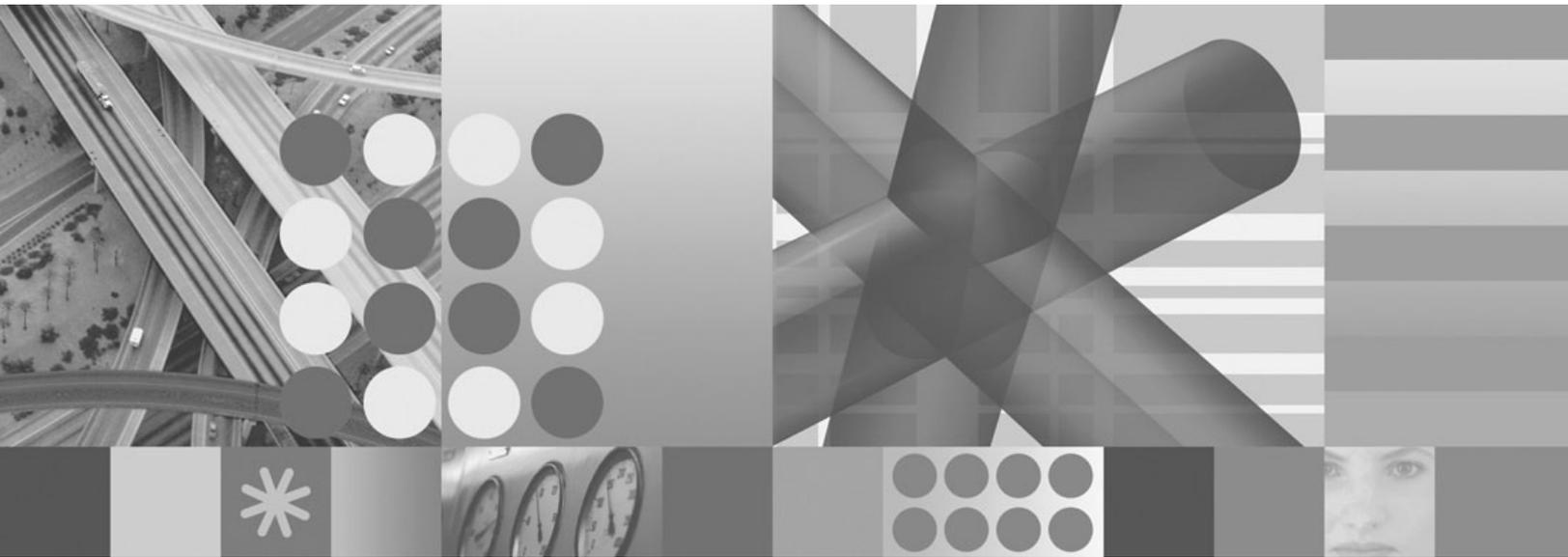




**Installation and User's Guide
for Windows**



**Installation and User's Guide
for Windows**

Note

Before using this information and the product it supports, read the information in "Notices" on page 133.

Edition notice

This edition applies to Version 2.1 of IBM Tivoli Storage FlashCopy Manager for Windows (program number 5724-X94) and to all subsequent releases and modifications until otherwise indicated in new editions.

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Preface

The subject of this publication is IBM® Tivoli® Storage FlashCopy® Manager for Windows®.

Tivoli Storage FlashCopy Manager provides the tools and information needed to create and manage volume-level snapshots while the applications that contain data on those volumes remain online.

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

- Windows Server 2003
- Windows Server 2003 R2
- 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

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

- SQL Server 2005
- SQL Server 2008

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

Who should read this publication

This publication is intended for administrators who are responsible for implementing a backup solution in one of the supported database server environments. It is assumed that you have an understanding of the following, as applicable:

- The IBM storage system used for the database:
 - IBM System Storage™ Disk Storage Model DS3000, DS4000, DS5000, or DS8000®
 - IBM System Storage SAN Volume Controller (SVC)
 - IBM XIV® Storage Systems
- Windows operating system
- Microsoft® Volume Shadow Copy Service (VSS)
- One of these server applications:
 - Microsoft Exchange Server
 - Microsoft SQL Server

Publications

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

You can search all Tivoli Storage FlashCopy Manager publications in this Information Center: <http://www.ibm.com/software/support/rss/tivoli>

You can download PDF versions of publications from this Information Center <http://publib.boulder.ibm.com/infocenter/tsminfo/v6/index.jsp> or from the IBM Publications Center at <http://www.elink.ibm.com/publications/servlet/pbi.wss>.

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 FlashCopy Manager publications

These publications are available to assist with using Tivoli Storage FlashCopy Manager.

