and all the List View items also have disabled selection boxes, then those items cannot be selected for backup or restore. This can happen only if you have an empty Tivoli Storage Manager server file space. See the restore option ***Auto Select*** for additional information on selecting items in the Tree and List View.

Note that some selectable items, such as inactive Tivoli Storage Manager Backups, can only be selected in the List View.

Messages

Please be aware of the following IMPORTANT messages when performing backup or restore operations:

- Selecting multiple Copy, Full, or Database Copy backups, or any combination of these backups, for restore, a warning message will ask you if you want to continue. If you continue, all backups will be restored but only the latest backup will take effect. All the time spent restoring the earlier backups will be wasted.
- When you request a backup to be restored, Data Protection for Exchange will first check to make sure any databases have been dismounted. If they have not, you will be prompted to stop them or cancel the restore. After a restore, you can check the ***Mount Databases After Restore*** option, or mount them from outside Data Protection for Exchange.
- If you are restoring a CCR database, after the restore completes successfully, the cluster database is mounted successfully. However, due to a Microsoft Exchange Server 2007 limitation, the database resources are not brought online. You must bring the database resources online using the Microsoft Cluster Administrator interface. See the following Microsoft Knowledge Base article for details regarding this limitation: http://support.microsoft.com/kb/938442/en-us

GUI tasks

How to perform a Legacy backup

Follow these steps to perform a Legacy backup using the Data Protection for Exchange GUI.

In order to perform backup tasks, Data Protection for Exchange must be operating in an account that meets these two conditions:

1. The account must be delegated with the appropriate privilege:
   - **Exchange Server 2003**: Exchange Administrator role
   - **Exchange Server 2007**: membership in the Exchange Organization Administrators group
2. The account must be a member of the local Administrators group for the machine on which the Exchange server is running.

This procedure assumes that Data Protection for Exchange and the Tivoli Storage Manager server are properly configured in your environment. See Chapter 3, "Configuring Data Protection for Exchange," on page 59 for detailed instructions on how to configure these applications.

Follow these steps to perform a Legacy backup of your data:

1. Start the Data Protection for Exchange GUI. If you are running Data Protection for Exchange in a MSCS or VCS:

   Note:

   a. If you are backing up the Site Replication Service (SRS), you must initialize the SRS database through the cluster administrator. The SRS must be running in order to be backed up.
   b. You MUST invoke the GUI with the ***/excserver*** parameter from the Data Protection for Exchange command line.
2. From the Tree View, select one or more storage groups to back up. You can also select one or more storage groups to back up in the List View. Note that you cannot back up more than one application (SRS, IS) in a single operation.
3. In the Backup Options section of the Backup window, select the ***Legacy Backup*** method.

   Note: You can specify that Data Protection for Exchange retry a failed backup by setting the ***Retries for Legacy Backup*** parameter in the Data Protection for Exchange Settings window. From the File Menu, click on **Edit -> Configuration -> General Tab**.
4. Specify the type of backup to perform with the ***Backup Type*** drop-down menu. Note that you cannot perform a database copy of an SRS database.
5. Click on the **Backup** button to begin the backup operation.

How to perform a VSS Backup

Follow these steps to perform a VSS Backup using the Data Protection for Exchange GUI.

In order to perform backup tasks, Data Protection for Exchange must be operating in an account that meets these two conditions:

1. The account must be delegated with the appropriate privilege:
   - **Exchange Server 2003**: Exchange Administrator role
   - **Exchange Server 2007**: membership in the Exchange Organization Administrators group
   - **Exchange Server 2010**: operating in an account with membership in the Organization Management group.
2. The account must be a member of the local Administrators group for the machine on which the Exchange server is running.

This procedure assumes that Data Protection for Exchange, the Tivoli Storage Manager backup-archive client, the Tivoli Storage Manager server, Tivoli Storage FlashCopy Manager, and a VSS or VDS provider are properly configured in your environment. See Chapter 3, "Configuring Data Protection for Exchange," on page 59 for detailed instructions on how to configure these applications.

Note: When running Exchange Server 2010 backups, the Exchange database file size may increase due to increase database commitments that are triggered by backup operations. This is a Microsoft Exchange server standard behavior.

Follow these steps to perform a VSS Backup of your data:

1. Start the Data Protection for Exchange GUI. If you are running Data Protection for Exchange in a MSCS or VCS, you MUST invoke the GUI with the ***/excserver*** parameter from the Data Protection for Exchange command line.
2. Make sure a ***Local DSMAGENT Node name*** is specified. You can specify this node name using the Data Protection for Exchange Settings window. From the File Menu, click on **Edit -> Configuration -> VSS Backup Tab**.
3. From the Tree View, select the storage group (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010) to back up. You can also select one or more storage groups to back up in the List View.
4. In the Backup Options section of the Backup window, select the ***VSS Backup*** method. Note that this method will automatically be selected when the ***Use VSS as the default Backup method*** parameter is selected in the Data Protection for Exchange Settings window. If Tivoli Storage FlashCopy Manager or the Microsoft Exchange VSS Integration Module is not installed, the ***VSS Backup*** method is not available for selection.
5. Specify the storage destination of your backup with the ***Backup Destination*** drop-down menu.

   You can also use an alternate machine to offload the movement of the Exchange data to Tivoli Storage Manager server storage. This type of backup requires that a ***Remote DSMAGENT Node*** be specified and that a VSS hardware subsystem (that supports transportable shadow copies) be available. See "How to perform a VSS offloaded backup" on page 96 for detailed information.
6. Specify the type of backup to perform with the ***Backup Type*** drop-down menu. Note that you can only perform a full, incremental, differential, copy, or copy without integrity check backup with the VSS Backup method.
7. (Optional) This step varies based on your version of Exchange Server.
   - **Exchange Server 2007**: If you are running in an Exchange Server 2007 Local Continuous Replication (LCR) or Cluster Continuous Replication (CCR) environment and you want to back up data from the replica copy, select ***From replica, if available*** in the Backup window. For CCR copies, you must run the backup while logged in to the secondary node of the cluster that contains the replica copy. Microsoft does not support back up operations to Standby Continuous Replication (SCR) replicated databases.
   - **Exchange Server 2010**: If you are running in an Exchange Server 2010 Database Availability Group (DAG) environment, you can back up an active database copy or passive database copy. View the copy status in the `DAG Status` column in the Backup window.
8. Click on the **Backup** button to begin the backup operation.

How to perform a VSS offloaded backup

Follow these steps to perform a VSS offloaded backup using the Data Protection for Exchange GUI.

In order to perform backup tasks, Data Protection for Exchange must be operating in an account that meets these two conditions:

1. The account must be delegated with the appropriate privilege:
   - **Exchange Server 2003**: Exchange Administrator role
   - **Exchange Server 2007**: membership in the Exchange Organization Administrators group
   - **Exchange Server 2010**: operating in an account with membership in the Organization Management group.
2. The account must be a member of the local Administrators group for the machine on which the Exchange server is running.

This procedure assumes that Data Protection for Exchange, the Tivoli Storage Manager backup-archive client, the Tivoli Storage Manager server, the Microsoft Exchange VSS Integration Module, and a VSS or VDS provider are properly configured in your environment. See Chapter 3, "Configuring Data Protection for Exchange," on page 59 for detailed instructions on how to configure these applications.

An offloaded backup uses an alternate machine (specified with the ***Remote DSMAGENT Node*** parameter) to move Exchange data to Tivoli Storage Manager server storage. This may reduce the impact on network, I/O, and CPU resources during backup processing. The alternate machine also performs the Exchange Integrity Check.

Follow these steps to perform a VSS offloaded backup of your data:

1. Start the Data Protection for Exchange GUI. If you are running Data Protection for Exchange in a MSCS or VCS, you MUST invoke the GUI with the ***/excserver*** parameter from the Data Protection for Exchange command line.
2. Make sure a ***Local DSMAGENT Node name*** is specified. You can specify this node name using the Data Protection for Exchange Settings window. From the File Menu, click on **Edit -> Configuration -> VSS Backup Tab**.
3. Make sure a ***Remote DSMAGENT Node name*** is specified. You can specify this node name using the Data Protection for Exchange Settings window. From the File Menu, click on **Edit -> Configuration -> VSS Backup Tab**.
4. From the Tree View, select the storage group (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010) to back up. You can also select one or more storage groups to back up in the List View.
5. In the Backup Options section of the Backup window, select the***VSS Backup*** method. Note that this method will automatically be selected when the ***Use VSS as the default Backup method*** option is selected in the Data Protection for Exchange Settings window. If Tivoli Storage FlashCopy Manager or the Microsoft Exchange VSS Integration Module is not installed, the VSS Backup method is not available.
6. In the ***Backup Destination*** drop-down menu, select *TSM Server (Offloaded)*.
7. Specify the type of backup to perform with the ***Backup Type*** drop-down menu. Note that you can only perform a full, copy, or copy without integrity check backup with the VSS offloaded backup method.
8. (Optional) This step varies based on your version of Exchange Server.

- **Exchange Server 2007**: If you are running in an Exchange Server 2007 Local Continuous Replication (LCR) or Cluster Continuous Replication (CCR) environment and you want to back up data from the replica copy, select ***From replica, if available*** in the Backup window. For CCR copies, you must run the backup while logged in to the secondary node of the cluster that contains the replica copy. Microsoft does not support back up operations to Standby Continuous Replication (SCR) replicated databases.
- **Exchange Server 2010**: If you are running in an Exchange Server 2010 Database Availability Group (DAG) environment, you can back up an active database copy or passive database copy. View the copy status in the `DAG Status` column in the Backup window.

9. Click on the **Backup** button to begin the backup operation.

Restoring Exchange data

Follow these steps to restore Exchange data using the Data Protection for Exchange GUI.

In order to perform restore tasks, Data Protection for Exchange must be operating in an account that meets these two conditions:

1. The account must be delegated with the appropriate privilege:
   - **Exchange Server 2003**: Exchange Administrator role
   - **Exchange Server 2007**: membership in the Exchange Organization Administrators group
   - **Exchange Server 2010**: operating in an account with membership in the Organization Management group.
2. The account must be a member of the local Administrators group for the machine on which the Exchange server is running.

Review the "VSS restore considerations" on page 99 and "Restoring VSS Backups into alternate locations" on page 19 before attempting any type of VSS restore.

(**Legacy restores only**) When performing a Legacy restore of mailbox databases, if a Recovery Storage Group exists, mailbox databases will be restored to the Recovery Storage Group instead of to the original storage group. Also, when restoring a mailbox database to a Recovery Storage Group, you must specify the ***Replay Restored Logs Only*** option in the GUI **Restore** window or the restore operation may fail. This note *only* applies to Legacy restores. VSS restores to the Recovery Storage Group are *only* supported by Microsoft with Exchange Server 2007 or later.

Legacy backups, also referred to as traditional "streaming" backups, cannot be restored using Exchange Server 2010. Instead, VSS Backups (and VSS restores) are available.

When you restore a storage group (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010), data that exists in the storage group or database is overwritten and is no longer available after the restore is complete.

Perform the following steps to restore an Exchange server storage group or database:

1. Start the Data Protection for Exchange GUI.
2. Click on the **Restore** tab.

3. From the Tree View, select the storage group (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010) to restore. To restore a particular Exchange Server 2003 or Exchange Server 2007 database, first highlight the storage group in the Tree View. Then select the database to be restored in the List View. To restore all available storage groups (Exchange Server 2003 and Exchange Server 2007) or databases (Exchange Server 2010), select the Exchange server in the Tree View.

   The List View displays the following information about your backups:

   - Backup Method (Legacy or VSS)
   - Type (Full, Incremental, Differential, Copy, Database Copy)
   - Backup Location (TSM Server or Local)
   - Management Class (The Tivoli Storage Manager server management class to which the backup belongs.)

4. (Optional) This step varies based on your version of Exchange Server.

   - **Exchange Server 2007**: If you want to restore an Exchange Server 2007 storage group (that was backed up using VSS) into the Recovery Storage Group, an alternate storage group, or into a relocated storage group:
     a. Right-mouse click the selected storage group.
     b. Click **Restore Into** in the pop-up menu and select the storage group name that you want to restore into from the list.
   - **Exchange Server 2010**: If you want to restore an Exchange Server 2010 database (that was backed up using VSS) into the Recovery Database, an alternate database, or into a relocated database:
     a. Right-mouse click the selected database.
     b. Click **Restore Into** in the pop-up menu and select the database name that you want to restore into from the list.

   Note the following characteristics:

   - If you are restoring data into a relocated storage group or database, choose the storage group or database with the same name as the one that you are restoring.
   - Any type of **Restore Into** function automatically disables VSS Instant Restore.

   CAUTION:
   The pop-up menu that contains Restore Into also contains Delete Backup. This function is only used to delete a backup and is not a restore option. For more information, see the Delete Backup function in the Related tasks list at the end of this page.

5. Select the appropriate restore options in the Restore Options section. See "Restore options" on page 104 for details.
6. Click **Restore** to begin the restore operation.

VSS restore considerations

Be aware of these considerations when performing VSS restores.

Unless otherwise specified, "VSS restores" refers to all restore types that use VSS (VSS Restore, VSS Fast Restore, VSS Instant Restore):

- If you are restoring a CCR database, after the restore completes successfully, the cluster database is mounted successfully. However, due to a Microsoft Exchange Server 2007 limitation, the database resources are not brought online. You must bring the database resources online using the Microsoft Cluster Administrator interface. See the following Microsoft Knowledge Base article for details regarding this limitation:http://support.microsoft.com/kb/938442/en-us
- When performing a VSS Instant Restore in an Exchange Server 2007 CCR or Exchange Server 2010 DAG environment, stop the Microsoft Exchange Replication Service on both the active node and the passive node before running the restore operation.
- Performing any type of ***Restore Into*** function will automatically disable VSS Instant Restore.
- If you are performing a VSS Restore of a storage group that has been relocated (system file path, log file path, or database file path), you must use the ***Restore Into*** function and specify the same storage group name as the one you are restoring. The restore will fail if you do not specify the same storage group name.
- An attempt to perform a VSS Restore into a Recovery Storage Group on Exchange Server 2003 will ignore the Recovery Storage Group and be placed directly into the production database.
- When performing VSS Instant Restores, you must make sure that any previous background copies (that involve the volumes being restored) are completed prior to initiating the VSS Instant Restore. This situation applies to DS6000, DS8000, and SAN Volume Controller (non space-efficient) volumes only.
- A VSS Instant Restore overwrites the entire contents of the source volumes. However, you can avoid overwriting the source volumes by selecting the ***Disable VSS Instant Restore*** option. This option bypasses volume-level copy and uses file-level copy instead to restore the files from a VSS Backup that resides on local shadow volumes.
- Unlike Legacy restores (which only dismount the database being restored), VSS restores dismount *all* databases in the storage group that is being restored into. This is a Microsoft requirement.
- Be aware that when a VSS restore from local shadow volumes is performed, the bytes transferred will display "0". That is because no data ("0") is restored from the Tivoli Storage Manager server.
- When performing a VSS Instant Restore, you must restore ALL databases within the specified storage group. You cannot perform a partial restore (***/partial***) while using VSS Instant Restore. Although Data Protection for Exchange allows this operation to begin, it will either fail or complete with undesirable consequences. If you need to restore just one database from a VSS Backup that resides on local VSS shadow volumes on DS6000, DS8000, SAN Volume Controller, or XIV disks, make sure to select the ***Disable VSS Instant Restore*** option in the Data Protection for Exchange GUI Restore Window. If VSS Instant Restore capability is needed for single databases, make sure to place these databases in their own storage group.

Restoring individual mailbox and mailbox item-level data

Use the Data Protection for Exchange GUI to restore mailboxes and mailbox data.

To perform mailbox restore tasks, configure Data Protection for Exchange and the Tivoli Storage Manager server for your environment. See Chapter 3, "Configuring Data Protection for Exchange," on page 59 for detailed instructions on how to configure these applications.

Requirements for Exchange Server 2003 environments: Review these requirements before attempting a mailbox restore tasks on Exchange Server 2003:

- "Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2003" on page 36
- "Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2003" on page 162

Requirements for Exchange Server 2007 environments: Review these requirements before attempting a mailbox restore tasks on Exchange Server 2007:

- "Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2007" on page 36
- "Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2007" on page 163

Requirements for Exchange Server 2010 environments: Review these requirements before attempting a mailbox restore tasks on Exchange Server 2010:

- "Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2010" on page 36
- "Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2010" on page 163

Follow these steps from the domain where the Exchange Server is installed and running to restore the mailbox data:

1. Start the Data Protection for Exchange GUI.
2. Click **File -> Utilities -> Mailbox Restore**, or on the toolbar, click the **Mailbox Restore** icon.
3. Select a mailbox to be restored from the **Mailbox Name** list and click **Add**.

   Tip: Enter the first few letters of the mailbox-display name in the **Mailbox Name** field to help locate a particular active mailbox. These letters are used as a filter and the search results are displayed in the **Mailbox Name** list. The search is not case-sensitive and is performed on the Display Name that is defined in the Active Directory.

   To restore a mailbox that is not in the **Mailbox Name** list, type an entry in the **Mailbox Name** field using the complete mailbox-display name or the mailbox-alias and click **Add**.

   You can restore from multiple mailboxes with the same mailbox restore operation by selecting each mailbox to be restored from the **Mailbox Name** list and click **Add** to add multiple mailboxes to be restored from.

   Restriction: For Exchange Server 2003, you must select multiple mailboxes to be restored with the same mailbox restore operation from the same storage group. To restore mailboxes from several storage groups, complete the restore

operations as separate tasks and use the Exchange System Manager to prepare the Recovery Storage Group between each operation.

4. Use the optional **Backup Date** fields to establish a date and time to restore mailbox data from. By default, Data Protection for Exchange restores the most current backup that is available for the specified mailbox.

   To restore data to a different point in time, use the **Backup Date** fields to select an earlier point in time. If you specify the backup date and the backup time, and a backup with the exact date and time that you specified cannot be found, Data Protection for Exchange uses the first available backup taken *after* the specified date and time. Be aware of these dependencies between the backup date and the backup time:

   - If a backup time is selected and a backup date is not selected, the current date is used.
   - If a backup time is not selected and a backup date is not selected, the default backup time is 23:59:59.

5. Use the optional **Item-Level Search Filters** panel to specify filters to restrict what mailbox data is restored. By default, Data Protection for Exchange restores the entire mailbox. To restore only a subset of items from a mailbox, use the **Item-Level Search Filters** panel to identify specific individual messages to restore. You can specify multiple filters; however, you must specify each filter only once.

6. From the **Restore to** panel, choose the destination to restore the mailbox data to. Use one of the following procedures:

   - Restore items to the Exchange Server.

     Click **Restore items to the Exchange Server** to restore mailbox data into the original location in the original active mailbox.

     When restoring multiple mailboxes with the same mailbox restore operation, this selection restores mailbox data into the original location in each original active mailbox.

   - Restore items to the Exchange Server into a specified folder in an active mailbox.

     Click **Restore items to the Exchange Server into an alternate mailbox** to restore mailbox data into a folder in an active mailbox. The active mailbox can be the original mailbox or an alternate mailbox.

     When restoring multiple mailboxes with the same mailbox restore operation, this selection restores mailbox data into a subfolder (designated by the mailbox-alias) of the specified target folder in an active mailbox. In each subfolder are the folders from the original mailbox that contain the restored mailbox messages.

     To restore mailbox data into a folder in an active mailbox:

     a. Click **Restore items to the Exchange Server into an alternate mailbox**.
     b. Select the name of the target mailbox that you want the data to be restored to.

        The target mailbox can be the original mailbox or an alternate mailbox.
     c. Specify the name of the target folder to which the items are to be restored.

        If the target folder specified does not exist in the target mailbox, a folder with the *target-folder-name* will be created in the target mailbox.

        The target folder contains one subfolder for each original-mailbox that is restored (designated by each original-mailbox alias). In each subfolder are the folders from the original mailbox that contain the restored mailbox

messages. If no search filters are applied, the target folder that you specified contains, within the subfolder designated by the original mailbox alias, all the folders that are in the mailbox that you are restoring from. If search filters are applied, the subfolder within the folder that you specified contains only the folders with messages that match the filter criteria.

- Restore items to an Exchange Server personal folders (.pst) file.

  Click **Restore items to .PST file** to restore mailbox data into an Exchange Server personal folders (.pst) file. The mailbox data that is restored is in non-Unicode format.

  You can specify a fully qualified path to a .pst file or you can specify a directory path without a .pst file name. You can enter a path to direct the restore to or you can click **Browse** to select a path to direct the restore to:

  – If you specify a fully qualified path to a .pst file, all mail is restored to that .pst file. The .pst directory must exist before performing the mailbox restore operation. The .pst file will be created if it does not exist.

    When you restore multiple mailboxes with the same mailbox restore operation, if you specify a fully qualified path to a .pst file, all the mailbox data is restored to the .pst file that is specified by the fully qualified path. Inside the pst file, the top level folder will be the original mailbox alias-name, with the rest of the mailbox folders below it.

  – If you specify a directory path, Data Protection for Exchange creates a .pst file using the mailbox-alias-name of the mailbox being restored and stores the .pst file in the specified directory. For example, the .pst file name of the restored mailbox `JOHN (john1)` is `john1.pst`. The .pst directory must exist before performing the mailbox restore operation. The .pst file will be created if it does not exist.

    When you restore multiple mailboxes with the same mailbox restore operation, if you specify a directory path, each mailbox is restored into a separate .pst file. For example, if mailboxes `John (john1), John Oblong (oblong), and Barney Olef (barneyo)` are restored and the specified directory path is `c:\finance`, all mailboxes are restored into the `c:\finance` directory as shown:

    ```
    c:\finance\john1.pst
    c:\finance\oblong.pst
    c:\finance\barneyo.pst
    ```

  Requirements:

  – The .pst directory must exist before performing the mailbox restore operation.

  – If you are running Exchange Server 2003, update your local MAPI configuration file to add the MAPI PST message service for the mailbox restore operation to complete successfully. See "4. Perform these tasks to configure your system for mailbox-level and item-level restore operations" on page 78 for details on how to define this message service.

  – The mailbox data that is restored must be less than 2 GB.

7. The amount of time needed to complete the restore process depends on the size of the mailbox databases, the network speed, and the number of mailboxes to process.

   Click **Restore** to begin the restore operation. Mailbox items are merged into the mailbox destination. If a mailbox item already exists in the mailbox destination, that item will not be restored.

In an Exchange Server 2003 environment, you will need to use the Exchange System Manager to perform some manual steps because Recovery Storage Groups cannot be created automatically:

a. If the Recovery Storage Group does not exist, create the Recovery Storage Group.
b. Add the mailbox databases to be restored to the Recovery Storage Group. A message is displayed and indicates the mailbox databases to be added.
c. Ensure that the databases are dismounted in the Recovery Storage Group.
d. Select `This database can be overwritten by a restore` check box for each database.
e. Return to the Data Protection for Exchange Mailbox Restore window.

A window provides the manual steps to perform, with the names of the storage group and the databases to prepare the Recovery Storage Group with.

Related concepts

Chapter 3, "Configuring Data Protection for Exchange," on page 59

Related tasks

"Restoring a deleted mailbox or items from a deleted mailbox" on page 220

Related reference

"Set command" on page 189

"Set positional parameters" on page 190

"Restoremailbox command" on page 161

"Restoremailbox syntax" on page 164

"Restoremailbox positional parameters" on page 166

"Restoremailbox optional parameters" on page 166

Appendix B, "Frequently asked questions," on page 211

Restoring the Site Replication Service

Follow these steps to restore the Site Replication Service using the Data Protection for Exchange GUI.

When you restore a Site Replication Service (SRS) database, be aware that data which exists in the SRS database is overwritten and is no longer available after the restore is complete.

Perform the following steps to restore an SRS database:

1. Stop the SRS service.
2. Rename the `SRSDATA` folder (located in the Exchange folder path) to a name of your choice.
3. Start the SRS service.
4. Start the Data Protection for Exchange GUI.
5. Click on the **Restore** tab.
6. From the Tree View, select the SRS database for restore. You cannot restore more than one application (SRS, IS) in a single operation.
7. Select the appropriate restore options.
8. Click on the **Restore** button to begin the restore operation.

Restore options

Run Recovery
Select this option to specify whether to replay just the restored logs or to replay both the restored and current logs. When recovery is not run, the databases are not online. As a result, recovery must be run for Legacy restores by either another restore operation (with ***Run Recovery*** specified) or manually using the ESEUTIL utility.

- Select ***Replay Restored AND Current® Logs*** to replay any transaction log entries appearing in the current active-transaction log. This includes both current and restored logs. This is the default value. Note that this option is not supported for VSS Instant Restore.
- Select ***Replay Restored Logs ONLY*** to replay any transactions appearing in the restored-transaction logs. IMPORTANT: After performing this type of restore, it is highly recommended that you perform a new full backup.

Note: (**Legacy restores only**) When performing a Legacy restore of mailbox databases, if a Recovery Storage Group exists, mailbox databases will be restored to the Recovery Storage Group instead of to the original storage group. Also, when restoring a mailbox database to a Recovery Storage Group, you must specify the ***Replay Restored Logs Only*** option or the restore operation may fail. This note ONLY applies to Legacy restores. VSS restores to the Recovery Storage Group are supported by Microsoft with Exchange Server 2007.

Mount Databases After Restore
Select this option to automatically mount databases within the storage group after the recovery completes. If the Legacy restore operation is a mailbox-database restore to the Recovery Storage Group, the database mounted is the database in the Recovery Storage Group, not the database in the original storage group. Note that if you are restoring a CCR database, the cluster database is mounted successfully. However, due to a Microsoft Exchange Server 2007 limitation, the database resources are not brought online. You must bring the database resources online using the Microsoft Cluster Administrator interface. See the following Microsoft Knowledge Base article for details regarding this limitation:http://support.microsoft.com/kb/938442/en-us

Disable VSS Instant Restore
Select this option to bypass volume-level copy and instead use file-level copy to restore the files from a VSS Backup that resides on local shadow volumes. Bypassing volume-level copy means that Exchange database files, log files, and the checkpoint file are the only data overwritten on the source volumes. This can result in a longer restore processing time. If this option is not selected, volume level snapshot restore is used for these VSS Backup if the backup exists on volumes that support it. The default value is to use volume level snapshot restore if supported.

Note: The ***Disable VSS Instant Restore*** option is automatically selected during Exchange Server 2007 and Exchange Server 2010 restore into operations.

Restore Into
On Exchange Server 2007, select the name of a storage group into which a VSS Backup will be restored. In order to restore into a Recovery Storage Group (RSG) or alternate storage group, an RSG or alternate storage group

must already exist (with the databases to be restored already added to it) before attempting the restore operation. On Exchange Server 2010, select the name of a database into which a VSS Backup will be restored. In order to restore into a Recovery Database (RDB) or alternate database, an RDB or alternate database must already exist before attempting the restore operation. Note that VSS restores to a Recovery Storage Group are NOT supported by Microsoft with Exchange Server 2003.

GUI operations in an MSCS or VCS environment

Consider this information when running Data Protection for Exchange in an MSCS or VCS environment.

- The GUI must be invoked from the command line with the **/excserver** parameter. For example, if the Exchange virtual server name on the cluster is *excvs1*, the command-line entry (GUI invocation) is

  ```
  tdpexc /excserver=excvs1
  ```

- The **Start** menu shortcut for the Data Protection for Exchange GUI application MUST be modified. Modify the **Start** menu shortcut for the Data Protection for Exchange GUI application by performing the following steps:

  1. Right-mouse click on the Data Protection for Exchange GUI icon.
  2. Select **Properties**.
  3. Select **Shortcut**.
  4. Enter the following text in the **Target** window:

     ```
     "C:\Program Files\Tivoli\TSM\TDPExchange\tdpexc.exe /excserver=excvs1"
     ```

     where Data Protection for Exchange is installed in the default installation directory and the Exchange virtual server name is excvs1.

Chapter 5. Using the command-line interface

This chapter describes how to use the Data Protection for Exchange command line interface. Each command includes a syntax diagram and a description. See "Reading syntax diagrams" on page xvi for more information.

The next section is an overview of the command-line interface. The commands are described in the following categories:

- Query
- Backup
- Restore
- Changetsmpassword
- Set
- Help

The Data Protection for Exchange command-line interface can also be used when scheduling automatic backups of Exchange databases. See Chapter 6, "Using the Tivoli Storage Manager scheduler," on page 201 for a discussion of using the Tivoli Storage Manager scheduler with Data Protection for Exchange.

Command overview

The name of the Data Protection for Exchange command line interface is **tdpexcc.exe**. This program is located in the directory where Data Protection for Exchange is installed.

The command-line parameters have the following characteristics:

- positional parameters do not include a leading slash (/) or dash (-)
- optional parameters can appear in any order after the required parameters
- optional parameters begin with a forward slash (/) or a dash (-)
- minimum abbreviations for keywords are indicated in upper case text
- some keyword parameters require a value
- for those keyword parameters that require a value, the value is separated from the keyword with an equal sign (=)
- if a parameter requires more than one value after the equal sign, the values are separated with commas
- each parameter is separated from the others by using spaces
- if a parameter's value includes spaces, the value must be enclosed in double quotation marks
- a positional parameter can appear only once per command invocation

Issue the `tdpexcc ?` or `tdpexcc help` command to display help for the command-line interface.

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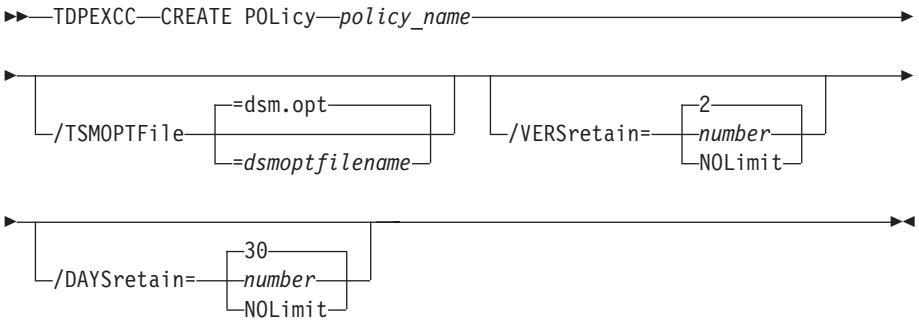
Policy commands for Data Protection for Exchange

Use the **policy** commands to create, update, copy, query, and delete local policy information.

Create Policy

This command is used to create a new policy.

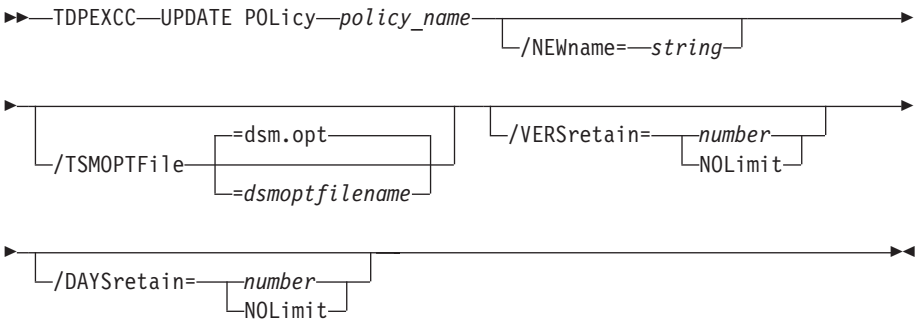


Parameters

- **policy_name** (required) specifies the name of the policy that is being created. In order to create a policy, the policy name must be unique.
- **VERSretain** specifies the number of snapshot versions to retain (1. . .9999). You can also specify "NOLimit" to represent an unlimited number of snapshot versions to retain.
- **DAYSretain** specifies the number of days to retain a snapshot (0. . .9999). You can also specify "NOLimit" to represent an unlimited number of days to retain snapshot versions.

Update Policy

This command is used to update or modify an existing policy.

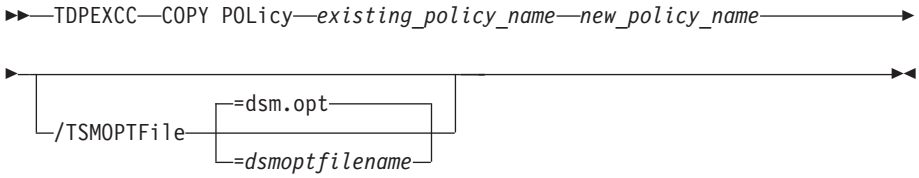


Parameters

- **NEWname** specifies the new name of the policy, if the name is being updated. The policy name must be unique.
- **policy_name** (required) specifies the name of the policy that is being updated.
- **VERSretain** specifies the number of snapshot versions to retain (1. . .9999). You can also specify "NOLimit" to represent an unlimited number of snapshot versions to retain.
- **DAYSretain** specifies the number of days to retain a snapshot (0. . .9999). You can also specify "NOLimit" to represent an unlimited number of days to retain snapshot versions.

Copy Policy

This command is used to copy an existing policy to a new policy.



Parameters

- **existing_policy_name** (required) specifies the name of the policy that is being copied.
- **new_policy_name** (required) specifies the name of the new policy. The policy name must be unique.

Query Policy

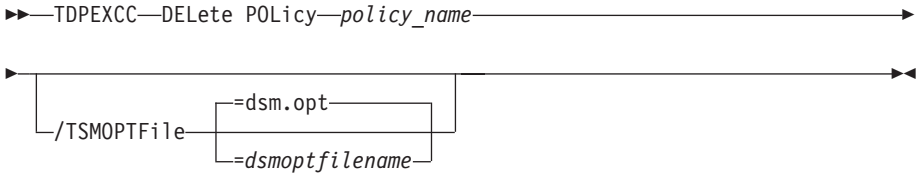
This command is used to list the attributes of a policy.

Parameters: * (required) specifies all policies are to be queried. The results of the query will be displayed as follows:

```
                Connecting to Exchange Server, please wait...

Policy      Number of snapshots to keep    Days to keep a snapshot

--------    ---------------------------    ----------

FCMPOL                      3               60

STANDARD                    2               30
```

Delete Policy

This command is used to delete a policy.



Parameters

- **policy_name** (required) specifies the name of the policy being deleted.

Query Exchange command

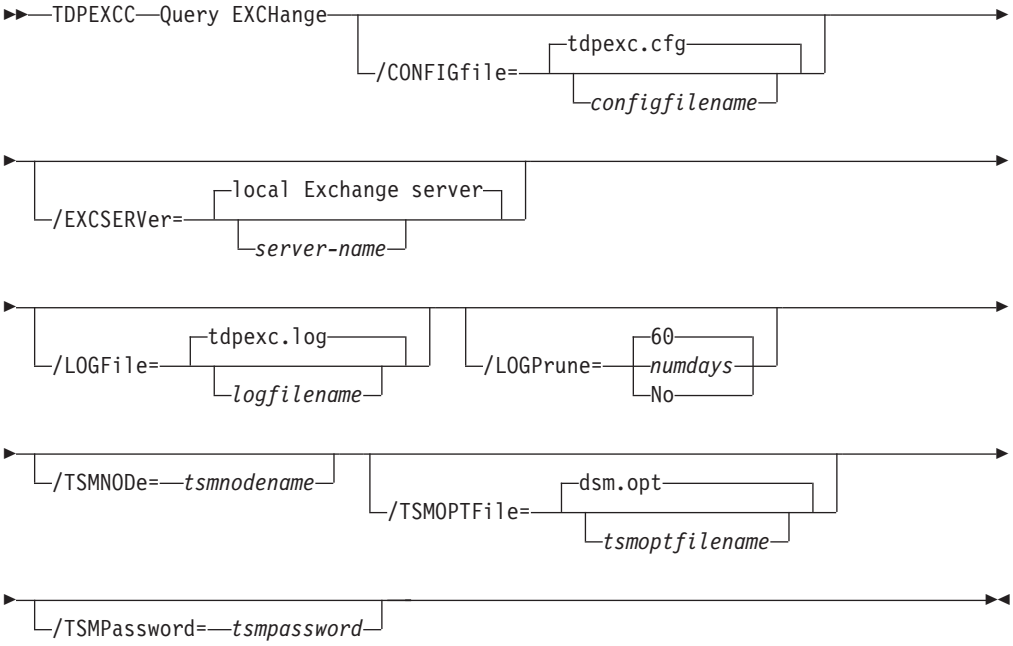
Use the **query exchange** command to query the local Exchange Server for general information.

The **query exchange** command returns the following information:

- Exchange Server name and version
- Domain name
- Names of all storage groups and databases
- Status (online, offline) of all storage groups and databases
- Recovery Storage Group status
- Circular logging status (enabled, disabled) of all storage groups
- VSS Information (only applicable when configured for VSS operations):
  - Writer Name
  - Local DSMAgent Node
  - Remote DSMAgent Node
  - Writer Status (online, offline)
  - Number of selectable components

Query Exchange syntax

Use the **query exchange** command syntax diagrams as a reference to view available options and truncation requirements.



Query Exchange optional parameters

Optional parameters follow the **query exchange** command.

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the Data Protection for Exchange configuration file that contains the values to use for a **query exchange** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

See "Set positional parameters" on page 190 for descriptions of available configuration parameters.

/EXCSERVer=*server-name*

Use the **/excserver** parameter to specify the name of the Exchange Server to query. The *server-name* variable specifies the name of the Exchange Server to query.

Considerations

- If the Exchange Server to query is a member of a Microsoft Cluster Server or Veritas Cluster Server, you must specify this parameter and set it to the name of the Exchange virtual server.
- The default value is the local Exchange Server.

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange. The *logfilename* variable identifies the name of the activity log file. If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange installation directory. If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpexchange.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, ***tdpexc.log***. The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Data Protection for Exchange to perform operations, use the **/logfile** parameter to specify a different log file for each instance used. This directs logging for each instance to a different log file and prevents interspersed log file records. Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays* | **No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the

number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the Data Protection for Exchange GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/logprune** parameter to override these defaults. When the value of the **/logprune** variable *numdays* is a number in the range 0 to 9999, the log is pruned even if log pruning has already been performed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat** or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

/TSMNODe=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if PASSWORDACCESS is set to PROMPT. This parameter is not valid when PASSWORDACCESS is set to GENERATE in the options file.

/TSMOPTFile=*tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Data Protection for Exchange options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in double quotation marks. For example:

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is **dsm.opt**.

/TSMPassword=*tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. If you specified PASSWORDACCESS GENERATE in the Data Protection for Exchange options file (dsm.opt), you do not need to supply the password here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when PASSWORDACCESS GENERATE is in effect, the command-line value is ignored unless the password for this node has not yet been stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Query Exchange Example 1

This output example provides a sample of the text, messages, and process status that displays when using the **query exchange** command.

The **tdpexcc query exchange** command queries the Exchange server. An example of the output in a non-VSS environment is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Querying Exchange Server to gather storage group information, please wait...

Microsoft Exchange Server Information
-------------------------------------

Server Name: SAGAN
Domain Name: sagan.cosmos.local
Exchange Server Version: 8.0.685.24 (Exchange Server 2007)

Storage Groups with Databases and Status
----------------------------------------

First Storage Group
Circular Logging - Disabled
Replica - None
Recovery - False
Mailbox Database Online
Mailbox Database Two Online

lcrsg1
Circular Logging - Disabled
Replica - Local
Recovery - False
Mailbox1 Online

myrsg
Circular Logging - Disabled
Replica - None
Recovery - True
MailboxDatabase1 Offline
```

```
STG100-rename
Circular Logging - Disabled
Replica - None
Recovery - False
Mail1 Online

STG101
Circular Logging - Disabled
Replica - None
Recovery - False
Mailbox1 Online

STG2
Circular Logging - Disabled
Replica - None
Recovery - False
Mail1 Online
Mail2 Online
Mailbox with a space in the name Online

STG3
Circular Logging - Disabled
Replica - None
Recovery - False
Mail3 Online
Maildb1 Online
PubFolder1 Online

Recovery Storage Group exists - All legacy backups of mailbox databases are rest
ored here.

Volume Shadow Copy Service (VSS) Information
-------------------------------------------

Writer Name : Microsoft Exchange Writer
Local DSMAgent Node : SAGAN
Remote DSMAgent Node : xyz
Writer Status : Online
Selectable Components : 7
```

```
STG101
Circular Logging - Disabled
Replica - None
Recovery - False
Mailbox1 Online

STG2
Circular Logging - Disabled
Replica - None
Recovery - False
Mail1 Online
Mail2 Online
Mailbox with a space in the name Online

STG3
Circular Logging - Disabled
Replica - None
Recovery - False
Mail3 Online
Maildb1 Online
PubFolder1 Online

Recovery Storage Group exists - All legacy backups of mailbox databases are rest
ored here.

Volume Shadow Copy Service (VSS) Information
-------------------------------------------

Writer Name : Microsoft Exchange Writer
Local DSMAgent Node : SAGAN
Remote DSMAgent Node : xyz
Writer Status : Online
Selectable Components : 7
```

Query Exchange Example 2

This output example provides a sample of the text, messages, and process status that displays when using the **query exchange** command.

This **tdpexcc query exchange** command output example displays that a Recovery Storage Group exists and that all mailbox database will be restored to it.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Querying Exchange Server to gather storage group information, please wait...

Microsoft Exchange Server Information
-------------------------------------

Server Name:                TREELO
Domain Name:                amiga.thestars.local
Exchange Server Version:    6.5.7638.1   (Exchange Server 2003)

Storage Groups with Databases and Status
----------------------------------------

CT_Treelo1
 Circular Logging - Disabled
   CT_treelo_mb1                                Offline

CT_TREELO2
 Circular Logging - Disabled
   ct_treelo_mb2                                Offline

First Storage Group
 Circular Logging - Disabled
   Mailbox Store (TREELO)                       Online
   Public Folder Store (TREELO)                 Online

Recovery Storage Group exists - All mailbox databases will be restored here.
```

Query Exchange Example 3

This output example provides a sample of the text, messages, and process status that displays when using the **query exchange** command.

In this example, the **tdpexcc query exchange** command queried an Exchange Server that is configured for VSS operations. The following output is displayed:

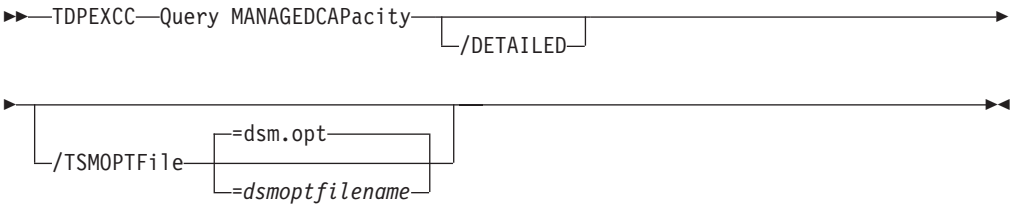
```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2008. All rights reserved.

Querying Exchange Server to gather storage group information, please wait...

Microsoft Exchange Server Information
-------------------------------------

Server Name:                KEEN
Domain Name:                keen.keen.local
Exchange Server Version:    8.0.728.0   (Exchange Server 2007)

Storage Groups with Databases and Status
----------------------------------------

First Storage Group
 Circular Logging - Disabled
 Replica - None
 Recovery - False
   Mailbox Database                              Online

LCR STG1
 Circular Logging - Disabled
 Replica - Local
 Recovery - False
   LCR1_mailbox                                  Online

STG 20
 Circular Logging - Disabled
 Replica - None
 Recovery - False
   STG 20 mailbox                                Online

STG 21
 Circular Logging - Disabled
 Replica - None
 Recovery - False
   STG 21 mailbox                                Online

STG 23
 Circular Logging - Disabled
 Replica - None
 Recovery - False
   STG 23 mailbox                                Online

STG 25
 Circular Logging - Disabled
 Replica - None
 Recovery - False
   STG 25 mailbox                                Online

Volume Shadow Copy Service (VSS) Information
--------------------------------------------

Please enter the password for node KEEN_EXCH:

*********
Writer Name            : Microsoft Exchange Writer
Local DSMAgent Node    : keen
Remote DSMAgent Node   : keen
Writer Status          : Online
Selectable Components  : 7
```

Query Managedcapacity command

Use the Query Managedcapacity command to assist with storage planning by determining the amount of managed capacity in use.

Purpose

The query managedcapacity command displays capacity related information about the volumes represented in local inventory managed by Data Protection for Exchange. This command is valid for all Windows platforms supported by Data Protection for Exchange.



Parameters

/DETAILED
Results in a detailed listing of snapped volumes. If this option is not specified then only the total capacity is displayed.

/TSMOPTFile=dsmoptfilename
The **/tsmoptfile** parameter specifies the Data Protection for Exchange options file to use.

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Data Protection for Exchange installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/tsmoptfile**, the default value is ***dsm.opt***.
- If you specify **/tsmoptfile** but not *dsmoptfilename*, the default is also ***dsm.opt***.

In this example, the **tdpexcc query managed capacity** command displays the total amount of managed capacity in use in the local inventory. The following output is displayed:

```
Total Managed Capacity : 47.99 GB (51,533,307,904 bytes)
```

In this example, the **tdpexcc query managed capacity /detailed** command displays a detailed listing of total amount of managed capacity and the snapped volumes in use. The following output is displayed:

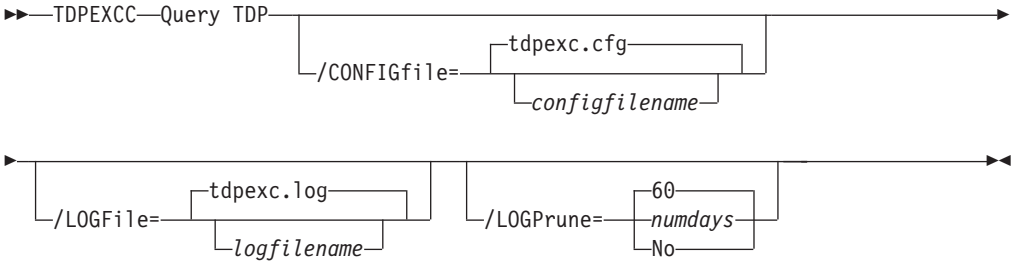
```
Total Managed Capacity : 1,019.72 MB (1,069,253,632 bytes)

Volume           : I:
Managed Capacity : 1,019.72 MB (1,069,253,632 bytes)
```

Query TDP command

Use the **query tdp** command to query a list of the current values set in the configuration file for Data Protection for Exchange.

Query TDP syntax

Use the **query TDP** command syntax diagrams as a reference to view available options and truncation requirements.



Query TDP optional parameters

Optional parameters follow the **query TDP** command.

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the Data Protection for Exchange configuration file that contains the values to use for a **query tdp** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

See "Set positional parameters" on page 190 for descriptions of available configuration parameters.

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpexchange.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, ***tdpexc.log***.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Data Protection for Exchange to perform operations, use the **/logfile** parameter to specify a different log file for each instance used. This directs logging for each instance to a different log file and prevents interspersed log file records. Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays* | **No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the Data Protection for Exchange GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/logprune** parameter to override these defaults. When the value of the **/logprune** variable *numdays* is a number in the range 0 to 9999, the log is pruned even if log pruning has already been performed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat** or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

Query TDP Example

This output example provides a sample of the text, messages, and process status that displays when using the **query TDP** command.