Table 1. Related Tivoli Storage FlashCopy Manager publications

Publication title	Order number
<i>Tivoli Storage FlashCopy Manager for AIX: Installation and User's Guide</i>	SC27-2503
<i>Tivoli Storage FlashCopy Manager Messages</i>	SC27-2505
<i>Tivoli Storage FlashCopy Manager Quick Start Guide</i>	CF27SML

Table 2. Related storage system publications

Publication title	Order number
<i>IBM System Storage DS8000 Introduction and Planning Guide</i>	GC35-0515
<i>IBM System Storage DS8000 Messages Reference</i>	GC26-7914
<i>IBM System Storage DS8000 Installation Guide</i>	GC26-7910
<i>IBM XIV[®] Storage System: Concepts, Architecture, and Usage</i>	SG24-7659
<i>IBM XIV[®] Storage System (Type: 2810) Model A14 (Gen 2) Introduction and Planning Guide for Customer Configuration</i>	GA52-1327
<i>IBM XIV[®] Storage System User Manual Version 10.1</i>	GC27-2213
<i>IBM System Storage SAN Volume Controller Planning Guide</i>	GA32-0551
<i>IBM System Storage SAN Volume Controller Hardware Installation Guide</i>	GC27-2132
<i>IBM System Storage SAN Volume Controller Software Installation and Configuration Guide</i>	SC23-6628

Support information

You can find support information for IBM products from a variety of sources.

To search Internet resources, go to the support Web site for Tivoli Storage FlashCopy Manager at <http://www.elink.ibm.com/publications/servlet/pbi.wss>. From there, you can search a variety of available resources.

Reading syntax diagrams

To read a syntax diagram for entering a command, follow the path of the line. Read from left to right and from 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.

►—KEYWOrd—►

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

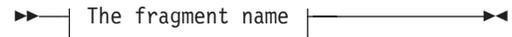
Syntax diagram description	Example
<p>Variables:</p> <p>Italicized lowercase items (<i>var_name</i>) denote variables.</p> <p>In this example, you can specify a <i>var_name</i> when you enter the KEYWORD command.</p>	
<p>Repetition:</p> <p>An arrow returning to the left means you can repeat the item.</p> <p>A character or space within an arrow means you must separate the repeated items with that character or space.</p>	
<p>Required Choices:</p> <p>When two or more items are in a stack and one of them is on the line, you <i>must</i> specify one item.</p> <p>In this example, you <i>must</i> choose A, B, or C.</p>	
<p>Optional Choice:</p> <p>When an item is below the line, that item is optional. In the first example, you can choose A or nothing at all.</p> <p>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.</p>	
<p>Defaults:</p> <p>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.</p> <p>In this example, A is the default. You can override A by choosing B or C. You can also specify the default explicitly.</p>	
<p>Repeatable Choices:</p> <p>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.</p> <p>In this example, you can choose any combination of A, B, or C.</p>	

Syntax diagram description

Example

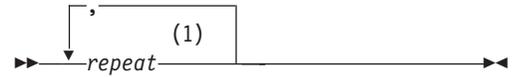
Syntax Fragments:

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.

**Notes:**

- 1 Specify *repeat* as many as 5 times.

In this example, the footnote by the arrow references the number of times you can repeat the item.

Chapter 1. Overview

Introductory information about IBM Tivoli Storage FlashCopy Manager is provided.

Current business practices demand that application servers must be continuously available. Critical data must be protected and readily accessible for quick restore operations. Because of the ever increasing amount of data requiring protection, the time needed to complete traditional file-level backups is no longer available in many information technology environments. As a result, administrators are looking for a solution that protects critical data in a way that also minimizes the downtime associated with necessary backup operations. Tivoli Storage FlashCopy Manager provides this solution.

Tivoli Storage FlashCopy Manager provides the tools and information needed to create and manage volume-level snapshots of Microsoft SQL Server and Microsoft Exchange server data. These snapshots are created while these applications (that contain data on their volumes) remain online. Tivoli Storage FlashCopy Manager uses Microsoft Volume Shadow Copy Services (VSS) and IBM storage hardware snapshot technology to protect your business-critical data.

Seamless installation and configuration features allow Tivoli Storage FlashCopy Manager to be easily integrated with these IBM System Storage products:

- DS3000, DS4000, DS5000, DS8000
- SAN Volume Controller
- XIV Model 2810 Storage System

Optionally, Tivoli Storage FlashCopy Manager can be integrated with Tivoli Storage Manager. This integration provides advanced data protection and centrally managed, policy-based administration.

How to create snapshots

Tivoli Storage FlashCopy Manager protects your application data by creating point-in-time snapshots of your Microsoft Exchange Server and Microsoft SQL Server data.

SQL Server

In the Tivoli Storage FlashCopy Manager Snap-in Tree View, a SQL Server node is displayed for each SQL Server instance on the computer.

- Select a SQL Server instance in the tree view. The integrated command line and action pane display.
- To create snapshots using the GUI, select **Launch Backup GUI** or **Launch Restore GUI** from the action pane.
- To create snapshots using commands, enter the commands in the bottom section of the integrated command line.
- Click **Tips** for useful information regarding the integrated command line.

Exchange Server

In the Tree View, an Exchange Server node is displayed for each Exchange Server instance on the computer.

- Select an Exchange Server instance in the tree view. The integrated command line and action pane display.
- To create snapshots using the GUI, select **Launch Backup GUI** or **Launch Restore GUI** from the action pane.
- To create snapshots using commands, enter the commands in the bottom section of the integrated command line.
- Click **Tips** for useful information regarding the integrated command line.

How policy is used

Tivoli Storage FlashCopy Manager uses policy to determine how backups are retained. With Tivoli Storage FlashCopy Manager, you can create, modify and view policies, and set policy binding statements to manage your backups.

Backup retention on local shadow volumes is dictated by version and time-based policies. 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 backup operations. The shadow copy volume that is the storage destination of a snapshot must have sufficient space for the snapshot. Environment and storage resources also impact how many backup versions are maintained on local shadow volumes. The amount of space required is dependant on the VSS provider that is used.

Policy binding statements

Set VSS policy binding statements by binding Microsoft SQL Server or Microsoft Exchange Server VSS snapshots using the respective backup or restore GUI.

Specify VSS policy binding statements to use for binding snapshots to a policy. You can perform this task by using the GUI or by manually adding binding statements to the configuration file. A default policy binds any backups that are not explicitly bound to a named policy.

How VSS Backups expire based on policy

VSS Backups are expired based on Tivoli Storage FlashCopy Manager policy.

Expiration is the process by which SQL Server or Exchange Server backup objects are identified for deletion because their expiration date has passed or the maximum number of backup versions to be retained is reached. The value of this data is dependent on the business needs as identified by the recovery point objective (RPO) and the recovery time objective (RTO). For example, legal, operational, and application requirements impact how data must be protected to meet these RPO and RTO demands. To support such requirements, Tivoli Storage FlashCopy Manager allows you specify the number of snapshot backups to retain and the length of time to retain them. Expiration is how Tivoli Storage FlashCopy Manager implements this function.

Expiration of VSS Backups occurs during the first query, VSS Backup, or VSS restore operation of a Tivoli Storage FlashCopy Manager session. Expiration of VSS Backups might also occur during any VSS Backup operation.

If an operation occurs when the maximum number of backup versions to be retained (as specified by the Tivoli Storage FlashCopy Manager policy) is reached, the oldest backup version is expired and deleted before creating, restoring, or displaying information about a VSS Backup.

If an operation occurs when the maximum number of days to retain a backup (as specified by the Tivoli Storage FlashCopy Manager policy) is reached, the *inactive* backup versions older than the number of days specified are expired before creating, restoring, or displaying information about a VSS Backup.

Learning about Tivoli Storage FlashCopy Manager

Online information

Tivoli Storage FlashCopy Manager provides Integrated Web content to online publications, and access to RSS feeds.

Online publications

Integrated Web content to Tivoli Storage FlashCopy Manager-related publications is provided.

Table 3. Tivoli Storage FlashCopy Manager-related publications

Tivoli Storage FlashCopy Manager-related publications
<i>IBM Tivoli Storage FlashCopy Manager 2.1 for AIX: Installation and User's Guide</i>
<i>IBM Tivoli Storage FlashCopy Manager 2.1 Messages</i>

IBM Support RSS feeds

View Integrated Really Simple Syndication (RSS) feeds for quick access to Tivoli Storage FlashCopy Manager-related information.

For further information about Tivoli Storage FlashCopy Manager-related RSS feeds, visit <http://www.ibm.com/software/support/rss/tivoli>.

Chapter 2. Basic steps: From clean computer to taking your first snapshots with Tivoli Storage FlashCopy Manager

Tivoli Storage FlashCopy Manager wizards guide you through the installation and configuration of Tivoli Storage FlashCopy Manager. After you run the setup and configuration wizards, your computer is ready to take snapshots.

Tivoli Storage FlashCopy Manager provides the following wizards for installation and configuration tasks:

Setup wizard

Use this wizard to install Tivoli Storage FlashCopy Manager on your computer.

Local configuration wizard

Use this wizard to configure Tivoli Storage FlashCopy Manager on your computer to provide locally managed snapshot support. To manually start the configuration wizard, double-click on **Local Configuration** in the results pane.

Tivoli Storage Manager configuration wizard

Use this wizard to configure Tivoli Storage FlashCopy Manager to manage snapshot backups using a Tivoli Storage Manager server. This wizard is only available when a Tivoli Storage Manager license is installed.