The **tdpexcc query tdp** command queries the values that are set in the Data Protection for Exchange configuration file. An output in a Legacy configuration:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Data Protection for Exchange Preferences
----------------------------------------

BACKUPDESTination.................. TSM
BACKUPMETHod....................... LEGACY
DATEformat ........................ 1
LANGuage .......................... ENU
LOCALDSMAgentnode.................. test_dpagent
LOGFile ........................... tdpexc.log
LOGPrune .......................... 60
MOUNTWait ......................... Yes
NUMberformat ...................... 1
REMOTEDSMAgentnode..................
TEMPDBRestorepath.................. e:\Exchange\mailboxrestore
TEMPLOGRestorepath................. c:\account\templog
TIMEformat ........................ 1
```

An example of the output in a VSS configuration is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Data Protection for Exchange Preferences
----------------------------------------

BACKUPDESTination................... TSM
BACKUPMETHod........................ VSS
DATEformat ......................... 1
LANGuage ........................... ENU
LOCALDSMAgentnode................... testdp_agent
LOGFile ............................ tdpexc.log
LOGPrune ........................... 60
MOUNTWait .......................... Yes
NUMberformat ....................... 1
REMOTEDSMAgentnode.................. testdp_agent
TEMPDBRestorepath................... e:\Exchange\mailboxrestore
TEMPLOGRESTOREPath.................. c:\account\templog
TIMEformat ......................... 1
```

Query TSM command

Use the **query tsm** command to display Tivoli Storage Manager server information.

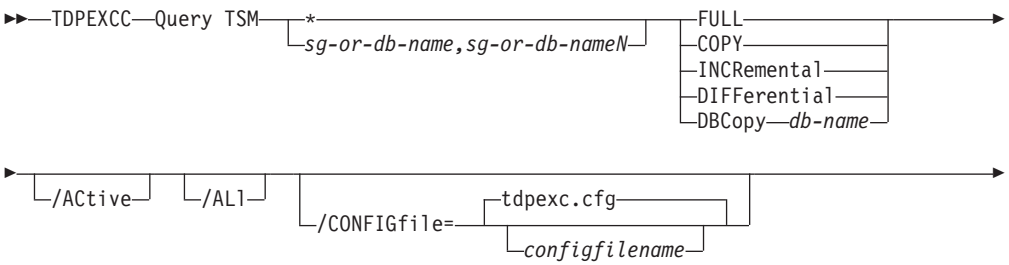
This command displays the following information:

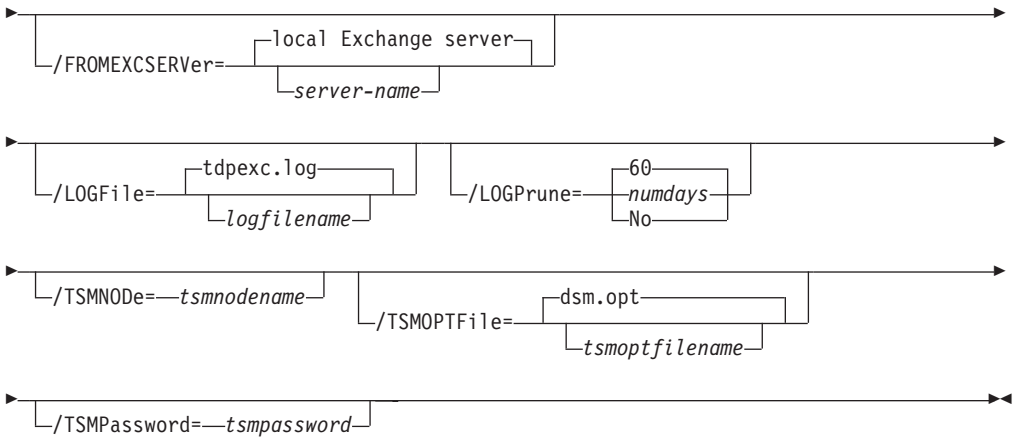
- Tivoli Storage Manager nodename
- Network host name of the server
- Tivoli Storage Manager API version
- Server name, type, and version
- Compression mode
- Domain
- Active policy set
- Default management class

This command can also display a list of backups that are stored on the Tivoli Storage Manager server that match the storage groups entered. Active and inactive objects can be displayed. However, only the active backup objects are displayed by default. To include inactive backup versions in the list, use the **/all** optional parameter.

Query TSM syntax

Use the **query TSM** command syntax diagrams as a reference to view available options and truncation requirements.





Query TSM positional parameters

Positional parameters immediately follow the **query TSM** command and precede the optional parameters.

The following positional parameters specify the object to query. If none of these positional parameters are specified, only the Tivoli Storage Manager API and Tivoli Storage Manager server information is displayed:

*** | DIR | IS |** ***sg-or-db-name***

***** Query all backup objects for all storage groups (Exchange Server 2003 or Exchange Server 2007) or databases (Exchange Server 2010)

sg-or-db-name
Query all backup objects for the specified storage group or database. Multiple entries are separated by commas.

The following positional parameters specify the type of backup to query. If this parameter is not specified, all backup types will be displayed:

FULL | COPY | INCRemental | DIFFerential | DBCopy ***db-name***

FULL Query only Full backup types

COPY Query only Copy backup types

INCRemental
Query only Incremental backup types

DIFFerential
Query only Differential backup types

DBCopy ***db-name***
Query only database copy backups for database **db-name**.

Query TSM optional parameters

Optional parameters follow the **query TSM** command and positional parameters.

/ACtive
Use the **/active** parameter to display active backup objects only. This is the default.

/ALl Use the **/all** parameter to display both active and inactive backup objects. If the **/all** parameter is not specified, only active backup objects are displayed.

/CONFIGfile=*configfilename*
Use the **/configfile** parameter to specify the name of the Data Protection for Exchange configuration file that contains the values for the Data Protection for Exchange configuration options. See "Set command" on page 189 for details about the contents of the file.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

/FROMEXCSERVer=*server-name*
Use the **/fromexcserver** parameter to specify the name of the Exchange Server where the original backup was performed.

The default is the local Exchange Server. However, you must specify the name if the Exchange Server is not the default or is a member of a MSCS or VCS.

/LOGFile=*logfilename*
Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks For example:

```
/LOGFile="c:\Program Files\mytdpexchange.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, ***tdpexc.log***.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Data Protection for Exchange to perform operations, use the **/logfile** parameter to specify a different log file for each instance used. This directs logging for each instance to a different log file and prevents interspersed log file records. Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays* | **No**

UUse the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the Data Protection for Exchange GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/logprune** parameter to override these defaults. When the value of the **/logprune** variable *numdays* is a number in the range 0 to 9999, the log is pruned even if log pruning has already been performed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat** or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

/TSMNODe=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if PASSWORDACCESS is set to PROMPT. This parameter is not valid when PASSWORDACCESS is set to GENERATE in the options file.

/TSMOPTFile=*tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Data Protection for Exchange options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in double quotation marks. For example:

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is **dsm.opt**.

/TSMPassword=*tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. If you specified PASSWORDACCESS GENERATE in the Data Protection for Exchange options file (dsm.opt), you do not need to supply the password here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when PASSWORDACCESS GENERATE is in effect, the command-line value is ignored unless the password for this node has not yet been stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Query TSM Example 1

This output example provides a sample of the text, messages, and process status that displays when using the **query TSM** command.

The **tdpexcc query tsm** command displays information about the Tivoli Storage Manager API and Tivoli Storage Manager server. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Tivoli Storage Manager Server Connection Information
---------------------------------------------------

Nodename ............................... TREELO_EXCH
NetWork Host Name of Server ............ TEMPLAR
TSM API Version ........................ Version 6, Release 1, Level 2.0

Server Name ............................ TEMPLAR
Server Type ............................ AIX-RS/6000
Server Version ......................... Version 5, Release 5, Level 1.0
Compression Mode ....................... Client Determined
Domain Name ............................ STANDARD
Active Policy Set ...................... STANDARD
Default Management Class ............... STANDARD
```

Query TSM Example 2

This output example provides a sample of the text, messages, and process status that displays when using the **query TSM** command.

The **tdpexcc query tsm * /all** command displays information about the list of backups on the Tivoli Storage Manager server. An example of the output in a VSS configuration is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Querying Tivoli Storage Manager server for a list of database backups, please wait...

Connecting to TSM Server as node 'TREELO_EXCH'...

                            Backup List
                            -----------

  Exchange Server  : TREELO

  Storage Group    : First Storage Group

     Backup Date        Size     S Fmt  Type   Loc Object Name/Database Name
-------------------  ----------- - ---- ----   --- -------------------------
06/27/2008 15:39:11      28.04MB A VSS  full   Srv 20080627153911
                       8,208.00KB                  Mailbox Store (TREELO)
                          15.01MB                  Logs
                       5,136.00KB                  Public Folder Store (TREELO)
06/29/2008 14:31:11      28.04MB A Lgcy full   Srv 20080629143111
                       8,212.37KB                  Mailbox Store (TREELO)
                       5,140.36KB                  Public Folder Store (TREELO)
                          15.00MB                  Logs

  Storage Group    : CT_TREELO2

     Backup Date        Size     S Fmt  Type   Loc Object Name/Database Name
-------------------  ----------- - ---- ----   --- -------------------------
06/27/2008 15:39:12      23.02MB A VSS  full   Srv 20080627153912
                          15.01MB                  Logs
                       8,208.00KB                  ct_treelo_mb2
06/29/2008 12:29:43      18.02MB A Lgcy full   Srv 20080629122943
                       8,212.46KB                  ct_treelo_mb2
                          10.00MB                  Logs
```

Query TSM Example 3

This output example provides a sample of the text, messages, and process status that displays when using the **query TSM** command.

The **tdpexcc query tsm "First Storage Group" full /all /fromexcserver=treelo** command displays information about the list of backups on the Tivoli Storage Manager server. An example of the output in a VSS configuration is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 20108. All rights reserved.

Querying Tivoli Storage Manager server for a list of database backups, please wait...

Connecting to TSM Server as node 'TREELO_EXCH'...

                            Backup List
                            -----------

  Exchange Server  : TREELO

  Storage Group    : First Storage Group

     Backup Date        Size     S Fmt  Type   Loc Object Name/Database Name
-------------------  ----------- - ---- ----   --- -------------------------
06/27/2008 15:39:11      28.04MB A VSS  full   Srv 20080627153911
                       8,208.00KB                  Mailbox Store (TREELO)
                          15.01MB                  Logs
                       5,136.00KB                  Public Folder Store (TREELO)
06/29/2008 14:31:11      28.04MB A Lgcy full   Srv 20080629143111
                       8,212.37KB                  Mailbox Store (TREELO)
                       5,140.36KB                  Public Folder Store (TREELO)
                          15.00MB                  Logs
```

Backup command

Use the **backup** command to perform Exchange Server storage group backups from the Exchange Server to Tivoli Storage Manager server storage.

You must have local registry rights (for all versions of Exchange Server) to perform a Data Protection for Exchange backup. This command also backs up Site Replication Service (SRS) databases. Use the ***/excapplication*** option when backing up this databases.

When a full Legacy backup is performed, all active Legacy backups previous to this full backup are automatically inactivated for the particular storage group that is being backed up.

Note: Microsoft Exchange Server considers the wildcard character (*) to be an invalid character when used in database and storage group names. As a result, database and storage groups that contain the wildcard character (*) in their name will not be backed up.
When a full VSS snapshot backup (created for back up to local shadow volumes) is performed, the backup remains active until the backup version is expired on the Tivoli Storage Manager server according to the defined server policy. As a result, five different active backups can exist at the same time:

- Legacy
- VSS local (full)
- VSS local (copy)
- VSS Tivoli Storage Manager server (full)
- VSS Tivoli Storage Manager server (copy)

Note: When running Exchange Server 2010 backups, the Exchange database file size may increase due to increase database commitments that are triggered by backup operations. This is a Microsoft Exchange server standard behavior.

For SAN Volume Controller storage subsystems, only one backup is allowed to occur while the background copy process is pending. A new backup is not performed until the background copy process for the previous backup completes. As a result, local backups for SAN Volume Controller storage subsystems should be initiated at a frequency greater than the time required for the background copy process to complete.

See "Backup strategies" on page 20 for additional information related to the **backup** command.

Data Protection for Exchange supports the following types of backup:

Full (Legacy and VSS)
Back up the entire storage group and transaction logs, and if a successful integrity check and backup is obtained, the Exchange Server deletes the committed log files.

Incremental (Legacy and VSS)
Back up the transaction logs, and if a successful integrity check and backup is obtained, the Exchange Server deletes the committed log files.

Differential (Legacy and VSS)
Back up the transaction logs but do NOT delete them

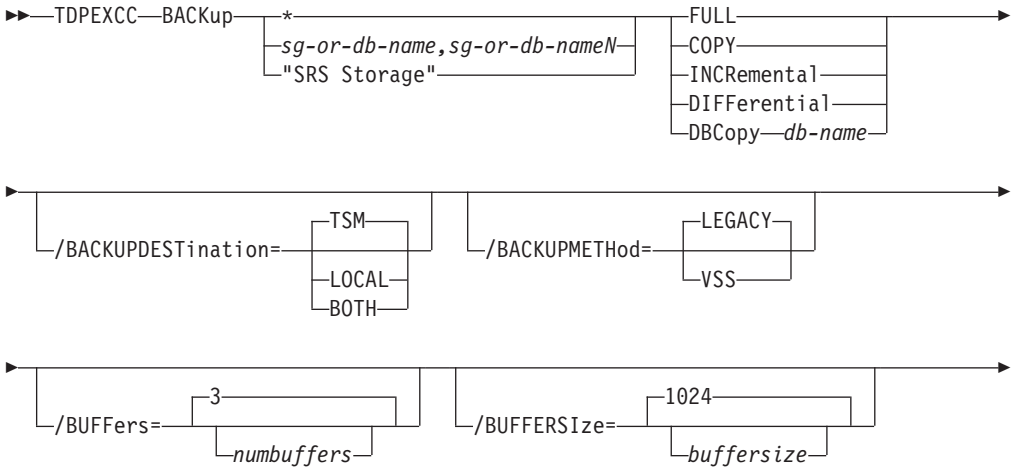
Copy (Legacy and VSS)
Back up the entire storage group and transaction logs, do NOT delete the transaction logs

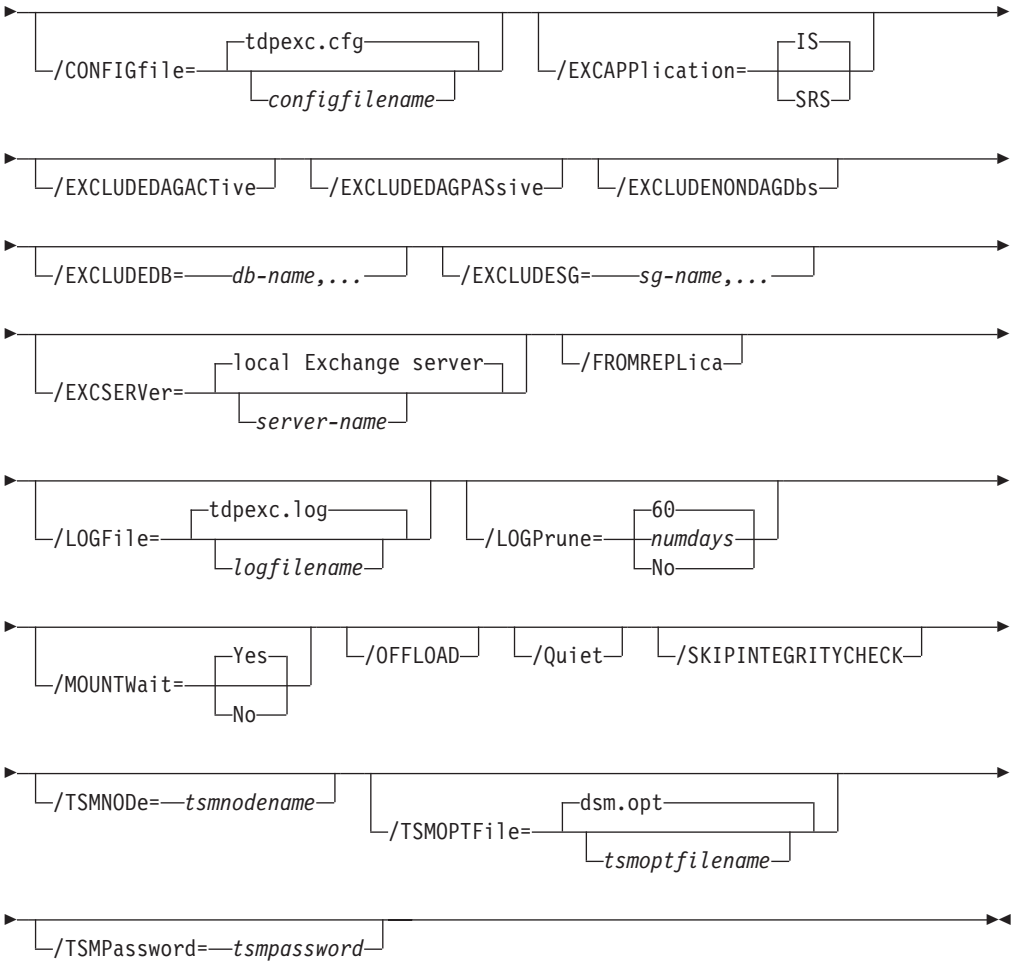
Database Copy (Legacy only)
Back up only the specified database and transaction logs, do NOT delete the transaction logs

Note: If there are databases within a storage group that are not mounted at the time of the backup, the transaction logs will NOT be deleted.

Backup syntax

Use the **backup** command syntax diagrams as a reference to view available options and truncation requirements.





Backup positional parameters

Positional parameters immediately follow the **backup** command and precede the optional parameters.

The following positional parameters specify the object to back up:

***** | ***sg-or-db-name***

*****
Back up all storage groups (Exchange Server 2003 or 2007) or databases (Exchange Server 2010) sequentially.

sg-or-db-name
Back up the specified storage group (Exchange Server 2003 or 2007) or database (Exchange Server 2010). If separated by commas, make sure there is no space between the comma and the storage group name. If any storage group contains commas or blanks, enclose the storage group name in double quotation marks.

The following positional parameters specify the type of backup to perform:

FULL | COPY | INCRemental | DIFFerential | DBCopy ***db-name***

FULL (Legacy and VSS)
Back up the entire storage group and transaction logs, and if a successful backup is obtained, truncate the transaction logs.

COPY (Legacy and VSS)
Back up the entire storage group and transaction logs, do NOT truncate the transaction logs.

INCRemental
Back up the transaction logs, and if a successful backup is obtained, truncate the transaction logs.

DIFFerential
Back up the transaction logs but do NOT truncate them.

DBCopy *db-name* **(Legacy only)**
Back up only the specified database and transaction logs, do NOT truncate the transaction logs. Note that this type of backup is not available with a VSS snapshot backup.

Attention: (Exchange Server 2003 or 2007) All databases within a storage group must be mounted at the time of the backup operation. If any database within a storage group is not mounted, the storage group is skipped and therefore, not backed up. In addition, the transaction logs will NOT be truncated.

Backup optional parameters

Optional parameters follow the **backup** command and positional parameters.

/BACKUPDESTination=TSM|LOCAL|BOTH
Use the **/backupdestination** parameter to specify the location where the backup is stored.

You can specify:

TSM The backup is stored on Tivoli Storage Manager server storage only. This is the default value.

LOCAL
The backup is stored on local shadow volumes only. This is only valid when the **/backupmethod** parameter specifies **VSS**.

BOTH The backup is stored on Tivoli Storage Manager server storage and local shadow volumes. This is only valid when the **/backupmethod** parameter specifies **VSS**.

/BACKUPMETHod=LEGACY|VSS
Use the **/backupmethod** parameter to specify the manner in which the backup is performed.

You can specify:

LEGACY
The backup is performed with the legacy API. This is the Exchange streaming backup and restore API as used in previous versions of Data Protection for Exchange. This is the default value for Exchange Server 2003 and Exchange Server 2007. This method is unavailable for Exchange Server 2010.

VSS The backup is performed with VSS. This is the only method available for Exchange Server 2010.

/BUFFers=*numbuffers*
Use the **/buffers** parameter to specify the number of data buffers that are used for moving data between the Exchange Server and the Tivoli Storage Manager API during Legacy backup and restore operations. Separate, asynchronous execution threads are used by Data Protection for Exchange

for communicating with the Exchange Server and Tivoli Storage Manager APIs. Increasing the number of data buffers improves throughput by reducing the possibility of one thread having to wait for another thread.

The *numbuffers* variable refers to the number of data buffers to use. The number of data buffers can be from 2 to 8. The default number of data buffers is **3**.

/BUFFERSIze=*buffersize*

Use the **/buffersize** parameter to specify the size of data buffers that are used to move data between the Exchange Server and the Tivoli Storage Manager API during Legacy backup and restore operations.

The *buffersize* variable refers to the size of the data buffers in kilobytes. The size of the data buffers can be from 64 to 8192 kilobytes and must be a multiple of 8. For example, you can specify 312 (a multiple of 8) but you cannot specify 313. The default size of the data buffers is **1024** kilobytes.

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the Data Protection for Exchange configuration file that contains the values to use for a **backup** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

See "Set positional parameters" on page 190 for descriptions of available configuration parameters.

ERASEexistinglogs=No/Yes

The **/eraseexistinglogs** parameter directs Data Protection for Exchange to erase the existing transaction log files for the database being restored, before it restores the specified database(s). If you do not erase existing data, any existing transaction logs could be reapplied when the Exchange databases are mounted. If you do not specify this parameter, existing transaction logs are not erased. This parameter is valid only when restoring a FULL or COPY VSS backup of Exchange Server storage groups or databases.

You can specify:

Yes Use volume level snapshot restore for a VSS Backup that resides on local shadow volumes if the backup exists on volumes that support it. This is the default.

No Use file level copy to restore the files from a VSS Backup that resides on local shadow volumes. Note that bypassing volume-level copy means that Exchange database files, log files, and the checkpoint file are the only data overwritten on the source volumes.

/EXCAPPlication=SRS

Use the **/excapplication** parameter to specify the name of the SRS database to be backed up during a Legacy backup operation. You must also specify `"SRS Storage"` for the storage group name in the command-line syntax.

The SRS database must be online and running to be backed up. Specify *SRS* for the Site Replication Service database to be backed up. If no value is specified, Data Protection for Exchange backs up the Information Store database.

/EXCLUDEDAGACTive
(Exchange Server 2010) Use the **/excludedagactive** parameter to exclude the Exchange Server 2010 databases from backup if they belong to a Database Availability Group and are an active database copy.

/EXCLUDEDAGPASsive
(Exchange Server 2010) Use the **/excludedagpassive** parameter to exclude the Exchange Server 2010 databases from backup if they belong to a Database Availability Group and are a passive database copy.

/EXCLUDENONDAGDbs
(Exchange Server 2010) Use the **/excludenondagdbs** parameter to exclude the Exchange Server 2010 databases from backup if they do not belong to a Database Availability Group.

/EXCLUDEDB=*db-name,...*
(Exchange Server 2010) Use the **/excludedb** parameter to exclude the specified Exchange Server 2010 databases from the backup operation.

/EXCLUDESG=*sg-name,...*
(Exchange Server 2003 and Exchange Server 2007) Use the **/excludesg** parameter to exclude the specified storage groups from the backup operation. This parameter is available for all VSS and Legacy backup types.

/EXCSERVer=*server-name*
Use the **/excserver** parameter to specify the name of the Exchange Server to be backed up.

The *server-name* variable specifies the name of the Exchange Server to be backed up.

Considerations

- If the Exchange Server to be backed up is a member of a Microsoft Cluster Server or Veritas Cluster Server, you must specify this parameter and set it to the name of the Exchange virtual server.
- The default value is the local Exchange Server.

/FROMREPLica
Use the **/fromreplica** parameter if you are running in an Exchange Server 2007 Local Continuous Replication (LCR) or Cluster Continuous Replication (CCR) environment and want to back up the Exchange data from the replica copy. This parameter is available for VSS Backups only.

Considerations

- For CCR copies, you must back up the replica copy from the secondary node of the cluster that currently contains the replica copy.
- For LCR copies, you must back up the replica copy from the same machine as the live production storage group.
- If the environment is not a CCR environment and replica does not exist, the production database is backed up.
- The default value is to not back up the replica.

/LOGFile=*logfilename*
Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpexchange.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, ***tdpexc.log***.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Data Protection for Exchange to perform operations, use the **/logfile** parameter to specify a different log file for each instance used. This directs logging for each instance to a different log file and prevents interspersed log file records. Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays* | **No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the Data Protection for Exchange GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/logprune** parameter to override these defaults. When the value of the **/logprune** variable *numdays* is a number in the range 0 to 9999, the log is pruned even if log pruning has already been performed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat** or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

/MOUNTWait=Yes | No

Use the **/mountwait** parameter to specify whether Data Protection for Exchange should wait for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify:

Yes Wait for tape mounts. This is the default.

No Do not wait for tape mounts.

/OFFLOAD

Specify this parameter to perform the integrity check and backup of files to Tivoli Storage Manager on the machine specified by the

remotedsmagentnode instead of the local machine. This parameter is ONLY valid when **/backupmethod=VSS** and **/backupdestination=TSM**. Note that this parameter requires a VSS provider that supports transportable shadow copies. It is not supported with the default Windows VSS System Provider.

/Quiet This parameter prevents status information from being displayed. This does not affect the level of information written to the activity log.

/SKIPINTEGRITYCHECK
Specify this parameter to bypass the Exchange integrity check typically performed during a backup. This parameter is ONLY valid when **/backupmethod=VSS** and the backup type is **COPY**.

Attention:

When using this parameter , it is possible that the stored backup is not valid because it is not being verified with the Exchange integrity check utility. Make sure that you have a valid backup stored on Tivoli Storage Manager server storage.

/TSMNODe=*tsmnodename*
Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if PASSWORDACCESS is set to PROMPT. This parameter is not valid when PASSWORDACCESS is set to GENERATE in the options file.

/TSMOPTFile=*tsmoptfilename*
Use the *tsmoptfilename* variable to identify the Data Protection for Exchange options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in double quotation marks. For example:

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is **dsm.opt**.

/TSMPassword=*tsmpassword*
Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. If you specified PASSWORDACCESS GENERATE in the Data Protection for Exchange options file (dsm.opt), you do not need to supply the password here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when PASSWORDACCESS GENERATE is in effect, the command-line value is ignored unless the password for this node has not yet been stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Backup Example 1

This output example provides a sample of the text, messages, and process status that displays when using the **backup** command.

This **tdpexcc backup "First Storage Group" incremental** command performs an incremental backup of the Exchange Server storage group *First Storage Group* to Tivoli Storage Manager server storage. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Starting storage group backup...
Connecting to TSM Server as node 'TREELO_EXCH'...

Beginning incr backup of First Storage Group, 1 of 1.
Full: 0   Read: 10485970  Written: 10485970  Rate: 1,623.63 Kb/Sec
Backup of First Storage Group completed successfully.


Total storage groups requested for backup:  1
Total storage groups backed up:             1
Total storage groups expired:               0
Total storage groups excluded:              0

Throughput rate:                            1,581.50 Kb/Sec
Total bytes transferred:                    10,485,970
Elapsed processing time:                    6.47 Secs
```

Backup Example 2

This output example provides a sample of the text, messages, and process status that displays when using the **backup** command.

This **tdpexcc backup "First Storage Group" copy** command performs a copy backup of Exchange Server storage group *First Storage Group* using VSS. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Querying Exchange Server to gather storage group information, please wait...

Connecting to TSM Server as node 'TREELO_EXCH'...
Connecting to Local DSM Agent 'treelo_agent'...
Starting storage group backup...

Beginning VSS backup of 'First Storage Group'...


Preparing to backup using snapshot.
Executing system command: Exchange integrity check for storage group 'First Stor
age Group'
   Files Examined/Completed/Failed: [ 13 / 13 / 0 ]   Total Bytes: 3698667

VSS Backup operation completed with rc = 0
   Files Examined   : 13
   Files Completed  : 13
   Files Failed     : 0
   Total Bytes      : 3698667
```

Backup Example 3

This output example provides a sample of the text, messages, and process status that displays when using the **backup** command.

The **tdpexcc backup stg1 full /backupdestination=tsm /backupmethod=vss** command performs a full VSS Backup of storage group *stg1* to Tivoli Storage Manager server storage. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Querying Exchange Server to gather storage group information, please wait...

Connecting to TSM Server as node 'TREELO_EXCH'...
Connecting to Local DSM Agent 'treelo_agent'...
Starting storage group backup...

Beginning VSS backup of 'stg1'...


Preparing to backup using snapshot.
Executing system command: Exchange integrity check for storage group 'stg1'
   Files Examined/Completed/Failed: [ 14 / 14 / 0 ]   Total Bytes: 4156788

VSS Backup operation completed with rc = 0
   Files Examined   : 14
   Files Completed  : 14
   Files Failed     : 0
   Total Bytes      : 4156788
```

Backup Example 4

This output example provides a sample of the text, messages, and process status that displays when using the **backup** command.

The **tdpexcc backup "First Storage Group",CT_TREELO2 full /backupdestination=local /backupmethod=vss** command performs a full VSS Backup of storage group *First Storage Group* to local shadow volumes. Note that in VSS Backup processing, if the databases are dismounted, the storage group that contains the databases is not backed up. As a result, only *First Storage Group* is backed up in the output example displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Querying Exchange Server to gather storage group information, please wait...

ACN5072W Databases in storage group <CT_TREELO2> are dismounted -- skipping.

Connecting to TSM Server as node 'TREELO_EXCH'...
Connecting to Local DSM Agent 'treelo_agent'...
Starting storage group backup...

Beginning VSS backup of 'First Storage Group'...


Preparing to backup using snapshot.
Executing system command: Exchange integrity check for storage group 'First Stor
age Group'
   Files Examined/Completed/Failed: [ 6 / 6 / 0 ]   Total Bytes: 9093

VSS Backup operation completed with rc = 0
   Files Examined   : 6
   Files Completed  : 6
   Files Failed     : 0
   Total Bytes      : 9093
```

Backup Example 5

This output example provides a sample of the text, messages, and process status that displays when using the **backup** command.

The **tdpexcc backup * copy /backupdestination=both /backupmethod=vss** command performs a copy VSS Backup of storage groups *LCR STG1*, *STG 20*, *STG 21*, *First Storage Group*, *STG 25*, and *STG 23* to local shadow volumes and to Tivoli Storage Manager server storage. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Please enter the password for node KEEN_EXCH:

*********
Querying Exchange Server to gather storage group information, please wait...

Connecting to TSM Server as node 'KEEN_EXCH'...
Connecting to Local DSM Agent 'keen'...
Starting storage group backup...

Beginning VSS backup of 'LCR STG1', 'STG 20', 'STG 21', 'STG 25', 'ST
G 23'...


Preparing to backup using snapshot.
Executing system command: Exchange integrity check for storage group 'STG 20'
Executing system command: Exchange integrity check for storage group 'STG 21'
Executing system command: Exchange integrity check for storage group 'LCR STG1'
Executing system command: Exchange integrity check for storage group 'STG 25'
Executing system command: Exchange integrity check for storage group 'STG 23'
   Files Examined/Completed/Failed: [ 81 / 81 / 0 ]   Total Bytes: 240292

VSS Backup operation completed with rc = 0
   Files Examined   : 81
   Files Completed  : 81
   Files Failed     : 0
   Total Bytes      : 240292
```

Backup Example 6

This output example provides a sample of the text, messages, and process status that displays when using the **backup** command.

The **tdpexcc backup "LCR STG1" copy /backupdestination=local /backupmethod=vss /fromreplica** command performs a copy VSS Backup of storage group *LCR STG1* from an available replica copy to local shadow volumes. An example of the output is displayed below. A query tsm **tdpexcc query tsm * /fromexcserver=keen /al**displays that this

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Querying Tivoli Storage Manager server for a list of database backups, please wait.

Connecting to TSM Server as node 'KEEN_EXCH'...

Please enter the password for node KEEN_EXCH:

*********
                            Backup List
                            -----------

  Exchange Server  : KEEN

    Storage Group    : LCR STG1

     Backup Date        Size     S Fmt  Type   Loc Object Name/Database Name
-------------------  ----------- - ---- ----   --- -------------------------
07/07/2008 12:24:26      12.02MB A VSS  full   Srv 20080707122426
                      8,200.00KB                  Logs
                      4,112.00KB                  LCR1_mailbox
07/13/2008 06:26:13   9,240.00KB A VSS  copy   Loc 20080713062613 (Replica)
                      5,128.00KB                  Logs
                      4,112.00KB                  LCR1_mailbox
```

Restore command

Use the **restore** command to restore a storage group backup from Tivoli Storage Manager storage to an Exchange Server.

You must have local registry rights (for all versions of Exchange Server) to perform a Data Protection for Exchange restore. This command also restores the Site Replication Service (SRS) database. Use the ***/excapplication*** option when restoring these databases.

VSS operations require special considerations that must be reviewed before attempting a VSS Restore. See these two sections for important guidelines:

- "VSS restore considerations" on page 141
- "Restoring VSS Backups into alternate locations" on page 19

When using the restore command, keep the following points in mind:

- When restoring inactive backups or active incremental backups, use the **/object** parameter to specify the name of the backup object to restore. This object name uniquely identifies the backup instance in Tivoli Storage Manager storage. You can issue a **tdpexcc query tsm** command to obtain a list of the object names.

  Note: If the `tdpexcc restore sgname incr` command is entered (without the **/object** parameter) to restore multiple active incremental backups, all multiple active incremental backups are restored sequentially. The **/object** parameter is used to restore only one incremental backup at a time.
- IMPORTANT: To initiate recovery, you MUST use the **/recover** parameter when restoring the last backup object of a storage group. In addition, the value of **/templogrestorepath** should not be the same value as the current location for the storage group. If the value is the same, the storage group can become corrupted.
  - Specify `/recover=applyalllogs` to replay the restored-transaction log entries AND the current active-transaction log entries.

– Specify `/recover=applyrestoredlogs` to replay ONLY the restored-transaction log entries. The current active-transaction log entries will NOT be replayed.

  Note: When choosing this option for a restore, your next backup MUST be a full or copy backup.

Failure to use the **/recover** parameter when restoring the last backup set of a storage group leaves the databases unmountable. If this occurs, for Legacy backups you can either restore the last backup again and specify the **/recover**=*value* option or you can use the Microsoft ESEUTIL /cc command to run recovery manually.

- Specify `/mountdatabases=yes` if you are restoring the last backup set and you want the databases within the storage group automatically mounted after the recovery completes. Note that when performing a Legacy restore of mailbox databases to a Recovery Storage Group, the mailbox databases will be restored to the Recovery Storage Group (when a Group exists) and that the original databases will *not* be dismounted. Only transaction logs that are contained in the backup will be applied to the mailbox database when performing a Recovery Storage Group restore. You must specify ***/recover***=*applyrestoredlogs* when restoring a mailbox database to a Recovery Storage Group or the restore operation may fail.
- If you are restoring a CCR database, the cluster database is mounted successfully. However, due to a Microsoft Exchange Server 2007 limitation, the database resources are not brought online. You must bring the database resources online using the Microsoft Cluster Administrator interface. See the following Microsoft Knowledge Base article for details regarding this limitation: http://support.microsoft.com/kb/938442/en-us

Note: Microsoft Exchange Server considers the wildcard character (*) to be an invalid character when used in database and storage group names. As a result, database and storage groups that contain the wildcard character (*) in their name will not be backed up.

The GUI provides an easy-to-use, flexible interface to help you perform a restore operation. The interface presents information in a way that allows multiple selection and, in some cases, automatic operation.

Important:
If the Windows event log, Data Protection for Exchange log file, or a command error indicates that a restore operation failed, this failure might be caused by the restore.env file remaining behind. This file is created by the Microsoft restore interface and is used for debugging the restore failure. This file is named *Enn*restore.env where *Enn* is the base name of the restored transaction log files. Once the restore error is resolved, remove any remaining restore.env files before attempting the next restore operation. See the following Microsoft Exchange documentation for further details:

- http://msdn.microsoft.com/en-us/library/bb204044.aspx
- http://technet.microsoft.com/en-us/library/aa996770(EXCHG.65).aspx
- http://www.computerperformance.co.uk/exchange2003/exchange2003_eseutil.htm

Data Protection for Exchange supports the following types of restore:

Full (Legacy and VSS)
Restore a Full type backup

Copy (Legacy and VSS)
Restore a Copy type backup

Incremental (Legacy and VSS)
Restore an Incremental type backup

Differential (Legacy and VSS)
Restore a Differential type backup

Database copy (Legacy only)
Restore a Database Copy type backup.

VSS restore considerations

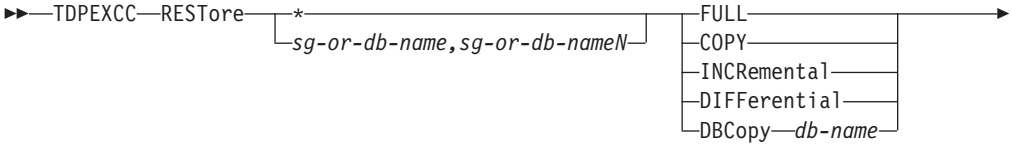
Be aware of these considerations when performing VSS restores.

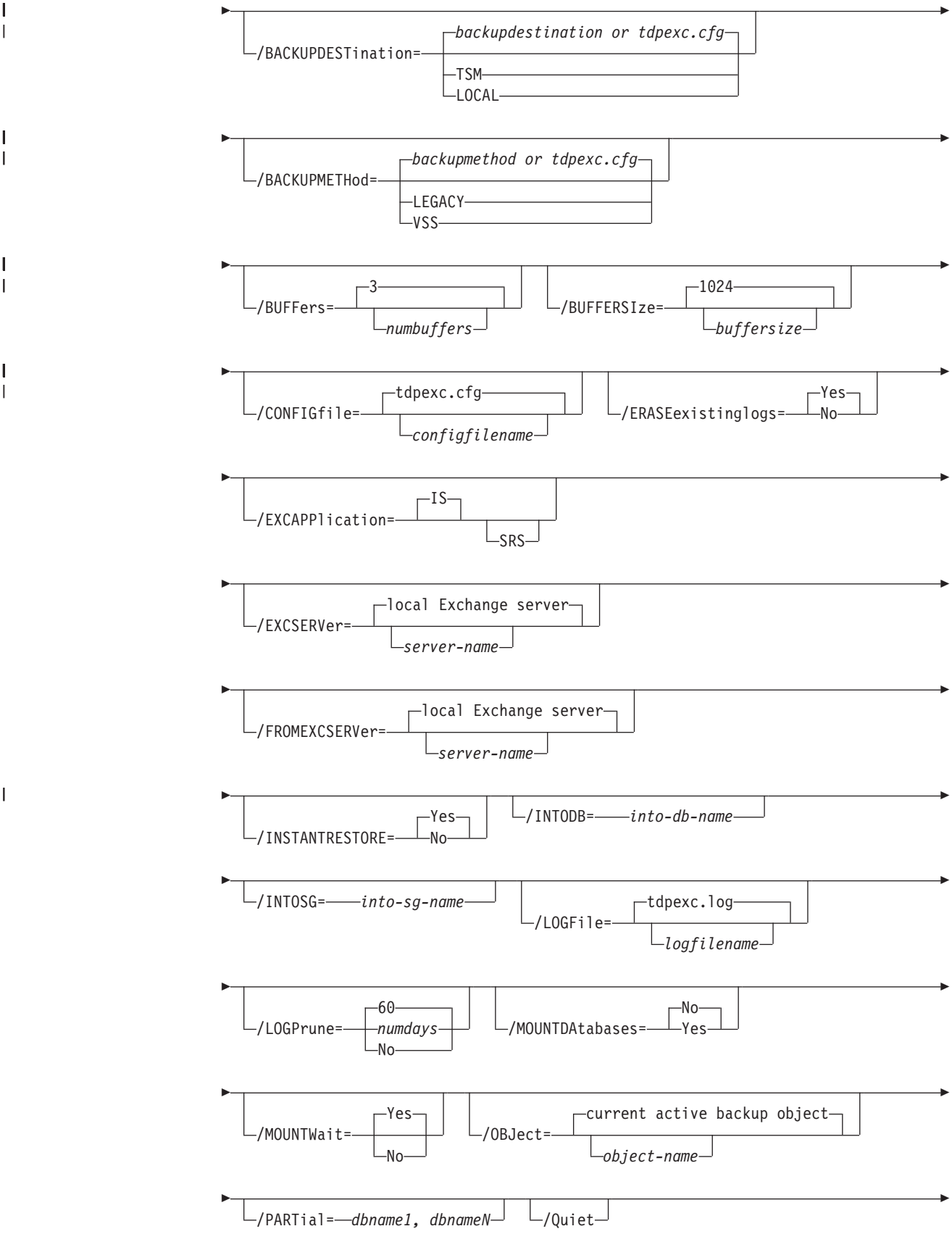
Unless otherwise specified, "VSS restores" refers to all restore types that use VSS (VSS Restore, VSS Fast Restore, VSS Instant Restore):

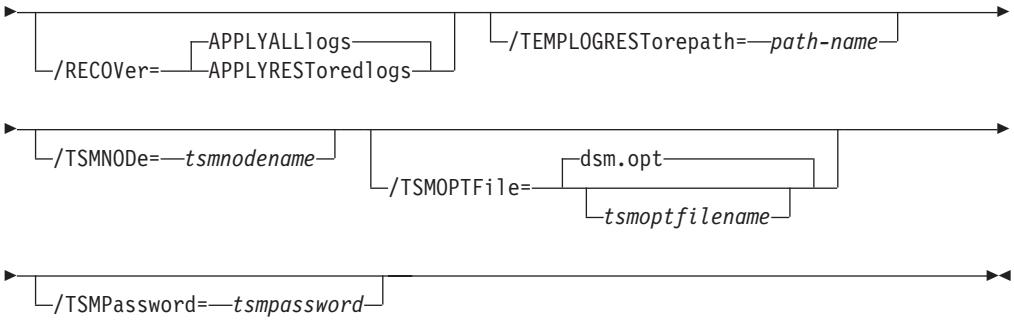
- Be aware that all VSS Restores of CCR and LCR, or DAG replicas can only be restored into the running instance of a storage group or database (primary, recovery, or alternate). Microsoft does not support VSS Restores into a replica instance.
- VSS restores ignore the Recovery Storage Group (Exchange Server 2003 or Exchange Server 2007) or Recovery Database (Exchange Server 2010) and are placed directly into the production database unless the ***/intosg*** or ***/intodb*** parameter is specified.
- A VSS Instant Restore overwrites the entire contents of the source volumes. However, you can avoid overwriting the source volumes by specifying **/INSTANTRESTORE**=*NO*. This parameter bypasses volume-level copy and uses file-level copy instead to restore the files from a VSS Backup that resides on local shadow volumes.
- Unlike Legacy restores (which only dismount the database being restored), VSS restores dismount *all* databases in the storage group that is being restored.
- VSS restores require all databases in the restored storage group (Exchange Server 2003 or Exchange Server 2007) or database (Exchange Server 2010) to be dismounted. This is also required when the ***/partial*** parameter is used when restoring a single database.
- If a hardware provider is used, it is recommended that the disks that contain Exchange data be configured as basic.
- Be aware that when a VSS restore from local shadow volumes is performed, the bytes transferred will display "0". That is because no data ("0") is restored from the Tivoli Storage Manager server.

Restore syntax

Use the **restore** command syntax diagrams as a reference to view available options and truncation requirements.




/BACKUPDESTination=
backupdestination or tdpexc.cfg
TSM
LOCAL
/BACKUPMETHod=
backupmethod or tdpexc.cfg
LEGACY
VSS
/BUFFers=
3
numbuffers
/BUFFERSIze=
1024
buffersize
/CONFIGfile=
tdpexc.cfg
configfilename
/ERASEexistinglogs=
Yes
No
/EXCAPPlication=
IS
SRS
/EXCSERVer=
local Exchange server
server-name
/FROMEXCSERVer=
local Exchange server
server-name
/INSTANTRESTORE=
Yes
No
/INTODB=
into-db-name
/INTOSG=
into-sg-name
/LOGFile=
tdpexc.log
logfilename
/LOGPrune=
60
numdays
No
/MOUNTDAtabases=
No
Yes
/MOUNTWait=
Yes
No
/OBJect=
current active backup object
object-name
/PARTial=
dbname1, dbnameN
/Quiet



Restore positional parameters

Positional parameters immediately follow the **restore** command and precede the optional parameters.

The following positional parameters specify the object to restore:

***** | ***sg-or-db-name***

***** Restore all storage groups sequentially.

sg-or-db-name
Restore the specified storage group (Exchange Server 2003 or Exchange Server 2007) or database (Exchange Server 2010). Multiple entries are separated by commas. If separated by commas, make sure there is no space between the comma and the storage group name. If any storage group contains commas or blanks, enclose the storage group name in double quotation marks.

The following positional parameters specify the type of restore to perform:

FULL | **COPY** | **INCRemental** | **DIFFerential** | **DBCopy** ***db-name***

FULL (Legacy and VSS)
Restore a Full type backup

COPY (Legacy and VSS)
Restore a Copy type backup

INCRemental (Legacy and VSS)
Restore an Incremental type backup

DIFFerential (Legacy and VSS)
Restore a Differential type backup

DBCopy *db-name* (Legacy only)
Restore the *db-name* database copy backup.

Restore optional parameters

Optional parameters follow the **restore** command and positional parameters.

/BACKUPDESTination=TSM | LOCAL

Use the **/backupdestination** parameter to specify the location from where the backup is to be restored. The default is the value (if present) specified in the Data Protection for Exchange preferences file (tdpexc.cfg). If no value is present, the backup is restored from Tivoli Storage Manager server storage.

You can specify:

TSM The backup is restored from Tivoli Storage Manager server storage. This is the default value.

LOCAL
The backup is restored from the local shadow volumes.

/BACKUPMETHod=LEGACY | VSS

Use the **/backupmethod** parameter to specify the manner in which the restore is performed. The default is the value (if present) specified in the Data Protection for Exchange preferences file (tdpexc.cfg). If no value is present, the backup is restored with the legacy API.

You can specify:

LEGACY
The restore is performed with the legacy API. This is the default value for Exchange Server 2003 and Exchange Server 2007 if no value is specified in the Data Protection for Exchange preferences file (tdpexc.cfg). This method is unavailable for Exchange Server 2010.

VSS The restore is performed with VSS. This is the only method available for Exchange Server 2010.

/BUFFers=*numbuffers*

Use the **/buffers** parameter to specify the number of data buffers that are used for moving data between the Exchange Server and the Tivoli Storage Manager API during Legacy restore operations. Separate, asynchronous execution threads are used by Data Protection for Exchange for communicating with the Exchange Server and Tivoli Storage Manager APIs. Increasing the number of data buffers improves throughput by reducing the possibility of one thread having to wait for another thread.

The *numbuffers* variable refers to the number of data buffers to use. The number of data buffers can be from 2 to 8. The default number of data buffers is **3**.

/BUFFERSIze=*buffersize*

Use the **/buffersize** parameter to specify the size of data buffers that are used to move data between the Exchange Server and the Tivoli Storage Manager API during Legacy backup and restore operations.

The *buffersize* variable refers to the size of the data buffers in kilobytes. The size of the data buffers can be from 64 to 8192 kilobytes and must be a multiple of 8. For example, you can specify 312 (a multiple of 8) but you cannot specify 313. The default size of the data buffers is **1024** kilobytes.

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name of the Data Protection for Exchange configuration file that contains the values for the Data

Protection for Exchange configuration options. See “Set command” on page 189 for details about the contents of the file.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

/ERASEexistinglogs=YES | NO

Use the **/eraseexistinglogs** parameter to erase the existing transaction log files for the database being restored before restoring the specified database(s). If you do not erase existing data, then any existing transaction logs could be reapplied when the Exchange databases are mounted. This parameter is valid only when restoring a VSS FULL or VSS COPY backup of Exchange Server storage groups or databases.

/EXCAPPlication=SRS

Use the **/excapplication** parameter to specify the name of the SRS database to be restored. Specify *SRS* for the Site Replication Service database to be restored. If no value is specified, Data Protection for Exchange restores the Information Store database.

/EXCSERVer=*server-name*

Use the **/excserver** parameter to specify the name of the Exchange Server to restore to.

The *server-name* variable specifies the name of the Exchange Server to be restored to.

Considerations

- If the Exchange Server to be restored is a member of a Microsoft Cluster Server or Veritas Cluster Server, you must specify this parameter and set it to the name of the Exchange virtual server.
- The default value is the local Exchange Server.

/FROMEXCSERVer=*server-name*

Use the **/fromexcserver** parameter to specify the name of the Exchange Server where the original backup was performed.

The default is the local Exchange Server. However, you must specify the name if the Exchange Server is not the default or is a member of a MSCS or VCS.

/INSTANTRESTORE=Yes | No

Use the **/instantrestore** parameter to specify whether to use volume level snapshot or file level copy to restore a VSS Backup that resides on local shadow volumes. Note that a SAN Volume Controller, DS6000, or DS8000 storage subsystem is required to perform VSS Instant Restores.

You can specify:

Yes Use volume level snapshot restore for a VSS Backup that resides on local shadow volumes if the backup exists on volumes that support it. This is the default.

No Use file level copy to restore the files from a VSS Backup that resides on local shadow volumes. Note that bypassing

volume-level copy means that Exchange database files, log files, and the checkpoint file are the only data overwritten on the source volumes.

When performing VSS Instant Restores, you must make sure that any previous background copies (that involve the volumes being restored) are completed prior to initiating the VSS Instant Restore. Be aware that the **/instantrestore** parameter is ignored and VSS Instant Restore capabilities are automatically disabled when performing any type of VSS restore into operation.

When performing a VSS Instant Restore in a CCR environment, stop the Microsoft Exchange Replication Service on both the active node and the passive node before running the restore operation.

When performing a VSS Instant Restore in a Database Availability Group (DAG) environment, do not choose the option that automatically mounts the databases after the recovery is completed. As described in the Database Availability Group considerations section, in order to perform the VSS Instant Restore for databases in a DAG environment, you must stop the Microsoft Exchange Replication service prior to performing the VSS Instant Restore or the restore will fail. In this case, after the VSS Instant Restore is completed, start the Microsoft Exchange Replication service and then finally mount the database.

/INTODB=*into-db-name*

Use the **/intodb** parameter to specify the name of the Exchange Server 2010 database into which the VSS Backup will be restored. The database name must be specified with the *into-db-name* variable. For example, if `RDB` is the name of the database into which the VSS Backup will be restored, the command line entry would be as follows:

```
TDPEXCC RESTore Maildb1 FULL /INTODB=RDB
```

However, when restoring a database that has been relocated (system file path, log file path, or database file path), you must specify the same database name as the one you are restoring. For example, if `Maildb1` is the name of the relocated database that is being restored, the command-line entry would be as follows:

```
TDPEXCC RESTore Maildb1 FULL /INTODB=Maildb1
```

Considerations

- There is no default value.
- In order to restore into a Recovery Database (RDB) or alternate database, an RDB or alternate database must already exist before attempting the restore operation.
- Note that the **/intodb** parameter is only available with Exchange Server 2010.

/INTOSG=*into-sg-name*

Use the **/intosg** parameter to specify the name of the Exchange Server 2007 storage group into which the VSS Backup will be restored. The storage group name must be specified with the *into-sg-name* variable. For example, if `RSG` is the name of the storage group into which the VSS Backup will be restored, the command line entry would be as follows:

```
TDPEXCC RESTore STG1 FULL /INTOSG=RSG /BACKUPMETHod=vss
 /BACKUPDESTination=local
```

However, when restoring a storage group that has been relocated (system file path, log file path, or database file path), you must specify the same storage group name as the one you are restoring. For example, if STG1 is the name of the relocated storage group that is being restored, the command-line entry would be as follows:

```
TDPEXCC RESTore STG1 FULL /INTOSG=STG1 /BACKUPMETHod=vss
 /BACKUPDESTination=local
```

Considerations

- There is no default value.
- In order to restore into a Recovery Storage Group (RSG) or alternate storage group, an RSG or alternate storage group must already exist (with the databases to be restored already added to it) before attempting the restore operation.
- Note that the **/intosg** parameter is only available with Exchange Server 2007 VSS restore operations.

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpexchange.log"
```

If you do not specify the **/logfile** parameter, log records are written to the default log file, ***tdpexc.log***.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Data Protection for Exchange to perform operations, use the **/logfile** parameter to specify a different log file for each instance used. This directs logging for each instance to a different log file and prevents interspersed log file records. Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays*|**No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the Data Protection for Exchange GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/logprune** parameter to override these defaults. When the value of the **/logprune** variable *numdays* is a number in the range 0 to 9999, the log is pruned even if log pruning has already been performed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat**

or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

/MOUNTDAtabases=No | Yes

Use the **/mountdatabases** parameter to specify whether to mount the databases after the restore operation completes. You MUST specify one of the following values:

Yes Mount the databases after the restore operation completes.

No Do not mount the databases after the restore operation completes. This is the default.

Note that if you are restoring a CCR database, the cluster database is mounted successfully. However, due to a Microsoft Exchange Server 2007 limitation, the database resources are not brought online. You must bring the database resources online using the Microsoft Cluster Administrator interface. See the following Microsoft Knowledge Base article for details regarding this limitation: http://support.microsoft.com/kb/938442/en-us

/MOUNTWait=Yes | No

Use the **/mountwait** parameter to specify whether Data Protection for Exchange should wait for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify:

Yes Wait for tape mounts. This is the default.

No Do not wait for tape mounts.

/OBJect=*object-name*

Use the **/object** parameter to specify the name of the backup object you want to restore. The object name uniquely identifies each backup object and is created by Data Protection for Exchange.

Use the Data Protection for Exchange **query tsm** command to view the names of the backup objects.

If the `tdpexcc restore sgname incr` command is entered (without the **/object** parameter) to restore multiple active incremental backups, all multiple active incremental backups are restored sequentially. The **/object** parameter is used to restore only one incremental backup at a time.

/PARTial=*dbname1,dbnameN*

Use the **/partial** parameter to specify that only the named databases (*dbname1,dbnameN*) within the *full* or *copy* backup should be restored.

Considerations

- If you specify this option, you must include at least one valid database name.
- If you do not specify this option, all databases within the backup are restored.
- You cannot specify this parameter while using VSS Instant Restore. You must restore ALL databases within the specified storage group when performing a VSS Instant Restore. Although Data Protection for

Exchange allows this operation to begin, it will either fail or complete with undesirable consequences. If you need to restore just one database from a VSS Backup that resides on local VSS shadow volumes on DS or SAN Volume Controller disks, make sure to specify ***/instantrestore***=*no* on the command-line interface. If VSS Instant Restore capability is needed for single databases, make sure to place these databases in their own storage group.

/Quiet This parameter prevents status information from being displayed. This does not affect the level of information written to the activity log.

/RECOVER=APPLYRESToredlogs | APPLYALLlogs

Use this parameter to specify whether or not you want to run recovery after you restore an object. It is recommended this parameter be specified on the last backup object restored for any particular storage group. To initiate recovery, you MUST use the **/recover** parameter when restoring the last backup object of a storage group. In addition, the value of **/templogrestorepath** should not be the same value as the current location for the storage group. If the value is the same, the storage group can become corrupted. Failure to use the **/recover** parameter when restoring the last backup set of a storage group leaves the databases unmountable. If this occurs, you can either restore the last backup again and specify the **/recover**=*value* option or you can use the Microsoft ESEUTIL /cc command to run recovery manually.

You MUST specify one of the following values when using this parameter:

APPLYALLlogs

Specify `/recover=applyalllogs` to replay the restored-transaction log entries AND the current active-transaction log entries. Any transaction logs entries that appear in the current active-transaction log are replayed. This is the default.

APPLYRESToredlogs

Specify `/recover=applyrestoredlogs` to replay ONLY the restored-transaction log entries. The current active-transaction log entries will NOT be replayed. When performing a Legacy restore of a mailbox database to a Recovery Storage Group, you must specify ***/recover***=*applyrestoredlogs* or the restore operation may fail.

Note: When choosing this option for a restore, your next backup MUST be a full or copy backup.

Considerations

- When restoring multiple backup objects, the **/recover** option should be used on the restore of the last object.

  Note: If you specify **/recover=applyrestoredlogs** when performing a restore, the next backup of the storage group MUST be a full backup.

/TEMPLOGRESTorepath=*path-name*

Use the **/templogrestorepath** parameter to specify the default temporary path to use when restoring logs and patch files. For best performance, this should be on a different physical device than the current active-transaction logger.

If you do not specify the **/templogrestorepath** parameter, the default value is the value that is specified by the TEMPLOGRESTOREPATH option in the Data Protection for Exchange configuration file. The default Data Protection for Exchange configuration file is ***tdpexc.cfg***.

If you do not specify the **/templogrestorepath** parameter, and the TEMPLOGRESTOREPATH value does not exist in the Data Protection for Exchange configuration file, the TEMP environment variable value is used.

Attention:

When performing a **full**, **copy**, or **dbcopy** restore operation, all log files residing in the path that is specified by the **/templogrestorepath** parameter are erased.

In addition, the value of **/templogrestorepath** should not be the same value as the current location for the storage group. If the value is the same, the storage group can become corrupted.

Restriction: Do not specify double-byte characters (DBCS) within the temporary log path.

/TSMNODe=*tsmnodename*
Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if PASSWORDACCESS is set to PROMPT. This parameter is not valid when PASSWORDACCESS is set to GENERATE in the options file.

/TSMOPTFile=*tsmoptfilename*
Use the *tsmoptfilename* variable to identify the Data Protection for Exchange options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in double quotation marks. For example:

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is **dsm.opt**.

/TSMPassword=*tsmpassword*
Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. If you specified PASSWORDACCESS GENERATE in the Data Protection for Exchange options file (dsm.opt), you do not need to supply the password here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when PASSWORDACCESS GENERATE is in effect, the command-line value is ignored unless the password for this node has not yet been stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Restore Example 1

This output example provides a sample of the text, messages, and process status that displays when using the **restore** command.

The **tdpexcc restore sg3.sg3 full /recover=applyalllogs** command restores a full type backup of the Exchange Server storage group identified as *sg3.sg3*, and replays the restored-transaction log entries AND the current active-transaction log entries. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Starting Microsoft Exchange restore...

Logging on to the Tivoli Storage Manager server, please wait...

Beginning full restore of storage group sg3.sg3 <06/16/2008 11:14:12>,
1 of 1, to sg3.sg3
Full: 1   Read: 26314796  Written: 26314796  Rate: 3,589.11 Kb/Sec
Restore of sg3.sg3 completed successfully.


Total backups inspected:                  1
Total backups requested for restore:      1
Total backups restored:                   1

Throughput rate:                          1,054.11 Kb/Sec
Total bytes transferred:                  26,314,796
Elapsed processing time:                  24.38 Secs
```

Restore Example 2

This output example provides a sample of the text, messages, and process status that displays when using the **restore** command.

The **tdpexcc restore sg3.sg3 dbcopy "A Public Store" /recover=applyalllogs** command restores a database copy backup of Exchange Server database *A Public Store*, located in storage group *sg3.sg3*, and replays the restored-transaction log entries AND the current active-transaction log entries. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Starting Microsoft Exchange restore...

Logging on to the Tivoli Storage Manager server, please wait...

Beginning dbcopy restore of storage group sg3.sg3 <07/10/2008 10:25:26>,
1 of 1, to sg3.sg3
Full: 1   Read: 10511010  Written: 10511010  Rate: 4,015.91 Kb/Sec
Restore of sg3.sg3 completed successfully.

Total backups inspected:                  1
Total backups requested for restore:      1
Total backups restored:                   1

Throughput rate:                          1,024.52 Kb/Sec
Total bytes transferred:                  10,511,010
Elapsed processing time:                  10.02 Secs
```

Restore Example 3

This output example provides a sample of the text, messages, and process status that displays when using the **restore** command.

The **tdpexcc restore stg2 full /backupdestination=tsm /backupmethod=vss** command restores a full VSS Backup of storage group *stg2* from Tivoli Storage Manager server storage to local shadow volumes. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Connecting to TSM Server as node 'SVC_TDP'...

Connecting to Local DSM Agent 'svc_ba'...

Preparing for restore of 'stg2' from TSM backup.

   Files Examined/Completed/Failed: [ 14 / 14 / 0 ]   Total Bytes: 88135694

VSS Restore operation completed with rc = 0
   Files Examined   : 14
   Files Completed  : 14
   Files Failed     : 0
   Total Bytes      : 88135694
```

Restore Example 4

This output example provides a sample of the text, messages, and process status that displays when using the **restore** command.

The **tdpexcc restore stg4 full /backupdestination=local /backupmethod=vss** command restores a full VSS Backup of storage group *stg4* from local shadow volumes. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Connecting to TSM Server as node 'TDP_REAL'...
Connecting to Local DSM Agent 'ba_real'...
Starting Microsoft Exchange restore...

Restoring 'stg4' using file-level copy from a snapshot volume.

VSS Restore operation completed with rc = 0
   Files Examined   : 7
   Files Completed  : 7
   Files Failed     : 0
   Total Bytes      : 0
```

Restore Example 5

This output example provides a sample of the text, messages, and process status that displays when using the restore command.

The tdpexcc restore JGROUP full /backupdestination=local/backupmethod=vss command restores a full VSS Backup of storage group JGROUP from SAN-attached shadow volumes. An example of the output is displayed below.

```
tdpexcc restore JGROUP full /backupdestination=local /backupmethod=vss

IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Starting Microsoft Exchange restore...

Beginning VSS restore of 'JGROUP'...

Restoring 'JGROUP' using volume-level-copy snapshot.

Starting snapshot restore process. This process may take several minutes.

Total number of volumes failed: 0

VSS Restore operation completed with rc = 0
Files Examined : 0
Files Completed : 0
Files Failed : 0
Total Bytes : 0
```

Restorefiles command

Use the **restorefiles** command to restore the .edb, .stm (only applicable to Exchange Server 2003), and .log files from a specified Data Protection for Exchange backup (that resides on Tivoli Storage Manager server storage) into a specified directory.

The following information provides details about this command:

- This command applies to Legacy backups only. It does not apply to VSS Backups.
- This command is not available with Exchange Server 2010, because Exchange Server 2010 does not support Legacy backups.
- The restore operation will fail if previous restore files exist.

- This command does not restore the data to the Exchange Server.
- This command does not require an Exchange Server to be installed on or accessible from the machine where the **restorefiles** command is issued. As a result, files can be restored to an alternative machine or to an alternative directory on the same machine as the Exchange Server.
- This command also restores the Site Replication Service (SRS) files. Use the ***/excapplication*** parameter when restoring these files.
- When restoring files from an inactive backup or an active incremental backup, use the ***/object*** parameter to specify the name of the backup object. The object name uniquely identifies the backup instance in Tivoli Storage Manager server storage. A list of backup object names is obtained by issuing the **query tsm** command.
- This command is only available on the command-line interface. It is not available in the Data Protection for Exchange GUI.

Data Protection for Exchange supports the following types of restores using the **restorefiles** command:

Full Restore the files from a Full type backup.

Copy Restore the files from a Copy type backup.

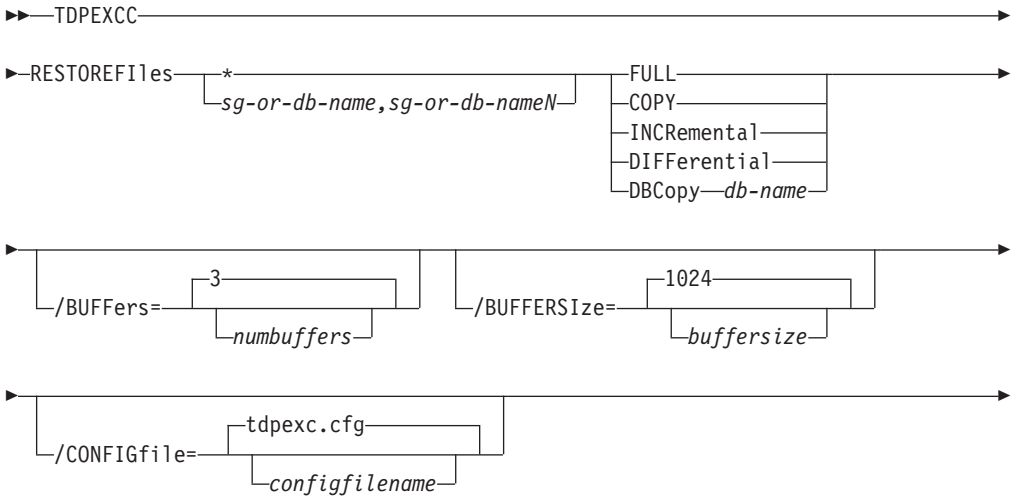
Incremental
Restore the files from an Incremental type backup.

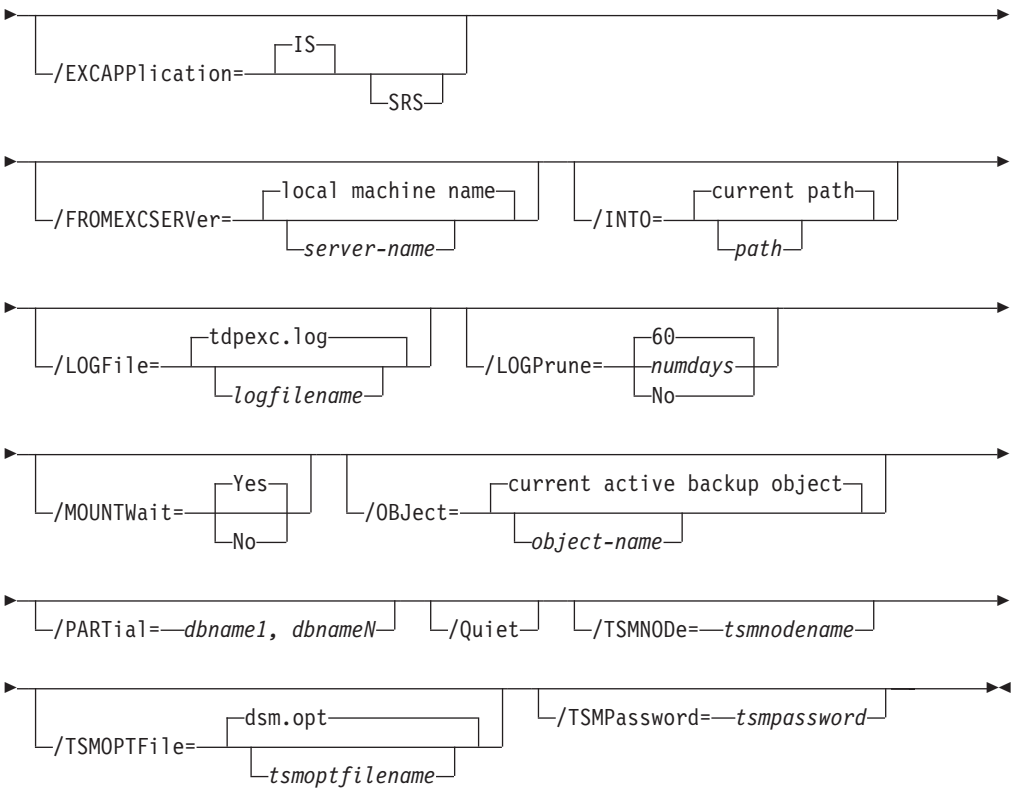
Differential
Restore the files from a Differential type backup.

Database copy
Restore the files from a Database Copy type backup.

Restorefiles syntax

Use the **restorefiles** command syntax diagrams as a reference to view available options and truncation requirements.





Restorefiles positional parameters

Positional parameters immediately follow the **restorefiles** command and precede the optional parameters.

The following positional parameters specify the object to restore:

***** | ***sg-name***

***** Sequentially restore all storage group files (Exchange Server 2003 or Exchange Server 2007).

sg-name
Restore the specified storage group files (Exchange Server 2003 or Exchange Server 2007). Multiple entries are separated by commas. If any storage group contains commas or blanks, enclose the storage group name in double quotation marks.

The following positional parameters specify the type of backup from which the files are restored:

FULL | **COPY** | **INCRemental** | **DIFFerential** | **DBCopy** ***db-name***

FULL Restore the files from a Full type backup.

COPY Restore the files from a Copy type backup.

INCRemental
Restore the files from an Incremental type backup.

DIFFerential
Restore the files from a Differential type backup.

DBCopy *db-name*
Restore the files from the *db-name* database copy backup.

Restorefiles optional parameters

Optional parameters follow the **restorefiles** command and positional parameters.

/BUFFers=*numbuffers*
Use the **/buffers** parameter to specify the number of data buffers that are used for retrieving data from the Tivoli Storage Manager API.

The *numbuffers* variable refers to the number of data buffers to use. The number of data buffers can be from 2 to 8. The default number of data buffers is **3**.

/BUFFERSIze=*buffersize*
Use the **/buffersize** parameter to specify the size of data buffers that are used to retrieve data from the Tivoli Storage Manager API.

The *buffersize* variable refers to the size of the data buffers in kilobytes. The size of the data buffers can be from 64 to 8192 kilobytes and must be a multiple of 8. For example, you can specify 312 (a multiple of 8) but you cannot specify 313. The default size of the data buffers is **1024** kilobytes.

/CONFIGfile=*configfilename*
Use the **/configfile** parameter to specify the name of the Data Protection for Exchange configuration file that contains the values for the Data Protection for Exchange configuration options. See "Set command" on page 189 for details about the contents of the file.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

/EXCAPPlication=SRS
Use the **/excapplication** parameter to specify the name of the SRS database from which files will be restored. Specify *SRS* for the Site Replication Service database files to be restored. If no value is specified, Data Protection for Exchange restores the Information Store database files.

/FROMEXCSERVer=*server-name*
Use the **/fromexcserver** parameter to specify the name of the Exchange Server where the original backup was performed. The default is the local machine name.

/INTO=*pathname*
Use the **/into** parameter to specify the root directory where files are to be restored. The **restorefiles** operation creates a subdirectory under the root directory that contains the name of the storage group. Restored files are placed in that subdirectory. If the **/into** parameter is not specified, the files will be restored into directory from which the **restorefiles** command is issued. For example, if Data Protection for Exchange is installed in the `c:\Program Files\Tivoli\TSM\TDPExchange` directory and the following command is issued from the `E:\Somedir` location: **e:\Somedir>**

c:\"Program Files"\Tivoli\TSM\TDPExchange\tdpexcc restorefiles ThirdSG full, then the files are restored to the subdirectories in the `e:\Somdir` location:

```
e:\Somedir\ThirdSG\DB3_1.edb
e:\Somedir\ThirdSG\DB3_1.stm
e:\Somedir\ThirdSG\E0200801.log
```

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpexchange.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, ***tdpexc.log***.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Data Protection for Exchange to perform operations, use the **/logfile** parameter to specify a different log file for each instance used. This directs logging for each instance to a different log file and prevents interspersed log file records. Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays* | **No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the Data Protection for Exchange GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/logprune** parameter to override these defaults. When the value of the **/logprune** variable *numdays* is a number in the range 0 to 9999, the log is pruned even if log pruning has already been performed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat** or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

/MOUNTWait=Yes | **No**

Use the **/mountwait** parameter to specify whether Data Protection for Exchange should wait for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli

Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify:

Yes Wait for tape mounts. This is the default.

No Do not wait for tape mounts.

/OBJect=*object-name*

Use the **/object** parameter to specify the name of the backup object files you want to restore. The object name uniquely identifies each backup object and is created by Data Protection for Exchange.

Use the Data Protection for Exchange **query tsm** command to view the names of the backup objects.

If the **tdpexcc restore** *sgname incr* command is entered (without the **/object** parameter), all multiple active incremental backup files are restored sequentially. The **/object** parameter is used to restore files from only one incremental backup at a time.

/PARTial=*dbname1,dbnameN*

Use the **/partial** parameter to specify that only files from the named databases (*dbname1,dbnameN*) within the *full* or *copy* backup should be restored into the alternative directory.

Considerations

- If you specify the **/partial** parameter, you must include at least one valid database name.
- If you do not specify the **/partial** parameter, all files within the backup are restored.

/Quiet This parameter prevents status information from being displayed. This does not affect the level of information written to the activity log.

/TSMNODe=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if PASSWORDACCESS is set to PROMPT. This parameter is not valid when PASSWORDACCESS is set to GENERATE in the options file.

/TSMOPTFile=*tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Data Protection for Exchange options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in double quotation marks. For example:

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is **dsm.opt**.

/TSMPassword=*tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. If you specified PASSWORDACCESS GENERATE

in the Data Protection for Exchange options file (dsm.opt), you do not need to supply the password here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when PASSWORDACCESS GENERATE is in effect, the command-line value is ignored unless the password for this node has not yet been stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Restorefiles Example 1

This output example provides a sample of the text, messages, and process status that displays when using the **restorefiles** command.

This command, **tdpexcc restorefiles Finance COPY /INTO=e:\test /FROMEXCSERVER=excsrv12 /TSMNODE=excsrv12 /TSMPASSWORD=password**, restores backup files from a COPY type backup of the *Finance* storage group (from the Exchange Server named *excsrv12*) into the *e:\test* directory. The restored files are:

```
e:\test\Finance\E0000011.log
e:\test\Finance\E0000012.log
e:\test\Finance\MB1.edb
e:\test\Finance\MB1.stm
e:\test\Finance\MB2.edb
e:\test\Finance\MB2.stm
e:\test\Finance\MB3.edb
e:\test\Finance\MB3.stm
```

Restorefiles Example 2

This output example provides a sample of the text, messages, and process status that displays when using the **restorefiles** command.

This command, **tdpexcc restorefiles FSG FULL /PARTIAL=Mailbox2 /INTO=e:\test /FROMEXCSERVER=excsrv05 /TSMNODE=excsrv05 /TSMPASSWORD=password**, restores *Mailbox2* backup files from a FULL type backup of the *FSG* storage group (from the Exchange Server named *excsrv05*) into the *e:\test* directory. The restored files are:

```
e:\test\FSG\E0000029.log
e:\test\FSG\E000002A.log
e:\test\FSG\Mailbox2.edb
e:\test\FSG\Mailbox2.stm
```

Restorefiles Example 3

This output example provides a sample of the text, messages, and process status that displays when using the **restorefiles** command.

First, this command, **tdpexcc q tsm * /all /FROMEXCSERVER=EXCH1**, queries the Tivoli Storage Manager server for all active and inactive backups that were originally backed up from the Exchange Server named *EXCH1*. The command displays the following backup objects:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Querying Tivoli Storage Manager server for a list of database
backups, please wait...
                            Backup List
                            -----------
  Exchange Server  : EXCH1

  Storage Group    : Second Storage Group

     Backup Date        Size     S Fmt  Type   Loc Object Name/Database Name
-------------------  ----------- - ---- ----   --- -------------------------
06/14/2008 14:01:19   2,940.06MB A Lgcy full   Srv 20080614140119
                      2,003.02MB                   mailbox_jie
                        924.02MB                   Second Mail Store
                      8,212.39KB                   Second Public Store
                      5,120.09KB                   Logs
06/14/2008 14:24:59   2,950.05MB A VSS  full   Loc 20080614142459
                         15.01MB                   Logs
                      8,208.00KB                   Second Public Store
                        924.02MB                   Second Mail Store
                      2,003.02MB                   mailbox_jie
```

Second, this command, **tdpexcc restorefiles "Second Storage Group" FULL /OBJECT=20080614140119 /INTO=c:\test /FROMEXCSERVER=EXCH1 /TSMNODE=tdp_geo /TSMPASSWORD=password**, restores backup files of *06/14/2008 14:01:19* FULL type backup of the storage group named *Second Storage Group* (from the Exchange Server named *EXCH1*) into the *e:\test* directory. The command displays the following output:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Starting Microsoft Exchange restore...
Logging on to the Tivoli Storage Manager server, please wait...

Beginning full restore of storage group Second Storage Group <06/14/2008 14:01:19>,
1 of 1, to Second Storage Group
Full: 2   Read: 2327880532  Written: 2325783380  Rate: 2,475.62 Kb/Sec
Waiting for TSM server...
Full: 0   Read: 3082876092  Written: 3082876092  Rate: 2,475.36 Kb/Sec
Restore of Second Storage Group completed successfully.

Total backups inspected:                  1
Total backups requested for restore:      1
Total backups restored:                   1

Throughput rate:                          2,475.36 Kb/Sec
Total bytes transferred:                  3,082,876,092
Elapsed processing time:                  1,216.24 Secs
```

Restoremailbox command

Use the **restoremailbox** command to restore mailbox-level data or mailbox-item-level data from Data Protection for Exchange backups.

The following information provides details about this command:

- For Exchange Server 2003, the **restoremailbox** command applies to Data Protection for Exchange Legacy backups stored on Tivoli Storage Manager server only. The **restoremailbox** command does not apply to VSS Backups. If any VSS Backups exist, they will be ignored by this command.
- For Exchange Server 2007 or Exchange Server 2010, the **restoremailbox** command applies to any Data Protection for Exchange Legacy backups (Exchange Server 2007) andVSS Backups (Exchange Server 2007 and Exchange Server 2010), which includes:
  - Legacy backups stored on Tivoli Storage Manager server
  - VSS Backups stored on Tivoli Storage Manager server
  - VSS Backups stored on local shadow volumes
- You can use the mailbox restore operation in the GUI to restore mailbox-level data or mailbox-item-level data. Some features of the **restoremailbox** command are only available on the command-line interface:
  - Use the command-line interface when you must use the ***/mailboxoriglocation*** parameter to specify the server, the storage group, and the database where the mailbox was located at the time of backup

    For example, you must use the ***/mailboxoriglocation*** parameter when restoring a mailbox from a backup taken with a version of Data Protection for Exchange prior to version 6.1, and the mailbox has been relocated since the time of backup.
  - For Exchange Server 2007 or Exchange Server 2010 environments, use the command-line interface when you must use the ***/tempmailboxalias*** optional parameter to specify the temporary mailbox to use when performing mailbox restore operations on mailboxes that were deleted, recreated, or moved since the time of the backup you are restoring from.
- With Data Protection for Exchange you can restore multiple mailboxes with the same mailbox restore operation.

  Restriction: For Exchange Server 2003, you must select multiple mailboxes to be restored with the same mailbox restore operation from the same storage group. To restore mailboxes from several storage groups, complete the restore operations as separate tasks and use the Exchange System Manager to prepare the Recovery Storage Group between each operation.
- You can use the **restoremailbox** command to restore data into a mailbox residing in an online Exchange Server or to restore data as an Exchange Server personal folders (.pst) file.
- You can use the **restoremailbox** command on the primary Exchange Server or on an alternate Exchange Server that is in the same domain.
- You can limit the range of the mailbox data to restore by using the ***/mailboxfilter*** parameter to specify filters based on these mailbox message elements:
  - Sender name
  - Folder name
  - Message body
  - Subject line

- Attachment name
- Range of the message delivery date and time

The amount of time needed to complete the restore process depends on the size of the mailbox databases, the network speed, and the number of mailboxes to process.

Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2003

Review these prerequisites before you perform mailbox restore tasks on Exchange Server 2003:

- See "Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2003" on page 36
- See "4. Perform these tasks to configure your system for mailbox-level and item-level restore operations" on page 78
- Temporary space is needed to accommodate the mailbox database during mailbox restore operations. Specify the location of this temporary space by setting these two parameters in the Data Protection for Exchange configuration file with the **tdpexcc set** command:
  - TEMPDBRESTorepath

    If you choose to not enter a path, the default value of TEMPDBRESTorepath is the value of the TEMP environment variable.
  - TEMPLOGRESTorepath

    If you choose to not enter a path, the default value of TEMPLOGRESTorepath is the value of the TEMP environment variable.

  Attention: The temporary restore locations *must* have enough space to restore the entire restored databases and log files.
- Use the Exchange System Manager to prepare the Exchange Server Recovery Storage Group for the mailbox restore operation. This must be done manually because Microsoft does not support programmatic access to the Exchange Server 2003 Recovery Storage Group:
  1. If the Recovery Storage Group does not exist, create the Recovery Storage Group.
  2. Add the mailbox databases to be restored to the Recovery Storage Group. A message is displayed and indicates the mailbox databases to be added.
  3. Ensure that the databases are dismounted in the Recovery Storage Group.
  4. Select the `This database can be overwritten by a restore` check box for each database.

  Requirement: To restore mailboxes from several storage groups, you must perform a separate mailbox restore operation for each set of mailboxes that are within a particular storage group. Also, you must use the Exchange System Manager to prepare the Recovery Storage Group between each restore operation.

The amount of time needed to complete the restore process depends on the size of the mailbox databases, the network speed, and the number of mailboxes to process.

Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2007

Review these prerequisites before you perform mailbox restore tasks on Exchange Server 2007:

- See "Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2007" on page 36
- See "4. Perform these tasks to configure your system for mailbox-level and item-level restore operations" on page 78
- Temporary space is needed to accommodate the mailbox database during mailbox restore operations. Specify the location of this temporary space by setting these two optional parameters in the Data Protection for Exchange configuration file with the **tdpexcc set** command:
  - TEMPDBRESTorepath

    If you choose to not enter a path, the default value of TEMPDBRESTorepath is the value of the TEMP environment variable.
  - TEMPLOGRESTorepath

    If you choose to not enter a path, the default value of TEMPLOGRESTorepath is the value of the TEMP environment variable.

  Attention: The temporary restore locations *must* have enough space to restore the entire restored databases and log files.
- Verify that Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 version 6.5.8147.0 (or later) is installed on the Exchange server that you will use to perform the mailbox restore operations.

The amount of time needed to complete the restore process depends on the size of the mailbox databases, the network speed, and the number of mailboxes to process.

Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2010

Review these prerequisites before you perform mailbox restore tasks on Exchange Server 2010:

- See "Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2010" on page 36
- See "4. Perform these tasks to configure your system for mailbox-level and item-level restore operations" on page 78
- Temporary space is needed to accommodate the mailbox database during mailbox restore operations. Specify the location of this temporary space by setting these two optional parameters in the Data Protection for Exchange configuration file with the **tdpexcc set** command:
  - TEMPDBRESTorepath

    If you choose to not enter a path, the default value of TEMPDBRESTorepath is the value of the TEMP environment variable.
  - TEMPLOGRESTorepath

    If you choose to not enter a path, the default value of TEMPLOGRESTorepath is the value of the TEMP environment variable.

  Attention: The temporary restore locations *must* have enough space to restore the entire restored databases and log files.

- Verify that Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 version 6.5.8147.0 (or later) is installed on the Exchange server that you will use to perform the mailbox restore operations.

The amount of time needed to complete the restore process depends on the size of the mailbox databases, the network speed, and the number of mailboxes to process.

Related tasks

Using the GUI to recover individual mailbox and mailbox item-level data

"Restoring a deleted mailbox or items from a deleted mailbox" on page 220

Related reference

Using the restoremailbox syntax diagram

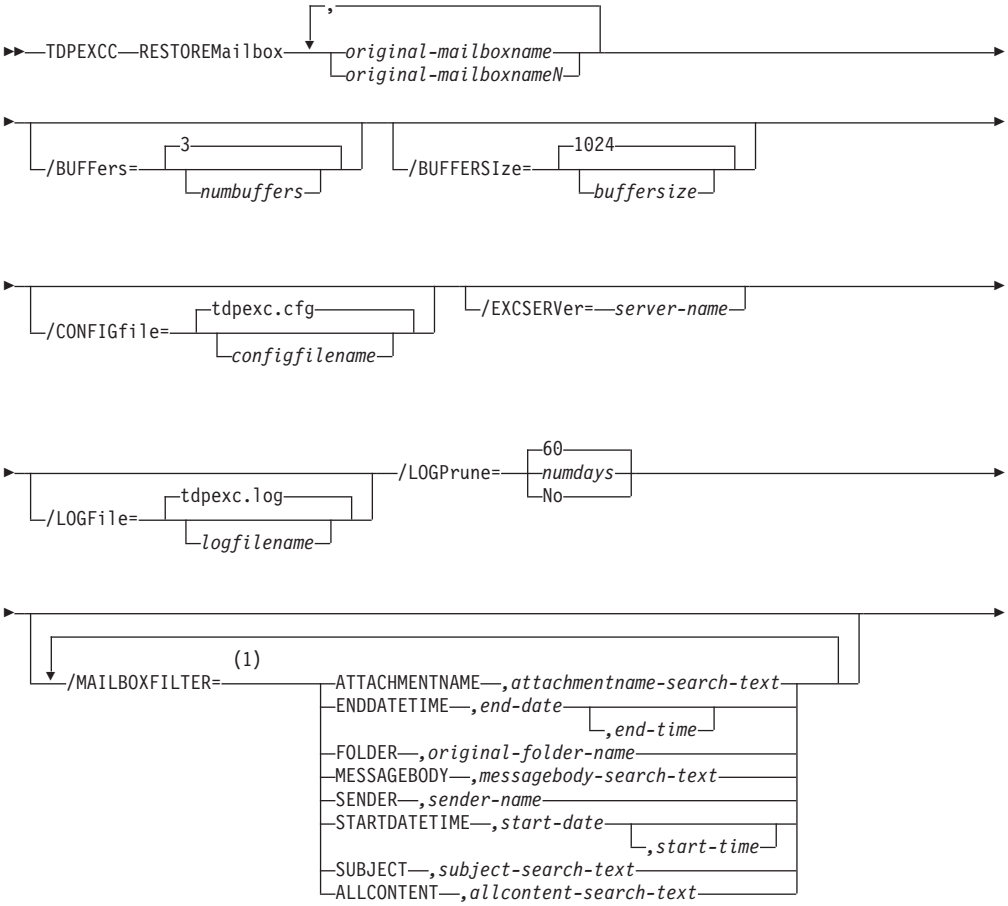
Specifying restoremailbox positional command-line parameters

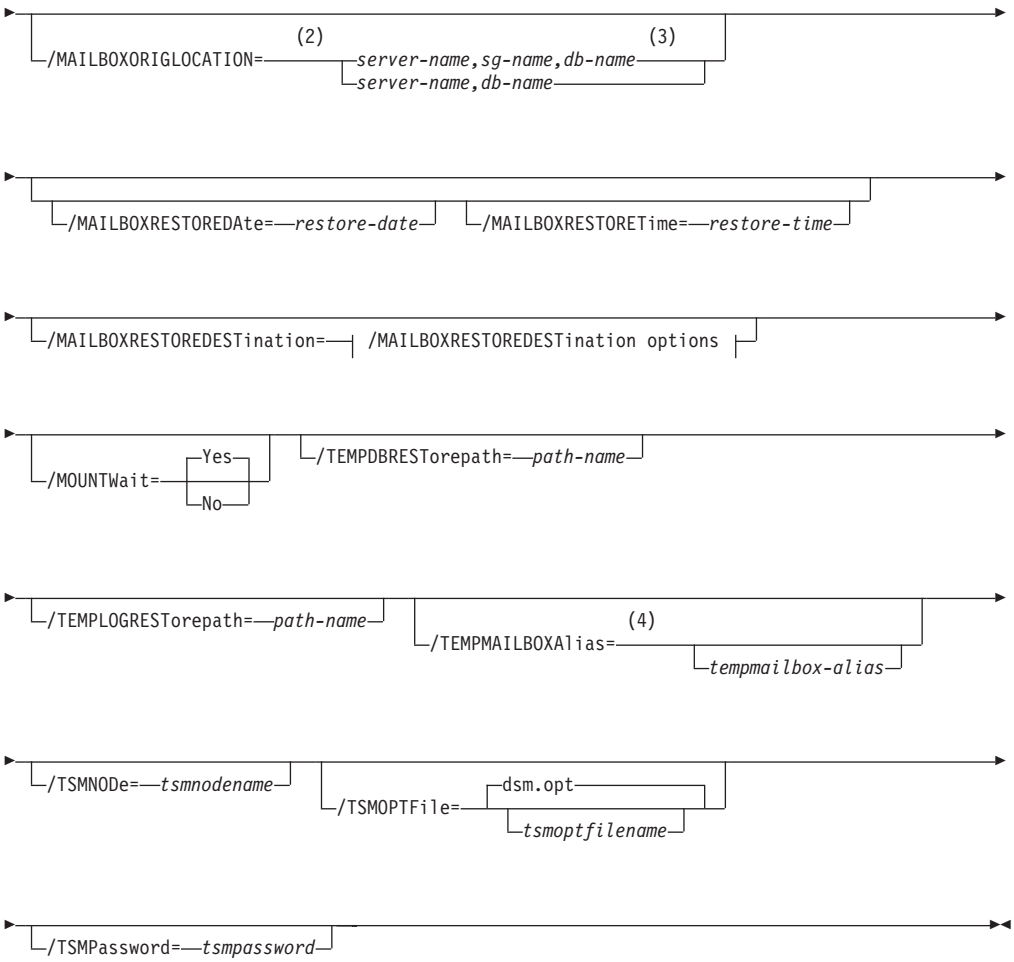
Specifying the /mailboxfilter parameter, the /mailboxoriglocation parameter, and other restoremailbox optional command-line parameters

Appendix B, "Frequently asked questions," on page 211

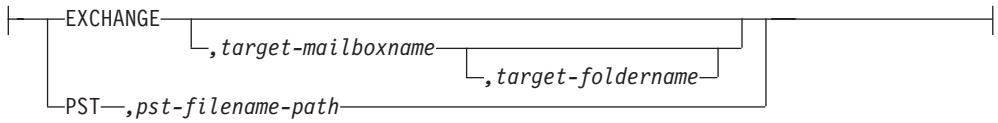
Restoremailbox syntax

Use the **restoremailbox** command syntax diagrams as a reference to view available options and truncation requirements.





/MAILBOXRESTOREDESTination options:



Notes:

1 You can specify the /MAILBOXFILTER parameter multiple times; however, you must specify each /MAILBOXFILTER subparameter only once.

2 Exchange Server 2003, Exchange Server 2007:

3 Exchange Server 2010:

4 The /TEMPMAILBOXAlias parameter is valid for Exchange Server 2007 and Exchange Server 2010 environments only.

Restoremailbox positional parameters

Positional parameters immediately follow the **restoremailbox** command and precede the optional parameters.

original-mailboxname

Use this parameter to specify the name of the mailbox to restore from. The mailbox name can be either the mailbox-alias or the mailbox-display name. The *original-mailboxname* parameter is required.

To specify more than one name, separate them by commas.

If any mailbox name contains commas or blank spaces, enclose the entire mailbox name in double quotation marks.

Restriction: For Exchange Server 2003, select multiple mailboxes to be restored from the same storage group in a mailbox restore operation. To restore mailboxes from several storage groups, perform the restore operations separately and use the Exchange System Manager to prepare the Recovery Storage Group between each operation.

Restoremailbox optional parameters

Optional parameters follow the **restoremailbox** command and positional parameters.

/BUFFers=*numbuffers*

Use the **/buffers** parameter to specify the number of data buffers that are used for retrieving data from the Tivoli Storage Manager API.

The *numbuffers* variable refers to the number of data buffers to use. The number of data buffers can be from 2 to 8. The default number of data buffers is **3**.

Note: The **/buffers** parameter only affects the operation when a mailbox is being restored from a Legacy Backup.

/BUFFERSIze=*buffersize*

Use the **/buffersize** parameter to specify the size of data buffers that are used to retrieve data from the Tivoli Storage Manager API.

The *buffersize* variable refers to the size of the data buffers in kilobytes. The size of the data buffers can be from 64 to 8192 kilobytes and must be a multiple of 8. For example, you can specify 312 (a multiple of 8) but you cannot specify 313. The default size of the data buffers is 1024 kilobytes.

Note: The **/buffersize** parameter only affects the operation when a mailbox is being restored from a Legacy Backup.

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name of the Data Protection for Exchange configuration file that contains the values for the Data Protection for Exchange configuration options. See "Set command" on page 189 for details about the contents of the file.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

/EXCSERVer=*server-name*

Use the **/excserver** parameter to specify the name of the Exchange Server to use for the restoremailbox operation.

The *server-name* variable specifies the name of the Exchange Server to use for the restoremailbox operation.

Considerations

- If the Exchange Server to be restored is a member of a Microsoft Cluster Server or Veritas Cluster Server, you must specify this parameter and set it to the name of the Exchange virtual server.
- The default value is the local Exchange Server.

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpexchange.log"
```

If you do not specify the **/logfile** parameter, log records are written to the default log file, ***tdpexc.log***.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Data Protection for Exchange to perform operations, use the **/logfile** parameter to specify a different log file for each instance that is used. This directs logging for each instance to a different log file and prevents interspersed log file records.

Attention: Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays*|**No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the Data Protection for Exchange GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/logprune** parameter to override these defaults. When the value of the **/logprune** variable *numdays* is a number in the range 0 to 9999, the log is pruned even if log pruning has already been performed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat**

or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

/MAILBOXFILTER=ATTACHMENTNAME | ENDDATETIME | FOLDER | MESSAGEBODY | SENDER | STARTDATETIME | SUBJECT | ALLCONTENT

Use the **/mailboxfilter** parameter to specify filters to restrict what mailbox data is restored.

You can specify multiple filters; however, you must specify each filter only once. For each filter that you specify, a separate /mailboxfilter parameter must be used. For example:

```
tdpexcc.exe restoremailbox dchang /MAILBOXFILTER=STARTDATETIME,07/01/2008
/MAILBOXFILTER=ENDDATETIME,07/31/2008
```

Mailbox data that matches a combination of all filters specified is restored. If no filters are specified, by default all data in the mailbox is restored.

Specify one of the following filters when using this parameter:

ATTACHMENTNAME,*attachmentname-search-text*

Use `/mailboxfilter=attachmentname` *`attachmentname-search-text`* to restore only the mailbox messages that contain a match of the specified text within a message attachment name. The match is not case-sensitive. For example, an *attachmentname-search-text* of **Rob** matches the attachment name: **Rob**, **robert.txt**, **PROBE**, and **prObe.pdf**.

Enclose the *attachmentname-search-text* variable in double quotation marks.

Attention: The ATTACHMENTNAME filter will not match the attachment names of encrypted mailbox messages. If a mailbox message is encrypted, it will be skipped by the ATTACHMENTNAME filter.

ENDDATETIME,*end-date[,end-time]*

Use `/mailboxfilter=enddatetime,`*`end-date`*`,`*`end-time`* to restore only the mailbox messages that have been sent or received earlier than the specified date and time.

The ***end-date*** variable is required. Use the same date format for the ***end-date*** that you selected with the DATEFORMAT option in the Data Protection for Exchange options file.