This list provides a high level overview of the tasks needed to proceed from installation to performing your first snapshot backups:

1. Verify that your environment meets “Tivoli Storage FlashCopy Manager prerequisites” on page 6.
2. Run the Tivoli Storage FlashCopy Manager setup wizard to install the product. This installs the base product code and prerequisites such as Microsoft .NET Framework 3.5 Service Pack 1, Microsoft Chart Controls and Report Viewer 2008 SP1.
3. Launch the Tivoli Storage FlashCopy Manager Management Console by selecting Start → All Programs → FlashCopy Manager Management Console.

Tip:

- The Tivoli Storage FlashCopy Manager local configuration wizard launches automatically when the FlashCopy Manager Management Console starts.
 - If this is an upgrade installation and a Tivoli Storage Manager license exists, then the Tivoli Storage Manager configuration wizard starts.
 - If you do not want either of the configuration wizards to launch automatically, use the option on the first page of the appropriate wizard to prevent an automatic start.
4. Complete the configuration wizard tasks. These tasks include selecting the applications to protect, verifying requirements, provisioning, and configuring the components required to support the selected applications.
 5. Verify the configuration settings by issuing the appropriate query command:
 - Exchange Server data: `tdpexcc query tdp`
 - SQL Server data: `tdpsqlc query tdp`
 6. Perform a backup and restore operation.

7. Once your Tivoli Storage FlashCopy Manager is operating successfully, define your policy settings and scheduled operations to ensure your business requirements are satisfied.

Tivoli Storage FlashCopy Manager prerequisites

Before you install Tivoli Storage FlashCopy Manager, make sure your system meets the minimum hardware, software and operating system requirements.

Minimum hardware requirements

Table 4. Minimum hardware requirements

Architecture	Hardware	Disk Space
32-bit Intel Pentium or equivalent processor of sufficient capacity to run Microsoft Exchange Server or SQL Server	One of the following: <ul style="list-style-type: none"> • IBM System Storage DS3000, DS4000, DS5000, or DS8000 Version 3.1.1 (or later) disk storage subsystem • IBM System Storage SAN Volume Controller Version 4.2.x, 4.3.x, or Version 5.1 • IBM XIV Storage System Model 2810 (Gen 2) 	200 MB of free disk space
64-bit x64 architecture-based processor of sufficient capacity to run Microsoft Exchange Server or SQL Server		

Note: Tivoli Storage FlashCopy Manager also supports hardware that is required when using the Windows System Provider or a Microsoft-compliant software or hardware VSS Provider.

Minimum software and operating system requirements

Table 5. Minimum software and operating system requirements

Operating System ¹	Software Application ²	VSS Provider
Microsoft Windows 2003 SP2 (32-bit)	(32-bit) <ul style="list-style-type: none"> • Exchange Server 2003 SP2 • SQL Server 2005 SP3 • SQL Server 2008 SP1 	On DS3000, DS4000, and DS5000 storage subsystems: <ul style="list-style-type: none"> • LSI VDS-VSS provider 10.60.G0.04
Microsoft Windows 2003 R2 SP2 (32-bit)		On DS8000 storage subsystems: <ul style="list-style-type: none"> • IBM System Storage VSS Hardware Provider 4.0
Microsoft Windows 2003 SP2 (x64)	(64-bit) <ul style="list-style-type: none"> • Exchange Server 2007³ • SQL Server 2005 SP3 • SQL Server 2008 SP1 	On IBM System Storage SAN Volume Controller 4.2.x, 4.3.x, or 5.1: <ul style="list-style-type: none"> • IBM System Storage VSS Hardware Provider 4.0
Microsoft Windows 2003 R2 SP2 (x64)		On IBM XIV Storage System Model 2810 (Gen 2): <ul style="list-style-type: none"> • IBM XIV VSS Hardware Provider Version 2.1 (or later)
Microsoft Windows 2008 (32-bit)		
Microsoft Windows 2008 (x64)		
Microsoft Windows 2008 R2 (x64)		

Note:

- 1 Datacenter, Enterprise, and Standard Editions
- 2 These software applications are also required and will be installed (if needed) during Tivoli Storage FlashCopy Manager installation:
 - Microsoft .NET Framework 3.5 Service Pack 1
 - Microsoft Chart Controls for Microsoft .NET Framework 3.5
 - Microsoft Report Viewer Redistributable 2008 Service Pack 1

Windows PowerShell 1.0 (or later) is recommended (but not required) in order to create and run PowerShell scripts.