The ***end-time*** variable is optional. Use the same time format for the ***end-time*** variable that you selected with the TIMEFORMAT option in the Data Protection for Exchange options file.
The ENDDATETIME filter date and time must be later than the STARTDATETIME filter date and time. If no time is specified, all messages sent or received on that date will be restored.

FOLDER,*folder-name*

Use `/mailboxfilter=folder,`*`original-folder-name`* to restore only the mailbox messages that are located in the specified folder within the original mailbox. The match is not case-sensitive.

Enclose the *original-folder-name* variable in double quotation marks.

MESSAGEBODY,*messagebody-search-text*

Use `/mailboxfilter=messagebody,messagebody-search-text` to restore only the mailbox messages that contain a match of the specified text within the message body. The match is not case-sensitive. For example, a *messagebody-search-text* of **Rob** matches the message body text: **Rob**, **robert**, **PROBE**, and **prObe**.

Enclose the *messagebody-search-text* variable in double quotation marks.

Attention: The MESSAGEBODY filter will not match the message body of encrypted mailbox messages. If a mailbox message is encrypted, it will be skipped by the MESSAGEBODY filter.

SENDER,*sender-name*

Use `/mailboxfilter=sender,sender-name` to restore only the mailbox messages received from the specified message sender.

Enclose the *sender-name* variable in double quotation marks.

STARTDATETIME,*start-date[,start-time]*

Use `/mailboxfilter=startdatetime,start-date,start-time` to restore only the mailbox messages that have been sent or received after the specified date and time.

The ***start-date*** variable is required. Use the same date format for the ***start-date*** that you selected with the DATEFORMAT option in the Data Protection for Exchange options file.

The ***start-time*** variable is optional. Use the same time format for the ***start-time*** variable that you selected with the TIMEFORMAT option in the Data Protection for Exchange options file."
The STARTDATETIME filter date and time must be earlier than the ENDDATETIME filter date and time. If no time is specified, all messages sent or received on that date will be restored.

SUBJECT,*subject-search-text*

Use `/mailboxfilter=subject,subject-search-text` to restore only the mailbox messages that contain a match of the specified text within the message subject line. The match is not case-sensitive. For example, a *subject-search-text* of **Rob** matches the subject text: **Rob**, **robert**, **PROBE**, and **prObe**.

Enclose the *subject-search-text* variable in double quotation marks.

ALLCONTENT,*allcontent-search-text*

Use `/mailboxfilter=allcontent,allcontent-search-text` to restore only the mailbox messages that contain a match of the specified text contained within the message sender, the message subject line, or the message body. The match is not case-sensitive. For example, an *allcontent-search-text* of **Rob** matches **Rob**, **robert**, **PROBE**, and **prObe** contained within the message sender, the subject line, or the message body.

Enclose the *allcontent-search-text* variable in double quotation marks.

Attention: The ALLCONTENT filter will not match the message body of encrypted mailbox messages. If a mailbox message is encrypted, the ALLCONTENT filter only matches text contained within the message sender or the subject line.

/MAILBOXORIGLOCATION=*server-name,sg-name,db-name* **(Exchange Server 2003, Exchange Server 2007)** *server-name,db-name* **(Exchange Server 2010)**

Use the **/mailboxoriglocation** parameter to specify the Exchange Server, the storage group, and the database where the mailbox resided at the time of backup.

If you do not specify the **/mailboxoriglocation** parameter, the default value is the location (found in the mailbox location history) of the mailbox to restore from, for the backup time specified. If no mailbox location history is available, the default value is the current active location of the mailbox.

server-name

The name of the Exchange Server where the mailbox resided at the time of backup.

sg-name

The name of the Exchange Server 2003 or Exchange Server 2007 storage group where the mailbox resided at the time of backup.

db-name

The name of the database where the mailbox resided at the time of backup.

Considerations

The **/mailboxoriglocation** parameter is only necessary if the mailbox to be restored from has been moved or deleted since the time of the backup, and no mailbox location history is available. Data Protection for Exchange 6.1 (and later) maintains mailbox location history.

Attention: A restoremailbox operation from a backup taken with Data Protection for Exchange prior to version 6.1 will fail if the **/mailboxoriglocation** parameter is not specified for mailboxes that meet one or both of the following the conditions:

- The mailbox to be restored has been moved (the mailbox is not located in the same server, the same storage group, and the same database where the mailbox resided at the time of backup).
- The mailbox to be restored has been deleted and the restore destination is to an alternate mailbox or to a .pst file.

For example:

```
TDPEXCC RESTOREMAILBOX annjones /MAILBOXORIGLOCATION=serv1,sg1,mbdb1
/MAILBOXRESTOREDATe=02/21/2010
/MAILBOXRESTOREDESTination=PST,c:\team99\rcvr.pst
```

```
TDPEXCC RESTOREMAILBOX johngrimshawe /MAILBOXORIGLOCATION=serv1,mbdb1
/MAILBOXRESTOREDATe=03/06/2010
/MAILBOXRESTOREDESTination=PST,c:\team54\rcvr.pst
```

The deleted mailbox needs to be recreated.

/MAILBOXRESTOREDATe=*restore-date*

Use the **/mailboxrestoredate** parameter with or without the **/mailboxrestoretime** parameter to establish a date and time to restore mailbox data from. A mailbox is restored from the earliest backup taken

after the date and time established by the **/mailboxrestoredate** and the **/mailboxrestoretime** parameters. Specify the appropriate date in the *restore-date* variable; use the same format that you selected with the DATEFORMAT option in the Data Protection for Exchange options file.

If neither *restore-date* nor *restore-time* is specified, then no date and time is established. By default the mailbox will be restored from the most recent available backup.

If either *restore-date* or *restore-time* is specified, then the mailbox is restored from the earliest backup taken after the established restoration date and time. If no backup of the mailbox after the established date and time is found, by default the mailbox will be restored from the most recent available backup.

Notes:

- If you specify both *restore-date* and *restore-time*, this establishes the mailbox restoration period.
- If you specify *restore-date* and you do not specify *restore-time*, *restore-time* defaults to a value of 23:59:59. This establishes the *restore-date* at the specified date.
- If you specify *restore-time* without *restore-date*, then *restore-date* defaults to the current date. This establishes the restoration date and time as the current date at the specified *restore-time*.

/MAILBOXRESTORETime=*restore-time*

Use the **/mailboxrestoretime** parameter with or without the **/mailboxrestoredate** parameter to establish a date and time to restore a mailbox from. A mailbox is restored from the earliest backup taken *after* the date and time established by the **/mailboxrestoredate** and the **/mailboxrestoretime** parameters. Specify the appropriate time in the *restore-time* variable; use the same format that you selected with the TIMEFORMAT option in the Data Protection for Exchange options file.

If neither *restore-date* nor *restore-time* is specified, then no date and time is established. By default the mailbox is restored from the most recent available backup.

If either *restore-date* or *restore-time* is specified, the mailbox is restored from the earliest backup taken after the established date and time. If no backup of the mailbox after the established date and time is found, by default the mailbox is restored from the most recent available backup.

Notes:

- If you specify both *restore-date* and *restore-time*, this establishes the mailbox restoration period.
- If you specify *restore-date* and you do not specify *restore-time*, *restore-time* defaults to a value of 23:59:59. This establishes the *restore-date* at the specified date.
- If you specify *restore-time* without *restore-date*, then *restore-date* defaults to the current date. This establishes the restoration date and time as the current date at the specified *restore-time*.

/MAILBOXRESTOREDESTination=EXCHANGE|PST

Use the **/mailboxrestoredestination** parameter to specify the destination to restore the mailbox data to.

If you do not specify the **/mailboxrestoredestination** parameter, the default is to restore mailbox data to the original location in the original active mailbox. When restoring multiple mailboxes with the same **restoremailbox** command, the default is to restore mailbox data into each original active mailbox.

Mailbox items are merged into the mailbox destination. If a mailbox item already exists in the mailbox destination, that item will not be restored.

You must specify one of the following values when using this parameter:

EXCHANGE*[,target-mailboxname,target-foldername]*
Use the **/mailboxrestoredestination EXCHANGE** option to restore mailbox messages into a live Exchange Server.

If you specify the **/mailboxrestoredestination EXCHANGE** option without specifying any variables, `/mailboxrestoredestination=EXCHANGE`, the result is the same as not specifying the **/mailboxrestoredestination** parameter. The mailbox data is restored to the original location in the original active mailbox.

Use `/mailboxrestoredestination=EXCHANGE,`*`target-mailboxname`*`,`*`target-foldername`* to restore mailbox messages into a destination other than the original location in the original active mailbox. The mailbox messages are restored into a subfolder of the specified folder within the target mailbox. The target mailbox can be the original mailbox or an alternate mailbox. When restoring multiple mailboxes with the same **restoremailbox** command, this choice of options restores mailbox data into a subfolder (designated by each original mailbox-alias) of the specified target folder in an active mailbox. In each subfolder are the folders (from the corresponding original mailbox) that contain the restored mailbox messages.

Use `/mailboxrestoredestination=EXCHANGE,`*`target-mailboxname`*`,`*`target-foldername`* to restore mailbox messages into a destination other than the original location in the original active mailbox. The target mailbox can be the original mailbox or an alternate mailbox.

In the target mailbox, the specified folder (in the target mailbox) contains a subfolder (designated by the original-mailbox alias name). In the subfolder are sub-subfolders that contain the restored mailbox messages. These sub-subfolders have the folder structure of the original mailbox.

target-mailboxname
Specify the target mailbox-alias or the target mailbox-display name. The target mailbox must be an active mailbox.

If the *target-mailboxname* variable includes spaces, enclose the entry in double quotation marks.

target-foldername
The *target-foldername* variable specifies the mailbox folder in the target mailbox to restore mailbox messages to. If you

specify the *target-mailboxname* variable and the target mailbox is not the original mailbox, you must specify a folder name.

If the mailbox folder specified by the *target-folder-name* variable does not exist in the target mailbox, a folder with the *target-folder-name* will be created in the target mailbox.

The target folder contains one subfolder for each original-mailbox that is restored (designated by each original-mailbox alias). In each subfolder are the folders from the original mailbox that contain the restored mailbox messages. If you have not specified the **/mailboxfilter** parameter, the target folder that you specified contains, within the subfolder designated by the original mailbox alias, all the folders that are in the mailbox that you are restoring from. If you have specified the **/mailboxfilter** parameter, the subfolder within the folder that you specified contains only the folders with messages that match the filter criteria.

If the *target-foldername* variable includes spaces, enclose the entire *target-foldername* variable entry in double quotation marks. For example:

```
/MAILBOXRESTOREDESTination=EXCHANGE,Kerry,"temp folder"
```

When restoring multiple mailboxes with the same **restoremailbox** command, and you specify a target folder, each original-mailbox is restored to the target folder in the target mailbox. The target folder contains one subfolder for each original-mailbox that is restored (designated by each original mailbox alias). In each subfolder are the folders from the original mailbox that contain the restored mailbox messages.

For example, this **restoremailbox** operation restores mailboxes "andrew baker" and "sally wood" to the folder "previous_acctmngr" in the target mailbox "mary brown":

```
restoremailbox "andrew baker","sally wood"
/mailboxrestoredest=exchange,"mary brown",previous_acctmngr
```

The restored mailbox messages are placed in folders copied from the original mailboxes using the following folder structure:

```
mary brown (target mailbox)
          >-previous_acctmngr     (specified folder)
          |    >-abaker           (original-mailbox1 alias)
          |    | >-Inbox      (restored folder from mailbox1)
          |    | >-Outbox     (restored folder from mailbox1)
          |    | >-My Accts   (restored folder from mailbox1)
          |    >-swood            (original-mailbox2 alias)
          |    | >-Inbox      (restored folder from mailbox2)
          |    | >-Outbox     (restored folder from mailbox2)
          |    | >-New Accnts (restored folder from mailbox2)
```

PST,*pst-filename-path*

Use /mailboxrestoredestination=PST,*pst-filename-path* to restore mailbox data to an Exchange Server personal folders (.pst) file. The mailbox data that is restored is in non-Unicode format.

You can include the *pst-filename-path* variable to specify the destination where the restoremailbox operation will write the .pst file. The *pst-filename-path* can be either a fully qualified path to a .pst file or a directory path. If you do not specify a path, the .pst file is written to the current directory.

- You can specify *pst-filename-path* as a fully qualified path to a .pst file to restore all mail to that .pst file.

  ```
  TDPEXCC RESTOREMAILBOX gclark
    /mailboxrestoredestination=PST,c:\mb\dept54\vpo.pst
  ```

  Requirement: The .pst directory must exist before using the **restoremailbox** command. The .pst file will be created if it does not exist.

  If you are restoring more than one mailbox and you specify a fully qualified path to a .pst file, all the mailbox data will be restored to the one .pst file specified. Inside the pst file, the top level folder will be the mailbox-alias-name, with the rest of the mailbox folders below it.

- You can specify *pst-filename-path* as a directory path to have Data Protection for Exchange create a .pst file using the mailbox-alias-name of the mailbox being restored, and store the .pst file in the specified directory. For example, the .pst file name of the restored mailbox `"George Clark"(gclark)` is `gclark.pst`.

  ```
  TDPEXCC RESTOREMAILBOX "george clark"
    /mailboxrestoredestination=PST,c:\mb\dept54\
  ```

  Requirement: The .pst directory must exist before using the **restoremailbox** command. The .pst file will be created if it does not exist.

  If you restore multiple mailboxes with the same **restoremailbox** command, and you specify a directory path, each mailbox is restored into a separate .pst file. For example, if mailboxes `John (john1)`, `John Oblong (oblong)`, and `Barney Olef (barneyo)` are restored and the specified directory path is `c:\finance`, all mailboxes are restored into the `c:\finance` directory as shown:

  ```
  c:\finance\john1.pst
  c:\finance\oblong.pst
  c:\finance\barneyo.pst
  ```

Requirements: The .pst directory must exist before using the **restoremailbox** command.

If you are running Exchange Server 2003, update your local MAPI configuration file to add the MAPI PST message service for the mailbox restore operation to complete successfully. See "4. Perform these tasks to configure your system for mailbox-level and item-level restore operations" on page 78 for details on how to define this message service.

The mailbox data that is restored using `/mailboxrestoredestination=PST,`*`pst-filename-path`* must be less than 2 GB.

If the *pst-filename-path* variable includes spaces, enclose the entire *pst-filename-path* variable entry in double quotation marks. For example:

```
TDPEXCC RESTOREMAILBOX "george clark"
  /mailboxrestoredestination=PST,"c:\mb\dept54\access group\"
```

/MOUNTWait=Yes | No

Use the **/mountwait** parameter to specify whether Data Protection for Exchange should wait for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify:

Yes Wait for tape mounts. This is the default.

No Do not wait for tape mounts.

/TEMPDBRESTorepath=*path-name*

Use the **/tempdbrestorepath** parameter to specify the default temporary path to use when restoring mailbox database files.

If you do not specify the **/tempdbrestorepath** parameter, the default value is the value that is specified by the TEMPDBRESTOREPATH option in the Data Protection for Exchange configuration file. The default Data Protection for Exchange configuration file is ***tdpexc.cfg***. If the TEMPDBRESTOREPATH value does not exist in the Data Protection for Exchange configuration file, the TEMP environment variable value is used.

If the *path-name* variable includes spaces, enclose the entire **/tempdbrestorepath** parameter entry in double quotation marks. For example:

```
TDPEXCC RESTOREMAILBOX richgreene
  /tempdbrestorepath="h:\Exchange Restore Directory"
```

Attention:

- Do not specify a value of **/tempdbrestorepath** that is the same value as the location of the active database. If the value is the same, the database might become corrupted.
- Choose a temporary database-restore location that has enough space to hold the entire restore for the storage group.

Tip: For better performance, the current active-transaction logger should be on a different physical device from the paths specified by the values of the **/templogrestorepath** parameter and the **/tempdbrestorepath** parameter. The paths that are specified by the values of the **/templogrestorepath** parameter and the **/tempdbrestorepath** parameter can be on the same or separate physical devices from each other.

Restriction: Do not specify double-byte characters (DBCS) within the temporary database-restore path.

/TEMPLOGRESTorepath=*path-name*

Use the **/templogrestorepath** parameter to specify the default temporary path to use when restoring logs and patch files.

If you do not specify the **/templogrestorepath** parameter, the default value is the value that is specified by the TEMPLOGRESTOREPATH option in the Data Protection for Exchange configuration file. The default Data

Protection for Exchange configuration file is ***tdpexc.cfg***. If you do not specify the **/templogrestorepath** parameter and the TEMPLOGRESTOREPATH value does not exist in the Data Protection for Exchange configuration file, the TEMP environment variable value is used.

Attention:

- Do not specify a value of **/templogrestorepath** that is the same value as the current location for the storage group used for recovery. If the value is the same, the storage group might become corrupted.
- Choose a temporary log-restore location that has enough space to hold all the log and patch files.

Tip: For better performance, the current active-transaction logger should be on a different physical device from the paths specified by the values of the **/templogrestorepath** parameter and the **/tempdbrestorepath** parameter. The paths that are specified by the values of the **/templogrestorepath** parameter and the **/tempdbrestorepath** parameter can be on the same or separate physical devices from each other.

Restriction: Do not specify double-byte characters (DBCS) within the temporary log-restore path.

/TEMPMAILBOXAlias=*tempmailbox-alias*

Use the **/tempmailboxalias** parameter to specify the mailbox-alias of a temporary mailbox to use. A temporary mailbox will be used when performing mailbox restore operations on mailboxes that were deleted, recreated, or moved since the time of the backup you are restoring from. A temporary mailbox is used by these mailbox restore operations to store mailbox messages during intermediate processing. The mailbox messages are deleted from the temporary mailbox when processing is complete.

The **/tempmailboxalias** parameter is valid for Exchange 2007 environments only. This parameter is not valid for Exchange 2003 environments.

If you do not specify the **/tempmailboxalias** parameter, the default value is the value that is specified by the TEMPMAILBOXALIAS option in the Data Protection for Exchange configuration file. The default Data Protection for Exchange configuration file is ***tdpexc.cfg***. If the TEMPMAILBOXALIAS value does not exist in the Data Protection for Exchange configuration file, the mailbox of the currently logged on user is used as the temporary mailbox.

Specify the following value when using this parameter:

tempmailbox-alias

Specify the mailbox-alias of the temporary mailbox to use for recovery of mailboxes that were deleted, recreated, or moved since the time of the backup you are restoring from.

Ensure that the temporary mailbox is active and has enough storage capacity to accommodate all items of the mailboxes that are being restored.

If the *tempmailbox-alias* variable includes spaces, enclose the entry in double quotation marks.

/TSMNODe=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node

name that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if PASSWORDACCESS is set to PROMPT. This parameter is not valid when PASSWORDACCESS is set to GENERATE in the options file.

/TSMOPTFile=*tsmoptfilename*
Use the *tsmoptfilename* variable to identify the Data Protection for Exchange options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in double quotation marks. For example:

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is **dsm.opt**.

/TSMPassword=*tsmpassword*
Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. If you specified PASSWORDACCESS GENERATE in the Data Protection for Exchange options file (dsm.opt), you do not need to supply the password here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when PASSWORDACCESS GENERATE is in effect, the command-line value is ignored unless the password for this node has not yet been stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Restoremailbox Example 1

This output example provides a sample of the output that is displayed when using the **restoremailbox** command with no optional parameters.

This restoremailbox command restores the latest copy of an entire user mailbox back to its original location:

```
tdpexcc restoremailbox "ann greene"
```

The following example shows the text, messages, and process status that is displayed when using this restoremailbox command:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Starting Microsoft Exchange restore...

Querying Exchange storage group and database information...
Querying mailbox information...
Preparing Exchange Recovery Storage Group...
Performing mailbox restore using closest available backup.
Starting Microsoft Exchange restore...

Connecting to TSM Server as node 'NODE1_TDP'...
Logging on to the Tivoli Storage Manager server, please wait...

Beginning full restore of storage group stg4 <07/29/2008 15:15:55>, 1 of 1,
  to stg4
Full: 0   Read: 15753784  Written: 15753784  Rate: 10,114.76 Kb/Sec

Recovery being run.  Please wait.  This may take a while...

Restore of stg4 completed successfully.


Total backups inspected:                  1
Total backups requested for restore:      1
Total backups restored:                   1

Throughput rate:                          10,094.85 Kb/Sec
Total bytes transferred:                  15,753,784
Elapsed processing time:                  1.52 Secs

Querying Exchange Recovery Storage Group...

Checking Active Directory entries...
Restoring mailbox 'ann greene (agreene)' to original location...
  Mailbox restore completed successfully with 1 items restored.

Removing Exchange Recovery Storage Group...


Total mailboxes requested for restore:    1
Total mailboxes restored:                 1
```

Restoremailbox Example 2

This output example provides a sample of the output that is displayed when using the **restoremailbox** command to restore a subset of items from a user mailbox from an earlier point in time into a folder in an alternate user mailbox.

This command restores only the items that were originally under the folder named "Inbox":

```
tdpexcc restoremailbox "ann greene" /mailboxrestoredate=07/29/2008
/mailboxrestoretime=20:03:40
/mailboxrestoredestination=exchange,"bill jones","tempfolder"
/mailboxfilter=folder,"Inbox"
```

The following example shows the text, messages, and process status that is displayed when using this restoremailbox command:

```
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Starting Microsoft Exchange restore...

Querying Exchange storage group and database information...
Querying mailbox information...
Preparing Exchange Recovery Storage Group...
Starting Microsoft Exchange restore...

Connecting to TSM Server as node 'NODE1_TDP'...
Logging on to the Tivoli Storage Manager server, please wait...

Beginning full restore of storage group stg4 <07/29/2008 20:03:40>, 1 of 1,
  to stg4
Full: 0   Read: 26240104  Written: 26240104  Rate: 5,591.34 Kb/Sec

Recovery being run.  Please wait.  This may take a while...

Restore of stg4 completed successfully.


Total backups inspected:                  1
Total backups requested for restore:      1
Total backups restored:                   1

Throughput rate:                          5,586.46 Kb/Sec
Total bytes transferred:                  26,240,104
Elapsed processing time:                  4.59 Secs

Querying Exchange Recovery Storage Group...

Checking Active Directory entries...
Restoring mailbox 'ann greene (agreene)' to 'bill jones (bjones)'...
  Mailbox restore completed successfully with 2 items restored.

Removing Exchange Recovery Storage Group...


Total mailboxes requested for restore:    1
Total mailboxes restored:                 1
```

Restoremailbox Example 3

This output example provides a sample of the output that is displayed when using the **restoremailbox** command to restore a subset of items from a user's mailbox from an earlier point in time into the .pst file *c:\reports_bill.pst*.

This command restores only the items that contain the text "reports" in the subject line:

```
tdpexcc restoremailbox bjones /mailboxrestoredate=07/29/2007
/mailboxrestoredestination=pst,c:\reports_bill.pst /mailboxfilter=subject,"reports"
```

The following example shows the text, messages, and process status that is displayed when using this restoremailbox command:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

ACN5057I The C:\Program Files\Tivoli\TSM\TDPExchange\tdpexc.log log file has bee
n pruned successfully.

Starting Microsoft Exchange restore...

Querying Exchange storage group and database information...
Querying mailbox information...
Preparing Exchange Recovery Storage Group...
Performing mailbox restore using closest available backup.
Starting Microsoft Exchange restore...

Connecting to TSM Server as node 'NODE1_TDP'...
Logging on to the Tivoli Storage Manager server, please wait...

Beginning full restore of storage group stg4 <07/29/2008 20:03:40>, 1 of 1,
  to stg4
Full: 0   Read: 26240104  Written: 26240104  Rate: 10,188.91 Kb/Sec

Recovery being run.  Please wait.  This may take a while...

Restore of stg4 completed successfully.


Total backups inspected:                  1
Total backups requested for restore:      1
Total backups restored:                   1

Throughput rate:                          10,176.77 Kb/Sec
Total bytes transferred:                  26,240,104
Elapsed processing time:                  2.52 Secs

Querying Exchange Recovery Storage Group...

Checking Active Directory entries...
Restoring mailbox 'bill jones (bjones)' to 'c:\reports_bill.pst'...
  Mailbox restore completed successfully with 3 items restored.

Removing Exchange Recovery Storage Group...


Total mailboxes requested for restore:    1
Total mailboxes restored:                 1
```

Restoremailbox Example 4

This output example provides a sample of the output that is displayed when using the **restoremailbox** command to restore multiple user's entire mailboxes from an earlier point in time back to each mailboxes original location.

The following command restores the multiple users on a single restore request. All of the mailboxes reside in the same storage group:

```
tdpexcc restoremailbox agreene,bjones,mbailey
/mailboxrestoretime=16:17:58
```

The following example shows the text, messages, and process status that is displayed when using this restoremailbox command:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Starting Microsoft Exchange restore...

Querying Exchange storage group and database information...
Querying mailbox information...
Preparing Exchange Recovery Storage Group...
Starting Microsoft Exchange restore...

Connecting to TSM Server as node 'NODE1_TDP'...
Logging on to the Tivoli Storage Manager server, please wait...

Beginning full restore of storage group stg4 <07/29/2008 16:17:58>, 1 of 1,
  to stg4
Full: 0   Read: 23094208  Written: 23094208  Rate: 10,204.95 Kb/Sec

Recovery being run.  Please wait.  This may take a while...

Restore of stg4 completed successfully.


Total backups inspected:                  1
Total backups requested for restore:      1
Total backups restored:                   1

Throughput rate:                          10,186.51 Kb/Sec
Total bytes transferred:                  23,094,208
Elapsed processing time:                  2.21 Secs

Querying Exchange Recovery Storage Group...

Checking Active Directory entries...
Restoring mailbox 'ann greene (agreene)' to original location...
  Mailbox restore completed successfully with 3 items restored.

Restoring mailbox 'bill jones (bjones)' to original location...
  Mailbox restore completed successfully with 2 items restored.

Restoring mailbox 'mary bailey (mbailey)' to original location...
  Mailbox restore completed successfully with 2 items restored.

Removing Exchange Recovery Storage Group...


Total mailboxes requested for restore:    3
Total mailboxes restored:                 3
```

Related reference

"Restoremailbox command" on page 161

Delete Backup command

Use the **delete backup** command to delete a VSS Backup of an Exchange Server storage group (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010).

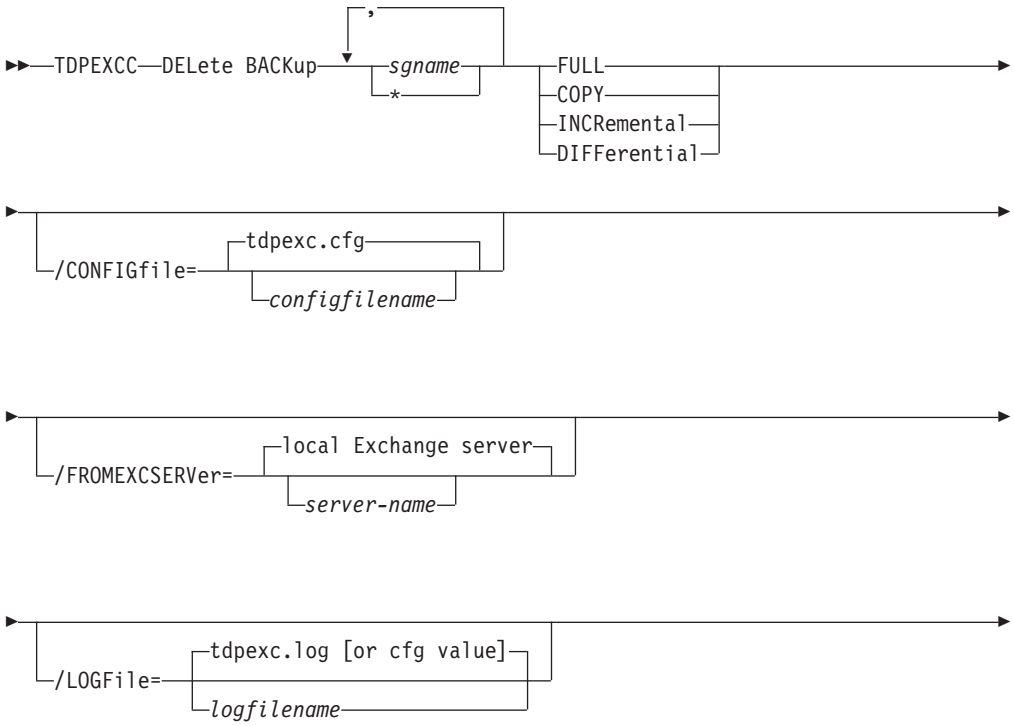
You must have local registry rights (for all versions of Exchange Server) to perform a Data Protection for Exchange delete backup.

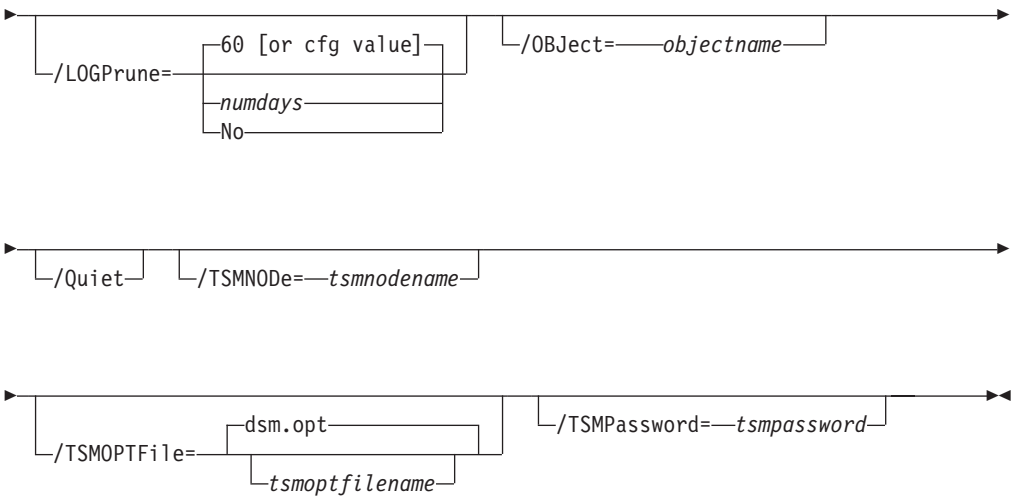
Note:

- When a full VSS snapshot backup is performed, the backup remains active until the backup version is deleted with the delete backup command, or expired by VSS according to the defined policy. As a result, two different active backups can exist at the same time:
  - Full backup, along with any associated incremental backups and differential backups.
  - Copy backup, along with any associated incremental backups and differential backups.
- When you delete an active full or copy backup, the state of the previous active full or copy backup changes from inactive to active. However, the current active incremental or differential backup is not deleted and erroneously appears to be associated with that newly-active full or copy backup. Also, the incremental or differential backup (associated with the previous inactive full or copy backup that has now changed to active) remains inactive. This inactive incremental or differential backup might not display in the query output unless the **/all** parameter is specified with the **query fcm** command.

Delete Backup syntax

Use the **delete backup** command syntax diagrams as a reference to view available options and truncation requirements.





Delete Backup positional parameters

Positional parameters immediately follow the **delete backup** command and precede the optional parameters.

The following positional parameters specify the backup to delete:

*** | *sgname***

***** Delete the active backups of all storage groups.

sg-name
Delete a backup of the specified storage group. The active backup is deleted unless you specify a different backup with the **/object** parameter. When multiple active incremental backups exist, the **/object** parameter must be specified with the **delete** command.

Multiple entries are separated by commas. If separated by commas, make sure there is no space between the comma and the storage group name. If any storage group contains commas or blanks, enclose the storage group name in double quotation marks.

CAUTION:

- **Be careful to delete only the desired backups.**
- **Deleting incremental or differential backups can cause loss of recovery points.**
- **Deleting a full backup might cause incremental or differential backups to remain in a suspended state and are considered useless without a corresponding full backup.**

The following positional parameters specify the type of delete backup to perform:

FULL | COPY | INCRemental | DIFFerential

FULL Delete full type backups.

COPY Delete copy type backups.

INCRemental
Delete incremental type backups.

DIFFerential
Delete differential type backups.

Delete Backup optional parameters

Optional parameters follow the **delete backup** command and positional parameters.

/CONFIGfile=*configfilename*
Use the **/configfile** parameter to specify the name (*configfilename*) of the Data Protection for Exchange configuration file that contains the values to use for a **delete backup** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

See "Set positional parameters" on page 190 for descriptions of available configuration parameters.

/FROMEXCSERVer=*server-name*
Use the **/fromexcserver** parameter to specify the name of the Exchange Server where the original backup was performed.

The default is the local Exchange Server. However, you must specify the name if the Exchange Server is not the default or is a member of a MSCS or VCS.

/LOGFile=*logfilename*
Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpexchange.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, ***tdpexc.log***.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Data Protection for Exchange to perform operations, use the **/logfile** parameter to specify a different log file for each instance used. This directs logging for each instance to a different log file and prevents interspersed log file records. Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays* | **No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the Data Protection for Exchange GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/logprune** parameter to override these defaults. When the value of the **/logprune** variable *numdays* is a number in the range 0 to 9999, the log is pruned even if log pruning has already been performed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat** or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

/OBJect=*objectname*

Use the **/object** parameter to specify the name of the backup object you want to delete. The object name uniquely identifies each backup object and is created by Data Protection for Exchange.

Use the Data Protection for Exchange **query tsm * /all** command to view the names of all available backup objects.

The **/object** parameter is used to delete only one incremental backup at a time. When multiple active incremental backups exist, the **/object** parameter must be specified with the **delete** command. If it is not specified, the **delete** command fails.

/Quiet This parameter prevents status information from being displayed. This does not affect the level of information written to the activity log.

/TSMNODe=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if PASSWORDACCESS is set to PROMPT. This parameter is not valid when PASSWORDACCESS is set to GENERATE in the options file.

/TSMOPTFile=*tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Data Protection for Exchange options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in double quotation marks. For example:

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is **dsm.opt**.

/TSMPassword=*tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server. If you specified PASSWORDACCESS GENERATE in the Data Protection for Exchange options file (dsm.opt), you do not need to supply the password here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when PASSWORDACCESS GENERATE is in effect, the command-line value is ignored unless the password for this node has not yet been stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Data Protection for Exchange uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Delete Backup Example

This output example provides a sample of the text, messages, and process status that displays when using the **delete backup** command.

In this example, the **tdpexcc delete backup "First Storage Group" full** command deletes the full backup of storage group First Storage Group. The following output is displayed:

```
Backup(s) to be deleted:
  <First Storage Group : VSS : full : 03/12/2010 10:24:11>
VSS Delete backup operation completed with rc = 0
   Files Examined   : 1
   Files Completed  : 1
   Files Failed     : 0
   Total Bytes      : 0
```

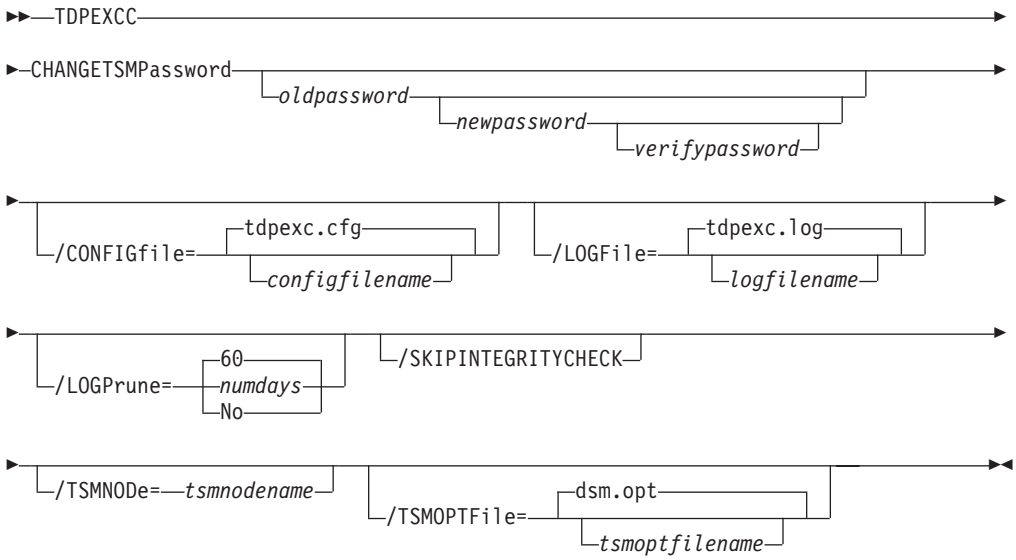
Changetsmpassword command

Use the **changetsmpassword** command to change the Tivoli Storage Manager password used by Data Protection for Exchange to log on to the Tivoli Storage Manager server.

If you do not enter the old and new passwords, Data Protection for Exchange prompts you for the old and new passwords. Data Protection for Exchange does not display the password on the screen. The Tivoli Storage Manager password Data Protection for Exchange uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Changetsmpassword syntax

Use the **changetsmpassword** command syntax diagrams as a reference to view available options and truncation requirements.



Changetsmpassword positional parameters

Positional parameters immediately follow the **changetsmpassword** command and precede the optional parameters.

The following positional parameters specify required password information:

oldpassword newpassword verifypassword

oldpassword
Specifies the current password used by Data Protection for Exchange.

newpassword
Specifies the new password used by Data Protection for Exchange.

verifypassword
Specifies the new password again for verification.

If any of these values are not entered during a command invocation, you are prompted for them.

Changetsmpassword optional parameters

Optional parameters follow the **changetsmpassword** command and positional parameters.

/CONFIGfile=*configfilename*
Use the **/configfile** parameter to specify the name of the Data Protection for Exchange configuration file that contains the values for the Data Protection for Exchange configuration options. See "Set command" on page 189 for details about the contents of the file.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for

Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpexchange.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, ***tdpexc.log***.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Data Protection for Exchange to perform operations, use the **/logfile** parameter to specify a different log file for each instance used. This directs logging for each instance to a different log file and prevents interspersed log file records.

Attention: Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays***|No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the Data Protection for Exchange GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/logprune** parameter to override these defaults. When the value of the **/logprune** variable *numdays* is a number in the range 0 to 9999, the log is pruned even if log pruning has already been performed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat** or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

/TSMNODe=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange uses to log on to the Tivoli Storage

Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if PASSWORDACCESS is set to PROMPT. This parameter is not valid when PASSWORDACCESS is set to GENERATE in the options file.

/TSMOPTFile=*tsmoptfilename*
Use the *tsmoptfilename* variable to identify the Data Protection for Exchange options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in quotation marks. For example:

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is **dsm.opt**.

Changetsmpassword Example

These output example provides a sample of the text, messages, and process status that displays when using the **changetsmpassword** command.

The **tdpexcc changetsmpassword oldpw newpw newpw** command changes the Tivoli Storage Manager password used by Data Protection for Exchange. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

ACN0260I Password successfully changed.
```

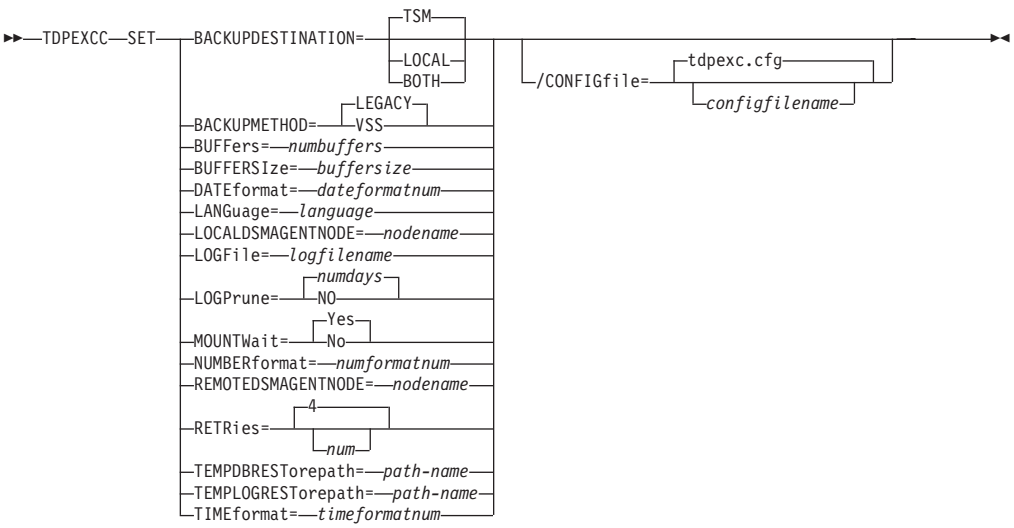
Set command

Use the **set** command to set the Data Protection for Exchange configuration parameters defined in the Data Protection for Exchange configuration file, ***tdpexc.cfg*** by default.

For command invocations other than this command or the **Configuration** task in the **Edit Menu** of the Data Protection for Exchange GUI, the value of a configuration parameter that is specified in a command invocation overrides the value of the configuration parameter that is specified in the Data Protection for Exchange configuration file. If, when you use this command, you do not override a value for the configuration file parameter, the values in the default Data Protection for Exchange configuration file (tdpexc.cfg) are used.

Set syntax

Use the **set** command syntax diagrams as a reference to view available options and truncation requirements.



Set positional parameters

Positional parameters immediately follow the **set** command and precede the optional parameters.

The following positional parameters specify the values in the Data Protection for Exchange configuration file. You can set only one value for each **tdpexcc set** command run:

BACKUPDESTination=TSM | LOCAL | BOTH
Use the BACKUPDESTINATION positional parameter to specify the storage location for your backup. You can specify:

TSM The backup is stored on Tivoli Storage Manager server storage only. This is the default.

LOCAL
The backup is stored on local shadow volumes only.

BOTH The backup is stored on both Tivoli Storage Manager server storage and local shadow volumes.

BACKUPMETHod=Legacy | VSS
Use the BACKUPMETHOD positional parameter to specify the method for your backup. You can specify:

LEGACY
Data Protection for Exchange uses the legacy API to perform the backup. This is the default.

VSS Data Protection for Exchange uses VSS to perform the backup.

BUFFers=*numbuffers*
Use the BUFFers positional parameter to specify the number of data buffers that are used for moving data between the Exchange Server and the Tivoli Storage Manager API. Increasing the number of data buffers can improve throughput. You can specify a value of *2* through *8* in the *numbuffers* value.

The **buffers** parameter is ignored when Data Protection for Exchange is used with Exchange Server 2010 or later, or with the stand-alone version of Tivoli Storage Manager FlashCopy Manager.

BUFFERSIze=*buffersize*

Use the BUFFERSIze positional parameter to specify the size of data buffers that are used to move data between the Exchange Server and the Tivoli Storage Manager API.

The *buffersize* variable refers to the size of the data buffers in kilobytes. The size of the data buffers can be from 64 to 8192 kilobytes and must be a multiple of 8. For example, you can specify 312 (a multiple of 8) but you cannot specify 313. The default size of the data buffers is **1024** kilobytes.

The **buffersize** parameter is ignored when Data Protection for Exchange is used with Exchange Server 2010 or later, or with the stand-alone version of Tivoli Storage Manager FlashCopy Manager.

DATEformat=*dateformatnum*

Use the DATEformat positional parameter to select the format you want to use to display dates.

The *dateformatnum* variable displays the date in one of the following formats. Select the format number that corresponds to the format you want to use.

1 MM/DD/YYYY. This is the default.

2 DD-MM-YYYY.

3 YYYY-MM-DD.

4 DD.MM.YYYY.

5 YYYY.MM.DD.

Changes to the value of the **dateformat** parameter can result in an undesired pruning of the Data Protection for Exchange log file (tdpexc.log by default). You can avoid losing existing log file data by performing one of the following:

- After changing the value of the **dateformat** parameter, make a copy of the existing log file before running Data Protection for Exchange.
- Specify a new log file with the **/logfile** parameter.

LANGuage=*language*

Specify the three-character code of the language you want to use to display messages:

CHS Simplified Chinese

CHT Traditional Chinese

DEU Standard German

ENU American English (This is the default.)

ESP Standard Spanish

FRA Standard French

ITA Standard Italian

JPN Japanese

KOR Korean

PTB Brazilian Portuguese

LOCALDSMAgentnode=*nodename*
Specify the node name of the local machine that performs the VSS backups. This positional parameter must be specified for VSS operations to be performed.

LOGFile=*logfilename*
Use the LOGFile positional parameter to specify the name of the activity log file generated by Data Protection for Exchange. The Data Protection for Exchange activity log records significant events, such as completed commands and error messages.

The *logfilename* variable identifies the name of the activity log file. If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is assigned to the Data Protection for Exchange installation directory.

LOGPrune=*numdays* **| No**
Use the LOGPrune positional parameter to disable log pruning or to set log pruning parameters. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. You can specify a value of **No** or *0* through *9999*. By default, **60** days of log entries are saved in the pruning process.

MOUNTWait=Yes | No
Use the MOUNTWait positional parameter to specify whether Data Protection for Exchange should wait for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

Specify **Yes** for Data Protection for Exchange to wait until all initial volumes of any required removable media are made available to the Tivoli Storage Manager server before completing the command.

Specify **No** for Data Protection for Exchange to terminate the command (if removable media are required). An error message will display.

NUMberformat=*fmtnum*
Use the NUMberformat positional parameter to specify the format you want to use to display numbers.

The *fmtnum* variable displays numbers using one of the following formats. Select the format number that corresponds to the format you want to use.

1 n,nnn.dd. This is the default.

2 n,nnn,dd.

3 n nnn,dd

4 n nnn.dd

5 n.nnn,dd

6 n'nnn,dd

REMOTEDSMAgentnode=*nodename*
Specify the node name of the machine that moves the VSS data to Tivoli Storage Manager server storage during offloaded backups.

RETRies=*num*

Use the RETRies positional parameter to specify the number of times that Data Protection for Exchange will retry a failed Legacy Backup. You can specify a value of *0* through *32* in the *num* value. The default value is *4*.

The **retries** parameter is ignored when Data Protection for Exchange is used with Exchange Server 2010 or later, or with the stand-alone version of Tivoli Storage Manager FlashCopy Manager.

TEMPDBRESTorepath=*path-name*

For mailbox restore operations, use the **TEMPDBRESTorepath** positional parameter to specify the default temporary path to use when restoring mailbox database files.

If you do not enter a path, the default value is the value of the TEMP environment variable.

If the path name includes spaces, you must enclose the entire **TEMPDBRESTorepath** positional parameter entry in double quotation marks. For example:

```
TDPEXCC SET TEMPDBRESTorepath="h:\Exchange Restore Directory"
```

Attention: Do not specify a value of **TEMPDBRESTorepath** that is the same value as the location of the active database. If the value is the same, the database might become corrupted.

Choose a temporary database-restore location that has enough space to hold the entire restore for the storage group.

Tip: For better performance, the current active-transaction logger should be on a different physical device from the paths specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting. The paths that are specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting can be on the same or separate physical devices from each other.

Restriction: Do not specify double-byte characters (DBCS) within the temporary database-restore path.

TEMPLOGRESTorepath=*path-name*

Use the **TEMPLOGRESTorepath** positional parameter to specify the default temporary path to use when restoring logs and patch files.

If you do not enter a path, the default value is the value of the TEMP environment variable.