- 3 Exchange Server 2007 is supported on Windows Server x64 editions only and requires Service Pack 1 (or later) with Update Rollup 8 (or later)

Minimum hardware requirements for VSS Instant Restore

Table 6. Minimum hardware requirements for VSS Instant Restore

Architecture	Hardware	Disk Space
32-bit Intel Pentium or equivalent processor of sufficient capacity to run Microsoft Exchange Server or SQL Server	One of the following: <ul style="list-style-type: none"> • IBM System Storage DS8000 Version 3.1.1 (or later) disk storage subsystem • IBM System Storage SAN Volume Controller Version 4.3.x or Version 5.1 • IBM XIV Storage System Model 2810 (Gen 2) 	200 MB of free disk space
64-bit x64 architecture-based processor of sufficient capacity to run Microsoft Exchange Server or SQL Server		

Minimum software and operating system requirements for VSS Instant Restore

Table 7. Minimum software and operating system requirements for VSS Instant Restore

Operating System ¹	Software Application ²	VSS Provider
Microsoft Windows 2003 SP2 (32-bit)	(32-bit) <ul style="list-style-type: none"> • Exchange Server 2003 SP2 • SQL Server 2005 SP3 • SQL Server 2008 SP1 	On DS8000 storage subsystems: <ul style="list-style-type: none"> • IBM System Storage VSS Hardware Provider 4.0
Microsoft Windows 2003 R2 SP2 (32-bit)		On IBM System Storage SAN Volume Controller 4.3.x or 5.1:
Microsoft Windows 2008 R2 (32-bit)		• IBM System Storage VSS Hardware Provider 4.0
Microsoft Windows 2003 SP2 (x64)	(64-bit) <ul style="list-style-type: none"> • Exchange Server 2007³ • SQL Server 2005 SP3 • SQL Server 2008 SP1 	On IBM XIV Storage System Model 2810 (Gen 2):
Microsoft Windows 2003 R2 SP2 (x64)		• IBM XIV VSS Hardware Provider Version 2.1 (or later)
Microsoft Windows 2008 (32-bit)		
Microsoft Windows 2008 (x64)		
Microsoft Windows 2008 R2 (x64)		

Note:

- **1** Datacenter, Enterprise, and Standard Editions
- **2** These software applications are also required and will be installed (if needed) during Tivoli Storage FlashCopy Manager installation:
 - Microsoft .NET Framework 3.5 Service Pack 1
 - Microsoft Chart Controls for Microsoft .NET Framework 3.5
 - Microsoft Report Viewer Redistributable 2008 Service Pack 1

Windows PowerShell 1.0 (or later) is recommended (but not required) in order to create and run PowerShell scripts.

- **3** Exchange Server 2007 is supported on Windows Server x64 editions only and requires Service Pack 1 (or later) with Update Rollup 8 (or later)

Restriction: VSS Instant Restore is not possible for incremental and differential backups of Exchange Server data.

Using the Tivoli Storage FlashCopy Manager setup wizard

The setup wizard guides you through installing Tivoli Storage FlashCopy Manager on your computer.

Follow these steps to install Tivoli Storage FlashCopy Manager with the setup wizard:

1. Log on as an administrator. Insert the Tivoli Storage FlashCopy Manager product DVD into your DVD drive.
2. If autorun is enabled, the installation dialog starts automatically when the DVD loads. Otherwise, select Start → **Run** , and at the prompt, specify:
x:\setupfcm.exe where x is your DVD drive, and click **OK**.
3. Follow the installation instructions displayed on the screen.
4. Click **Finish** to complete the installation of Tivoli Storage FlashCopy Manager.

Related tasks

After installing Tivoli Storage FlashCopy Manager, use the configuration wizard to configure Tivoli Storage FlashCopy Manager on your computer.

Using the Tivoli Storage FlashCopy Manager local configuration wizard

The configuration wizard guides you through configuring Tivoli Storage FlashCopy Manager on your computer to provide locally managed snapshot support.

Follow these steps to configure Tivoli Storage FlashCopy Manager with the local configuration wizard:

1. Select Start → All Programs → FlashCopy Manager Management Console. The Tivoli Storage FlashCopy Manager local configuration wizard automatically starts. The local configuration wizard window opens, a list of configuration rules is displayed, and the status of each configuration rule is displayed when it is completed.
 - Select the types of data that you want to protect.
 - Review the results of the requirements checks.
 - Review the results of the configuration process.
 - Verify that the types of data that you want to protect are now configured.

2. Follow these steps to verify that Tivoli Storage FlashCopy Manager is correctly configured:
 - a. Expand the protect and recover data node.
 - b. In the tree view, select a SQL Server node or Exchange node.
 - c. Enter the appropriate command in the integrated command line.
 - For SQL Server, run `tdpsqlc.exe` from the command prompt, and issue the following Tivoli Storage FlashCopy Manager for SQL commands:

```
tdpsqlc query tdp
tdpsqlc query fcm
tdpsqlc query sql
```
 - For Exchange Server, run `tdpexcc.exe` from the command prompt, and issue the following Tivoli Storage FlashCopy Manager for Exchange commands:

```
tdpexcc query tdp
tdpexcc query fcm
tdpexcc query exchange
```
 - d. Review the command results. If all the commands complete successfully, Tivoli Storage FlashCopy Manager is correctly configured.

Note: To manually start the configuration wizard, click **Start** in the action pane.

Using Tivoli Storage FlashCopy Manager for VSS operations

After successfully installing and configuring Tivoli Storage FlashCopy Manager, you can perform VSS operations.

Click **Launch GUI** in the action pane to start the Tivoli Storage FlashCopy Manager GUI.

Chapter 3. Protecting data with IBM Tivoli Storage FlashCopy Manager for Windows

Tivoli Storage FlashCopy Manager protects business-critical application data. You can back up and restore data to and from local shadow volumes with automated tasks, utilities, and interfaces.

Tivoli Storage FlashCopy Manager security is governed by standard Windows security. If a user has permission to log into the system and perform snapshot operations for Exchange and SQL, the user also has the ability to use Tivoli Storage FlashCopy Manager to perform those operations.

VSS Service

The Microsoft Volume Shadow Copy Service (VSS) is a Microsoft component that is provided with the Windows operating system. VSS manages and directs the Tivoli Storage FlashCopy Manager VSS requestor and other VSS software applications.

Tivoli Storage FlashCopy Manager backup and restore operations use the Microsoft Volume Shadow Copy Service technology to produce online snapshots (point-in-time consistent copies) of Exchange or SQL data, and to restore those snapshots to a specified location. The Tivoli Storage FlashCopy Manager VSS operations are implemented through the VSS requestor, which communicates with the VSS Service to access the Exchange or SQL data.

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

VSS writer

This is the software application that places the persistent information for the shadow copy on the specified volume(s).

For Exchange data, the Microsoft Exchange Server contains the writer components and requires no configuration.

For SQL data, Microsoft SQL Server contains the writer components (SqlServerWriter). It is installed with the SQL Server software and requires the following minor configuration tasks:

1. The SqlServerWriter service should be set to "Automatic." This enables the service to start automatically when the machine is rebooted.
2. Start the SqlServerWriter service.

VSS requestor

This is the software application that commands a shadow copy be created of a specified volume. The VSS requestor is provided by Tivoli Storage FlashCopy Manager and is installed with the Tivoli Storage FlashCopy Manager software.

VSS provider

This is the application that actually produces the shadow copy and also manages the volumes where the Exchange or SQL data resides. A system provider (such as the one included with the Microsoft Windows operating system), a software provider, or a hardware provider (such as one shipped

with a storage system) can be a provider. 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 you plan to perform VSS Instant Restores, be aware that DS8000, SAN Volume Controller, and XIV Gen 2 are the only storage subsystems that support VSS Instant Restores and require a VSS provider. Therefore, if you use DS8000 or SAN Volume Controller storage subsystems, you *must* install and configure IBM System Storage Support for Microsoft Virtual Disk and Volume Shadow Copy Services as your VSS hardware provider in order to perform VSS Instant Restore.
If you use XIV Gen 2, you *must* install and configure IBM XIV VSS Hardware Provider.
- If you are using a VSS software provider, consult the documentation provided with your VSS software provider.

System Provider

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

If you are using the Windows VSS System Provider, no configuration tasks are required to perform VSS operations.

Protecting Exchange data

Tivoli Storage FlashCopy Manager helps protect and manage Exchange Server environments by facilitating the back up, restore, and recovery of Exchange Server data. Tasks required for backing up and restoring Microsoft Exchange Server data are provided.

Software or hardware provider requirements

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 operations on Exchange data:

- If a hardware provider is used, it is recommended that the disks that contain Exchange data be configured as basic.
- 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 or software 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.
- VSS Instant Restore is supported on IBM Systems Storage SAN Volume Controller, DS8000, and XIV Gen 2 storage subsystems.

Restriction: For DS8000, and SAN Volume Controller storage systems, if you have enabled the incremental FlashCopy option of your VSS provider, the provider will always use (or reuse) the same target set for each VSS snapshot request (of a given source set). This occurs regardless of the number of backup versions specified or the number of target volumes defined in the VSS free pool. However, to exploit incremental refresh of the same target volumes, you must set the Tivoli Storage FlashCopy Manager policy to have a version limit of 2 (rather than 1) so that Tivoli Storage FlashCopy Manager does not delete the previous snapshot backup prior to creating the new backup. In this configuration, Tivoli Storage FlashCopy Manager will incorrectly show that two backup versions exist when in fact only one (the latest) really exists but if the version limit in Tivoli Storage FlashCopy Manager is set to 1, then each snapshot backup will cause a full background copy from source to target volumes.

Backing up Exchange Server data

VSS Backup

A VSS Backup of Exchange data uses Microsoft Volume Shadow Copy Service technology to produce an online snapshot (point-in-time consistent copies) of the data. A VSS Backup storage destination must have sufficient space available for the snapshot.

A VSS Backup allows a snapshot of large amounts of data at once. During a VSS Backup, the Exchange or SQL 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.