If the path name includes spaces, you must enclose the entire TEMPLOGRESTorepath positional parameter entry in double quotation marks. For example:

```
TEMPLOGRESTorepath="c:\Program Files\templog"
```

Attention: Do not specify a value of **TEMPLOGRESTorepath** that is the same value as the current location for the storage group used for recovery. If the value is the same, the storage group might become corrupted.

Choose a temporary log-restore location that has enough space to hold all the log and patch files.

Tip: For better performance, the current active-transaction logger should be on a different physical device from the paths specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting. The paths that are specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting can be on the same or separate physical devices from each other.

Restriction: Do not specify double-byte characters (DBCS) within the temporary log-restore path.

TIMEformat=*formatnumber*
Use the TIMEformat positional parameter to specify the format in which you want system time displayed.

The *formatnumber* variable displays time in one of the following formats. Select the format number that corresponds to the format you want to use.

1 HH:MM:SS This is the default.

2 HH,MM,SS

3 HH.MM.SS

4 HH:MM:SSA/P

Set optional parameters

Optional parameters follow the **set** command and positional parameters.

/CONFIGfile=*configfilename*
Use the **/configfile** parameter to specify the name of the Data Protection for Exchange configuration file in which these values will be set.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is ***tdpexc.cfg***.

If the *configfilename* variable includes spaces, enclose the entire **/configfile** parameter entry in double quotation marks. For example:

```
/CONFIGfile="c:\Program Files\file.cfg"
```

Set Example

This output example provides a sample of the text, messages, and process status that displays when using the **set** command.

The **tdpexcc set logfile=d:\tsm\tdpexchange\exchange.log** command specifies *exchange.log*, in the *d:\tsm\tdpexchange* directory, as the Data Protection for Exchange log file instead of the default Data Protection for Exchange log file, *tdpexc.log*, located in the directory where Data Protection for Exchange is installed. An example of the output is displayed below.

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

ACN5054I The preference has been set successfully.
```

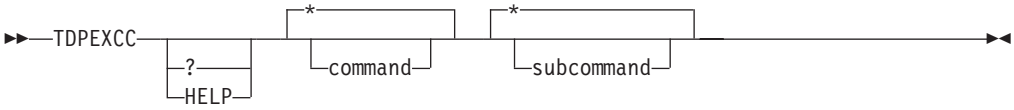
Help command

Use the **help** command to display help for Data Protection for Exchange commands.

This command lists one or more commands and their parameters. When using a non-English language, you might need to set the width of your screen display to a value greater than 80 characters in order to view the entire help description in one screen. For example, set the screen width to 100 characters.

Help syntax

Use the **help** command syntax diagrams as a reference to view available options and truncation requirements.



Help optional parameters

Optional parameters follow the Data Protection for Exchange **help** command.

The following optional parameters specify the help to be displayed:

*|*command*

Identifies the specific Data Protection for Exchange command that is to be displayed. If the wildcard character (*) is used, help for all Data Protection for Exchange commands is displayed.

The valid command names are shown below:

```
BACKup
CHANGETSMPassword
HELP
Query
RESTore
RESTOREFIles
RESTOREMailbox
SET
```

*|*subcommand*

Help can be displayed for commands that have several subcommands, for example, the **query** command. If you do not specify a subcommand or the wildcard character (*), help for all Data Protection for Exchange **query** commands is displayed.

The valid subcommand names for the **query** command are shown below:

```
EXCHange
TDP
TSM
```

Help Example 1

This output example provides a sample of the text, messages, and process status that displays when using the Data Protection for Exchange **help** command.

The **tdpexcc help** command displays available help for Data Protection for Exchange. The following output is displayed:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

Choose from the following commands:

TDPEXCC BACKup *|sgname1,...,sgnameN backuptype
  where backuptype can be:
      FULL|COPY|INCRemental|DIFFerential|DBCopy dbname
  [/BACKUPDESTination=TSM|LOCAL|BOTH]    (default: TSM)
  [/BACKUPMETHod=LEGACY|VSS]    (default: LEGACY)
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)
  [/EXCAPPlication=SRS] (default: Information Store)
  [/EXCSERVer=servername] (default: local exchange server)
  [/FROMREPLICA]
  [/LOGFile=tdpexc.log|logfilename] (default: tdpexc.log)
  [/LOGPrune=60|n|No] (default: 60)
  [/MOUNTWait=Yes|No] (default: Yes)
  [/OFFLOAD]
  [/Quiet]
  [/SKIPINTEGRITYCHECK]
  [/TSMNODe=nodename]
  [/TSMOPTFile=dsm.opt|filename] (default: dsm.opt)
  [/TSMPassword=password]

TDPEXCC CHANGETSMPassword [oldpw [newpw [verifypw]]]
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)
  [/LOGFile=tdpexc.log|logfilename] (default: tdpexc.log)
  [/LOGPrune=60|n|No] (default: 60)
  [/TSMNODe=nodename]
  [/TSMOPTFile=dsm.opt|filename] (default: dsm.opt)

TDPEXCC [ HELP|? [*|command [*|subcommand]] ]
Valid command names:         Valid subcommands:
   BACKup                       EXCHange
   CHANGETSMPassword            TDP
   HELP                         TSM
   Query
   RESTore
   RESTOREFIles
   SET

TDPEXCC Query EXCHange
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)
  [/EXCSERVer=servername] (default: local exchange server)
  [/LOGFile=tdpexc.log|logfilename] (default: tdpexc.log)
  [/LOGPrune=60|n|No] (default: 60)

TDPEXCC Query TDP
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)
  [/LOGFile=tdpexc.log|logfilename] (default: tdpexc.log)
  [/LOGPrune=60|n|No] (default: 60)
```

```
TDPEXCC Query TSM [*|sgname1,...,sgnameN [backuptype]]
  where backuptype can be:
      FULL|COPY|INCRemental|DIFFerential|DBCopy dbname
  [/ACtive]
  [/ALl]
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)
  [/FROMEXCSERVer=servername] (default: local exchange server)
  [/LOGFile=tdpexc.log|logfilename] (default: tdpexc.log)
  [/LOGPrune=60|n|No] (default: 60)
  [/TSMNODe=nodename]
  [/TSMOPTFile=dsm.opt|filename] (default: dsm.opt)
  [/TSMPassword=password]

TDPEXCC RESTore *|sgname1,...,sgnameN backuptype
  where backuptype can be:
      FULL|COPY|INCRemental|DIFFerential|DBCopy dbname
  [/BACKUPDESTination=TSM|LOCAL]    (default: TSM)
  [/BACKUPMETHod=LEGACY|VSS]    (default: LEGACY)
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)
  [/EXCAPPlication=SRS] (default: Information Store)
  [/EXCSERVer=servername] (default: local exchange server)
  [/FROMEXCSERVer=servername] (default: local exchange server)
  [/INSTANTRestore=Yes|No] (default: Yes)
  [/INTOSG=sg-name] (default: NONE)
  [/LOGFile=tdpexc.log|logfilename] (default: tdpexc.log)
  [/LOGPrune=60|n|No] (default: 60)
  [/MOUNTDAtabases=No|Yes] (default: No)
  [/MOUNTWait=Yes|No] (default: Yes)
  [/OBJect=object] (default: current active object)
  [/PARTial=dbname1,..,dbnameN] (default: NONE)
  [/Quiet]
  [/RECOVer=APPLYALLlogs|APPLYRESToredlogs]
  [/TEMPLOGRESTorepath=pathname] (default: TEMP environment var)
  [/TSMNODe=nodename]
  [/TSMOPTFile=dsm.opt|filename] (default: dsm.opt)
  [/TSMPassword=password]
```

```
TDPEXCC RESTOREFIles *|sgname1,...,sgnameN backuptype
  where backuptype can be:
      FULL|COPY|INCRemental|DIFFerential|DBCopy dbname
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)
  [/EXCAPPlication=SRS] (default: Information Store)
  [/FROMEXCSERVer=servername] (default: local exchange server)
  [/INTO=path] (default: current path)
  [/LOGFile=tdpexc.log|logfilename] (default: tdpexc.log)
  [/LOGPrune=60|n|No] (default: 60)
  [/MOUNTWait=Yes|No] (default: Yes)
  [/OBJect=object] (default: current active object)
  [/PARTial=dbname1,..,dbnameN] (default: NONE)
  [/Quiet]
  [/TSMNODe=nodename]
  [/TSMOPTFile=dsm.opt|filename] (default: dsm.opt)
  [/TSMPassword=password]

TDPEXCC RESTOREMailbox mailbox-name[,mailbox-name2,...,mailbox-nameN]
  where mailbox-name can be:
      mailbox-alias or mailbox-display name
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)
  [/EXCSERVer=servername] (default: local exchange server)
  [/LOGFile=tdpexc.log|logfilename] (default: tdpexc.log)
  [/LOGPrune=60|n|No] (default: 60)
    [/MAILBOXFilter=filter-name,filter-criteria[,filter-time-criteria]]
  where filtername can be:
      ATTACHMENTNAME|ENDDATETIME|FOLDER|MESSAGEBODY|SENDER|STARTDATETIME|SUBJECT|ALLCONTENT
  [/MAILBOXOriglocation=server-name,sg-name,db-name][/MAILBOXRESTOREDAte=date-stamp]
  [/MAILBOXRESTOREDESTination=dest[,dest-parms]]
  where dest can be:
      EXCHANGE|PST
  [/MAILBOXRESTORETIme=time-stamp]
  [/MOUNTWait=Yes|No] (default: Yes)[/Quiet]
  [/TEMPDBRESTorepath=pathname] (default: TEMP environment var)[/TSMNODe=nodename]
  [/TEMPLOGRESTorepath=pathname] (default: TEMP environment var)
  [/TEMPMAILBOXAlias=alias] (default: mailbox alias of the current user)
  [/TSMOPTFile=dsm.opt|filename] (default: dsm.opt)[/TSMPassword=password]
```

```
TDPEXCC SET PARMname=value
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)

  where PARMname and default values are:
     BACKUPDESTination=TSM|LOCAL|BOTH
     BACKUPMETHod=LEGACY|VSS
     DATEformat=
       1    MM/DD/YYYY
       2    DD-MM-YYYY
       3    YYYY-MM-DD
       4    DD.MM.YYYY
       5    YYYY.MM.DD
     LANGuage=3-letter country code
       ENU        American English
       PTB        Brazilian Portuguese
       CHS        Chinese, Simplified
       CHT        Chinese, Traditional
       FRA        Standard French
       DEU        Standard German
       ITA        Standard Italian
       JPN        Japanese
       KOR        Korean
       ESP        Standard Spanish
     LOCALDSMAGENTNODE=nodename
     LOGFile=tdpexc.log (filename)
     LOGPrune=60  (0..9999) | No
     MOUNTWait=Yes (Yes|No)
     NUMberformat=
       1    n,nnn.dd
       2    n,nnn,dd
       3    n nnn,dd
       4    n nnn.dd
       5    n.nnn,dd
       6    n'nnn,dd
     REMOTEDSMAGENTNODE=nodename
     TEMPDBRestorepath=path (pathname)
     TEMPLOGRestorepath=path (pathname)
     TIMEformat=
       1    HH:MM:SS
       2    HH,MM,SS
       3    HH.MM.SS
       4    HH:MM:SSA/P



EXAMPLES:

  TDPEXCC Backup "Storage Group 1" full
  TDPEXCC Query TSM
```

Help Example 2

This output example provides a sample of the text, messages, and process status that displays when using the Data Protection for Exchange **help** command.

The **tdpexcc help restore** command displays available help for Data Protection for Exchange query commands. The following output is displayed:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2010. All rights reserved.

TDPEXCC RESTore *|sgname1,...,sgnameN backuptype
  where backuptype can be:
    FULL|COPY|INCRemental|DIFFerential|DBCopy dbname
  [/BACKUPDESTination=TSM|LOCAL] (default: TSM)
  [/BACKUPMETHod=LEGACY|VSS] (default: LEGACY)
  [/CONFIGfile=tdpexc.cfg|filename] (default: tdpexc.cfg)
  [/ERASEexistinglogs=Yes|No] (default: No)
  [/EXCAPPlication=SRS] (default: Information Store)
  [/EXCSERVer=servername] (default: local exchange server)
  [/FROMEXCSERVer=servername] (default: local exchange server)
  [/INSTANTRestore=Yes|No] (default: Yes)
  [/INTOSG=sg-name] (default: NONE)
  [/LOGFile=tdpexc.log|logfilename] (default: tdpexc.log)
  [/LOGPrune=60|n|No] (default: 60)
  [/MOUNTDAtabases=No|Yes] (default: No)
  [/MOUNTWait=Yes|No] (default: Yes)
  [/OBJect=object] (default: current active object)
  [/PARTial=dbname1,..,dbnameN] (default: NONE)
  [/Quiet]
  [/RECOVer=APPLYALLlogs|APPLYRESToredlogs]
  [/TEMPLOGRESTorepath=pathname] (default: TEMP environment var)
  [/TSMNODe=nodename]
  [/TSMOPTFile=dsm.opt|filename] (default: dsm.opt)
  [/TSMPassword=password]
```

Chapter 6. Using the Tivoli Storage Manager scheduler

Information about how to use the Tivoli Storage Manager scheduler with Data Protection for Exchange to automate a full Legacy back up of Exchange Server storage groups is provided.

You can automate a full backup of Exchange Server storage groups as well. We recommend that you have the most current Tivoli Storage Manager backup-archive client installed.

For VSS operations, it is recommended that you set up different schedules to meet the policy needs that are defined for your Legacy and VSS backups.

Once Data Protection for Exchange has been registered to a Tivoli Storage Manager server and installed on the Exchange Server, the procedure involves the following steps:

1. **On the Tivoli Storage Manager server:**
   a. Define a schedule to run a Windows command file in the policy domain to which Data Protection for Exchange is registered.
   b. Associate the Data Protection for Exchange node to the defined schedule.
2. **On the machine where Data Protection for Exchange and the Exchange Server are installed:**
   a. Install the Tivoli Storage Manager scheduler client as a Windows service for Data Protection for Exchange. If a scheduler already exists for the regular Tivoli Storage Manager backup-client, install another one for Data Protection for Exchange.

      Note: If the schedule will back up Exchange Server 2007 CCR copies, the schedule must be running on the alternate node.
   b. Define a command file that contains Data Protection for Exchange commands to perform the desired backup.
   c. If you are running in a cluster server environment, install the Tivoli Storage Manager scheduler as a Windows service *on both cluster nodes*.
   d. If you are running in a cluster server environment, create a new cluster resource that represents the Tivoli Storage Manager scheduler. Verify that the cluster resource is started.
   e. Start the scheduler installed in step 2a (this is step 2.1 in some HTML browsers).

Example scheduler procedure

Refer to this example when scheduling backup operations.

This example assumes the following environment:

- Data Protection for Exchange is registered to a Tivoli Storage Manager server:
  - The node name is *mynode*.
  - The password is *mypassword*.
  - The policy domain is *mydomain*.
- The event to be scheduled:

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  - A daily full Legacy backup of all storage groups.
  - The backups begin between 9:00 and 9:15 pm.
- Exchange Server is installed on a Windows 2003 system.

Complete these tasks on the Tivoli Storage Manager server

You must set up a scheduler service on the machine where the backup-archive client is installed before performing this procedure.

1. Create a command file called c:\excfull.cmd. A sample command file (excfull.smp) is provided in the directory where Data Protection for Exchange is installed. This sample file contains commands necessary to perform a scheduled full Legacy backup of all Exchange Server storage groups to Tivoli Storage Manager storage. You must specify COMPLETE PATHNAMES in the command file for all file names and non-system commands.

   Note: Perform the following if you are setting up the scheduler for an Exchange Server running in a cluster environment:

   - Your command file must reside on the Exchange Server File Share. The schedule you define on the Tivoli Storage Manager server needs to match this command file. In Step 1 and Step 2, the command file *c*:\excfull.cmd could be *x*:\excfull.cmd where *x* is the Exchange Server File Share.
   - The ***tsmoptfile*** and ***logfile*** options specified in your command file must reflect the location of the options file and log file on the Exchange Server File Share.
   - The Exchange virtual server must be specified in the c:\excfull.cmd file. Use the ***excserver*** option to specify the Exchange virtual server in the command text located at the end of the c:\excfull.cmd file:

     ```
     tdpexcc backup * full /tsmoptfile=dsm.opt /logfile=excsch.log
     /excserver=virtualservername>> excfull.log
     ```

     Note that this command text is divided on two lines to accommodate page formatting.
2. Enter the following command to define the schedule. You can enter this command on the server console or from an administrative client. The administrative client does not have to be running on the same system as the Tivoli Storage Manager server.

   ```
   def sched mydomain my_schedule desc="Exchange Daily Full Legacy
   Backup" action=command objects="c:\excfull.cmd" priority=2 starttime=
   21:00 duration=15 duru=minutes period=1 perunits=day dayofweek=any
   ```

   Note that if there is a space in the directory specified for the ***object*** parameter, then the directory must be enclosed in two sets of quotation marks. For example:

   ```
   objects=""c:\Program Files\Tivoli\TSM\TDPEXchange\excfull.cmd""
   ```

   Tivoli Storage Manager displays this message:

   ```
   ANR2500I Schedule MY_SCHEDULE defined in policy domain MYDOMAIN.
   ```
3. Issue the following command to associate Data Protection for Exchange to this schedule:

   ```
   define association mydomain my_schedule mynode
   ```

   Tivoli Storage Manager displays this message:

   ```
   ANR2510I Node MYNODE associated with schedule MY_SCHEDULE in
    policy domain MYDOMAIN.
   ```

   A schedule is now defined on the Tivoli Storage Manager server with the following attributes:

- It runs a command file called c:\excfull.cmd.
- It begins at 9:00 pm.
- It is performed daily and can start on any day of the week.

You can use the Tivoli Storage Manager administrative commands **query schedule** and **query association** to confirm that the schedule and association are set correctly.

Complete these tasks on the Exchange Server

These tasks are performed on the Exchange Server.

This section of the procedure assumes the following environment:

- The Tivoli Storage Manager Backup-Archive client is installed on the Exchange Server in the `d:\Program Files\Tivoli\TSM\baclient` directory.
- Data Protection for Exchange is installed on the Exchange Server in the `d:\Program Files\Tivoli\TSM\TDPExchange` directory.
- The communication options in the dsm.opt option files located in these directories point to the Tivoli Storage Manager server to which the Exchange storage groups are to be backed up.

  The options file that is defined for Data Protection for Exchange is used by the scheduler when validating the node and password. The options file is also used when contacting the Tivoli Storage Manager server for schedule information.

  If this message displays:

  ```
  A communications error occurred connecting to
  the Tivoli Storage Manager Server
  ```

  Then:

  1. make sure the communication options in the dsm.opt file points to the correct Tivoli Storage Manager server.
  2. make sure the Tivoli Storage Manager server is running.

Perform the following steps on the Exchange Server:

1. Login using a Windows account that has administrative privileges.
2. Open a Windows command prompt window.
3. In the window, issue the following command:

   ```
   cd /d d:\"Program Files"\Tivoli\TSM\baclient
   ```

   You must place quotation marks around the section of a directory pathname that contains a space (for example: `d:\"Program Files"\Tivoli\TSM\baclient`. You can also use the short form of a pathname by placing a tilde (~) and unique identifier after the first six characters in the pathname. An example of the short form of the pathname is shown below:

   ```
   d:\Progra~1\Tivoli\TSM\baclient
   ```

   Note: If a Tivoli Storage Manager scheduler is already installed on your machine (for the regular backups of the Windows system), you need to install another scheduler (with a unique name) to run the schedules defined for Data Protection for Exchange. The Tivoli Storage Manager scheduler must have a different node name from the regular Tivoli Storage Manager backup-archive client.
4. In the window, issue the following command:

```
dsmcutil inst /name:"Data Protection for Exchange Scheduler"
/node:mynode /password:mypassword /autostart:yes
/clientdir:"d:\Program Files\Tivoli\TSM\baclient"
/optfile:"d:\Program Files\Tivoli\TSM\TDPExchange\dsm.opt"
/startnow:no
```

The Windows ID that is used to start the scheduler service may require that you specify the client **dsmcutil** options ***ntdomain***, ***ntaccount***, and ***ntpassword*** in this command.

Note: If you are setting up the scheduler for an Exchange Server running in a cluster environment:

a. Change the ***/autostart*** option to *no* and add the ***/clusternode*** and ***/clustername*** options. For example:

   ```
   /autostart:no /clusternode:yes /clustername:your cluster name
   ```

b. Move the Exchange virtual server to the secondary node of the cluster to create the scheduler service. Make sure the secondary node of the cluster has ownership of the Exchange virtual server.

c. The primary node of the cluster must contain the command file on the file share used to create the scheduler service.

d. Copy the options file (dsm.opt in the Step 4 example) to a shared drive associated with the virtual server. For example:

   ```
   /optfile:"x:\dsm.opt"
   ```

Tivoli Storage Manager displays this output:

```
TSM Windows Client Service Configuration Utility
Command Line Interface - Version 6, Release 1, Level 2.0
(C) Copyright IBM Corporation, 1990, 2010, All Rights Reserved.
TSM Api Verison 6.1.2

Command: Install TSM Client Service
Machine: TDPEX1(Local Machine)

Installing TSM Client Service:

Machine : MYNODE

Service Name : Data Protection for Exchange Scheduler

Client Directory : D:\Program Files\Tivoli\TSM\baclient

Automatic Start : yes

Logon Account : LocalSystem

The service was successfully installed.

Creating Registry Keys ...

Updated registry value 'ImagePath' .
Updated registry value 'EventMessageFile' .
Updated registry value 'TypesSupported' .
Updated registry value 'Data Protection for Exchange Scheduler' .
Updated registry value 'ADSMClientKey' .
Updated registry value 'OptionsFile' .
Updated registry value 'EventLogging' .
Updated registry value 'ClientNodeName'.

Generating registry password ...
Authenticating password with Tivoli Storage Manager for node MYNODE ....

Connecting to Tivoli Storage Manager via client options file
```

```
'd:\Program Files\Tivoli\TSM\TDPExchange\dsm.opt' ...

Password authentication successful.

The Registry password for node MYNODE has been updated .
```

Note: If you need to make corrections after installing a service:

a. Issue the following command to remove the service:

```
dsmcutil  remove /name:"Data Protection for Exchange Scheduler"
```

b. Issue the command in Step 4 again to install a new service.

Note: If you are setting up the scheduler service for an Exchange Server running in a cluster environment, repeat Step 1 through Step 4 on the secondary node of the cluster. IMPORTANT! The name of the scheduler service created by the **dsmc util** command in Step 4 and the cluster service must have the same logon authority.

5. The Tivoli Storage Manager scheduler is now installed but has not started. To start the scheduler IN A NON-CLUSTER ENVIRONMENT, issue the following command in the Windows command prompt window:

```
net start "Data Protection for Exchange Scheduler"
```

This output is displayed:

```
The Data Protection for Exchange Scheduler service is starting.
  The Data Protection for Exchange Scheduler service was started
  successfully.
```

Because ***/autostart***:*yes* is specified, the Tivoli Storage Manager scheduler automatically starts each time the Windows system is rebooted.

Note: The following steps are for the Microsoft Cluster Administrator interface in a Windows Server 2003 environment. If you are operating in a Windows Server 2008 environment, the step details are different. Consult the Microsoft Failover Cluster Management console documentation for the steps to follow using the new Microsoft Failover Cluster Management console that is included with Windows Server 2008.

- If you are creating the scheduler service in a *non-cluster* environment, proceed directly to Step 13.
- If you are creating the scheduler service in a *cluster* environment, perform Step 6 through Step 13.

The newly created scheduler service is tied to a cluster group. This allows the Tivoli Storage Manager scheduler to correctly fail over between the nodes and also manage automatic password changes.

6. Start the Cluster Administrator.
7. Select the Exchange Server Cluster Group and create a new Resource to represent the Data Protection for Exchange scheduler (**File–>New–>Resource**). Make sure the following parameters are specified:

Resource Type
Specify *Generic Service*.

Group Specify the Exchange Virtual Server.

Possible Owners
Make sure both node machines are listed. Add them if they are not listed.

Resource Dependencies
Make sure the Exchange Virtual server and the shared drives where the options file is located are listed.

Generic Service–>Service Name
Specify the exact name of the scheduler service.

For example:

```
Name:    Data Protection for Exchange Scheduler
Description:   Data Protection for Exchange Scheduler
Resource Type:    Generic Service
Group:     MARSEXC1

Dependencies: Microsoft Exchange Information Store Instance

Service Name:   Data Protection for Exchange Scheduler
    (this MUST match the name of the service
    that you installed earlier)

Registry Replication:  None
```

8. Select the new resource and modify its properties. Under the **Registry Replication–>Root Registry Key** parameter, add the exact key where the Data Protection for Exchange node name is listed. For example:

   ```
   SOFTWARE\IBM\ADSM\CurrentVersion\Nodes\<nodename>\<tsm-server-name>\
   ```

   Replace <nodename> with your Data Protection for Exchange node name. For example:

   ```
   SOFTWARE\IBM\ADSM\CurrentVersion\NODES\MYNODE\TSMServerName
   ```

9. In the Windows command prompt window, change to the Data Protection for Exchange installation directory.

   ```
   cd /d d:\"Program Files"\Tivoli\TSM\TDPExchange
   ```

10. Verify that the ***clusternode*** option in the dsm.opt file is set to *yes*. After this is verified, enter a command that connects with the Tivoli Storage Manager server. Specify the ***/tsmpassword***=*yourpassword* parameter to ensure the correct password is stored in the registry. This allows the scheduler to properly connect automatically to the Tivoli Storage Manager server.

    ```
    tdpexcc query tsm /tsmpassword=mypassword
    ```

11. From the Cluster Administrator, select the new resource and bring it online (**File–> Bring Online**).
12. After the new resource is online, move the Group from the secondary node to the primary node of the cluster. Verify that the Data Protection for Exchange scheduler service on the primary node has started.
13. Your system is now ready to run the scheduled full Legacy backups of the Exchange storage groups.

Scheduler considerations

Review these characteristics when defining a Tivoli Storage Manager schedule.

- If the schedule will back up Exchange Server 2007 CCR copies, the schedule must be running on the alternate node. Also, you must set up the scheduler service to be dependant on the cluster resource representing the CCR database. This dependence ensures that regardless of the node that the replica is running on, the replica copy is backed up.
- If you are using both Legacy and VSS Backups, make sure your backup schedules do not overlap as the second backup may fail. This failure is due to Exchange not allowing Legacy and VSS Backups to process at the same time.
- If you want to use the Tivoli Storage Manager server-prompted scheduling mode, you must ensure that the Data Protection for Exchange option file has the ***tcpclientaddress*** and ***tcpclientport*** options specified. If you want to run more than one scheduler service, use the same ***tcpclientaddress***. However, you must use different values for ***tcpclientport*** (in addition to the different node names). An example of running more than one scheduler service is when you are scheduling Data Protection for Exchange as well as the regular Windows backup client.

  Server-prompted scheduling is supported only when TCP/IP communication is being used. By default, Data Protection for Exchange uses the client polling schedule mode.
- If any changes that affect the scheduler are made to the Data Protection for Exchange options file, the scheduler has to be restarted in order to pick up the changes. An example of this is the Tivoli Storage Manager server address, the schedule mode, or the client TCP address or port. This can be done by issuing the following commands:

  ```
  net stop "Data Protection for Exchange Scheduler"
  net start "Data Protection for Exchange Scheduler"
  ```

  Note: IMPORTANT! If you are running the scheduler service in a cluster environment, use the Cluster Administrator to stop and restart your scheduler service. Do NOT use the *net stop* and *net start* commands.
- The default Tivoli Storage Manager scheduler log file (dsmsched.log) contains status information for the Tivoli Storage Manager scheduler. In this example, the file is located in this path:

  ```
  d:\Program Files\Tivoli\TSM\TDPExchange\dsmsched.log
  ```

  You can override this file name by specifying the ***schedlogname*** option in the Data Protection for Exchange options file.
- Data Protection for Exchange creates its own log file with statistics about the backed up storage group objects when the ***/logfile*** parameter is specified during the **tdpexcc** command. In the sample file (excfull.smp), the log file is excsched.log. This file is different from the Tivoli Storage Manager scheduler log file and must also be different from the file to which the **tdpexcc** command output is redirected. In the example above, this file is excfull.log.

  Note: Output from scheduled commands are sent to the scheduler log file (dsmsched.log). After scheduled work is performed, check the log to ensure the work completed successfully.

  When a scheduled command is processed, the scheduler log might contain the following entry:

  ```
  Scheduled event eventname completed successfully
  ```

This is merely an indication that Tivoli Storage Manager successfully issued the scheduled command associated with the *eventname*. No attempt is made to determine the success or failure of the command. You should assess the success or failure of the command by evaluating the return code from the scheduled command in the scheduler log. The scheduler log entry for the command's return code is prefaced with the following text:

```
Finished command. Return code is:
```

- If ***passwordaccess*** *generate* is not specified in the dsm.opt file, then the Tivoli Storage Manager password needs to be specified on the **tdpexcc** command. To specify the password, use the ***/tsmpassword*** parameter in the command file being run by the scheduler (excfull.cmd). You can also specify the password on the Data Protection for Exchange command line. For example:

  ```
  tdpexcc query tsm /tsmnode=mars1 /tsmpassword=newpassword
  ```

If you plan to perform scheduled VSS operations in a cluster environment, be aware of these considerations:

- Install the Tivoli Storage Manager scheduler as a Windows service on both cluster nodes.
- If the command file resides on a local drive, you must make sure that it remains consistent on all cluster nodes. Optionally, you can create the command file on a shared drive. Make sure the ***objects*** parameter (specified with the **define schedule** command on the Tivoli Storage Manager server) points to this command file.

Appendix A. Quick configuration (Legacy)

This section provides instructions on how to perform a quick install, configuration, and Legacy back up of a storage group using the Data Protection for Exchange GUI. This procedure applies to Exchange Server 2003 and Exchange Server 2007 only.

This Quick configuration applies to Legacy backups only. If you plan to perform VSS operations, you must follow configuration instructions provided in Chapter 3, "Configuring Data Protection for Exchange," on page 59. It minimizes set up time and allows you to proceed quickly to a state where you can begin backing up your Exchange storage group(s). See Chapter 3, "Configuring Data Protection for Exchange," on page 59 for detailed instructions on how to customize Data Protection for Exchange for your environment and processing needs.

1. Install Data Protection for Exchange from an account that is a member of the local Administrators group for the machine on which the Exchange server is running.
   - Detailed installation instructions are available in "Installing Data Protection for Exchange" on page 49.
2. In the `Program Files\Tivoli\TSM\TDPExchange` directory, edit this dsm.opt file with the following options:
   - ***nodename***: Specify the nodename of the machine where Data Protection for Exchange is installed. This is the unique name by which the Tivoli Storage Manager server recognizes your machine.
   - ***tcpserveraddress***: Specify the TCP/IP address of the Tivoli Storage Manager server to which you will back up your Exchange databases. You can specify the address as a domain name (`server.xyz.company.com`) or a dot address (`10.100.23.5`).
3. Launch the Data Protection for Exchange GUI by selecting **Start–>Programs–>Tivoli Storage Manager–>Data Protection for Exchange–>Exchange Client GUI**. By default, the Backup window displays and ***Legacy Backup*** is selected as the backup method.
4. Select the Exchange storage group(s) you want to back up in the Exchange Server tree by clicking on the box next to the desired storage group(s).
5. Select *Full* in the ***Backup Type*** drop-down menu of the Backup window.
6. Click the **Backup** button to start the backup process. Enter the Tivoli Storage Manager password provided by your Tivoli Storage Manager administrator when prompted. A **Backup Progress** panel displays that shows the progress of your backup.
7. When the backup is complete, click the **OK** button to return to the Backup window.
8. Exit the GUI by selecting **File–>Exit** in the Menu bar.

At this point, Data Protection for Exchange is installed, configured, and has performed the initial full backup of the selected storage group(s). Review the rest of this publication to become familiar with Data Protection for Exchange features, policies, procedures, and backup strategies, including VSS operations.

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Appendix B. Frequently asked questions

Answers related to frequently asked questions about Data Protection for Exchange are provided.

What do I need to perform Data Protection for Exchange mailbox-level and mailbox item-level restores?

Review these security requirements and prerequisites before you perform mailbox restore tasks on Exchange Server 2003:

"Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2003" on page 36

"Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2003" on page 162

Review these prerequisites before you perform Data Protection for Exchange mailbox restore tasks on Exchange Server 2007:

"Security requirements for Data Protection for Exchange mailbox restore tasks on Exchange Server 2007" on page 36

"Prerequisites for Data Protection for Exchange mailbox restore tasks on Exchange Server 2007" on page 163

How do I verify that I have Microsoft Exchange Server MAPI Client and Collaboration Data Objects (MAPI) correctly installed to perform Data Protection for Exchange mailbox restore operations on my Exchange Server?

Exchange Server 2003 is provided the Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 (MAPI) as a base product installation. However, for Exchange Server 2003 environments, you must update your local MAPI configuration file, mapisvc.inf, prior to performing mailbox restore operations to a .pst file. Use the Microsoft Exchange Server MAPI Editor (MAPI Editor) to verify your MAPI configuration. Please refer to your Microsoft documentation for further details.

For Exchange Server 2007 environments, MAPI 1.2.1 version 6.5.8147.0 or later must be installed on the Exchange Server that you will use to perform mailbox restore operations. Use the MAPI Editor to verify your MAPI configuration. Please refer to your Microsoft documentation for further details.

For Exchange Server 2010 environments, MAPI 1.2.1 version 6.5.8147.0 or later must be installed on the Exchange Server that you will use to perform mailbox restore operations. Use the MAPI Editor to verify your MAPI configuration. Please refer to your Microsoft documentation for further details.

How does a Data Protection for Exchange mailbox restore operation really do mailbox-level and mailbox item-level restores?

When a mailbox restore operation is initiated, Data Protection for Exchange performs the following actions:

1. Starts a session with the Tivoli Storage Manager server.
2. Queries the Tivoli Storage Manager server for a list of available backups.
3. Selects an appropriate backup based on user input.

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4. For Exchange Server 2010 environments only, when necessary, creates an Exchange Recovery Database.
5. For Exchange Server 2007 environments only, when necessary, creates an Exchange Recovery Storage Group.
6. For Exchange Server 2003 environments only, presents the user with the names of the storage groups and the databases that must be used to manually prepare an Exchange Server Recovery Storage Group.
7. Restores the selected backup into the Exchange Server 2007 Recovery Storage Group or Exchange Server 2010 Exchange Recovery Database.

   Note: Data Protection for Exchange will restore the databases necessary for the mailbox restore operation only, not the entire storage group (Exchange Server 2007) or database (Exchange Server 2007 or Exchange Server 2010). When restoring from multiple mailboxes with the same mailbox restore operation, each database (Exchange Server 2007 or Exchange Server 2010) to be restored will be restored only once, even if the mailboxes to be restored are on different databases (Exchange Server 2007 or Exchange Server 2010) or storage groups (Exchange Server 2007), or both.
8. Copies individual mailboxes or individual mailbox items from the Exchange Recovery Storage Group into the original storage group or other location.
9. Removes the Exchange Recovery Storage Group (Exchange Server 2007) or Exchange Recovery Database (Exchange Server 2010) and the associated files.

How do I use Data Protection for Exchange to restore a deleted mailbox or items from a deleted mailbox?

Review "Restoring a deleted mailbox or items from a deleted mailbox" on page 220

How can I verify that my Exchange Server is ready to perform VSS operations?

Review "Verify that an Exchange Server is ready to perform VSS operations" on page 81

Can I use IBM Tivoli Storage Manager for Copy Services Version 5.5.1 or later to perform a VSS Instant Restore of backups created with IBM Tivoli Storage Manager for Copy Services Version 5.3.3?

On **DS** storage: Backups created with IBM Tivoli Storage Manager for Copy Services Version 5.3.3 on local shadow volumes that reside on DS storage *cannot* be restored using VSS Instant Restore using IBM Tivoli Storage Manager for Copy Services Version 5.5.1 or later. You must create backups on local shadow volumes (residing on DS storage) using IBM Tivoli Storage Manager for Copy Services Version 5.5.1 or later to restore them using VSS Instant Restore. Backups that are created with IBM Tivoli Storage Manager for Copy Services Version 5.3.3 on local shadow volumes (residing on DS storage) can be restored using VSS Fast Restore using IBM Tivoli Storage Manager for Copy Services Version 5.5.1 (or later).

On **SAN Volume Controller** storage: Backups that are created with IBM Tivoli Storage Manager for Copy Services Version 5.3.3 on local shadow volumes that reside on SAN Volume Controller storage *can* be restored using VSS Instant Restore (and VSS Fast Restore) using IBM Tivoli Storage Manager for Copy Services Version 5.5.1 or later. See "VSS Instant Restore" on page 16 for more information.

Can I back up and restore a Local Continuous Replication (LCR) or Cluster Continuous Replication (CCR) copy?

Exchange Server 2007 CCR and LCR replica copies can be backed up and restored using the VSS method only. Microsoft does not allow Legacy backups of Exchange Server 2007 CCR and LCR replica copies. See "Continuous replication backups" on page 11 for more information. Be aware that all VSS Restores of a CCR or LCR replica can only be restored into the running instance of a storage group (primary, recovery, or alternate). Microsoft does not support VSS Restores into a replica instance.

If you want to back up from the replica copy when running in a CCR or LCR environment, select the ***From replica, if available*** option in the Backup window of the GUI or specify the **/fromreplica** parameter with the **backup** command on the command-line interface. Note that for CCR copies, you must run the backup while logged in to the secondary node of the cluster that currently contains the replica copy.

Can I back up and restore a Database Availability Group (DAG) copy?

Exchange Server 2010 DAG replica copies can be backed up and restored using the VSS method. See "Continuous replication backups" on page 11 for more information. Be aware that all VSS Restores of a DAG replica can only be restored into the running instance of a database (primary, recovery, or alternate). Microsoft does not support VSS Restores into a replica instance.

Can I back up and restore a Standby Continuous Replication (SCR) replica copy? No. Microsoft does not support VSS or Legacy backups of Standby Continuous Replication (SCR) replicas. If your Exchange Server 2007 environment is configured to use SCR replicas, you must back up the original database in the SCR scenario. See "Continuous replication backups" on page 11 for more information.

What is a VSS restore into operation?

A VSS **restore into** operation can be performed on VSS backups of Exchange Server 2007 data and Exchange Server 2010 data.

When performed on Exchange Server 2007 data, a VSS **restore into** operation allows a VSS Backup of Exchange Server 2007 data to be restored into the Recovery Storage Group, an alternate storage group, or a relocated storage group.

When performed on Exchange Server 2010 data, a VSS **restore into** operation allows a VSS Backup of Exchange Server 2010 data to be restored into the Recovery Database, an alternate database, or a relocated database.

See "Restoring VSS Backups into alternate locations" on page 19 for more information.

How do I restore data from a retired Exchange Server 2003 into an existing recovery storage group when the server no longer exists in the domain?

In this scenario, make sure to consult your Microsoft documentation for guidelines. In addition, make sure that the following conditions exist:

- The new storage group and database (where the data is to be restored) must have the exact same name as the storage group and database to be restored. The name must also match in terms of upper or lower case characters and parenthesis, if any.
- The database to be restored must be defined to the new storage group.

Can I use the same nodename for my Exchange Server 2003 and Exchange Server 2007 installations?

When an environment contains Exchange Server 2003 and Exchange Server 2007 installed on *separate* machines, the node name used for each machine must be different.

What applications must I configure to use Data Protection for Exchange features?

A list of applications (by feature) is provided in Table 13 "List of applications to configure" in Chapter 3, “Configuring Data Protection for Exchange,” on page 59

Are VSS Restores restored into the Recovery Storage Group or Recovery Database?

Yes. Exchange Server 2007 VSS Restores can be restored into the Recovery Storage Group or into an alternate storage group. See “VSS restore considerations” on page 99 and “Restoring VSS Backups into alternate locations” on page 19 for more information. Exchange Server 2010 VSS Restores can be restored into the Recovery Database or into an alternate database. See “VSS restore considerations” on page 99 and “Restoring VSS Backups into alternate locations” on page 19 for more information.

Can I perform VSS operations in a clustered Exchange Server environment?

Yes, Data Protection for Exchange supports VSS operations in a clustered Exchange Server environment. See “Using VSS operations in a cluster” on page 24 for detailed information.

Why can I not perform VSS operations?

The *IBM Tivoli Storage Manager for Copy Services Microsoft Exchange Integration Module* must be installed. See “Software and operating system requirements” on page 39 detailed information.

Why can I not perform VSS Instant Restore even though I have SAN Volume Controller or a DS storage subsystem installed?

If you are using the Tivoli Storage Manager backup-archive client Version 5.5.1, install the IBM Tivoli Storage Manager for Copy Services Hardware Devices Snapshot Integration Module Version 5.5.1. If you are using the Tivoli Storage Manager backup-archive client Version 6.1 (or later), the Hardware Devices Snapshot Integration Module is automatically installed with the Tivoli Storage Manager backup-archive client. As a result, you do not need to manually install this module. See “Software and operating system requirements” on page 39 for detailed information.

Why is the VSS Instant Restore failing over to a VSS Fast Restore?

A failover can occur if the Exchange data resides on storage subsystems that are not supported for VSS Instant Restore. See “VSS Instant Restore” on page 16 for information about failovers.

Can I use VSS Instant Restore to restore a single database (partial restore)?

You cannot perform a partial restore (***/partial***) while using VSS Instant Restore. You must restore ALL databases within the specified storage group when performing a VSS Instant Restore. Although Data Protection for Exchange allows this operation to begin, it will either fail or complete with undesirable consequences. If you need to restore just one database from a VSS Backup that resides on local VSS shadow volumes on DS or SAN Volume Controller disks, make sure to select the ***Disable VSS Instant Restore*** option in the Data Protection for Exchange GUI Restore Window

or specify */instantrestore=no* on the command-line interface. If VSS Instant Restore capability is needed for single databases, make sure to place these databases in their own storage group.

How can I use VSS and Legacy backups together in a common backup strategy?
See "Using VSS and Legacy Backups together (Exchange Server 2003 and Exchange Server 2007)" on page 21 and "Back up to Tivoli Storage Manager storage versus back up to local shadow volumes" on page 61 for detailed information.

Can I restore Legacy backups and VSS Backups together?
No, Legacy backups and VSS Backups cannot be mixed due to a Microsoft limitation. See "Using VSS and Legacy Backups together (Exchange Server 2003 and Exchange Server 2007)" on page 21 for more information.

Why are all my databases dismounted when I perform a VSS Restore?
All databases are dismounted during VSS Restore processing due to a Microsoft requirement.

How does VSS Instant Restore work?
VSS Instant Restore is a volume-level hardware-assisted copy where target volumes (that contain the snapshot) are copied back to the original source volumes. A SAN Volume Controller, XIV, DS6000, or DS8000 storage subsystem is required to perform VSS Instant Restores. See "VSS Instant Restore" on page 16 for more information.

Now that I am performing VSS operations, why are there so many active backups?
Tivoli Storage Manager policy manages VSS Backups residing on local shadow volumes and on Tivoli Storage Manager server storage. This allows for different policies which can lead to an increase in the number of active backups. See "How Tivoli Storage Manager server policy affects Data Protection for Exchange" on page 26 and "Back up to Tivoli Storage Manager storage versus back up to local shadow volumes" on page 61 for more information.

Can I use UNC drive letters with VSS offloaded backups?
No, Data Protection for Exchange VSS offloaded backups will not process correctly if the Exchange storage group, database, or log location are specified with UNC-based drive letters. For example, the following path uses UNC drive letters and is not supported in a VSS offloaded backup:

```
\\host_srv1\c$\Program Files\Exchsrvr\First Storage Group
```

The following path is specified correctly:

```
C:\Program Files\Exchsrvr\First Storage Group
```

Drive-based names are supported when using a volume mount point, cluster drive, or both. For example:

```
X:\Exch_Mount_Point\Program Files\Exchsrvr\First Storage Group
```

However, UNC-based naming (as shown in the following example) is not supported when using a volume mount point, cluster drive, or both:

```
\\host_srv1\x$\Exch_Mount_Point\Program Files\Exchsrvr\First Storage Group
```

Why do I receive a TCP/IP timeout failure when I have Windows internal VSS tracing turned on?
Data Protection for Exchange VSS operations may timeout with a TCP/IP failure when Windows internal VSS tracing is turned on because of the additional time required to write entries to the trace file. You can avoid

this issue by increasing the values for the Tivoli Storage Manager server ***commtimeout*** and ***idletimeout*** options or by decreasing the amount of Windows internal VSS tracing.

How do I perform mailbox-level and item-level backup and restore for Exchange?

With the Data Protection for Exchange mailbox restore feature, you can perform individual mailbox recovery and item-level recovery operations in Microsoft Exchange Server 2003, Microsoft Exchange Server 2007 and Microsoft Exchange Server 2010 environments on Data Protection for Exchange backups. See "Restoring individual mailbox and mailbox item-level data" on page 100 for details about this task.

How should I set up my policy settings for Data Protection for Exchange?

See the following sections for information about Data Protection for Exchange policy settings:

- "How Tivoli Storage Manager server policy affects Data Protection for Exchange" on page 26
- "Specifying Data Protection for Exchange options" on page 69

How do I perform an alternate server restore?

See Appendix C, "Advanced restore procedures," on page 219 for information about performing this procedure.

What should my Data Protection for Exchange performance settings be?

The default value of the ***buffers*** parameter (*3*) and the ***buffersize*** parameter (*1024*) have demonstrated the best performance in testing. However, environment factors such as network speed, physical database layout, machine resources, and Exchange Server resources all affect Data Protection for Exchange performance and should be considered when determining your settings. Note that the ***buffers*** and ***buffersize*** parameters apply to Legacy backups only.

See the following sections for more information:

- "Data Protection for Exchange performance overview" on page 36
- "Specifying Data Protection for Exchange options" on page 69
- "***/buffers*** and ***/buffersize*** parameters" (with the **backup** command) on "Backup optional parameters" on page 130.
- "***/buffers*** and ***/buffersize*** parameters" (with the **restore** command) on "Restore optional parameters" on page 144.
- "***/buffers*** and ***/buffersize*** parameter" (with the **set** command) on "Set positional parameters" on page 190.

Can I restore my Data Protection for Exchange Version 1 backups with later versions of Data Protection for Exchange?

No, you cannot restore Data Protection for Exchange Version 1 backups with later versions of Data Protection for Exchange (versions 2.2.0, 2.2.1, 5.1.5, 5.2.1, 5.3.3, 5.5.0, 5.5.1, 6.1, or 6.2.1). You must retain Data Protection for Exchange Version 1 for as long as you maintain Version 1 backups.

How do I set deleted item or deleted mailbox retention to avoid a mailbox level backup and restore?

See Appendix C, "Advanced restore procedures," on page 219 for information related to mailbox level backup and restore.

How do I schedule Data Protection for Exchange backups?

You can schedule Data Protection for Exchange backups by using the Tivoli Storage Manager Backup-Archive client scheduler.

See the following sections for more information:

- Chapter 6, "Using the Tivoli Storage Manager scheduler," on page 201
- "Backup types" on page 6
- "Backup strategies" on page 20

What should I do if I get an "unknown Exchange API error" when running Data Protection for Exchange?

See "What to do when you encounter a problem" on page xiv for more information about error messages.

How do I set up Data Protection for Exchange to run in a cluster?

The following sections contain information about using Data Protection for Exchange in a cluster environment:

- "Microsoft Cluster Server and Veritas Cluster Server Support" on page 38
- "**CLUSTERnode** option" in "Specifying Data Protection for Exchange options" on page 69
- "GUI operations in an MSCS or VCS environment" on page 105

Make sure the user can access the universal naming convention (UNC) share name of the directory specified by the ***templogrestorepath*** option. If that is not possible, specify a directory that has a valid share drive available and that is accessible to the user.

How do I know if my backup ran successfully?

A message displays that states the backup completed successfully. In addition, processing information is available in the following files:

- Data Protection for Exchange log file (default: tdpexc.log)

  This file indicates the date and time of a backup, data backed up, and any error messages or completion codes.
- Tivoli Storage Manager server activity log

  Data Protection for Exchange logs information on backup and restore commands to the Tivoli Storage Manager server activity log. A Tivoli Storage Manager administrator can view this log for you if you do not have a Tivoli Storage Manager administrator user ID and password.
- Tivoli Storage Manager API error log file (default: dsierror.log)

To prevent unsuccessful backups, consider the following information:

- Storage group databases in the Exchange Server Information Store must be mounted for a backup to complete successfully.
- An incremental back up of an Exchange Server database can fail if a previous full backup attempt of the same database terminated prematurely. If you receive Data Protection for Exchange errors ACN3025E or ACN4226E, perform a full backup of the database.
- A backup can fail if necessary transaction logs have been deleted or truncated. An error message will display stating that log files or patch files are missing. Perform the following steps to recover from this type of backup failure:

  1. Verify that only one product is performing backups on your system.
  2. Perform a full backup.

3. If an error is still encountered, shut down and restart the Exchange Server, then perform a full backup.
4. If an error is still encountered, reboot the machine, then perform a full backup.

How do the Exchange Server transaction logs get deleted?

Be aware that the Exchange Server deletes transaction logs, not Data Protection for Exchange. As a result, the Exchange Server only deletes logs containing transactions that have been committed to the Exchange database. During high processing times, the Exchange Server may not delete all the transaction logs. Thus, it is possible that log files remain after the Data Protection for Exchange backup completes.

What do I do when this Tivoli Storage Manager server error displays: "ANR9999D snmode.c(xxxx): Error validating inserts etc."?

You do not have to do anything as this message can be ignored. Installing a later version of Tivoli Storage Manager server will prevent this message from being displayed.

What authority do I need to perform a Data Protection for Exchange backup and restore?

See "Security" on page 35 for the required authority to perform Data Protection for Exchange backup and restore tasks.

Should I use the same *nodename* as used by my Backup-Archive client?

Legacy backups: It is recommended that you use different node names to simplify scheduling, data separation, and policy management tasks.

VSS Backups: You MUST use different node names.

See "Specifying Data Protection for Exchange options" on page 69 for more information.

How do I set up LAN-free to back up Data Protection for Exchange over my SAN?

See "LAN-free data movement" on page 37 for more information.

Can I run Data Protection for Exchange with multiple sessions backing up?

For Legacy backups, yes: you can run separate instances of Data Protection for Exchange to back up different storage groups.

See "Backup strategies" on page 20 for more information.

Microsoft does not recommend simultaneous snapshot creation for VSS backups.

Can I delete a single Data Protection for Exchange backup from the Tivoli Storage Manager server based on the date that the backup was performed?

For Legacy backups, no. It is not possible to delete a single Data Protection for Exchange backup from the Tivoli Storage Manager server. With VSS backups, you can delete a single backup.

Appendix C. Advanced restore procedures

The following procedure explains how you might need to restore your Exchange data after the rest of the machine system is recovered or installed.

The following topics go into detail about how to restore the entire machine or even your Exchange Server.

Complete restore or replacement

Information regarding a complete restore or replacement is provided.

For information on how to recover an Exchange Server 2003, see the "Exchange Server 2003 Disaster Recovery Operations Guide" at the following URL: `http://www.microsoft.com/technet/prodtechnol/exchange/2003/library/disrecopgde.mspx`

For information on how to recover an Exchange Server 2007, see the Microsoft TechNet magazine article, "Data Protection and Disaster Recovery for Exchange Server 2007" at the following URL: `http://support.microsoft.com/default.aspx?scid=kb;en-us;326052`

For information on how to recover an Exchange Server 2010, see the article "Understanding Backup, Restore and Disaster Recovery" at the following URL: `http://support.microsoft.com/default.aspx?scid=kb;en-us;326052`

Individual mailbox recovery

Information about individual mailbox recovery is provided.

Backing up Exchange servers at the item-level can cause the following issues:

- Insufficient scalability as item-level backups performed hourly on each day of the week have still proven to be an inadequate solution.
- Additional resource strain is added to the production servers.
- Since database backups are still performed, the Exchange data is duplicated as item-level backups result in the same data being backed up a second time.

To address these issues, Microsoft provides these features in Exchange:

- "Deleted Item Restore" can be configured to keep items within the Exchange Server databases, even after they have been deleted. This enables the items to be restored at a later time.
- "Deleted Mailbox Restore" can be configured to keep mailboxes within the Exchange Server databases, even after they have been deleted. This enables the items to be restored or reconnected at a later time.
- The Recovery Storage Group (Exchange Server 2003 and Exchange Server 2007) enables a database to be restored to a special storage group. Wizards and tools are provided by Exchange to extract data from this storage group. This can be performed without disrupting the production servers.

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- The Recovery Database (Exchange Server 2010) enables a database to be restored to a special database. Wizards and tools are provided by Exchange to extract data from this database. This can be performed without disrupting the production servers.

With the Data Protection for Exchange mailbox restore feature, you can perform individual mailbox and item-level recovery operations in Microsoft Exchange Server 2003, Microsoft Exchange Server 2007, or Microsoft Exchange Server 2010 environments utilizing Data Protection for Exchange backups. See "Restoring individual mailbox and mailbox item-level data" on page 100.

Restoring a deleted mailbox or items from a deleted mailbox

You can use the Data Protection for Exchange mailbox restore operation to restore a mailbox (or items from a mailbox) that was deleted from an Exchange Server.

Perform these steps to restore a deleted mailbox or items from a deleted mailbox prior to performing the mailbox restore operation:

1. For Exchange Server 2003 environments, create an active source-mailbox *regardless* of the restore destination of the deleted mailbox. For Exchange Server 2007 and Exchange Server 2010 environments, you must create an active source-mailbox to restore a deleted mailbox. If you must create an active source-mailbox, it must be created *prior* to performing the mailbox restore operation. Perform the following actions to create an active source-mailbox:
   a. Create a new user mailbox with the same mailbox-display name and mailbox-alias as the mailbox-display name and mailbox-alias of the deleted mailbox.
   b. Ensure the new mailbox is active. A mailbox is active after either the first login to the new mailbox or after the first time the mailbox receives mail.
2. Perform a Data Protection for Exchange mailbox restore operation to restore the deleted mailbox.

   Requirement: For Exchange Server 2007 and Exchange Server 2010 environments, Data Protection for Exchange requires a temporary mailbox to perform mailbox restore operations on mailboxes that were deleted, recreated, or moved since the time of the backup you are restoring from. Use the **/TEMPMAILBOXAlias** parameter to specify the temporary mailbox. Ensure that the temporary mailbox is active and has enough storage capacity to accommodate all items of the mailboxes that are being restored. See "Restoremailbox optional parameters" on page 166 for details about the TEMPMAILBOXAlias parameter.
   With the mailbox restore operation there are three options for choosing where to direct the restore of mailbox data from a deleted mailbox:
   - Restore the deleted mailbox data to the original location of the original mailbox.
   - Restore the deleted mailbox data into an active alternate mailbox in an online Exchange Server.
   - Restore the deleted mailbox data into an Exchange Server personal folders (.pst) file.

   However, prior to performing the mailbox restore operation for Exchange Server 2007 or Exchange Server 2010, you must create a new mailbox as instructed in Step 1.

Attention: If the backup containing the deleted mailbox was taken with a version of Data Protection for Exchange prior to version 6.1, and the mailbox has been relocated since the time it was backed up, you *must* use the /MAILBOXORIGLOCATION parameter of the "Restoremailbox command" on page 161 to specify the Exchange Server, the storage group, and the database where the mailbox resided at the time of backup. See "Restoremailbox optional parameters" on page 166 for details about the /MAILBOXORIGLOCATION parameter.

Restoring the Recovery Storage Group and the Recovery Database

Information about how to restore mailbox databases using the Recovery Storage Group (Exchange Server 2003 and Exchange Server 2007) and the Recovery Database (Exchange Server 2010) feature is provided.

Legacy restores can be performed in Exchange Server 2003 or Exchange Server 2007 environments. VSS Restores to the Recovery Storage Group (Exchange Server 2007) or Recovery Database (Exchange Server 2010) can be performed in Exchange Server 2007 and Exchange Server 2010 environments only, as VSS Restores are not supported by Microsoft in Exchange Server 2003.

Requirements for using the Recovery Storage Group or Recovery Database

These requirements must be met for this procedure to be successful.

- For Legacy restores, the mailbox database to be restored can reside on any server running Exchange Server 2003 or Exchange Server 2007 within the same Admin group.
- For VSS Restores, the mailbox database to be restored can reside on any server running Exchange Server 2007 or Exchange Server 2010 within the same Admin group.
- If you are restoring multiple Exchange Server 2003 or Echange Server 2007 mailbox stores at the same time, they all must be from a single storage group.
- You must run the restore from an account that has Receive As and Send As permissions on all mailboxes to be restored.
- You cannot use multiple instances of Data Protection for Exchange to restore databases into the Recovery Storage Group (Exchange Server 2003 and Exchange Server 2007) or Recovery Database (Exchange Server 2010) simultaneously.

Restoring data to a Recovery Storage Group or Recovery Database

This procedure assumes that you have already backed up your storage group (Exchange Server 2003 or Exchange Server 2007) or database (Exchange Server 2010).

Information regarding Recovery Storage Group or Recovery Database processing is written to the Data Protection for Exchange activity log file (tdpexc.cfg by default).

Note: When restoring to a Recovery Storage Group or Recovery Database, you must specify the option to replay restored logs only, otherwise the restore operation may fail. Select ***Replay Restored Logs ONLY*** in the GUI Restore Window or specify ***/recover***=*applyrestoredlogs* on the command line.

1. Use the Exchange System Manager (Exchange Server 2003) or Exchange Management Console (Exchange Server 2007 and Exchange Server 2010) to create the Recovery Storage Group (Exchange Server 2003 or Exchange Server 2007) or Recovery Database (Exchange Server 2010) if one does not already exist.
2. Use the Exchange System Manager (Exchange Server 2003) or Exchange Management Console (Exchange Server 2007) to add the mailbox database you want to restore to the Recovery Storage Group.
3. Use Data Protection for Exchange to restore the mailbox database. Make sure that no public folders within the storage group or database are selected.
   - **Legacy restore Recovery Storage Group processing:**

     For legacy restores, by default, the database is restored directly to the Recovery Storage Group. The Data Protection for Exchange GUI will display a text message to remind you that all mailbox database restores will go to the Recovery Storage Group if a Recovery Storage Group exists. For legacy restores, if a Recovery Storage Group does *not* exist, the database is restored directly to the original storage group.
   - **VSS Restore Recovery Storage Group processing (Exchange Server 2007 only):**

     For VSS Restores, you must select the name of an Exchange Server 2007 storage group into which a VSS Backup will be restored (using the GUI "Restore Into" window or the command-line interface /INTOSG parameter). In order to restore into a Recovery Storage Group, a Recovery Storage Group must already exist (with the databases to be restored already added to it) before you attempt the restore operation.
   - **VSS Restore Recovery Database processing (Exchange Server 2010 only):**

     For VSS Restores, you must select the name of an Exchange Server 2010 database into which a VSS Backup will be restored (using the GUI "Restore Into" window or the command-line interface /INTODB parameter). In order to restore into a Recovery Database, a Recovery Database must already exist before you attempt the restore operation.

   Attention: Please note that only transaction logs that are contained in the backup will be applied to the mailbox database when performing a Recovery Storage Group or Recovery Database restore.

Restoring a Continuous Cluster Replication database copy on Exchange Server 2007

This procedure assumes that you have already backed up your Exchange Server 2007 storage group.

Follow these steps to restore a replicated database copy in a Continuous Cluster Replication (CCR) environment. You can perform some of these steps using either the Exchange Management Console or the Exchange Management Shell commands, which are provided below in parentheses.

1. Make the mailbox server active that hosts the storage group that you want to restore (Move-ClusteredMailboxServer).
2. Suspend replication of the copies of the storage group. Perform this step on both the passive CCR and the passive SCR nodes (Suspend-StorageGroupCopy).
3. Dismount the database in the storage group (Dismount-Database). If you are using the GUI, the databases are automatically dismounted for you.

4. Restore the database and logs using the Data Protection for Microsoft Exchange Server command line or the GUI. If you want databases to be mounted automatically after the restore, use the **/MOUNTDAtabases** command line option, or select **Mount Databases After Restore** in the Restore panel.
5. Mount the restored database (Mount-Database). Omit this step if the database was mounted automatically in the previous step.
6. Verify the health of the storage group before you update or reseed to replicated database copies.
7. Update or reseed the replicated storage group on the passive node and on any SCR nodes (Update-StorageGroupCopy).
8. If necessary, make the mailbox server active that hosts the restored storage group or database (Move-ClusteredMailboxServer).
9. Check the health of the CCR copies (Get-ClusteredMailboxServerStatus).

Restoring a Database Availability Group database copy

This procedure assumes that you have already backed up your database.

Follow these steps to restore a replicated database copy in a Database Availability Group (DAG). You can perform some of these steps using either the Exchange Management Console or the Exchange Management Shell commands, which are provided below in parentheses.

1. Make the database active that you want to restore. (Move-ActiveMailboxDatabase)
2. Suspend replication of the all passive copies of the database (Suspend-MailboxCopy).
3. Dismount the active mailbox database (Dismount-Database).
4. Restore the database and logs using the Data Protection for Exchange command line or the GUI. If you want the database to be mounted automatically after the restore, use the ***/mountdatabases*** command line option, or select **Mount Databases After Restore** in the Restore panel.
5. If not performed in Step 4, mount the active mailbox database (Mount-Database).
6. Verify the health of the database before you update or reseed to replicated database copies. (Get-MailboxDatabaseCopyStatus)
7. Update or reseed all replicas (Update-MailboxDatabaseCopy). This step avoids potential transaction log synchronization problems that might arise if replication were resumed directly.
8. Move the active database to the desired server. (Move-ActiveMailboxDatabase)

Restoring backups to an alternate server

An alternate server restore is restore of backups that were backed up on one server (Server1) and restored using a different server (Server2). A typical reason for performing an Alternate Server Restore is that a restore operation consumes too many resources to be run on the production server.

A common scenario consists of restoring backups from one server into a Recovery Database (Exchange Server 2010) or a Recovery Storage Group (Exchange Server 2003 or 2007) on another server. The example in this procedure uses two servers: Server1 and Server2. Server1 is the production server running scheduled backups of the production Exchange databases or storage groups. Server2 is not a

production server; it is used by the Exchange administrator for administrative tasks and is used to run a VSS restore operation.

VSS operations require two nodes to work in tandem backup or restore data. One node represents Data Protection for Exchange, and the other node represents the LOCALDSMAGENTNODE. This is also the VSS requestor. Legacy restores do not use a VSS requestor.

In this example, the Data Protection for Exchange NODENAME for Server1 is known by the Tivoli Storage Manager server as SERVER1_EXC, and the LOCALDSMAGENTNODE for Server1 is known by the Tivoli Storage Manager server as SERVER1. For Server2, the NODENAMEs are SERVER2_EXC and SERVER2 respectively.

1. In order for Server2 to access the backups for Server1, two things must occur.
   a. (VSS restores only) Server2 must have permission to access the backups done by Server1 on the Tivoli Storage Manager server. This is done using the Tivoli Storage Manager server GRANT PROXY command: `GRANT PROXY TARGET=SERVER1_EXC AGENT=SERVER2`
   b. The Data Protection for Exchange client on Server2 must be configured so that it can query and restore backups done by Server1. To do this the NODename option of the Data Protection for Exchange client on Server2 is changed to the NODename option of the Data Protection for Exchange client on Server1 in the `dsm.opt` file in the Data Protection for Exchange directory. (By default, this is `c:\Program Files\Tivoli\TSM\TDPExchange`). We recommend making a copy of your original `dsm.opt` file and renaming the copy to `dsm_Server1`, then modifying the NODename value in the `dsm_Server1.opt` file to SERVER1_EXC. Original NODename: SERVER2_EXC Updated NODename: SERVER1_EXC All subsequent commands require the `/TSMOPTFILE=dsm_Server1.opt` option to access the Tivoli Storage Manager server with the Server1 node name.
2. The first time that you query the Tivoli Storage Manager server after updating the `dsm_Server1.opt` file, you will need to supply the password for Server1. If your are using the CLI, we recommend that you use the /tsmpassword option on the first query to save the password.
   a. Query and save the password. `tdpexcc query tsm /tsmpassword=secret /tsmoptfile=dsm_server1.opt`
   b. Now you can query the Tivoli Storage Manager server without the specifying the password. `tdpexcc query tsm /tsmoptfile=dsm_server1.opt`

   If you are using the GUI, you are prompted for the password if it is not saved. By default, the GUI uses the `dsm.opt` file in the installation directory. In order to use the OPT file that you created, in this example `dsm_server1.opt`, launch the GUI from the command line and pass in the /TSMOPTFILE option. (You cannot launch the GUI from the MMC using this option.)
   a. Launch the GUI from command line with /TSMOPTFILE option `tdpexc /tsmoptfile=dsm_server1.opt`
3. 3) Restore the Exchange database into the Recovery Database (Exchange Server 2010) or the storage group into a Recovery Storage Group (Exchange Server 2003 or Exchange Server 2007). If you are doing an Individual Mailbox Recovery only, then skip this step.
   - CLI

     a) You can query for all available backups with the following command. The /FROMEXCSERVer and /TSMOPTFILE options are required.`tdpexcc query TSM * /FROMEXCSERVer=server1 /tsmoptfile=dsm_server1.opt /ALL`

b) Issue the restore command. The /FROMEXCSERVer option is required. Follow the procedure in "Restoring data to a Recovery Storage Group or Recovery Database" on page 221. Include the /fromexcserver=Server1 and /TSMOPTFILE=dsm_server1.opt options in all your commands.

- GUI

  a) By default, the GUI uses the `dsm.opt` file in the installation directory. In order to use the OPT file that you created, in this case `dsm_server1.opt`, launch the GUI from the command line, and pass in the /TSMOPTFILE option. You cannot launch the GUI from the MMC. Launch the GUI from command line with the /TSMOPTFILE option. For example:`tdpexc /tsmoptfile=dsm_server1.opt`

  b) Follow the procedure in "Restoring data to a Recovery Storage Group or Recovery Database" on page 221.

4. Follow these steps if you are doing an Individual Mailbox Recovery from an alternate server.

   - CLI

     a) Issue the Individual Mailbox Recovery command. Follow the procedure in "Individual mailbox recovery" on page 219. Include the /TSMOPTFILE=dsm_server1.opt option in all your commands.

   - GUI

     a) By default, the GUI uses the `dsm.opt` file in the installation directory. In order to use the OPT file that you created; in this case `dsm_server1.opt`, you must launch the GUI from the command line and pass in the /TSMOPTFILE option. You cannot launch the GUI from the MMC. Launch the GUI from command line with the /TSMOPTFILE option. For example:`tdpexc /tsmoptfile=dsm_server1.opt`

     b) Follow the procedure in the "Individual mailbox recovery" on page 219 section in appendix C of this document.

Appendix D. Transitioning Exchange Server backups from Tivoli Storage FlashCopy Manager to Tivoli Storage Manager

Configure Tivoli Storage FlashCopy Manager so that you can access both a local and Tivoli Storage Manager server at the same time. This might be useful if you decide to move to a Tivoli Storage Manager environment and want to continue to interact with the locally managed snapshots until policy marks them for expiration.

Tivoli Storage FlashCopy Manager works when connected to the local Tivoli Storage FlashCopy Manager server or a Tivoli Storage Manager server. The Tivoli Storage Manager server can be located anywhere on your network. The Tivoli Storage FlashCopy Manager Snapin includes two configuration wizards. These enable you to do a local configuration and a Tivoli Storage Manager configuration. You can move from one type of server to another by running the corresponding configuration wizard at any time.

Note: Some command examples provided in this section are formatted on multiple lines. Issue each command on a single line.

Complete these tasks on the Tivoli Storage Manager server

Coordinate efforts with your Tivoli Storage Manager server administrator to get these tasks completed:

1. Select or create the policy definitions that will be used for each type of backup you plan to use. You can provide the administrator with the existing locally-defined policy settings in your Tivoli Storage FlashCopy Manager stand-alone environment. Use the GUI or the command-line interface of Data Protection for Exchange to retrieve this information.
2. Register your Data Protection for Exchange node name and password with the Tivoli Storage Manager **register node** command. For example:

   ```
   register node DPnodename DPpassword
   ```
3. If not already defined in the Tivoli Storage Manager server, register the Tivoli Storage Manager backup-archive client node name and password for the workstation where the Exchange server is installed. For example:

   ```
   register node BAnodename BApassword
   ```
4. Define the proxy node relationship for the Target Node and agent nodes with the Tivoli Storage Manager **grant proxynode** command. For example:

   ```
   grant proxynode target=DP agent=BAnodename
   ```

Complete these tasks on the workstation running the Exchange Server

1. In the directory where the Data Protection for Exchange is installed, make a copy of the options file named dsm.opt. After you begin using the Tivoli Storage Manager server, the copy is used for access to the Tivoli Storage FlashCopy Manager stand-alone environment. One method of making the copy is to start the Exchange command line prompt from the Tivoli Storage FlashCopy Manager Snapin: In the Tivoli Storage FlashCopy Manager Snapin Tree view, an Exchange server node is displayed for each Exchange server instance on the computer.

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a. Select an Exchange server instance in the tree view. The integrated command line and an Actions pane is displayed.
b. Launch the Data Protection for Exchange command line from the Actions pane. Select:

   ```
   Launch Command Line
   ```

c. To make a copy of the options file, enter:

   ```
   copy dsm.opt dsm_local.opt
   ```

2. In the same directory, make a copy of the Data Protection for Exchange configuration file. For example:

   ```
   copy tdpexc.cfg tdpexc_local.cfg
   ```

   Preserve the contents of the local configuration file if:

   - you have specified policy bindings during the use of Tivoli Storage FlashCopy Manager.
   - you will be updating the policy bindings to reflect changes in your policy specifications for your Tivoli Storage Manager server usage.

3. In the Tivoli Storage Manager backup-archive client installation directory, make a copy of the VSS requestor options file named dsm.opt. Use the Windows **copy** command. For example:

   ```
   C:\Program Files\Tivoli\TSM\baclient>copy dsm.opt dsm_local.opt
   ```

4. In all of the files named dsm.opt, modify the TCPSERVERADDRESS line. Replace FLASHCOPYMANAGER with the IP address of the Tivoli Storage Manager server. For example:

   ```
   TCPServeraddress 9.52.170.67
   ```

   To accomplish this task, use a text editor like Notepad or Wordpad.

5. To access the Tivoli Storage FlashCopy Manager stand-alone environment during the transition period, open a Windows command prompt and change the directory to the Tivoli Storage Manager backup-archive client installation directory. The default is:

   ```
   C:\Program Files\Tivoli\TSM\baclient
   ```

   Create an alternate Windows service for the Tivoli Storage Manager Client Acceptor service by using the **dsmcutil** command. For example:

   ```
   dsmcutil install cad /name:tsmcad4local
   /node:my_backup-archive_client_node
   /password:my_TSM_server_password
   /optfile:"C:\Program Files\Tivoli\TSM\baclient\dsm_local.opt"
   /httpport:1583
   ```

   For more information on using the **dsmcutil** command, refer to the information on using the client service configuration utility in the Tivoli Storage Manager Windows Backup-Archive Clients Installation and User's Guide.

6. Create an alternate Windows service for the Tivoli Storage Manager remote agent service. For example:

   ```
   dsmcutil install cad /name:tsmcad4local
   /node:my_backup-archive_client_node
   /password:my_TSM_server_password
   /optfile:"C:\Program Files\Tivoli\TSM\baclient\dsm_local.opt"
   /httpport:1583
   ```

7. Edit the dsm_local.opt file in the Data Protection for Exchange installation directory. Add this line:

```
HTTPPORT 1583
```

8. Start the alternate Tivoli Storage Manager Client Acceptor service:

   ```
   dsmcutil start /name:tsmcad4local
   ```

9. Stop and restart the original Tivoli Storage Manager Client Acceptor service so that the new values in the dsm.opt file are activated. You can do this through the Windows Services GUI or by using the **dsmcutil** command:

   ```
   dsmcutil stop /name:"TSM Remote Client Agent"
   dsmcutil stop /name:"TSM Client Acceptor"
   dsmcutil start /name:"TSM Client Acceptor"
   ```

10. As backups start occurring and are managed in the Tivoli Storage Manger server environment, you will need to phase out the remaining backups created in the Tivoli Storage FlashCopy Manager stand-alone environment. You can choose between two ways of achieving the phase-out:

    a. In the Tivoli Storage FlashCopy Manager stand-alone environment, define a time-based policy that will automatically cause the old backups to expire and be deleted . For example, if you want to expire each backup after it is 30 days old, update the time-based policy by using the command:

       ```
       tdpexcc update policy mypolicy /daysretain=30
       /tsmoptfile=dsm_local.opt
       /configfile=tdpexc_local.cfg
       ```

       You can also make this change using the Local Policy Management dialog that is accessed from the Utilities menu of the Data Protection for Exchange Backup/Restore GUI. Information on how to start the GUI is located below in the section describing how to access the Tivoli Storage FlashCopy Manager stand-alone environment.

       The process of expiring backups when their age exceeds the daysretain limit depends upon a basic function that is run in the stand-alone environment. The function must include an operation that queries the backups.If you will not be regularly using the stand-alone environment client, you can use a scheduler to periodically start a command such as:

       ```
       tdpexcc query tsm * /all
       /tsmoptfile=dsm_local.opt
       /configfile=tdpexc_local.cfg
       ```

       For example, if your backups are created each week, then you can schedule the **query** command above to run once a week in order to cause the expiration of out-of-date backups.

       The very last backup, that is created while running the stand-alone environment, will not be automatically deleted by the process of expiring the backups. For that, you will need to use the explicit delete operation, as described next.

    b. Alternatively, you can explicitly delete each backup when you determine that it is no longer needed. Use the Data Protection for Exchange **delete backup** command, or the Delete Backup (right mouse-click menu option) in the GUI Restore window.

11. To access the Tivoli Storage FlashCopy Manager stand-alone environment:

    a. Start the Exchange Client – Command Line prompt.

    b. Start Tivoli Storage FlashCopy Manager stand-alone commands by appending the /tsmoptfile option, for example:

       ```
       tdpexcc query tsm * /all
       /tsmoptfile=dsm_local.opt
       /configfile=tdpexc_local.cfg
       ```

c. Start the GUI (from the Command Line prompt) by issuing the GUI invocation command, for example:

```
tdpexc /tsmoptfile=dsm_local.opt
/configfile=tdpexc_local.cfg
```

12. If necessary, start the Tivoli Storage FlashCopy Manager stand-alone environment to restore from a backup that was created in that environment.
13. When the transition is complete and you no longer need to access the Tivoli Storage FlashCopy Manager stand-alone environment, you can remove the alternate services. To do this, use the Windows Services GUI or the **dsmcutil** command:

```
dsmcutil remove /name:tsmagent4local
dsmcutil remove /name:tsmcad4local
```

Appendix E. Data Protection for Exchange messages reference

Data Protection for Exchange messages changes

This section contains lists of the new, changed, and deleted Data Protection for Exchange messages. The changes occurred since the last edition of this publication, November 2007.

New Data Protection for Exchange messages

- ACN5892E
- ACN5893E
- ACN5901E
- ACN5902E
- ACN5906E
- ACN5907E
- ACN5908E
- ACN5909E
- ACN5910E
- ACN5911E
- ACN5912E
- ACN5915W
- ACN5916E
- ACN5917I
- ACN5918W
- ACN5920E
- ACN5921E
- ACN5922E
- ACN5923E
- ACN5924E
- ACN5929E
- ACN5930E
- ACN5931E
- ACN5932E
- ACN5934E

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Changed Data Protection for Exchange messages

In addition to the message number, the part of the message that has changed is listed.

Message Number	Change
ACN5067	Message type

Deleted Data Protection for Exchange messages

There are no deleted messages.

Data Protection for Exchange messages (ACN0000–ACN9999)

This section contains a listing of messages for Data Protection for Exchange.

The messages contain a common **ACN** message prefix and a unique message number. The messages are listed in numeric order.

This section also contains Diagnosis, Modification, or Tuning Information. Some of these messages include information about the Tivoli Storage Manager error log that you can use when working with your service representative.

ACN0003S: An internal processing error has occurred.

Explanation

An internal processing error has occurred.

System action

Processing ends.

User response

Retry the operation. If this error persists, contact your service representative.

ACN0004E: An unknown error has been detected.

Explanation

An internal processing error has occurred that prevents the generation of a message for a return code.

System action

Processing continues.

User response

Retry the operation. If this error persists, contact your service representative.

ACN0005E: Out of memory. Stop other processes and try the operation again.

Explanation

The machine has run out of memory.

System action

Processing continues.

User response

Close unnecessary processes and try the operation again.

ACN0053E: License file (*licensefile*) could not be opened.

Explanation

An attempt to read from the license file failed.

System action

Processing ends.

User response

Install the product again. This ensures that the correct license file is installed.

ACN0054E: Read failure on license file (*licensefile*).

Explanation

An attempt was made to read from the license file. This attempt failed.

System action

Processing ends.

User response

Reinstall the product. This will ensure that the correct license file is installed.

ACN0055E: Write failure on license file (*licensefile*).

Explanation

An attempt to write to the license file failed.

System action

Processing ends.

User response

Make sure enough space exists on the workstation to write to the license file. If enough space exists, run the command again.

ACN0056E: Data in the license file (*licensefile*) is not in a valid format.

Explanation

An attempt to read information from the license file failed.

System action

Processing ends.

User response

Install the product again.

ACN0057E: The checksum in the license file (*licensefile*) does not match the license string text.

Explanation

An attempt was made to read information from the license file. The checksum was not valid so it appears that the license file is not at the correct level.

System action

Processing ends.

User response

Reinstall the product.

ACN0058E: The 'Try and Buy' license has expired.

Explanation

This 'Try and Buy' license that was detected has expired.

System action

Processing ends.

User response

This product is no longer valid for use. A valid license must be obtained before running the product.

ACN0100E: Incomplete command:

Explanation

This message displays the incomplete command that was entered.

System action

Processing ends.

User response

Re-enter the complete command.

ACN0101E: Invalid argument:

Explanation

This message displays the command that was entered, up to and including the invalid command or option argument that was detected.

System action

Processing ends.

User response

Re-enter the command specifying a valid argument for the command or option.

ACN0102E: Invalid command:

Explanation

This message displays the invalid command that was entered.

System action

Processing ends.

User response

Re-enter a valid command.

ACN0103E: Invalid option for the specified command:

Explanation

This message displays the command that was entered, up to and including the option that was detected as invalid for the command.

System action

Processing ends.

User response

Re-enter the command specifying valid command options.

ACN0104E: Invalid option:

Explanation

This message displays the command that was entered, up to and including the invalid option that was detected.

System action

Processing ends.

User response

Re-enter the command specifying valid command options.

ACN0105E: Missing argument:

Explanation

This message displays the command that was entered, up to and including the command or option whose required argument is missing.

System action

Processing ends.

User response

Re-enter the command specifying a valid argument for the command or option.

ACN0132W: Tracing could not be started. Processing will continue.

Explanation

A problem prevented tracing from beginning.

System action

Processing will continue with the command entered.

User response

Refer to the other messages that display with this message to determine the problem.

ACN0133W: Could not locate installation directory. Attempting to continue...

Explanation

An attempt was made to read the registry to determine where the Tivoli Data Protection application client was installed. This attempt failed.

System action

Processing will continue with the command entered.

User response

There should be other messages along with this one. Refer to the other messages to determine the problem. If the problem can not be determined, it may be necessary to reinstall the application client code. This will ensure that the registry entries are set up correctly.

ACN0134W: Could not locate log directory. Processing will continue...

Explanation

An attempt was made to read the registry to determine where the Tivoli Data Protection application client log is located. This attempt failed.

System action

Processing will continue with the command entered.

User response

There should be other messages along with this one. Refer to the other messages to determine the problem. If the problem can not be determined, it may be necessary to reinstall the application client code. This will ensure that the registry entries are set up correctly.

ACN0150I: Operation canceled by user.

Explanation

The user has requested that the IBM Tivoli Storage Manager application client end by entering ctrl-C.

System action

Processing ends.

User response

None

ACN0151E: Errors occurred while processing the request.

Explanation

Attempting to process the request entered, an error occurred.

System action

Processing ends.

User response

Attempt to determine the source of the errors from viewing the log file. Correct the problems and try running the command again.

ACN0152I: Performance stats: *seconds* seconds spent in *apicall* API calls

Explanation

The indicated number of seconds were spent making API calls for the indicated system.

System action

Processing continues.

User response

None

ACN0153I: Performance stats: *seconds* seconds spent in *function*

Explanation

The indicated number of seconds were spent the named function.

System action

Processing continues.

User response

None

ACN0154E: The IBM Tivoli Storage Manager application client cannot work with the version of the Tivoli Storage Manager API you have installed. Please install version *version*.*release*.*level* or greater.

Explanation

The version of the Tivoli Storage Manager API currently installed on the system is older than the version used to build the IBM Tivoli Storage Manager application client.

System action

Processing ends.

User response

Install a version of the Tivoli Storage Manager API at or later than the indicated level. A copy is distributed with the IBM Tivoli Storage Manager application client.

ACN0155E: The IBM Tivoli Storage Manager application client cannot work with the release of Tivoli Storage Manager API you have installed. Please install release *version.release.l evel* or greater.

Explanation

The release of the Tivoli Storage Manager API currently installed on the system is older than the release used to build the IBM Tivoli Storage Manager application client.

System action

Processing ends.

User response

Install a release of the Tivoli Storage Manager API at or later than the indicated level. A copy is distributed with the IBM Tivoli Storage Manager application client.

ACN0156E: Could not load the Tivoli Storage Manager API.

Explanation

The Tivoli Storage Manager API could not be loaded.

System action

Processing ends.

User response

Ensure the Tivoli Storage Manager API is correctly installed. Run the IBM Tivoli Storage Manager application client with the /TRACEFLAGS=API /TRACEFILE=filename options and view the tracefile to determine why it could not be loaded. Another possible cause is that the TSMAPI.DLL does not exist in the system directory. Re-install the Tivoli Storage Manager API, if this is the case.

ACN0160E: An authentication error occurred with your stored Tivoli Storage Manager password.

Explanation

You were unable to log on to the Tivoli Storage Manager server due an authentication error.

System action

Processing stops.

User response

The stored Tivoli Storage Manager password may have become corrupted. Contact your Tivoli Storage Manager server administrator.

ACN0161E: Authentication error. The password entered is not valid. You are not logged on to the Tivoli Storage Manager server.

Explanation

An incorrect password was entered.

System action

Processing stops.

User response

Enter the correct Tivoli Storage Manager password and try again.

ACN0162E: The passwords entered do not match. Please enter them again.

Explanation

An incorrect password was entered.

System action

Processing stops.

User response

Enter the passwords again.

ACN0163E: The directory path needs to be fully-qualified.

Explanation

The /intopath option was specified without a fully-qualified path.

System action

Processing stops.

User response

Enter the command again and specify a fully-qualified path in the /intopath option.

ACN0167E: The fully-qualified file name is too long.

Explanation

An attempt was made to use a fully-qualified file name that was too long. This attempt failed.

System action

Processing ends.

User response

None

ACN0200E: File (*filename*) could not be opened for reading.

Explanation

An attempt was made to open a file for reading. This attempt failed.

System action

Processing ends.

User response

None

ACN0201E: File (*filename*) could not be opened for writing.

Explanation

An attempt was made to open a file for writing. This attempt failed.

System action

Processing ends.

User response

None

ACN0202E: Read failure on file (*filename*).

Explanation

An attempt was made to read from a file. This attempt failed.

System action

Processing ends.

User response

None

ACN0203E: Write failure on file (*filename*).

Explanation

An attempt was made to write to a file. This attempt failed.

System action

Processing ends.

User response

None

ACN0204E: File (*filename*) could not be closed.

Explanation

An attempt was made to close a file. This attempt failed.

System action

Processing ends.

User response

None

ACN0205E: File (*filename*) statistics could not be obtained.

Explanation

An attempt was made to obtain file statistics. This attempt failed.

System action

Processing ends.

User response

None

ACN0206E: Directory (*directory*) could not be created.

Explanation

An attempt was made to create a directory. This attempt failed.

System action

Processing ends.

User response

None

ACN0207E: Directory path (*directorypath*) is too long.

Explanation

An attempt was made to use a directory path that was too long. This attempt failed.

System action

Processing ends.

User response

None

ACN0208E: There is not enough disk space for the operation attempted.

Explanation

An attempted operation required more disk space than was available. The attempt failed.

System action

Processing ends.

User response

None

ACN0209E: The rename of file (*filename1*) to (*filename2*) failed.

Explanation

An attempt was made to rename a file. This attempt failed.

System action

Processing ends.

User response

None

ACN0210E: The Tivoli Storage Manager high level qualifier is too long.

Explanation

An attempt was made to use a Tivoli Storage Manager high level qualifier that was too long. This attempt failed.

System action

Processing ends.

User response

None

ACN0211E: The Tivoli Storage Manager low level qualifier is too long.

Explanation

An attempt was made to use a Tivoli Storage Manager low level qualifier that was too long. This attempt failed.

System action

Processing ends.

User response

None

ACN0212E: The Tivoli Storage Manager filespace name is too long.

Explanation

An attempt was made to use a Tivoli Storage Manager filespace name that was too long. This attempt failed.

System action

Processing ends.

User response

None

ACN0213E: The maximum number of objects allowed per Tivoli Storage Manager transaction is too small.

Explanation

In order to maintain backup data integrity, multiple backup objects are sent to the Tivoli Storage Manager server in a single transaction. The Tivoli Storage Manager server has indicated that the maximum number of objects allowed per transaction is less than the minimum required by the IBM Tivoli Storage Manager application client.

System action

Processing ends.

User response

Increase the maximum number of objects allowed per transaction on the Tivoli Storage Manager server and retry the operation.

ACN0214E: The backup object's management class backup copy group does not exist.

Explanation

The Tivoli Storage Manager server has indicated that the backup object's management class backup copy group does not exist.

System action

Processing ends.

User response

Contact your Tivoli Storage Manager server administrator.

ACN0215E: All backup objects do not have the same management class backup copy destination.

Explanation

In order to maintain backup data integrity, multiple backup objects are sent to the Tivoli Storage Manager server within a single transaction. All backup objects within a single transaction are required to have the same management class backup copy destinations.

System action

Processing ends.

User response

Contact your Tivoli Storage Manager server administrator.

ACN0216E: Unable to obtain space information for volume (*volumename*).

Explanation

An attempt was made to obtain space information for a volume. This attempt failed.

System action

Processing ends.

User response

None

ACN0217E: The Tivoli Storage Manager filespace name is invalid.

Explanation

The filespace name or directory delimeter is invalid.

System action

Processing ends.

User response

Check that the filespace name length, characters, and directory delimeters are valid.

ACN0218E: The Tivoli Storage Manager high level qualifier is invalid.

Explanation

The high level qualifier name or directory delimeter is invalid.

System action

Processing ends.

User response

Check that the high level qualifier name length, characters, and directory delimeters are valid.

ACN0219E: The Tivoli Storage Manager low level qualifier is invalid.

Explanation

The low level qualifier name or directory delimeter is invalid.

System action

Processing ends.

User response

Check that the low level qualifier name length, characters, and directory delimeters are valid.

ACN0256E: The password in your Tivoli Storage Manager options file has expired. Please change your password on the Tivoli Storage Manager server using the 'change password' command and then either change or remove the password value in your options file.

Explanation

Your Tivoli Storage Manager password has expired. You need to change your password.

System action

Processing ends.

User response

Obtain a new password for your Tivoli Storage Manager server; node using the change password command or by asking your Tivoli Storage Manager Administrator to change your password.

ACN0257E: Your password has expired.

Explanation

Your Tivoli Storage Manager password has expired. A new password needs to be obtained.

System action

Processing ends.

User response

Obtain a new password for your Tivoli Storage Manager node using the change password command or by asking your Tivoli Storage Manager Administrator to change your password.

ACN0258E: You did not enter a valid password. Processing ends.

Explanation

The password that was entered was not a valid password.

System action

Processing ends.

User response

Re-enter the command specifying a valid password.

ACN0259E: The password you entered for verification does not match the password you entered for your new password. Your password will not be changed.

Explanation

The password you entered for verification of your new password does not match the new password that was entered.

System action

Processing ends.

User response

Try again to change your password being sure to enter the same password for the new password and for the verification password.

ACN0260I: Password successfully changed.

Explanation

The change password command completed successfully

System action

Processing ends.

User response

None

ACN0261I: There are no backups for the server named *servername*.

Explanation

There are no backups on the Tivoli Storage Manager server for the specified server name.

System action

Processing ends.

User response

None

ACN0263E: Failed to start Web browser with a return code of *returncode*.

Explanation

An attempt was made to start the web browser to view the TSM HTML b ook. This attempt failed.

System action

Processing ends.

User response

Start your web browser manually and point it to bookfrm.htm in the agent htm directory.

ACN0264I: Could not find the default browser defined. An attempt will be made to use Microsoft Internet Explorer.

Explanation

An attempt was made to read the registry to determine the default browser. However, a default browser is not defined. A determination will be made where Microsoft Internet Explorer is installed.

System action

Processing continues.

User response

It is possible that a default browser is not defined for the system. This is okay. An attempt will be made to use Microsoft Internet Explorer.

ACN0265E: Could not find Internet Explorer.

Explanation

An attempt was made to read the registry to determine where Microsoft's Internet Explorer was installed. This attempt failed.

System action

Processing ends.

User response

Make sure that the registry is set up correctly for Internet Explorer.

ACN0266E: Could not find the Tivoli Storage Manager HTML books.

Explanation

An attempt was made to read the registry to determine where the Tivoli Storage Manager books were installed. This attempt failed.

System action

Processing ends.

User response

It may be necessary to reinstall the application client code. This will ensure that the registry entries are set up correctly.

ACN0267E: The verify password entered does not match the new password entered.

Explanation

The verify password does not match the new password.

System action

Processing ends.

User response

Retry the command with a matching verify password.

ACN0300E: Invalid restore type.

Explanation

The type of restore requested is invalid.

System action

Processing ends.

User response

Re-enter the command specifying a valid restore type.

ACN0301E: Invalid backup type.

Explanation

The type of backup requested is invalid.

System action

Processing ends.

User response

Re-enter the command specifying a valid backup type.

ACN0351E: Invalid trace keyword - '*keyword*'

Explanation

A TRACEFLAG option in the user configuration file or on the command line is incorrect.

System action

Client program did not initialize or tracing was not enabled in the applet.

User response

Correct the value.

ACN0357E: Unable to open trace output file *file-name*.

Explanation

A TRACEFILE option in the user configuration file or on the command line used a directory path and *file-name* combination to which you do not have write access.

System action

Client program did not initialize.

User response

Change the TRACEFILE value so that it is a location to which you have write access.

ACN0366E: Unable to close trace output file *file-name*.

Explanation

An error occurred during the closing of a trace output *file-name* (for example, not enough disk space).

System action

Processing continues.

User response

Check the options.doc file for a description of possible causes of the error, or see your system administrator.

ACN0367E: Unable to write to trace file *tracefile*. Tracing disabled.

Explanation

An error occurred when writing to the specified *tracefile.*

System action

Tracing is disabled. Processing continues.

User response

Ensure the device that the *tracefile* access is available and has sufficient space for the tracefile. Retry the command.

ACN0368E: Invalid trace file name (name too long).

Explanation

A TRACEFILE option in the preferences files used a file name that is too long.

System action

Client program did not initialize.

User response

Change the file name used as the TRACEFILE so that it is equal to or less than 255 characters in length.

ACN0383E: Specifying the trace file '*link*' as a symbolic link is not allowed.

Explanation

Trace file '*linkname*' cannot be a symbolic link.

System action

The symbolic link '*linkname*' is deleted, the trace file is recreated, and processing stops.

User response

Specify the trace file location with the 'tracefile' option.

ACN0384E: Symbolic link '*linkname*' to '*target*' was successfully deleted.

Explanation

Log '*linkname*' cannot be a symbolic link.

System action

The symbolic link '*linkname*' is deleted, the log is recreated, and processing stops.

User response

Check the location of the new file. To specify the location of log files, refer to the user's manual for the 'errorlogname' option, the 'schedlogname' option, and the 'DSM_LOG' environmental variable.

ACN0385E: Unable to delete symbolic link '*link*'.

Explanation

Log '*linkname*' cannot be a symbolic link.

System action

Processing stops.

User response

Delete the symbolic link '*linkname*'.

ACN0476E: *program-name*: cannot open file *file-spec*: *error*.

Explanation

TSM cannot open the file.

System action

TSM cannot complete the requested operation.

User response

Retry the operation. If the problem continues, check with your system administrator.

ACN0487E: Specifying the error log '*link*' as a symbolic link is not allowed.

Explanation

Error log '*linkname*' cannot be a symbolic link.

System action

The symbolic link '*linkname*' is deleted, the error log is recreated, and processing stops.

User response

Check the location of the new error log. To specify the location of the error logs, refer to the user's manual for the 'errorlogname' option and 'DSM_LOG' environmental variable.

ACN0488E: Initialization functions cannot open the error log: *log-name*. errno = *errno-value*,

Explanation

The file *log-name* could not be opened during initialization. The system set the error code *errno-value*. If the reason given is "access denied," the current user does not have permission to write to the log in the directory specified. It is also possible that no space is available at the given log location.

System action

Processing terminates.

User response

Set the DSM_LOG (or DSMI_LOG) environment variable to a directory into which the current user can write. You may also use the ERRORLOGNAME option to specify a file to which the current has write permission.

ACN0495E: Failure writing to a Tivoli Storage Manager log or log-related file: *file-name*, errno = *errno-value*, *reason*

Explanation

A failure was encountered when writing to one of the log files or a related file named *file-name*. The system set the error code *errno-value*. *reason* is the system explanation of that error code. Among other things, it is possible that no space is available at the given log location.

System action

Processing terminates.

User response

Set the DSM_LOG (or DSMI_LOG) environment variable to a directory with adequate space to write the log data.

ACN0496I: TSM is converting the *log-file* from continuous (pruning) mode to wrapping mode. This process may take several minutes.

Explanation

The *log-file* was previously in continouos mode where the only size control was through the use of ERRORLOGRETENTION or SCHEDLOGRETENTION option. This is the first occasion where ERRORLOGMAX or SCHEDLOGMAX is specified for this log, so its format must be changed and old data saved.

System action

Transition processing continues.

User response

None.

ACN0497I: TSM is converting the *log-file* from wrapping mode to continuous (pruning) mode. This process may take several minutes.

Explanation

The *log-file* was previously in wrapping mode where the size control was through the use of the ERRORLOGMAX or SCHEDLOGMAX option. This is the first occasion where ERRORLOGMAX or SCHEDLOGMAX is not specified for this log, so its format must be changed and old data saved.

System action

Transition processing continues.

User response

None.

ACN0498I: *count* log records processed.

Explanation

This is just a progress report to let you know the process is still ongoing.

System action

Transition processing continues.

User response

None.

ACN0501E: Invalid Proxy Configuration Detected: Target Node '*targetnode*' is not listed as a valid node to proxy to for Node Name '*nodename*'.

Explanation

The proxy node configuration on the TSM Server is not correct to support this VSS operation.

System action

The VSS operation stops.

User response

Contact the TSM Server administrator to have the correct TSM Server GRANT PROXY commands issued to enable proxy authority for the nodes. If the error persists, contact your service representative.

ACN0515E: Invalid DSMAGENT Node configuration found for node '*dsmagentnode*'.

Explanation

The DSMAGENT Node specified is not configured properly.

System action

The VSS operation stops.

User response

Verify that the DSMAGENT Node specified is correct and that the Client Acceptor Daemon (CAD) is running for the DSMAGENT Node. If the error persists, contact your service representative.

ACN0516I: The Windows console event handler received a '*event*' console event.

Explanation

A console event was received by one of the IBM Tivoli Storage Manager processes or programs. The following events can be recevied:

- Ctrl-C - This indicates either the user entered the ctrl-c sequence or that one of the Windows services was stopped.

System action

None.

User response

None.

ACN0517I: An unexpected error was encountered. TSM function name : *function-name* TSM function : *function-desc* TSM return code : *TSM-rc* TSM file : *file-name* (*line-number*)

Explanation

None.

System action

Processing stops.

User response

Contact the TSM administrator with the information provided in this message.

ACN0518E: Backups selected for restore must have the same backup location (TSM or LOCAL).

Explanation

A VSS restore operation was submitted that specified multiple backup objects. The backup objects chosen had different backup locations. This is not allowed. All backup objects submitted in the same VSS restore operation must have the same backup location, either TSM or LOCAL, but not both.

System action

The VSS restore operation stops.

User response

Retry the VSS restore operation specifying one backup object at a time.

ACN0519E: The VSS operation failed with rc = *returncode*.

Explanation

There was a failure when TSM performed the VSS operation.

System action

The VSS operation stops.

User response

Verify that the TSM Client Acceptor Daemon (CAD) is installed, configured, and running properly on the machine. Retry the operation. If the error persists, contact your service representative.

ACN0520E: Failed to connect to Local DSMAGENT Node '*localdsmagentnode*' at address:port '*address*:*portnumber*'. Verify that the TSM Client Acceptor Daemon (CAD) is installed, configured, and running properly.

Explanation

An attempt was made to connect to the TSM Client Acceptor Daemon (CAD) running on the local machine. A communication error occurred when this connection was attempted.

System action

The operation stops.

User response

In order to perform VSS operations, you must have a TSM Client Acceptor Daemon (CAD) and a TSM Remote Client Agent Service (DSMAGENT) installed and configured properly. In addition, the TSM Client Acceptor Daemon (CAD) must be running. Verify that the TSM Client Acceptor Daemon (CAD) is installed, configured, and running properly on the local machine. If the error persists,

contact your service representative.

ACN0521E: Pruning functions cannot open one of the Tivoli Storage Manager prune files: *log-name*. errno = *errno-value*,

Explanation

The file "*log-name*" could not be opened during pruning. The system set the error code *errno-value*. If the reason given is "access denied," the current user does not have permission to write to the file in the directory specified. It is also possible that no space is available at the given file location or another Tivoli Storager Manager process started by different user id is performing pruning at the same time.

System action

Pruning stops, processing continues.

User response

Set the DSM_LOG (or DSMI_LOG) environment variable to a directory into which the current user can write.

ACN0522E: DIAG:

Explanation

The message text is provided for diagnostic purposes and is meant to provide information to IBM support in problem determination.

System action

None.

User response

None.

ACN0524S: Error '*errtxt*' (errno=*errno*) occurred trying to write to audit log '*file-name*'. The audit log function is disabled.

Explanation

There was an error encountered writing to the audit log (for example, there is not enough space on the disk).

System action

Audit logging is disabled for the rest of the operation. The return code for the operation is set to 12 to indicate that the contents of the audit log are incomplete.

User response

If this is an out of space condition either free up space on the volume or try to write the audit log to a volume with more space.

ACN3500I: Application Client: Starting *backup type* backup of *object name* from server *server name*.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log when a backup is started.

System action

None

User response

None **Centrally logged**

ACN3501I: Application Client: *backup type* backup of *object name* from server *server name* completed successfully. *bytes* bytes sent in *seconds* seconds.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log when a backup completes successfully.

System action

None

User response

None **Centrally logged**

ACN3502E: Application Client: *backup type* backup of *object name* from server *server name* failed, rc = *return code*.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log when a backup fails.

System action

None

User response

None **Centrally logged**

ACN3503I: Application Client: *backup type* backup of *storage group name* from server *server name* was cancelled by the user.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log when a storage group backup was cancelled by the user.

System action

None

User response

None **Centrally logged**

ACN3504I: Application Client: Starting restore for server *servername*.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the start of a restore.

System action

None

User response

None **Centrally logged**

ACN3505I: Application Client: Restore from server *servername* to *servername* is complete. Total backups restored: Total bytes transferred: Elapsed processing time: Secs Throughput rate: Kb/Sec

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the end of a restore.

System action

None

User response

None **Centrally logged**

ACN3506I: Application Client: Starting *backup type* restore of storage group *storage group name* to server *server name*.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the start of a storage group restore.

System action

None

User response

None **Centrally logged**

ACN3507E: Application Client: *backup type* restore of storage group *storage group name* to server *server name* completed successfully.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log when a storage group restore completes successfully.

System action

None

User response

None **Centrally logged**

ACN3508E: Application Client: *backup type* restore of storage group *storage group name* to server *server name* failed, rc = *return code*.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log when a storage group restore fails.

System action

None

User response

None **Centrally logged**

ACN3509I: Application Client: *backup type* restore of storage group *storage group name* to server *server name* was cancelled by the user.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log when a storage group restore was cancelled by the user.

System action

None

User response

None **Centrally logged**

ACN3510I: Application Client: Attempting to inactivate the object: filespace - [*filespace name*], hl - [*high level*], ll - [*low level*]

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the attempt to inactivate an object.

System action

None

User response

None **Centrally logged**

ACN3511I: Application Client: Inactivation of the previous objects succeeded.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the success of the inactivation of objects.

System action

None

User response

None **Centrally logged**

ACN3512E: Application Client: Inactivation of the previous objects failed.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the failure of the inactivation of objects.

System action

None

User response

None **Centrally logged**

ACN3513E: Application Client: Inactivation of the previous objects was canceled.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the failure of the inactivation of objects because the task was canceled by the user.

System action

None

User response

None **Centrally logged**

ACN3514I: Application Client: Starting backup for server *servername*.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the start of a backup.

System action

None

User response

None **Centrally logged**

ACN3516I: Application Client: Backup of server *servername* is complete. Total storage groups backed up: Total bytes transferred: Elapsed processing time: Secs Throughput rate: Kb/Sec

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the end of a backup request.

System action

None

User response

None **Centrally logged**

ACN3517E: Application Client: Backup of server *servername* failed, rc = *returncode*.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the failure of a backup request.

System action

None

User response

None **Centrally logged**

ACN3518I: Application Client: Backup of server *servername* failed. The request was canceled by the user.

Explanation

This is an informational message that is written to the Tivoli Storage Manager Server activity log indicating the failure of a backup request. The user canceled the backup.

System action

None

User response

None **Centrally logged**

ACN5050I: A new configuration file has been created.

Explanation

The /configfile value specified a file name that does not exist. A new file has been created.

System action

Processing continues.

User response

None.

ACN5051I: The configuration file cannot be found, using default settings.

Explanation

The /configfile value specified a file that cannot be found. Default settings will be used.

System action

Processing continues using default settings.

User response

Ensure that the configuration file exists, and enter the command again.

ACN5052E: An error occurred trying to set the *preference* preference.

Explanation

An error occurred while writing to the preferences file.

System action

Processing ends.

User response

View any other messages that were displayed. Fix any of the problems indicated and enter the command again.

ACN5053E: The value for the *preference* preference is not valid. See the TDPEXCC HELP SET output or the User's Guide for valid SET command parameters.

Explanation

The preference being set is not valid.

System action

Processing ends.

User response

Run the "tdpexcc help set" command or see the User's Guide for valid SET command parameters.

ACN5054I: The preference has been set successfully.

Explanation

The preference was set successfully.

System action

Processing ends.

User response

None

ACN5055E: The Microsoft Exchange API could not be loaded.

Explanation

If running on Microsoft Exchange 5.5, the dll that is attempting to load is edbbcli.dll. If running on a later version of Microsoft Exchange, the dll that is attempting to load is esebcli2.dll.

System action

Processing ends.

User response

Ensure that the Microsoft Exchange Server has been correctly installed.

ACN5056I: The *logfile* log file could not be pruned. Processing will continue.

Explanation

An attempt to prune the log was unsuccessful.

System action

Processing continues.

User response

Ensure that the log file name is valid and that the log file exists. If a valid log file name was specified, view the log for indications of what the problem may be.

ACN5057I: The *logfile* log file has been pruned successfully.

Explanation

The specified log file was pruned successfully.

System action

Processing continues.

User response

None.

ACN5058W: The length of the logf ile name is greater than the maximum allowed. Processing will continue using a log file name of *logfile* in the current directory.

Explanation

The log file name entered was not fully qualified. When the fully qualified log file name was created, it was longer than the maximum allowed length for a log file name.

System action

Processing continues creating and using a log file in the current directory.

User response

Update the log file name using a fully qualified path.

ACN5059W: The *logfile* log file cannot be opened for writing. There will be no logging of events.

Explanation

The specified log file could not be opened for append and logging of events will not occur. The log file may be read-only or the log file name is not valid.

System action

Processing continues without logging.

User response

Determine why the log could not be opened. You may need to ensure that the log file is not read-only, or ensure that a valid drive or partition is specified in the log file name.

ACN5060E: A Tivoli Storage Manager API error has occurred.

Explanation

A Tivoli Storage Manager API api error has occurred.

System action

Processing ends.

User response

Try the operation again. If the error persists, contact your service representative.

ACN5061E: A Microsoft Exchange api error has occurred.

Explanation

A Microsoft Exchange api error has occurred.

System action

Processing ends.

User response

Try the operation again. If the error persists, contact your service representative.

ACN5062E: The version of Microsoft Exchange that is running is not a supported version for IBM Tivoli Storage Manager for Hardware.

Explanation

IBM Tivoli Storage Manager for Hardware has detected a version of Microsoft Exchange Server that is not supported.

System action

Processing ends.

User response

Refer to the software requirements section of the product documentation to view a list of the supported versions of Microsoft Exchange Server. If the version of Microsoft Exchange Server running is a supported version, try the operation again. If the error persists, contact your service representative.

ACN5063E: An error occurred trying to get the Microsoft Exchange version information. It could be a problem with the registry. Or, a Microsoft Exchange Server is not installed on this machine.

Explanation

An attempt was made to read the registry to determine the level of Microsoft Exchange that is currently running. This attempt failed.

System action

Processing ends.

User response

Determine if the registry has been corrupted. Also, ensure that the Microsoft Exchange Server is installed on this machine.

ACN5064W: The *service* cannot be started when doing a restore.

Explanation

A request was made to restore the listed database. However, the service associated with this database has already started. The service needs to be stopped in order to do this restore.

System action

Processing ends.

User response

Stop the associated service and enter the restore command again.

ACN5065E: All of the services associated with this restore are running.

Explanation

A request was made to restore several databases. However, all of the services associated with these databases are running. The services need to be stopped in order to do this restore.

System action

Processing ends.

User response

Stop the associated services and enter the restore command again.

ACN5066W: The storage group <*storagegroup*> does not exist.

Explanation

The storage group that was entered that does not exist on the server specified.

System action

Processing ends.

User response

Enter the command specifying a storage group that exists.

ACN5067E: The specified storage groups/databases do not exist or have not been dismounted.

Explanation

The storage groups that were entered either do not exist on the Microsoft Exchange Server or the databases within the storage groups have not been dismounted.

System action

Processing ends.

User response

Verify that the storage groups or databases exist and that the databases have been dismounted before starting the restore.

ACN5068W: The database <*databasename*> does not exist in the storage group <*storagegroup*>.

Explanation

The database that was entered does not exist in the storage group that was entered.

System action

Processing ends.

User response

Enter the command again specifying a valid database name that exists in a valid storage group.

ACN5069W: The database <*database*> in the storage group <*storage group*> is not dismounted.

Explanation

While examining the list of databases to restore, it was determined that not all of the databases within the specified storage groups were dismounted.

System action

Processing continues skipping over the listed databases and storage groups.

User response

Ensure that the databases are dismounted and enter the command again.

ACN5070W: The Directory Service is not running. The Directory will not be backed up.

Explanation

A request was made to backup the Directory service. However, the Directory service needs to be running in order to do the backup.

System action

Processing ends.

User response

Start the Directory service and enter the backup command again.

ACN5071W: The Information Store is not running. The Information Store will not be backed up.

Explanation

A request was made to backup the Information Store. However, the Information Store needs to be running in order to do the backup.

System action

Processing ends.

User response

Start the Information Store and enter the backup command again.

ACN5072W: Databases in storage group <*storage group*> are dismounted -- skipping.

Explanation

A request was made to backup a set of storage groups. However, some databases in this storage group are not mounted. All of the databases need to be mounted in order to backup this storage group.

System action

Processing continues, but dismounted databases are skipped.

User response

Ensure that all of the databases are mounted in the storage group and start the backup for the storage group again.

ACN5073E: None of the storage groups entered are in a state to be backed up.

Explanation

A request was made to backup a set of storage groups. However, each of the storage groups entered has at least one database that is dismounted.

System action

Processing ends.

User response

Ensure that all of the databases are mounted in the storage groups and start the backup for the storage groups again.

ACN5074E: None of the databases or storage groups entered exist.

Explanation

A request was made to backup a set of storage groups or databases that do not. The storage group and database names might not have been entered using the correct casing.

System action

Processing ends.

User response

Ensure that the correct casing is used when entering the list of databases or storage groups to be backed up. Enter the backup command again.

ACN5076W: Unable to inactivate all previous backup objects.

Explanation

A request to inactivate some previous backup objects failed.

System action

Processing ends.

User response

When the next full backup of the database is run, another attempt will be made to inactivate the failed objects.

ACN5083I: All of the storage groups entered have been excluded.

Explanation

An attempt was made to do a backup. However, the storage groups or databases entered have been excluded by an exclude statement in the options file.

System action

Processing ends.

User response

If you want these storage groups or databases backed up, modify the exclude statements in your options file.

ACN5084W: IS was not input as one of the parts to restore. The partial option will be ignored.

Explanation

A request was made to restore either the private or public part of the Information Store. However, the IS was not input as one of the parts to restore.

System action

Processing continues ignoring the partial option.

User response

To restore either the public or private part of the Information Store, enter IS as an input.

ACN5086W: None of the storage groups entered exist. Or, if doing a DBCOPY backup, the database entered does not exist.

Explanation

A storage group was entered that does not exist on the server specified. Or, if a DBCOPY backup was entered, the dbname specified does not exist on the Microsoft Exchange Server.

System action

Processing ends.

User response

Enter the command specifying a storage group or dbname that exists.

ACN5087E: PASSWORDACCESS is Generate. Either the stored password is incorrect or there is no stored password. If you do not have a stored password, use of the -TSMPassword=xxx option will set and store your password.

Explanation

The client options file has the PASSWORDACCESS option set to generate. Currently, there is no password that has been stored. An initial password needs to be stored.

System action

Processing ends.

User response

Invoke the command again using the -TSMPassword option. Any subsequent commands should then complete without specifying a password.

ACN5140I: Storage Group <*storagegroup*> does not exist - skipping.

Explanation

The storage group that was specified by the user is not found on this Exchange server.

System action

This storage group is skipped.

User response

Ensure that the storage group name is spelled correctly and enter the command again.

ACN5141I: Database <*database*>, Storage Group <*storagegroup*> does not exist - skipping.

Explanation

This combination of storage group and database name that was specified is not found on this Microsoft Exchange server.

System action

The storage group and database are skipped.

User response

Ensure that the the storage group name and databse name are spelled correctly and enter the command again.

ACN5142E: No storage group was found that matches the request.

Explanation

The storage groups or databases could not be found on this Microsoft Exchange server.

System action

Processing ends.

User response

Ensure that the storage group or database names are spelled correctly and enter the command again.

ACN5209I: There are no backups matching the server name *servername* and the following filespecs:*filespecs*.

Explanation

There are no database backups on the Tivoli Storage Manager server for the specified server name.

System action

Processing ends.

User response

None

ACN5228I: Application Client is not configured for VSS operations.

Explanation

Application Client has not been configured to perform VSS operations.

System action

None.

User response

In order to perform VSS operations, the Tivoli Storage Manager for Copy Services - Microsoft Exchange VSS Integration Module must be installed and the Application Client LOCALDSMAGENTNODE preference must be set correctly. Refer to the Application Client User's Guide for details on configuring the client for VSS operations.

ACN5229E: Error obtaining VSS information from Local DSMAgent Node: '*localdsmagentnode*'.

Explanation

Application Client attempted to obtain VSS information through the specified LOCALDSMAGENTNODE but failed. The error message encountered is also displayed.

System action

VSS information is not displayed.

User response

Refer to the error message displayed along with this message.

ACN5237E: Unable to communicate with the Microsoft Exchange Server.

Explanation

An attempt was made to communicate the with the Microsoft Exchange Server that was entered. This attempt failed.

System action

Processing ends.

User response

Ensure that the name of the Microsoft Exchange server that was entered is valid. Also, ensure that the Microsoft Exchange server is running.

ACN5238E: Unable to retrieve the domain information for the Microsoft Exchange Server.

Explanation

An attempt was made to retrieve the domain information for the Microsoft Exchange Server. This attempt failed.

System action

Processing ends.

User response

Ensure that the Microsoft Exchange server is running.

ACN5239E: Unable to retrieve the storage group information.

Explanation

An attempt was made to retrieve the storage group information for the Microsoft Exchange Server. This attempt failed.

System action

Processing ends.

User response

Ensure that the Microsoft Exchange Server is running properly.

ACN5240E: Unable to retrieve the database information.

Explanation

An attempt was made to retrieve the database information for the storage group of the Microsoft Exchange Server. This attempt failed.

System action

Processing ends.

User response

Ensure that the Microsoft Exchange Server is running properly.

ACN5241E: The Microsoft Exchange Information Store is currently not running.

Explanation

An attempt was made to retrieve the Microsoft Exchange Server information. This attempt failed.

System action

Processing ends.

User response

In order to retrieve the Microsoft Exchange Server information, the Microsoft Exchange Information Store needs to be running. Start this service to get the requested information.

ACN5301E: Unable to get the value for the Organization from the registry.

Explanation

An attempt was made to read the registry to determine the organization for the Microsoft Exchange Server. This attempt failed.

System action

Processing ends.

User response

Determine if there is a problem with the registry or ensure that the Microsoft Exchange Server is installed properly.

ACN5302E: Unable to get the value for the Site from the registry.

Explanation

An attempt was made to read the registry to determine the site for the Microsoft Exchange Server. This attempt failed.

System action

Processing ends.

User response

Determine if there is a problem with the registry or ensure that the Microsoft Exchange Server is installed properly.

ACN5303E: Unable to get the value for Circular Logging from the registry.

Explanation

An attempt was made to read the registry to determine the Circular Logging setting for either the IS or the DIR of the Microsoft Exchange Server. This attempt failed.

System action

Processing ends.

User response

Determine if there is a problem with the registry or ensure that the Microsoft Exchange Server is installed properly.

ACN5304E: Unable to open service to determine if running or not.

Explanation

An attempt to open a service failed.

System action

Processing ends.

User response

Determine if there is a problem with the Microsoft Exchange server.

ACN5305E: Unable to query service information.

Explanation

An attempt to query specific service information failed.

System action

Processing ends.

User response

Determine if there is a problem with the Microsoft Exchange server.

ACN5350E: An unknown Exchange API error has occurred.

Explanation

An Exchange API error has occurred but the associated error message could not be found. The Windows NT event log may contain more information.

System action

Processing ends.

User response

If the Windows NT event log does not help resolve the problem, verify the Exchange Server installation and retry the operation. If the error persists, contact your service representative.

ACN5351E: The Exchange server application is not registered for backup.

Explanation

The Exchange server application must be registered for backup with the Windows Server. The Windows NT event log may contain more information.

System action

Processing ends.

User response

If the Windows NT event log does not help resolve the problem, verify the Exchange Server installation and retry the operation. If the error persists, contact your service representative.

ACN5352E: The Exchange server application is not registered for offline restore.

Explanation

The Exchange server application must be registered for offline restore with the Windows Server. The Windows NT event log may contain more information.

System action

Processing ends.

User response

If the Windows NT event log does not help resolve the problem, verify the Exchange Server installation and retry the operation. If the error persists, contact your service representative.

ACN5353E: The Exchange server application is not registered for online restore.

Explanation

The Exchange server application must be registered for online restore with the Windows Server. The Windows NT event log may contain more information.

System action

Processing ends.

User response

If the Windows NT event log does not help resolve the problem, verify the Exchange Server installation and retry the operation. If the error persists, contact your service representative.

ACN5354E: The storage group was not found.

Explanation

The specified storage group name was not found.

System action

Processing ends.

User response

Verify the command input and retry the operation. If the error persists, contact your service representative.

ACN5355E: The database was not found.

Explanation

The specified database name was not found.

System action

Processing ends.

User response

Verify the command input and retry the operation. If the error persists, contact your service representative.

ACN5356E: The database file name is undefined.

Explanation

Every Microsoft Exchange database must specify a database file name.

System action

Processing ends.

User response

Verify the database properties and retry the operation. If the error persists, contact your service representative.

ACN5357W: The truncation of the transaction log failed.

Explanation

The truncation of the transaction log failed.

System action

Processing continues.

User response

Refer to other messages that are displayed to determine the problem.

ACN5358E: A Microsoft Exchange API protocol error has occurred.

Explanation

An unrecoverable Microsoft Exchange API protocol error has occurred.

System action

Processing ends.

User response

Contact your service representative.

ACN5359E: An attempt was made to get the TEMP environment variable. This attempt failed.

Explanation

The TEMPLOGRESTOREPATH option was not set for the restore. Therefore, an attempt was made to get the TEMP environment variable for the machine. This attempt failed.

System action

Processing ends.

User response

Ensure that the TEMP environment variable is set for this machine. You can also use the TEMPLOGRESTOREPATH option with the restore.

ACN5360E: The /ERASEexistingdata option is not allowed during a partial restore.

Explanation

A partial storage group restore was requested with the /ERASEexistingdata option. The /ERASEexistingdata option is not allowed during a partial restore.

System action

Processing ends.

User response

Enter the command to restore the entire storage group or enter the command without the /ERASEexistingdata option.

ACN5361E: It is invalid to have an '*' within a storage group name.

Explanation

An attempt was made to backup a storage group that contains an '*'. It is invalid to have an '*' in a storage group name.

System action

Processing continues, but this storage group will not be backed up.

User response

Rename the storage group, otherwise this storage group cannot be backed up.

ACN5362W: The filespace <*filespace*> in an invalid filespace name.

Explanation

The filespace displayed in the message exists, but is an invalid filespace.

System action

Processing continues, but this filespace will not be used.

User response

Ensure that the storage group name does not contain invalid characters. Refer to the Microsoft Exchange documentation for the list of invalid characters.

ACN5500E: The MultiByteToWideChar() function failed.

Explanation

An internal error occurred.

System action

Processing ends.

User response

Retry the operation. If this error persists, contact your service representative.

ACN5501E: The WideCharToMultiByte() function failed.

Explanation

An internal error occurred.

System action

Processing ends.

User response

Retry the operation. If this error persists, contact your service representative.

ACN5705W: An error was encountered with Tivoli Storage Manager API initialization, rc = *returncode*. Examine the dsierror.log for more information or determine if the TSM API is installed properly.

Explanation

An attempt was made to run setup for the Tivoli Storage Manager API. However, errors were encountered.

System action

Processing continues.

User response

Examine the dsierror.log file to determine the problem. If this file does not exist, it is possible that the TSM API is not installed properly. If this is the case, reinstall the TSM API and try running the command again.

ACN5706I: The *logfile_name* log file did not need pruning.

Explanation

The log file specified did not need to be pruned.

System action

Processing continues.

User response

The log file will automatically be pruned at a later date. If the log file is too large now, lower the number of days the log entries are retained.

ACN5707W: The *logfile_name* log file could not be opened for writing. The log was not pruned and there will be no logging of events.

Explanation

The log could not be opened for append. Therefore, there will be no logging done and the request to prune was not done.

System action

Processing continues without logging and without pruning.

User response

Determine why the log could not be opened. You may need to ensure that the file is not read-only, or ensure that a valid drive or partition is specified with the log

file name.

ACN5724I: No databases have been selected for backup.

Explanation

The Backup button was pressed but no databases have been selected in the list in the graphical user interface.

System action

Processing stops.

User response

Select a database and press the Backup button.

ACN5725I: No Storage Groups have been selected for backup.

Explanation

The Backup button was pressed but no Storage Groups have been selected in the tree or list in the graphical user interface.

System action

Processing stops.

User response

Select a Storage Group and press the Backup button.

ACN5741I: No Backups have been selected for restore.

Explanation

The Restore button was pressed but nothing was selected in the tree or list view.

System action

Processing stops.

User response

Make a selection in the tree or list view and press the Restore button again.

ACN5758W: At least one of the database's services that is selected for restore is running. Do you want to stop the service(s)?

Explanation

A service that you are trying to restore is running. The service cannot be running in order to perform the restore.

System action

None

User response

Choose the desired response and continue.

ACN5759W: At least one of the databases that is selected for restore is mounted. Do you want to dismount the database(s)?

Explanation

A database you are trying to restore is mounted.

System action

None

User response

Click 'OK' to dismount and continue, or cancel to stop.

ACN5766E: Unable to dismount database *database* in storage group *storage group*. Do you want to continue the restore process?

Explanation

An error occurred while trying to dismount a database.

System action

None.

User response

Press OK to continue the restore or press cancel to stop.

ACN5798E: MS Exchange API *api name* failed with HRESULT: *api retcode* -

Explanation

A Microsoft Exchange API error occurred during an operation. The specific API function that failed along with the HRESULT code of the failure and possible message associated with that error is displayed.

System action

Processing ends.

User response

If the Windows Event Log does not help resolve the problem, stop and restart the Exchange server and retry the operation. If the error persists, contact your service representative.

ACN5800E: Backup is corrupt. See log file for additional information.

Explanation

When attempting to process an Exchange backup on the Tivoli Storage Manager Server, not all required objects were present. The operation cannot proceed. The specific backup affected is logged.

System action

Processing ends.

User response

Retry the operation. If the error persists, contact your service representative.

ACN5802I: Restore failed.

Explanation

When a Recovery Storage Group exists, mailbox and public folder databases cannot be restored in the same operation.

System action

Processing ends.

User response

Please select either a mailbox OR public folder database for restore.

ACN5803I: The Replay Restored Logs ONLY option must be specified.

Explanation

When performing a mailbox database restore to a Recovery Storage Group, the Replay Restored Logs ONLY option must be specified or the restore may fail.

System action

The Replay Restored Logs ONLY option will AUTOMATICALLY be used on the restore.

User response

Decide whether to continue with the restore.

ACN5805E: Restore failed. File already exists.

Explanation

The specified file already exists in the restore (/INTO) path. The RESTOREFILES command is designed not to overwrite existing files.

System action

The restore operation fails and processing ends.

User response

If you want to restore the specified file, you must first delete the file that exists in the restore (/INTO) path and retry the operation or specify a different restore (/INTO) path and retry the operation.

ACN5810E: Restoring Legacy backups and VSS backups in the same restore operation is not supported. Retry the restores in separate operations.

Explanation

At least one VSS backup object and one Legacy backup object were selected for a restore in the same operation. This is not supported.

System action

The restore operation is canceled.

User response

Retry the restores specifying the Legacy backups and VSS backups in separate operations.

ACN5811E: Invalid command. Application Client only supports VSS backup types of FULL and COPY.

Explanation

An invalid backup type was specified on the VSS backup request. Application Client supports backup types of FULL and COPY when using the VSS backup method.

System action

The backup operation is canceled.

User response

Retry the backup operation specifying a supported VSS backup type.

ACN5812E: Invalid command. Application Client does not support OFFLOAD with the Legacy backup method.

Explanation

The OFFLOAD option was specified when using the Legacy backup method. Application Client does not support offload with the Legacy backup method. Application Client supports offload with the VSS backup method only.

System action

The backup operation is canceled.

User response

Retry the backup operation without specifying the offload option or by specifying the VSS backup method.

ACN5813E: Invalid command. Application Client only supports Legacy backups with a backup destination of TSM.

Explanation

An invalid backup destination was specified with the Legacy backup method. Application Client only supports a backup destination of TSM when using the Legacy backup method.

System action

The backup operation is canceled.

User response

Retry the backup operation specifying a backup destination of TSM.

ACN5814E: Invalid command. Application Client does not support OFFLOAD with the specified backup destination.

Explanation

The OFFLOAD option was specified with an unsupported backup destination. Application Client only supports offload with a backup destination of TSM.

System action

The backup operation is canceled.

User response

Retry the VSS offloaded backup operation specifying a backup destination of TSM.

ACN5815E: The VSS operation failed with rc = *returncode*.

Explanation

There was a failure when Application Client performed the VSS operation.

System action

The VSS operation stops.

User response

Verify that the Client Acceptor Daemon (CAD) is installed, configured, and running properly on the machine. Retry the operation. If the error persists, contact your service representative.

ACN5816E: Application Client is not able to run VSS operations. You must be running Exchange Server 2003 (or later) and have the Tivoli Storage Manager for Copy Services - Microsoft Exchange VSS Integration Module installed.

Explanation

In order to perform VSS operations, Application Client verifies that the Exchange Server level is at least Exchange Server 2003 and that the Tivoli Storage Manager for Copy Services - Microsoft Exchange VSS Integration Module is installed. If the Tivoli Storage Manager for Copy Services - Microsoft Exchange VSS Integration Module is installed, there will be a license file, acsexc.lic, in the Application Client installation directory.

System action

The operation stops.

User response

Verify that the prerequisites identified above are met and retry the operation. If the error persists, contact your service representative.

ACN5817E: Missing, blank, or invalid Local DSMAGENT Node Name is not allowed.

Explanation

In order to run VSS operations, Application Client verifies that the Local DSMAGENT Node Name is specified and valid. This error indicates that the Local DSMAGENT Node Name is missing, blank, or invalid.

System action

The operation stops.

User response

Set the Local DSMAGENT Node Name to a valid value and retry the operation.

ACN5818E: Invalid command. Application Client only supports restoring VSS backup types of FULL and COPY.

Explanation

An invalid backup type was specified on the VSS restore request. Application Client supports restoring backups of type FULL and COPY.

System action

The restore operation is canceled.

User response

Retry the restore operation specifying a supported VSS backup type.

ACN5819E: Multiple backup objects were found for the specified storage group(s) and backup destination. Use the OBJECT= and BACKUPDESTINATION= options to identify which specific backup object to restore.

Explanation

The backup object specified for the VSS restore operation was not specific enough to be unique. More information is required in order to restore the correct backup object.

System action

The restore operation is canceled.

User response

Retry the restore operation specifying the /OBJECT= and /BACKUPDESTINATION parameters.

ACN5820E: There were no Exchange backups found on the Tivoli Storage Manager server matching the specified criteria.

Explanation

A query was issued to the Tivoli Storage Manager server to find the Application Client backups that match the specified search criteria. There were no backups found.

System action

None.

User response

None.

ACN5824I: Storage Group <*storagegroup*> does not have replica - skipping.

Explanation

Replica for the storage group specified by the user is not found on this Exchange server.

System action

This storage group is skipped.

User response

Ensure that the storage group name is spelled correctly and has a replica and enter the command again.

ACN5825E: Invalid command. Application Client does not support FROMREPLICA with the Legacy backup method.

Explanation

The FROMREPLICA option was specified when using the Legacy backup method. Application Client does not support fromreplica with the Legacy backup method. Application Client supports fromreplica with the VSS backup method only.

System action

The backup operation is canceled.

User response

Retry the backup operation without specifying the fromreplica option or by specifying the VSS backup method.

ACN5829E: Invalid command. Application Client does not support INTOSG with the Legacy restore method.

Explanation

The INTOSG option was specified when using the Legacy restore method. Application Client does not support INTOSG with the Legacy restore method. Application Client supports INTOSG with the VSS restore method only.

System action

The restore operation is canceled.

User response

Retry the restore operation without specifying the INTOSG option or by specifying the VSS restore method.

ACN5837E: Invalid command. Application Client does not support INTOSG with the Exchange Servers earlier than Exchange 2007.

Explanation

The INTOSG option was specified when using not Exchange 2007 or later. Application Client does not support INTOSG with the Exchange Servers earlier than Exchange 2007. Application Client supports INTOSG with the Exchange Server 2007 or later.

System action

The restore operation is canceled.

User response

Retry the restore operation without specifying the INTOSG option or by using Exchange 2007.

ACN5839E: Alternate or recovery storage group(s)/database(s) you are restoring to do not exist.

Explanation

The alternate or recovery storage groups that were entered do not exist on the Microsoft Exchange Server or the databases within the storage groups do not exist on the Microsoft Exchange Server.

System action

Processing ends.

User response

Verify that the storage groups and databases exist and the databases have been dismounted before starting the restore.

ACN5840W: Did not find any storage group on Exchange Server that has all databases that matched databases selected to alternate restore. Verify that all necessary databases are created in the alternate storage group then try calling the dialog again.

Explanation

Did not find any storage group on Exchange Server that has all databases that matched databases selected to alternate restore.

System action

The Restore Into dialog is not pop up.

User response

Verify that all necessary databases are created in the alternate storage group then try calling the dialog again.

ACN5841W: Database *database* from storage group *storagegroup* has not been found on Exchange Server. The database files will be restored.

Explanation

Database has not been found on Exchange Server. The restore will continue to allow VSS writer to restore the database files.

System action

The restore operation continues.

User response

After the restore completed, you can recreate the database on the Exchange Server from the restored files.

ACN5843I: No backups found for a Storage Group <*storagegroup*> that match the specifications entered.

Explanation

No backups found for the entered storage group that match specified backup method, backup destination and OBJECT (if any).

System action

This storage group is skipped.

User response

Ensure that the storage group name is spelled correctly, backup method, backup destination and OBJECT (if any) are specified correctly and enter the command again.

ACN5892E: Recovery Storage Group does not exist. Please create the Recovery Storage Group and add the appropriate mailbox databases to be recovered.

Explanation

On Exchange 2003, the Recovery Storage Group must be created before running mailbox restore.

System action

The mailbox restore operation has failed.

User response

Use System Manager to create the Recovery Storage Group and add the appropriate mailbox databases to be recovered. Ensure that the RSG databases are dismounted, and the 'This database can be overwritten by a restore' flag has been set. Run the command again.

ACN5893E: Mailbox restore failed. Please verify that the appropriate databases have been added to the Recovery Storage Group (RSG), the RSG databases are dismounted, and the 'This database can be overwritten by a restore' flag has been set.

Explanation

On Exchange 2003, the Recovery Storage Group must be created appropriately before running mailbox restore.

System action

The mailbox restore operation has failed.

User response

Use System Manager to create the Recovery Storage Group and add the appropriate mailbox databases to be recovered. Ensure that the RSG databases are dismounted, and the 'This database can be overwritten by a restore' flag has been set. Run the command again.

ACN5901E: *mapi32.dll* does not exist.

Explanation

The Messaging Application Programming Interface library mapi32.dll is required for mailbox restore operations.

System action

The mailbox restore operation has failed.

User response

Verify that the mapi32.dll is installed on the system. Run the command again.

ACN5902E: *mapi32.dll* has version *version.release*. Expected *expected version.expected release* or higher.

Explanation

The correct version of Messaging Application Programming Interface library mapi32.dll is required for mailbox restore operations.

System action

The mailbox restore operation has failed.

User response

Verify that the correct version of mapi32.dll is installed on the system. Run the command again.

ACN5906E: Loading the MAPI dynamic load library has failed.

Explanation

The mapi32.dll is required for mailbox restore operations.

System action

The mailbox restore operation has failed.

User response

Verify that the mapi32.dll is installed on the system. Run the command again.

ACN5907E: Initializing the MAPI subsystem failed.

Explanation

The MAPI subsystem is necessary for mailbox restore operations.

System action

The mailbox restore operation has failed.

User response

Verify that the mapi32.dll is installed on the system and that MAPI is enabled for your mailboxes. Run the command again.

ACN5908E: Creating the MAPI Profile has failed.

Explanation

MAPI requires a user with an active exchange mailbox and sufficient privilege to perform mailbox restore operations.

System action

The mailbox restore operation has failed.

User response

Either log on as a user with sufficient privileges, or add a mailbox with sufficient privileges to the current user.

ACN5909E: The MAPI subsystem logon has failed. Please check that you have an active mailbox and sufficient privileges for this operation.

Explanation

Mailbox restore operations requires a user with sufficient privileges, and an active exchange mailbox.

System action

The mailbox restore operation has failed.

User response

Either log on as a user with sufficient privileges, or add a mailbox with sufficient privileges to the current user.

ACN5910E: Opening a MAPI mailbox has failed.

Explanation

The MAPI mailbox was not able to be opened.

System action

The mailbox restore operation has failed.

User response

Either log on as a user with a mailbox that has sufficient privileges, or add a mailbox with sufficient privileges to the current user.

ACN5911E: The MAPI subsystem has experienced a network failure.

Explanation

The MAPI subsystem has experienced a network failure.

System action

The mailbox restore operation has failed.

User response

Verify that the Exchange Server has network connectivity. Verify the 'Microsoft Exchange Information Store' and 'Microsoft System Attendant' services are running. Run the command again.

ACN5912E: The MAPI subsystem has experienced a failure.

Explanation

The MAPI subsystem has experienced a failure.

System action

The mailbox restore operation has failed.

User response

Run the command again.

ACN5915W: Unable to obtain the Microsoft Exchange Server version running on your system. Microsoft Exchange 2003 is being assumed. Unexpected results may occur.

Explanation

An attempt was made to determine the level of Microsoft Exchange Server running on the current system. This attempt failed.

System action

Processing continues, however, unexpected results may occur.

User response

If the operation fails or produces unexpected results, verify that Microsoft Exchange Server is correctly installed on the system, and retry the operation. If the problem persists, contact your service representative.

ACN5916E: You must add one or more mailboxes to be restored before continuing.

Explanation

No mailboxes were selected for restore.

System action

No mailboxes were restored.

User response