VSS Backups are stored on VSS shadow volumes, which the Exchange system can directly access.

Requirement: The shadow copy volume that is the storage destination of a snapshot must have sufficient space for the snapshot. The amount of space required is dependant on the VSS provider that is used.

VSS Backups expiration during VSS Backup operations

When a VSS Backup occurs, if the maximum number of backup versions to be retained (as specified by the Tivoli Storage FlashCopy Manager policy) is exceeded, the oldest backup version is expired and deleted before creating the new backup.

When a VSS Backup occurs, if the maximum number of days to retain a backup (as specified by the Tivoli Storage FlashCopy Manager policy) is reached, the *inactive* backup versions older than the number of days specified are expired before creating the new backup.

See "How policy is used" on page 2 for details about setting and managing policy.

Exchange data VSS Backup characteristics

VSS Backups for Exchange data have the following characteristics:

- Full, copy, differential, copy without integrity check, and incremental backup types are supported.
- Backups are managed through Tivoli Storage FlashCopy Manager policy. Different policy settings can be defined for each backup type.
- Backup granularity is at the storage group level only.

- 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 Microsoft Exchange Site Replication Service (SRS) is not supported.
- Restore into a Recovery Storage Group is supported on Exchange Server 2007.
- There is no automatic retry for VSS operations.
- Although it is possible for a storage group to have the same name as another storage group by using different letter cases in the name, the Tivoli Storage FlashCopy Manager command-line interface does not differentiate between the letter cases and therefore, does not recognize that two separate storage groups exist with the same name. This is due to the Windows operating system not recognizing case sensitivity. VSS operation errors might occur when using the Tivoli Storage FlashCopy Manager command-line interface to backup, query, restore, or delete such a storage group. As a result, make sure the storage group has a unique name.

Exchange data 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.

- Have a well-defined and tested recovery plan that meets your service level objectives.
- 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.
- Consider using LCR and CCR replicas in accordance with Microsoft recommendations.
- Use single hardware LUNs for log and system files.
- Use single hardware LUNs for the database files.
- Use basic disks.
- 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 Tivoli Storage FlashCopy Manager, make sure to consult your VSS provider documentation for a complete understanding of your VSS implementation.
- Do not perform parallel VSS Backups, which are not supported by VSS and can create problems.
- Use careful consideration when enabling circular logging for a storage group when using incremental or differential backup types. 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.

Planning requirements for differential and incremental Exchange backups

A differential backup backs up the transaction log changes that occurred since the last full backup completed. When a differential backup is restored, you must first restore the full backup, followed by the differential backup being applied. An incremental backup backs up the transaction log changes that occurred since the last incremental or full backup completed. When an incremental backup is restored, you must first restore the full backup, followed by the application of all subsequent incremental backups. When using the Tivoli Storage FlashCopy Manager GUI to restore Exchange differential or incremental backups, all backups (differential, incremental, or full) required for the operation are automatically selected. When using the Tivoli Storage FlashCopy Manager command line to restore these backups, each backup must be specified. Before a differential or incremental backup can be performed, a full backup must be completed.

Consider your hardware configuration when implementing differential and incremental backups. For example, although differential and incremental backups typically require less storage demands than full backups, XIV and DS8000 use different amounts of storage per snapshot and as a result, might require a different backup strategy depending on which storage system is used.

Be aware that differential and incremental backups cannot be mixed together. For example, these two series of backup operations are supported:

- Full backup, plus differential backup, plus differential backup.
- Full backup, plus incremental backup, plus incremental backup.

However, this series of backup operations is not supported because an attempt was made to mix the differential and incremental backups:

- Full backup, plus differential backup, plus incremental backup.

Backup strategies

Depending on your specific requirements regarding 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.
- Do not mix incremental and differential backups.
- If you are using Exchange Server 2007 or later, 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.

Restoring Exchange Server data

The Tivoli Storage FlashCopy Manager restore operations are VSS Fast Restore and VSS Instant Restore. They restore VSS Backups (Exchange storage group files and log files) that reside on Tivoli Storage FlashCopy Manager managed storage to their original or to an alternate location.

VSS Fast Restore

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

With a VSS Fast Restore restore, an application can become operational relatively quickly. After data is restored, the transaction logs must still be replayed, which can increase application recovery time. The following characteristics are true of VSS Fast Restore restores:

- Full, copy, differential and incremental backup types can be restored.
- Restore granularity is at the database level.
- VSS restores support restoring one (or more) databases from a VSS snapshot backup located on local shadow volumes managed by Tivoli Storage FlashCopy Manager.
- Supports restoring an Exchange Server 2007 VSS Backup to an alternate storage group.
- Restores can be performed in a Microsoft Cluster Server (MSCS) environment.
- Parallel VSS restore operations are not supported on Microsoft Windows 2003 and Microsoft Windows 2008.