Add one or more mailboxes to be restored before continuing.

ACN5917I: The mailbox history has been successfully updated on the TSM Server.

Explanation

The mailbox location history stored on the TSM Server was compared to the current mailbox location information in the Active Directory and updated accordingly. This operation is performed to help facilitate individual mailbox restore operations.

System action

None

User response

None

ACN5918W: The mailbox history did not update successfully on the TSM Server.

Explanation

An attempt was made to update the mailbox location history stored on the TSM Server. This operation is performed to help facilitate individual mailbox restore operations. Problems were encountered during the update attempt. This warning message is followed by an additional message that explains the error encountered.

System action

The mailbox history is not updated, but processing continues.

User response

If the error persists, contact your service representative.

ACN5920E: Cannot restore mailboxes from different Exchange Server 2003 storage groups. Please restore mailboxes from each storage group separately.

Explanation

All Exchange Server 2003 mailboxes selected must come from the same storage group.

System action

No mailboxes were restored.

User response

Perform the mailbox restore operation with mailboxes from a single Exchange Server 2003 storage group. Repeat as necessary for each of the other storage groups.

ACN5921E: DP Exchange requires a user with "Exchange Organization Administrators" or "Domain Admins" permissions. For mailbox restores, the user must also have a user mailbox in the domain.

Explanation

Mailbox restore operations requires a user with sufficient privileges, and an active exchange mailbox.

System action

No mailboxes were restored.

User response

Either log on as a user with a mailbox that has sufficient privileges, or add a mailbox with sufficient privileges to the current user.

ACN5922E: Could not find mailbox '*mailboxname*'. Verify that the mailbox name is correct.

Explanation

The mailbox specified for the mailbox restore operation or the destination mailbox was not found in the Active Directory or in the mailbox history information stored on the TSM Server.

System action

The specified mailbox is not restored.

User response

Verify that the specified mailbox name is correct. Make sure that you are using the mailbox alias when specifying the mailbox name. The mailbox alias can be obtained from the Active Directory or Exchange Server administrator. After correcting the mailbox name, retry the mailbox restore operation. If this mailbox restore is for a deleted mailbox, you may need to retry the mailbox restore operation using the command-line interface and specifying the 'MAILBOXOriglocation' option.

ACN5923E: Unknown mailbox name(s) specified or mailbox backup was not found in RSG. Verify that the mailbox name(s) are correct. If specified mailbox name is correct verify that it has been successfully backed up.

Explanation

The mailboxes specified for the mailbox restore operation were not found in the Active Directory or in the mailbox history information stored on the TSM Server. If specified mailboxes exist in AD than their backed up was not found.

System action

The specified mailboxes are not restored.

User response

Verify that the specified mailbox names are correct. Make sure that you are using the mailbox alias when specifying the mailbox names. The mailbox alias can be obtained from the Active Directory or Exchange Server administrator. After correcting the mailbox names, retry the mailbox restore operation. If this mailbox restore is for a deleted mailbox, you may need to retry the mailbox restore operation using the command-line interface and specifying the 'MAILBOXOriglocation' option. If specified mailbox name is correct verify that it has been successfully backed up.

ACN5924E: No usable backups found on the TSM Server.

Explanation

The mailbox restore operation failed because no usable backups were found on the TSM Server.

System action

No mailboxes were restored.

User response

Verify that you have specified the correct TSM Server and node name, and retry the operation.

ACN5929E: Microsoft Exchange Server MAPI Client is not installed.

Explanation

Microsoft Exchange Server MAPI Client and Collaboration Data Objects are required for restore mailbox operations.

System action

The specified mailboxes are not restored.

User response

Verify that the Microsoft Exchange Server MAPI Client and Collaboration Data Objects are installed.

ACN5930E: The requested MAPI message service was not found.

Explanation

The MAPI message service was not found. This is most likely due to the service not being defined in your local MAPISVC.INF file.

System action

The mailbox restore operation has failed.

User response

Verify that the requested MAPI message service is defined in your local MAPISVC.INF file. If this error resulted from trying to restore to a Personal Folders (.pst) file, look for the section "MSPST MS" in this file. If it is not defined please add the message service to your MAPISVC.INF file. Run the command again.

ACN5931E: You must specify an alternate destination folder before continuing.

Explanation

A destination folder is required for restoring to an alternate destination.

System action

The mailbox restore operation could not continue.

User response

Supply an alternate destination folder. Run the command again.

ACN5932E: Environment variable TEMP points to invalid directory.

Explanation

Environment variable TEMP points to invalid directory. Recovery Storage Group can not be created.

System action

Can not create Recovery Storage Group.

User response

Verify that the TSMP environment variable points to valid and accessible directory and try again.

ACN5934E: Mailbox GUID '*mailboxguid*' is associated with the disconnected mailbox '*mailboxname*'.

Explanation

DP for Exchange attempted to update mailbox GUID in order to perform mailbox restore. The GUID is already associated with another mailbox and cannot be set for the mailbox beeing processed. This condition usually occurs when restoring mailboxes that were previously deleted.

System action

Processing ends.

User response

Purge or reconnect the disconnected mailbox and re-try the operation.

Appendix F. Accessibility features for Tivoli Storage Manager

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

Accessibility features

The following list includes the major accessibility features in Tivoli Storage Manager:

- Keyboard-only operation
- Interfaces that are commonly used by screen readers
- Keys that are discernible by touch but do not activate just by touching them
- Industry-standard devices for ports and connectors
- The attachment of alternative input and output devices
- User documentation provided in HTML and PDF format. Descriptive text is provided for all documentation images.

The Tivoli Storage Manager Information Center, and its related publications, are accessibility-enabled.

Keyboard navigation

The Tivoli Storage Manager for Windows Console follows Microsoft conventions for all keyboard navigation and access. Drag and Drop support is managed using the Microsoft Windows Accessibility option known as MouseKeys. For more information about MouseKeys and other Windows accessibility options, please refer to the Windows Online Help (keyword: MouseKeys).

Vendor software

Tivoli Storage Manager includes certain vendor software that is not covered under the IBM license agreement. IBM makes no representation about the accessibility features of these products. Contact the vendor for the accessibility information about its products.

Related accessibility information

You can view the publications for Tivoli Storage Manager in Adobe® Portable Document Format (PDF) using the Adobe Acrobat Reader. You can access these or any of the other documentation PDFs at the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

IBM and accessibility

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Glossary

This glossary includes terms and definitions for IBM Tivoli Storage Manager.

To view glossaries for other IBM products, go to http://www.ibm.com/software/globalization/terminology/.

The following cross-references are used in this glossary:

- *See* refers the reader from a term to a preferred synonym, or from an acronym or abbreviation to the defined full form.
- *See also* refers the reader to a related or contrasting term.

A

absolute mode
In storage management, a backup copy-group mode that specifies that a file is considered for incremental backup even if the file has not changed since the last backup. See also *modified mode*.

access control list (ACL)
In computer security, a list associated with an object that identifies all the subjects that can access the object and their access rights. For example, an access control list is associated with a file that identifies the users who can access that file and their access rights.

access mode
An attribute of a storage pool or a storage volume that specifies whether the server can write to or read from the storage pool or storage volume. The access mode can be read/write, read-only, or unavailable. Volumes in primary storage pools can also have an access mode of destroyed. Volumes in copy storage pools can also have an access mode of offsite.

acknowledgment
The transmission of acknowledgment characters as a positive response to a data transmission.

ACL See *access control list*.

activate
To validate the contents of a policy set and then make it the active policy set.

active-data pool
A named set of storage pool volumes that contain only active versions of client backup data.

active file system
A file system to which space management has been added. With space management, tasks for an active file system include automatic migration, reconciliation, selective migration, and recall. Contrast with *inactive file system*.

active policy set
The activated policy set that contains the policy rules in use by all client nodes that are assigned to the policy domain. See also *policy domain* and *policy set*.

active version
The most recent backup copy of a file stored. The active version of a file cannot be deleted until a backup process detects that the user has either replaced the file with a newer version or has deleted the file from the file server or workstation. Contrast with *inactive version*.

activity log
A log that records normal activity messages that are generated by the server. These messages include information about server and client operations, such as the start time of sessions or device I/O errors.

adaptive subfile backup
A type of backup that sends only changed portions of a file to the server, instead of sending the entire file. Adaptive subfile backup reduces network traffic and increases the speed of the backup.

administrative client
A program that runs on a file server, workstation, or mainframe that administrators use to control and monitor the Tivoli Storage Manager server. Contrast with *backup-archive client*.

administrative command schedule
A database record that describes the planned processing of an administrative

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command during a specific time period. See also *client schedule*.

administrative privilege class
See *privilege class*.

administrative session
A period of time during which an administrator user ID communicates with a server to perform administrative tasks. Contrast with *client node session*.

administrator
A user who is registered to the server as an administrator, and who is authorized to perform tasks and issue commands through the assignment of an administrative privilege class.

Advanced Program-to-Program Communication (APPC)
An implementation of the SNA LU 6.2 protocol that allows interconnected systems to communicate and share the processing of programs.

agent node
A client node that has been granted proxy authority to perform operations on behalf of another client node, which is the target node.

aggregate
An object, stored in one or more storage pools, consisting of a group of logical files that are packaged together. See also *logical file* and *physical file*.

aggregate data transfer rate
A performance statistic that indicates the average number of bytes that were transferred per second while processing a given operation.

APPC See *Advanced Program-to-Program Communication*.

application client
A program that is installed on a system to protect an application. The Tivoli Storage Manager server provides backup services to an application client.

archive
To copy programs, data, or files to another storage media, usually for long-term storage or security. Contrast with *retrieve*.

archive copy
A file or group of files that was archived to server storage.

archive copy group
A policy object containing attributes that control the generation, destination, and expiration of archived files.

archive-retention grace period
The number of days that the storage manager retains an archived file when the server is unable to rebind the file to an appropriate management class. See also *bind*.

association
(1) The defined relationship between a client node and a client schedule. An association identifies the name of a schedule, the name of the policy domain to which the schedule belongs, and the name of a client node that performs scheduled operations.

(2) On a configuration manager, the defined relationship between a profile and an object such as a policy domain. Profile associations define the configuration information that is distributed to a managed server when it subscribes to the profile.

audit To check for logical inconsistencies between information that the server has and the actual condition of the system. The storage manager can audit information about items such as volumes, libraries, and licenses. For example, when a storage manager audits a volume, the server checks for inconsistencies between information about backed-up or archived files that are stored in the database and the actual data that are associated with each backup version or archive copy in server storage.

authentication
The process of checking a user's password before permitting user access to the Tivoli Storage Manager server. Authentication can be turned on or off by an administrator with system privilege.

authentication rule
A specification that another user can use to either restore or retrieve files from storage.

authority
The right to access objects, resources, or functions. See also *privilege class*.

authorization rule
A specification that permits another user to either restore or retrieve a user's files from storage.

authorized user
A user who has administrative authority for the Tivoli Storage Manager client on a workstation. This user changes passwords, performs open registrations, and deletes file spaces.

AutoFS
See *automounted file system*.

automatic detection
A feature that detects, reports, and updates the serial number of a drive or library in the database when the path from the local server is defined.

automatic migration
The process that is used to automatically move files from a local file system to storage, based on options and settings that are chosen by a root user on a workstation. See also *threshold migration* and *demand migration*.

automatic reconciliation
The process that is used to reconcile file systems at regular intervals. The intervals are set by a user with root user authority. See also *reconciliation*.

automounted file system (AutoFS)
A file system that is managed by an automounter daemon. The automounter daemon monitors a specified directory path, and automatically mounts the file system to access data.

B

backup-archive client
A program that runs on a workstation or file server and provides a means for users to back up, archive, restore, and retrieve files. Contrast with *administrative client*.

backup copy group
A policy object containing attributes that control the generation, destination, and expiration of backup versions of files. A backup copy group belongs to a management class.

backup-retention grace period
The number of days the storage manager retains a backup version after the server is unable to rebind the file to an appropriate management class.

backup set
A portable, consolidated group of active versions of backup files that are generated for a backup-archive client.

backup set collection
A group of backup sets that are created at the same time and which have the same backup set name, volume names, description, and device classes. The server identifies each backup set in the collection by its node name, backup set name, and file type.

backup version
A file or directory that a client node backed up to server storage. More than one backup version can exist in server storage, but only one backup version is the active version. See also *active version* and *inactive version*.

bindery
A database that consists of three system files for a NetWare server. The files contain user IDs and user restrictions.

bind To associate a file with a management class name. See *rebind*.

C

cache To place a duplicate copy of a file on random access media when the server migrates a file to another storage pool in the hierarchy.

cache file
A snapshot of a logical volume created by Logical Volume Snapshot Agent. Blocks are saved immediately before they are modified during the image backup and their logical extents are saved in the cache files.

CAD See *client acceptor*.

central scheduler
A function that permits an administrator to schedule client operations and administrative commands. The operations can be scheduled to occur periodically or on a specific date. See *client schedule* and *administrative command schedule*.

client A software program or computer that requests services from a server.

client acceptor daemon (CAD)
See *client acceptor*.

client acceptor
An HTTP service that serves the Java™ applet for the Web client to Web browsers. On Windows systems, the client acceptor is installed and run as a service. On AIX®, UNIX, and Linux® systems, the client acceptor is run as a daemon, and is also called the *client acceptor daemon* (CAD).

client domain
The set of drives, file systems, or volumes that the user selects to back up or archive data, using the backup-archive client.

client node
A file server or workstation on which the backup-archive client program has been installed, and which has been registered to the server.

client node session
A session in which a client node communicates with a server to perform backup, restore, archive, retrieve, migrate, or recall requests. Contrast with *administrative session*.

client options file
An editable file that identifies the server and communication method, and provides the configuration for backup, archive, hierarchical storage management, and scheduling.

client option set
A group of options that are defined on the server and used on client nodes in conjunction with client options files.

client-polling scheduling mode
A method of operation in which the client queries the server for work. Contrast with *server-prompted scheduling mode*.

client schedule
A database record that describes the planned processing of a client operation during a specific time period. The client operation can be a backup, archive, restore, or retrieve operation, a client operating system command, or a macro. See also *administrative command schedule*.

client/server
Pertaining to the model of interaction in distributed data processing in which a program on one computer sends a request to a program on another computer and awaits a response. The requesting program is called a client; the answering program is called a server.

client system-options file
A file, used on AIX, UNIX, or Linux system clients, containing a set of processing options that identify the servers to be contacted for services. This file also specifies communication methods and options for backup, archive, hierarchical storage management, and scheduling. This file is also called the dsm.sys file. See also *client user-options file*.

client user-options file
A file that contains the set of processing options that the clients on the system use. The set can include options that determine the server that the client contacts, and options that affect backup operations, archive operations, hierarchical storage management operations, and scheduled operations. This file is also called the dsm.opt file. For AIX, UNIX, or Linux systems, see also *client system-options file*.

closed registration
A registration process in which only an administrator can register workstations as client nodes with the server. Contrast with *open registration*.

collocation
The process of keeping all data belonging to a single-client file space, a single client node, or a group of client nodes on a minimal number of sequential-access volumes within a storage pool. Collocation can reduce the number of volumes that must be accessed when a large amount of data must be restored.

collocation group
A user-defined group of client nodes whose data is stored on a minimal number of volumes through the process of collocation.

commit point
A point in time when data is considered consistent.

communication method
The method by which a client and server exchange information. See also *Transmission Control Protocol/Internet Protocol*.

Common Programming Interface for Communications (CPI-C)
A call-level interface that provides a consistent application programming interface (API) for applications that use program-to-program communications. CPI-C uses LU 6.2 architecture to create a set of interprogram services that can establish and end a conversation, send and receive data, exchange control information, and notify a partner program of errors.

communication protocol
A set of defined interfaces that permit computers to communicate with each other.

compression
A function that removes repetitive characters, spaces, or strings of characters from the data being processed and replaces the repetitive characters with control characters. Compression reduces the amount of storage space that is required for the data.

configuration manager
A server that distributes configuration information, such as policies and schedules, to managed servers according to their profiles. Configuration information can include policy and schedules. See also *managed server* and *profile*.

conversation
A connection between two programs over a session that allows them to communicate with each other while processing a transaction.

copy backup
A full backup in which the transaction log files are not deleted so that backup procedures that use incremental or differential backups are not disrupted

copy group
A policy object containing attributes that control how backup versions or archive copies are generated, where backup versions or archive copies are initially located, and when backup versions or archive copies expire. A copy group belongs to a management class. See also *archive copy group*, *backup copy group*, *backup version*, and *management class*.

copy storage pool
A named set of volumes that contain copies of files that reside in primary storage pools. Copy storage pools are used only to back up the data that is stored in primary storage pools. A copy storage pool cannot be a destination for a backup copy group, an archive copy group, or a management class (for space-managed files). See also *primary storage pool* and *destination*.

CPI-C See *Common Programming Interface for Communications*.

D

daemon
A program that runs unattended to perform continuous or periodic functions, such as network control.

damaged file
A physical file in which Tivoli Storage Manager has detected read errors.

data access control mode
A mode that controls whether a command can access a migrated file, see a migrated file as zero-length, or receive an input/output error if it attempts to access a migrated file. See also *execution mode*.

database backup series
One full backup of the database, plus up to 32 incremental backups made since that full backup. Each full backup that is run starts a new database backup series. A number identifies each backup series.

database snapshot
A complete backup of the entire database to media that can be taken off-site. When a database snapshot is created, the current database backup series is not interrupted. A database snapshot cannot have incremental database backups associated with it. See also *database backup series*. Contrast with *full backup*.

data deduplication
A method of reducing storage needs by eliminating redundant data. Only one instance of the data is retained on storage

media, such as disk or tape. Other instances of the same data are replaced with a pointer to the retained instance.

data manager server
A server that collects metadata information for client inventory and manages transactions for the storage agent over the local area network. The data manager server informs the storage agent with applicable library attributes and the target volume identifier.

data mover
A device that moves data on behalf of the server. A network-attached storage (NAS) file server is a data mover.

data storage-management application-program interface (DSMAPI)
A set of functions and semantics that can monitor events on files, and manage and maintain the data in a file. In an HSM environment, a DSMAPI uses events to notify data management applications about operations on files, stores arbitrary attribute information with a file, supports managed regions in a file, and uses DSMAPI access rights to control access to a file object.

default management class
A management class that is assigned to a policy set. This class is used to govern backed up or archived files when a file is not explicitly associated with a specific management class through the include-exclude list.

deduplication
See *data deduplication.*

demand migration
The process that is used to respond to an out-of-space condition on a file system for which hierarchical storage management (HSM) is active. Files are migrated to server storage until space usage drops to the low threshold that was set for the file system. If the high threshold and low threshold are the same, one file is migrated.

desktop client
The group of backup-archive clients that includes clients on Microsoft Windows, Apple, and Novell NetWare operating systems.

destination
A copy group or management class attribute that specifies the primary storage pool to which a client file will be backed up, archived, or migrated.

device class
A named set of characteristics that are applied to a group of storage devices. Each device class has a unique name and represents a device type of disk, file, optical disk, or tape.

device configuration file
(1) For a server, a file that contains information about defined device classes, and, on some servers, defined libraries and drives. The information is a copy of the device configuration information in the database.

(2) For a storage agent, a file that contains the name and password of the storage agent, and information about the server that is managing the SAN-attached libraries and drives that the storage agent uses.

device driver
A program that provides an interface between a specific device and the application program that uses the device.

disaster recovery manager (DRM)
A function that assists in preparing and using a disaster recovery plan file for the server.

disaster recovery plan
A file that is created by the disaster recovery manager (DRM) that contains information about how to recover computer systems if a disaster occurs and scripts that can be run to perform some recovery tasks. The file includes information about the software and hardware that is used by the server, and the location of recovery media.

domain
A grouping of client nodes with one or more policy sets, which manage data or storage resources for the client nodes. See *policy domain* or *client domain*.

DRM See *disaster recovery manager*.

DSMAPI
See *data storage-management application-program interface*.

dynamic serialization
A type of copy serialization in which a file or folder is backed up or archived on the first attempt regardless of whether it changes during a backup or archive.

E

EA See *extended attribute*.

EB See *exabyte*.

EFS See *Encrypted File System*.

Encrypted File System (EFS)
A file system that uses file system-level encryption.

enterprise configuration
A method of setting up servers so that the administrator can distribute the configuration of one of the servers to the other servers, using server-to-server communication. See also *configuration manager*, *managed server*, *profile*, and *subscription*.

enterprise logging
The process of sending events from a Tivoli Storage Manager server to a designated event server. The event server routes the events to designated receivers, such as to a user exit. See also *event*.

error log
A data set or file that is used to record error information about a product or system.

estimated capacity
The available space, in megabytes, of a storage pool.

event (1) An administrative command or a client operation that is scheduled to be run using Tivoli Storage Manager scheduling.

(2) A message that an Tivoli Storage Manager server or client issues. Messages can be logged using Tivoli Storage Manager event logging.

event record
A database record that describes actual status and results for events.

event server
A server to which other servers can send events for logging. The event server routes the events to any receivers that are enabled for the sending server's events.

exabyte (EB)
For processor storage, real and virtual storage, and channel volume, 1 152 921 504 606 846 976 bytes. For disk storage capacity and communications volume, 1 000 000 000 000 000 000 bytes.

exclude
The process of identifying files in an include-exclude list. This process prevents the files from being backed up or migrated whenever a user or schedule enters an incremental or selective backup operation. A file can be excluded from backup and space management, backup only, or space management only.

exclude-include list
See *include-exclude list*.

execution mode
A mode that controls the space-management related behavior of commands that run under the **dsmmode** command.

expiration
The process by which files, data sets, or objects are identified for deletion because their expiration date or retention period has passed.

expiring file
A migrated or premigrated file that has been marked for expiration and removal from storage. If a stub file or an original copy of a premigrated file is deleted from a local file system, or if the original copy of a premigrated file is updated, the corresponding migrated or premigrated file is marked for expiration the next time reconciliation is run.

extend
To increase the portion of available space that can be used to store database or recovery log information.

extended attribute (EA)
Names or value pairs that are associated with files or directories. There are three classes of extended attributes: user attributes, system attributes, and trusted attributes.

external library
A type of library that is provided by Tivoli Storage Manager that permits LAN-free data movement for StorageTek libraries that are managed by Automated

Cartridge System Library Software (ACSLS). To activate this function, the Tivoli Storage Manager library type must be EXTERNAL.

F

file access time
On AIX, UNIX, or Linux systems, the time when the file was last accessed.

file age
For migration prioritization purposes, the number of days since a file was last accessed.

file device type
A device type that specifies the use of sequential access files on disk storage as volumes.

file server
A dedicated computer and its peripheral storage devices that are connected to a local area network that stores programs and files that are shared by users on the network.

file space
A logical space in server storage that contains a group of files that have been backed up or archived by a client node, from a single logical partition, file system, or virtual mount point. Client nodes can restore, retrieve, or delete their file spaces from server storage. In server storage, files belonging to a single file space are not necessarily stored together.

file space ID (FSID)
A unique numeric identifier that the server assigns to a file space when it is stored in server storage.

file state
The space management mode of a file that resides in a file system to which space management has been added. A file can be in one of three states: resident, premigrated, or migrated. See also *resident file*, *premigrated file*, and *migrated file*.

file system migrator (FSM)
A kernel extension that intercepts all file system operations and provides any space management support that is required. If no space management support is required, the operation is passed to the operating system, which performs its normal functions. The file system migrator is mounted over a file system when space management is added to the file system.

file system state
The storage management mode of a file system that resides on a workstation on which the hierarchical storage management (HSM) client is installed. A file system can be in one of these states: native, active, inactive, or global inactive.

frequency
A copy group attribute that specifies the minimum interval, in days, between incremental backups.

FSID See *file space ID*.

FSM See *file system migrator*.

full backup
The process of backing up the entire server database. A full backup begins a new database backup series. See also *database backup series* and *incremental backup*. Contrast with *database snapshot*.

fuzzy backup
A backup version of a file that might not accurately reflect what is currently in the file because the file was backed up at the same time as it was being modified.

fuzzy copy
A backup version or archive copy of a file that might not accurately reflect the original contents of the file because it was backed up or archived the file while the file was being modified. See also *backup version* and *archive copy*.

G

General Parallel File System
A high-performance shared-disk file system that can provide data access from nodes in a cluster environment.

gigabyte (GB)
In decimal notation, 1 073 741 824 when referring to memory capacity; in all other cases, it is defined as 1 000 000 000.

global inactive state
The state of all file systems to which space management has been added when space management is globally deactivated for a client node. When space management is globally deactivated, hierarchical storage management (HSM)

cannot perform migration, recall, or reconciliation. However, a root user can update space management settings and add space management to additional file systems. Users can access resident and premigrated files.

Globally Unique Identifier (GUID)
An algorithmically determined number that uniquely identifies an entity within a system.

GPFS™
See *General Parallel File System*.

GPFS node set
A mounted, defined group of GPFS file systems.

group backup
The backup of a group containing a list of files from one or more file space origins.

GUID See *Globally Unique Identifier*.

H

hierarchical storage management (HSM)
A function that automatically distributes and manages data on disk, tape, or both by regarding devices of these types and potentially others as levels in a storage hierarchy that range from fast, expensive devices to slower, cheaper, and possibly removable devices. The objectives are to minimize access time to data and maximize available media capacity.

hierarchical storage management (HSM) client
A client program that works with the Tivoli Storage Manager server to provide hierarchical storage management (HSM) for a system. See also *hierarchical storage management* and *space manager client*.

HSM See *hierarchical storage management*.

HSM client
See *hierarchical storage management client*.

I

ILM See *information lifecycle management*.

image A file system or raw logical volume that is backed up as a single object.

image backup
A backup of a full file system or raw logical volume as a single object.

inactive file system
A file system for which space management has been deactivated. Contrast with *active file system*.

inactive version
A backup version of a file that is either not the most recent backup version, or that is a backup version of a file that no longer exists on the client system. Inactive backup versions are eligible for expiration processing according to the management class assigned to the file. Contrast with *active version*.

include-exclude file
A file containing statements to determine the files to back up and the associated management classes to use for backup or archive. See also *include-exclude list*.

include-exclude list
A list of options that include or exclude selected files for backup. An exclude option identifies files that should not be backed up. An include option identifies files that are exempt from the exclusion rules or assigns a management class to a file or a group of files for backup or archive services.

incremental backup
(1) A copy of all database data that has changed since the most recent successful full backup operation. An incremental backup is also known as a *cumulative backup image* because each incremental backup includes the contents of the previous incremental backup.

(2) The process of backing up information in the database that is new or changed since the last full backup. Contrast with *full backup*. See also *database backup series*.

(3) For Data Protection for Microsoft Exchange Server, a backup in which the transaction logs are backed up and then cleared.

individual mailbox restore
See *mailbox restore*.

information lifecycle management (ILM)
GPFS policy-based file management for storage pools and file sets.

i-node The internal structure that describes the individual files on AIX, UNIX, or Linux systems. An i-node contains the node, type, owner, and location of a file.

i-node number
A number specifying a particular i-node file in the file system.

IP address
A unique address for a device or logical unit on a network that uses the IP standard.

J

job file
A generated file that contains configuration information for a migration job. The file is XML format and can be created and edited in the hierarchical storage management (HSM) client for Windows client graphical user interface.

journal-based backup
A method for backing up Windows clients and AIX clients that exploits the change notification mechanism in a file to improve incremental backup performance by reducing the need to fully scan the file system.

journal daemon
On AIX, UNIX, or Linux systems, a program that tracks change activity for files residing in file systems.

journal service
In Microsoft Windows, a program that tracks change activity for files residing in file systems.

K

kilobyte (KB)
For processor storage, real and virtual storage, and channel volume, 210 or 1 024 bytes. For disk storage capacity and communications volume, 1 000 bytes.

L

LAN See *local area network*.

LAN-free data movement
The movement of client data between a client system and a storage device on a storage area network (SAN), bypassing the local area network. This process is also referred to as *LAN-free data transfer*.

LAN-free data transfer
See *LAN-free data movement*.

leader data
Bytes of data, from the beginning of a migrated file, that are stored in the file's corresponding stub file on the local file system. The amount of leader data that is stored in a stub file depends on the stub size that is specified.

library
(1) A repository for demountable recorded media, such as magnetic disks and magnetic tapes.

(2) A collection of one or more drives, and possibly robotic devices (depending on the library type), which can be used to access storage volumes.

library client
A server that uses server-to-server communication to access a library that is managed by another storage management server. See also *library manager*.

library manager
A server that controls device operations when multiple storage management servers share a storage device. See also *library client*.

local Pertaining to a device, file, or system that is accessed directly from a user's system, without the use of a communication line.

local area network (LAN)
A network that connects several devices in a limited area (such as a single building or campus) and that can be connected to a larger network.

local shadow volumes
Data that is stored on shadow volumes localized to a disk storage subsystem.

LOFS See *loopback virtual file system.*

logical file
A file that is stored in one or more server storage pools, either by itself or as part of an aggregate. See also *aggregate* and *physical file*.

logical occupancy
The space that is used by logical files in a storage pool. This space does not include the unused space created when logical files are deleted from aggregate files, so it might be less than the physical occupancy.

logical unit (LU)
An access point through which a user or application program accesses the Systems

Network Architecture (SNA) network to communicate with another user or application program.

logical unit number (LUN)
In the Small Computer System Interface (SCSI) standard, a unique identifier that is used to differentiate devices, each of which is a logical unit (LU).

logical volume
A portion of a physical volume that contains a file system.

logical volume backup
A back up of a file system or logical volume as a single object.

Logical Volume Snapshot Agent (LVSA)
Software that can act as the snapshot provider for creating a snapshot of a logical volume during an online image backup.

loopback virtual file system (LOFS)
A file system that is created by mounting a directory over another local directory, also known as mount-over-mount. A LOFS can also be generated using an automounter.

LU See *logical unit*.

LUN See *logical unit number*.

LVSA See *Logical Volume Snapshot Agent*.

M

MB See *megabyte*.

macro file
A file that contains one or more storage manager administrative commands, which can be run only from an administrative client using the MACRO command. Contrast with *Tivoli Storage Manager command script*.

mailbox restore
A function that restores Microsoft Exchange Server data (from IBM Data Protection for Exchange backups) at the mailbox level or mailbox-item level.

managed object
In Tivoli Storage Manager, a definition in the database of a managed server that was distributed to the managed server by a configuration manager. When a managed server subscribes to a profile, all objects that are associated with that profile become managed objects in the database of the managed server. In general, a managed object cannot be modified locally on the managed server. Objects can include policy, schedules, client option sets, server scripts, administrator registrations, and server and server group definitions.

managed server
A Tivoli Storage Manager server that receives configuration information from a configuration manager using a subscription to one or more profiles. Configuration information can include definitions of objects such as policy and schedules. See also *configuration manager*, *subscription*, and *profile*.

management class
A policy object that users can bind to each file to specify how the server manages the file. The management class can contain a backup copy group, an archive copy group, and space management attributes. See also *copy group*, *space manager client*, *bind*, and *rebind*.

maximum transmission unit
The largest possible unit of data that can be sent on a given physical medium in a single frame. For example, the maximum transmission unit for Ethernet is 1500 bytes.

megabyte (MB)
(1) 1 048 576 bytes (two to the twentieth power) when used in this publication.

(2) For processor storage, real and virtual storage, and channel volume, 2 to the power of 20 or 1 048 576 bits. For disk storage capacity and communications volume, 1 000 000 bits.

metadata
Data that describes the characteristics of data; descriptive data.

migrate
To move data from one storage location to another. In Tivoli Storage Manager products, migrating can mean moving data from a client node to server storage, or moving data from one storage pool to the next storage pool defined in the server storage hierarchy. In both cases the

movement is controlled by policy, such as thresholds that are set. See also *migration threshold*.

migrated file
A file that has been copied from a local file system to Tivoli Storage Manager storage. For HSM clients on UNIX or Linux systems, the file is replaced with a stub file on the local file system. On Windows systems, creation of the stub file is optional. See also *stub file* and *resident file*. For HSM clients on UNIX or Linux systems, contrast with *premigrated file*.

migrate-on-close recall mode
A mode that causes a migrated file to be recalled back to its originating file system temporarily. Contrast with *normal recall mode* and *read-without-recall recall mode*.

migration job
A specification of files to migrate, and actions to perform on the original files after migration. See also *job file*.

migration threshold
High and low capacities for storage pools or file systems, expressed as percentages, at which migration is set to start and stop.

mirroring
The process of writing the same data to multiple locations at the same time. Mirroring data protects against data loss within the recovery log.

mode A copy group attribute that specifies whether to back up a file that has not been modified since the last time the file was backed up. See *modified mode* and *absolute mode*.

modified mode
In storage management, a backup copy-group mode that specifies that a file is considered for incremental backup only if it has changed since the last backup. A file is considered a changed file if the date, size, owner, or permissions of the file have changed. See also *absolute mode*.

mount limit
The maximum number of volumes that can be simultaneously accessed from the same device class. The mount limit determines the maximum number of mount points. See also *mount point*.

mount point
On the Tivoli Storage Manager server, a logical drive through which volumes in a sequential access device class are accessed. For removable-media device types, such as tape, a mount point is a logical drive that is associated with a physical drive. For the file device type, a mount point is a logical drive that is associated with an I/O stream. The number of mount points for a device class is defined by the value of the mount limit attribute for that device class. See also *mount limit*.

mount retention period
The maximum number of minutes that the server retains a mounted sequential-access media volume that is not being used before it dismounts the sequential-access media volume.

mount wait period
The maximum number of minutes that the server waits for a sequential-access volume mount request to be satisfied before canceling the request.

MTU See *maximum transmission unit*.

N

Nagle algorithm
An algorithm that reduces congestion of TCP/IP networks by combining smaller packets and sending them together.

named pipe
A type of interprocess communication that permits message data streams to pass between peer processes, such as between a client and a server.

NAS See *network-attached storage*.

NAS node
A client node that is a network-attached storage (NAS) file server. Data for the NAS node is transferred by a NAS file server that is controlled by the network data management protocol (NDMP). A NAS node is also called a NAS file server node.

native file system
A file system that is locally added to the file server and is not added for space management. The hierarchical storage

manager (HSM) client does not provide space management services to the file system.

native format
A format of data that is written to a storage pool directly by the Tivoli Storage Manager server. Contrast with *non-native data format*.

NDMP
See *Network Data Management Protocol*.

NetBIOS
See *Network Basic Input/Output System*.

network-attached storage (NAS) file server
A dedicated storage device with an operating system that is optimized for file-serving functions. A NAS file server can have the characteristics of both a node and a data mover.

Network Basic Input/Output System (NetBIOS)
A standard interface to networks and personal computers that is used on local area networks to provide message, print-server, and file-server functions. Application programs that use NetBIOS do not have to handle the details of LAN data link control (DLC) protocols.

Network Data Management Protocol (NDMP)
A protocol that allows a network storage-management application to control the backup and recovery of an NDMP-compliant file server, without installing vendor-acquired software on that file server.

network data-transfer rate
A rate that is calculated by dividing the total number of bytes that are transferred by the data transfer time. For example, this rate can be the time that is spent transferring data over a network.

node A file server or workstation on which the backup-archive client program has been installed, and which has been registered to the server.

node name
A unique name that is used to identify a workstation, file server, or PC to the server.

node privilege class
A privilege class that gives an administrator the authority to remotely access backup-archive clients for a specific client node or for all clients in a policy domain. See also *privilege class*.

non-native data format
A format of data that is written to a storage pool that differs from the format that the server uses for operations.

normal recall mode
A mode that causes a migrated file to be copied back to its originating file system when it is accessed.

O

offline volume backup
A backup in which the volume is locked so that no other system applications can access it during the backup operation.

online volume backup
A backup in which the volume is available to other system applications during the backup operation.

open registration
A registration process in which users can register their workstations as client nodes with the server. Contrast with *closed registration*.

operator privilege class
A privilege class that gives an administrator the authority to disable or halt the server, enable the server, cancel server processes, and manage removable media. See also *privilege class*.

options file
A file that contains processing options. On Windows and NetWare systems, the file is called dsm.opt. On AIX, UNIX, Linux, and Mac OS X systems, the file is called dsm.sys.

originating file system
The file system from which a file was migrated. When a file is recalled using normal or migrate-on-close recall mode, it is always returned to its originating file system.

orphaned stub file
A file for which no migrated file can be found on the Tivoli Storage Manager server that the client node is contacting for space management services. For example, a stub file can be orphaned when the client system-options file is

modified to contact a server that is different than the one to which the file was migrated.

out-of-space protection mode
A mode that controls whether the program intercepts out-of-space conditions. See also *execution mode*.

P

pacing
In SNA, a technique by which the receiving system controls the rate of transmission of the sending system to prevent overrun.

packet In data communication, a sequence of binary digits, including data and control signals, that is transmitted and switched as a composite whole.

page A defined unit of space on a storage medium or within a database volume.

partial-file recall mode
A recall mode that causes the hierarchical storage management (HSM) function to read just a portion of a migrated file from storage, as requested by the application accessing the file.

password generation
A process that creates and stores a new password in an encrypted password file when the old password expires. Automatic generation of a password prevents password prompting. Password generation can be set in the options file (passwordaccess option). See also *options file*.

path An object that defines a one-to-one relationship between a source and a destination. Using the path, the source accesses the destination. Data can flow from the source to the destination, and back. An example of a source is a data mover (such as a network-attached storage [NAS] file server), and an example of a destination is a tape drive.

pattern-matching character
See *wildcard character*.

physical file
A file that is stored in one or more storage pools, consisting of either a single logical file, or a group of logical files that are packaged together as an aggregate. See also *aggregate* and *logical file*.

physical occupancy
The amount of space that is used by physical files in a storage pool. This space includes the unused space that is created when logical files are deleted from aggregates. See also *physical file*, *logical file*, and *logical occupancy*.

plug-in
A self-contained software component that modifies (adds, or changes) the function in a particular system. When a plug-in is added to a system, the foundation of the original system remains intact.

policy domain
A grouping of policy users with one or more policy sets, which manage data or storage resources for the users. The users are client nodes that are associated with the policy domain.

policy privilege class
A privilege class that gives an administrator the authority to manage policy objects, register client nodes, and schedule client operations for client nodes. Authority can be restricted to certain policy domains. See also *privilege class*.

policy set
A group of rules in a policy domain. The rules specify how data or storage resources are automatically managed for client nodes in the policy domain. Rules can be contained in management classes. See also *active policy set* and *management class*.

premigrated file
A file that has been copied to Tivoli Storage Manager storage, but has not been replaced with a stub file on the local file system. An identical copy of the file resides both on the local file system and in Tivoli Storage Manager storage. Premigrated files occur on UNIX and Linux file systems to which space management has been added. Contrast with *migrated file* and *resident file*.

premigrated files database
A database that contains information about each file that has been premigrated to Tivoli Storage Manager storage. The database is stored in a hidden directory

named `.SpaceMan` in each file system to which space management has been added.

premigration
The process of copying files that are eligible for migration to Tivoli Storage Manager storage, but leaving the original file intact on the local file system.

premigration percentage
A space management setting that controls whether the next eligible candidates in a file system are premigrated following threshold or demand migration.

primary storage pool
A named set of volumes that the server uses to store backup versions of files, archive copies of files, and files migrated from client nodes. See also *destination* and *copy storage pool*.

privilege class
A level of authority that is granted to an administrator. The privilege class determines which administrative tasks the administrator can perform. See also *node privilege class*, *operator privilege class*, *policy privilege class*, *storage privilege class*, and *system privilege class*.

profile
A named group of configuration information that can be distributed from a configuration manager when a managed server subscribes. Configuration information can include registered administrator IDs, policies, client schedules, client option sets, administrative schedules, storage manager command scripts, server definitions, and server group definitions. See also *configuration manager* and *managed server*.

Q

quota (1) For HSM on AIX, UNIX, or Linux systems, the limit (in megabytes) on the amount of data that can be migrated and premigrated from a file system to server storage.

(2) For HSM on Windows systems, a user-defined limit to the space that is occupied by recalled files.

R

randomization
The process of distributing schedule start times for different clients within a specified percentage of the schedule's startup window.

raw logical volume
A portion of a physical volume that is comprised of unallocated blocks and has no journaled file system (JFS) definition. A logical volume is read/write accessible only through low-level I/O functions.

read-without-recall recall mode
A mode that causes hierarchical storage management (HSM) to read a migrated file from storage without storing it back on the local file system. The last piece of information read from the file is stored in a buffer in memory on the local file system. Contrast with *normal recall mode* and *migrate-on-close recall mode*.

rebind
To associate a backed-up file with a new management class name. For example, rebinding occurs when the management class associated with a file is deleted. See also *bind*.

recall In Tivoli Storage Manager, to copy a migrated file from server storage back to its originating file system using the space management client. See also *transparent recall*, *selective recall*, and *recall mode*.

recall mode
A mode that is assigned to a migrated file with the dsmattr command that determines how the file is processed when it is recalled. It determines whether the file is stored on the local file system, is migrated back to Tivoli Storage Manager storage when it is closed, or is read from Tivoli Storage Manager storage without storing it on the local file system.

receiver
A server repository that contains a log of server and client messages as events. For example, a receiver can be a file exit, a user exit, or the Tivoli Storage Manager server console and activity log. See also *event*.

reclamation
The process of consolidating the remaining data from many sequential-access volumes onto fewer, new sequential-access volumes.

reclamation threshold
The percentage of space that a sequential-access media volume must have before the server can reclaim the volume. Space becomes reclaimable when files are expired or are deleted.

reconciliation
The process of synchronizing a file system with the Tivoli Storage Manager server, and then removing old and obsolete objects from the Tivoli Storage Manager server.

recovery log
A log of updates that are about to be written to the database. The log can be used to recover from system and media failures. The recovery log consists of the active log (including the log mirror) and archive logs.

register
To define a client node or administrator ID that can access the server.

registry
A repository that contains access and configuration information for users, systems, and software.

resident file
On a Windows system, a complete file on a local file system that might also be a migrated file because a migrated copy can exist in Tivoli Storage Manager storage. On a UNIX or Linux system, a complete file on a local file system that has not been migrated or premigrated, or that has been recalled from Tivoli Storage Manager storage and modified. Contrast with *stub file* and *premigrated file*. See *migrated file*.

restore
To copy information from its backup location to the active storage location for use. For example, to copy information from server storage to a client workstation.

retention
The amount of time, in days, that inactive backed-up or archived files are kept in the storage pool before they are deleted. Copy group attributes and default retention grace periods for the domain define retention.

retrieve
To copy archived information from the storage pool to the workstation for use. The retrieve operation does not affect the archive version in the storage pool.

roll back
To remove changes that were made to database files since the last commit point.

root user
A system user who operates without restrictions. A root user has the special rights and privileges needed to perform administrative tasks.

S

SAN See *storage area network*.

schedule
A database record that describes client operations or administrative commands to be processed. See *administrative command schedule* and *client schedule*.

scheduling mode
The type of scheduling operation for the server and client node that supports two scheduling modes: client-polling and server-prompted.

scratch volume
A labeled volume that is either blank or contains no valid data, that is not defined, and that is available for use.

script A series of commands, combined in a file, that carry out a particular function when the file is run. Scripts are interpreted as they are run. Contrast with *Tivoli Storage Manager command script*.

Secure Sockets Layer (SSL)
A security protocol that provides communication privacy. With SSL, client/server applications can communicate in a way that is designed to prevent eavesdropping, tampering, and message forgery.

selective backup
The process of backing up certain files or directories from a client domain. The files that are backed up are those that are not excluded in the include-exclude list. The files must meet the requirement for serialization in the backup copy group of the management class that is assigned to each file. Contrast with *incremental backup*.

selective migration
The process of copying user-selected files

from a local file system to Tivoli Storage Manager storage and replacing the files with stub files on the local file system. Contrast with *threshold migration* and *demand migration*.

selective recall
The process of copying user-selected files from Tivoli Storage Manager storage to a local file system. Contrast with *transparent recall*.

serialization
The process of handling files that are modified during backup or archive processing. See *dynamic serialization*, *static serialization*, *shared static serialization*, and *shared dynamic serialization*.

server A software program or a computer that provides services to other software programs or other computers.

server options file
A file that contains settings that control various server operations. These settings affect such things as communications, devices, and performance.

server-prompted scheduling mode
A client/server communication technique where the server contacts the client node when tasks must be done. Contrast with *client-polling scheduling mode*.

server storage
The primary, copy, and active-data storage pools that are used by the server to store user files such as backup versions, archive copies, and files migrated from space manager client nodes (space-managed files). See also *active-data pool*, *primary storage pool*, *copy storage pool*, *storage pool volume*, and *volume*.

session
A logical or virtual connection between two stations, software programs, or devices on a network that allows the two elements to communicate and exchange data.

session resource usage
The amount of wait time, processor time, and space that is used or retrieved during a client session.

shared dynamic serialization
A value for serialization that specifies that a file must not be backed up or archived if it is being modified during the operation. Tivoli Storage Manager retries the backup or archive operation a number of times; if the file is being modified during each attempt, Tivoli Storage Manager will back up or archive the file on its last try. See also *serialization*. Contrast with *dynamic serialization*, *shared static serialization*, and *static serialization*.

shared library
A library device that is used by multiple storage manager servers.

shared static serialization
A copy-group serialization value that specifies that a file must not be modified during a backup or archive operation. Tivoli Storage Manager attempts to retry the operation a number of times. If the file is in use during each attempt, the file is not backed up or archived. See also *serialization*. Contrast with *dynamic serialization*, *shared dynamic serialization*, and *static serialization*.

snapshot
An image backup type that consists of a point-in-time view of a volume.

space-managed file
A file that is migrated from a client node by the space manager client. The space manager client recalls the file to the client node on demand.

space management
The process of keeping sufficient free storage space available on a local file system for new data by migrating files to server storage. Synonymous with *hierarchical storage management*.

space manager client
A program that runs on a UNIX or Linux system to manage free space on the local file system by migrating files to server storage. The program can recall the files either automatically or selectively. Also called *hierarchical storage management (HSM) client*.

space monitor daemon
A daemon that checks space usage on all file systems for which space management is active, and automatically starts threshold migration when space usage on a file system equals or exceeds its high threshold.

sparse file
A file that is created with a length greater than the data it contains, leaving empty spaces for the future addition of data.

special file
On AIX, UNIX, or Linux systems, a file that defines devices for the system, or temporary files that are created by processes. There are three basic types of special files: first-in, first-out (FIFO); block; and character.

SSL See *Secure Sockets Layer*.

stabilized file space
A file space that exists on the server but not on the client.

stanza A group of lines in a file that together have a common function or define a part of the system. Each stanza is identified by a name that occurs in the first line of the stanza. Depending on the type of file, a stanza is ended by the next occurrence of a stanza name in the file, or by an explicit end-of-stanza marker. A stanza can also be ended by the end of the file.

startup window
A time period during which a schedule must be initiated.

static serialization
A copy-group serialization value that specifies that a file must not be modified during a backup or archive operation. If the file is in use during the first attempt, the storage manager cannot back up or archive the file. See also *serialization*. Contrast with *dynamic serialization*, *shared dynamic serialization*, and *shared static serialization*.

storage agent
A program that enables the backup and restoration of client data directly to and from storage attached to a storage area network (SAN).

storage area network (SAN)
A dedicated storage network that is tailored to a specific environment, combining servers, systems, storage products, networking products, software, and services.

storage hierarchy
(1) A logical order of primary storage pools, as defined by an administrator. The order is typically based on the speed and capacity of the devices that the storage pools use. The storage hierarchy is defined by identifying the next storage pool in a storage pool definition. See also *storage pool*.

(2) An arrangement of storage devices with different speeds and capacities. The levels of the storage hierarchy include: main storage, such as memory and direct-access storage device (DASD) cache; primary storage (DASD containing user-accessible data); migration level 1 (DASD containing data in a space-saving format); and migration level 2 (tape cartridges containing data in a space-saving format).

storage pool
A named set of storage volumes that are the destination that is used to store client data. A storage pool contains backup versions, archive copies, and files that are migrated from space manager client nodes. A primary storage pool is backed up to a copy storage pool. See also *primary storage pool*, *copy storage pool*, and *active-data pool*.

storage pool volume
A volume that has been assigned to a storage pool. See also *volume*, *active-data pool*, *copy storage pool*, and *primary storage pool*.

storage privilege class
A privilege class that gives an administrator the authority to control how storage resources for the server are allocated and used, such as monitoring the database, the recovery log, and server storage. See also *privilege class*.

stub A shortcut on the Windows file system that is generated by the hierarchical storage management (HSM) client for a migrated file that allows transparent user access. A stub is the sparse file representation of a migrated file, with a reparse point attached.

stub file
A file that replaces the original file on a local file system when the file is migrated to storage. A stub file contains the information that is necessary to recall a migrated file from Tivoli Storage Manager storage. It also contains additional

information that can be used to eliminate the need to recall a migrated file.

stub file size
The size of a file that replaces the original file on a local file system when the file is migrated to Tivoli Storage Manager storage. The size that is specified for stub files determines how much leader data can be stored in the stub file. The default for stub file size is the block size defined for a file system minus 1 byte.

subscription
In a Tivoli environment, the process of identifying the subscribers that the profiles are distributed to. For Tivoli Storage Manager, a subscription is the process by which a managed server receives configuration information associated with a particular profile on a configuration manager. See also *managed server*, *configuration manager*, and *profile*.

Systems Network Architecture (SNA)
The description of the logical structure, formats, protocols, and operational sequences for transmitting information through and controlling the configuration and operation of networks.

system privilege class
A privilege class that gives an administrator the authority to issue all server commands. See also *privilege class*.

T

tape library
A set of equipment and facilities that support an installation's tape environment. The tape library can include tape storage racks, mechanisms for automatic tape mounting, a set of tape drives, and a set of related tape volumes mounted on those drives.

tape volume prefix
The high-level-qualifier of the file name or the data set name in the standard tape label.

target node
A client node for which other client nodes (called agent nodes) have been granted proxy authority. The proxy authority allows the agent nodes to perform operations such as backup and restore on behalf of the target node, which owns the data.

TCA See *trusted communications agent*.

TCP/IP
See *Transmission Control Protocol/Internet Protocol*.

threshold migration
The process of moving files from a local file system to Tivoli Storage Manager storage based on the high and low thresholds that are defined for the file system. Contrast with *demand migration*, *selective migration*, and *migration job*.

throughput
In storage management, the total bytes in the workload, excluding overhead, that are backed up or restored, divided by elapsed time.

timeout
A time interval that is allotted for an event to occur or complete before operation is interrupted.

timestamp control mode
A mode that determines whether commands preserve the access time for a file or set it to the current time.

Tivoli Storage Manager command script
A sequence of Tivoli Storage Manager administrative commands that are stored in the database of the Tivoli Storage Manager server. The script can run from any interface to the server. The script can include substitution for command parameters and conditional logic.

tombstone object
A small subset of attributes of a deleted object. The tombstone object is retained for a specified period, and at the end of the specified period, the tombstone object is permanently deleted.

Transmission Control Protocol/Internet Protocol (TCP/IP)
An industry-standard, nonproprietary set of communication protocols that provides reliable end-to-end connections between applications over interconnected networks of different types.

transparent recall
The process that is used to automatically recall a file to a workstation or file server when the file is accessed. See also *recall mode*. Contrast with *selective recall*.

trusted communications agent (TCA)
A program that handles the sign-on password protocol when clients use password generation.

U

UCS-2 A 2-byte (16-bit) encoding scheme based on ISO/IEC specification 10646-1. UCS-2 defines three levels of implementation: Level 1-No combining of encoded elements allowed; Level 2-Combining of encoded elements is allowed only for Thai, Indic, Hebrew, and Arabic; Level 3-Any combination of encoded elements are allowed.

UNC See *Universal Naming Convention name*.

Unicode
A character encoding standard that supports the interchange, processing, and display of text that is written in the common languages around the world, plus some classical and historical texts. The Unicode standard has a 16-bit character set defined by ISO 10646.

Unicode-enabled file space
Unicode file space names provide support for multilingual workstations without regard for the current locale.

Unicode transformation format 8
Unicode Transformation Format (UTF), 8-bit encoding form, which is designed for ease of use with existing ASCII-based systems. The CCSID value for data in UTF-8 format is 1208.

Universal Naming Convention (UNC) name
A name that is used to access a drive or directory containing files shared across a network. The UNC name includes the system name and a SharePoint name that represents the shared drive or directory.

Universally Unique Identifier (UUID)
The 128-bit numerical identifier that is used to ensure that two components do not have the same identifier.

UTF-8 See *Unicode transformation format 8*.

UUID See *Universally Unique Identifier*.

V

validate
To check a policy set for conditions that can cause problems if that policy set becomes the active policy set. For example, the validation process checks whether the policy set contains a default management class.

version
A backup copy of a file stored in server storage. The most recent backup copy of a file is the active version. Earlier copies of the same file are inactive versions. The number of versions retained by the server is determined by the copy group attributes in the management class.

virtual file space
A representation of a directory on a network-attached storage (NAS) file system as a path to that directory.

virtual volume
An archive file on a target server that represents a sequential media volume to a source server.

volume
A discrete unit of storage on disk, tape or other data recording medium that supports some form of identifier and parameter list, such as a volume label or input/output control. See also *scratch volume*, and *storage pool volume*.

volume history file
A file that contains information about volumes that have been used by the server for database backups and for export of administrator, node, policy, or server data. The file also has information about sequential-access storage pool volumes that have been added, reused, or deleted. The information is a copy of volume information that is recorded in the server database.

Volume Shadow Copy Service
A set of Microsoft application-programming interfaces (APIs) that you can use to create shadow copy backups of volumes, exact copies of files, including all open files, and so on.

VSS See *Volume Shadow Copy Service*.

VSS Backup
A backup operation that uses Microsoft Volume Shadow Copy Service (VSS) technology. The backup operation produces an online snapshot (point-in-time consistent copy) of Exchange data. This copy can be stored

on local shadow volumes or on Tivoli Storage Manager server storage.

VSS Fast Restore
A function that uses a Microsoft Volume Shadow Copy Service (VSS) software provider to restore VSS Backups (IBM Data Protection for Exchange database files and log files) that reside on local shadow volumes.

VSS Instant Restore
A volume-level hardware-assisted Microsoft Volume Shadow Copy Service (VSS) function where target volumes that contain the snapshot are copied back to the original source volumes.

VSS offloaded backup
A backup operation that uses a Microsoft Volume Shadow Copy Service (VSS) hardware provider (installed on an alternate system) to move IBM Data Protection for Exchange data to the Tivoli Storage Manager server. This type of backup operation shifts the backup load from the production system to another system.

VSS Restore
A function that uses a Microsoft Volume Shadow Copy Service (VSS) software provider to restore VSS Backups (IBM Data Protection for Exchange database files and log files) that reside on Tivoli Storage Manager server storage to their original location.

W

wildcard character
A special character such as an asterisk (*) or a question mark (?) that can be used to represent one or more characters. Any character or set of characters can replace the wildcard character.

workstation
A configuration of input/output equipment at which an operator works. A workstation is a terminal or microcomputer at which a user can run applications and that is usually connected to a mainframe or a network.

worldwide name
A 64-bit, unsigned name identifier that is unique.

workload partition (WPAR)
A partition within a single operating system instance.

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Program Number: 5608-E06, 5608-E11

Printed in USA

SC23-9796-01