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 IBM Systems Storage SAN Volume Controller, DS8000, or XIV Gen 2 storage subsystem is required to perform VSS Instant Restores.

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. When performing VSS Instant Restores with SAN Volume Controller or DS8000 storage subsystems, make sure that any previous background copies (that involve the volumes being restored) are completed prior to initiating the VSS Instant Restore. VSS Instant Restore of differential and incremental backups is not supported.

When performing a VSS Instant Restore, you must restore *all* databases within the specified storage group. If you need to restore just one database from a VSS Backup that resides on local VSS shadow volumes on DS, SAN Volume Controller, or XIV Gen 2 disks, select the **Disable VSS Instant Restore** option in the Tivoli Storage FlashCopy Manager 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 (RSG).
- A VSS restore into a relocated or alternate storage group.
- A VSS restore from a CCR or LCR replica backup when the passive node is converted to the active node.

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. 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:

When preparing for VSS Instant Restore, take into account VSS Instant Restore considerations such as the restore granularity and requirements for where backups must reside.

Consider the following points when planning for VSS Instant Restore:

- Full, copy, differential and incremental backup types can be restored.
- VSS restores support restoring one (or more) storage groups from a VSS snapshot backup located on local shadow volumes managed by Tivoli Storage FlashCopy Manager.
- Before you begin a VSS Instant Restore operation, you must close any applications or windows that are open.
- Restore granularity is at the storage group level.
- VSS requires that data must always be restored to the same drive letters and paths as existed during the original backup.
- VSS requires either an IBM XIV VSS Provider or IBM System Storage Support for Microsoft Volume Shadow Copy Service software.
- Backups must reside on the same IBM Systems Storage SAN Volume Controller, DS8000, or XIV Gen 2 storage subsystem to which they are restored.
- In a CCR environment, suspend the storage group copy before performing the VSS Instant Restore. After the VSS Instant Restore completes, resume the storage group copy.
- 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.
- Restores can be performed in a Microsoft Cluster Server (MSCS) environment.
- Parallel VSS restore operations are not supported on Microsoft Windows 2003 and Microsoft Windows 2008.

Restoring VSS Backups into alternate locations

Tivoli Storage FlashCopy Manager 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.

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 later.
- 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.
- 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.

VSS Instant Restore in a Cluster Continuous Replication environment

A Cluster Continuous Replication (CCR) environment requires that specific tasks be performed when using VSS Instant Restore.

Consider these guidelines before attempting a VSS Instant Restore in your CCR environment:

- The Exchange Server storage group to be restored must originally be backed up from the passive node.
 - Only use CCR replicas in accordance with Microsoft recommendations.
 - CCR is available with Exchange Server 2007 (or later). This task is not available on Exchange Server 2003.
 - A VSS Instant Restore of CCR replicas can only be restored into the running instance of a storage group (primary, recovery, or alternate). Microsoft does not support VSS Instant Restore into a replica instance.
1. Make sure the original backup was performed from the passive node.
 2. Move the cluster from active node to passive node. This step makes the passive node in Step 1 the current active node.
 3. Suspend the storage group copy for the Exchange Server storage group(s) that will be used in the VSS Instant Restore.
 4. Restore the Exchange Server storage group(s) by issuing the **tdpexcc restore** command or by using the GUI procedure described in "Restoring Exchange storage groups" on page 118. If using the command line interface, make sure to dismount the mailbox database. This is performed automatically in the GUI.
 5. Resume the storage group copy for the Exchange Server storage group(s) that was used in the VSS Instant Restore.

Protecting SQL Server data

Tivoli Storage FlashCopy Manager helps protect and manage SQL Server environments by facilitating the back up, restore, and recovery of SQL data. Tasks required for backing up and restoring Microsoft SQL Server data are provided.

Software or hardware provider requirements

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 operations on SQL data:

- If a hardware provider is used, it is recommended that the disks that contain SQL data be configured as basic.
- Place databases files for each database or group of databases that will be backed up and restored together as a unit on their own dedicated logical volume.
- Place logs for each database on their own logical volume.
- Do not place non-SQL data on storage volumes that are dedicated to SQL.
- When using hardware or software snapshot providers, do not share database LUNs with other databases or applications.
- Make sure to read and follow specific installation and configuration instructions in the documentation provided by your VSS provider vendor.
- VSS Instant Restore is supported on IBM Systems Storage SAN Volume Controller, DS8000, and XIV Gen 2 storage subsystems.

Restriction: For DS8000, and SAN Volume Controller storage systems, if you have enabled the incremental FlashCopy option of your VSS provider, the provider will always use (or reuse) the same target set for each VSS snapshot request (of a given source set). This occurs regardless of the number of backup versions specified or the number of target volumes defined in the VSS free pool. However, to exploit incremental refresh of the same target volumes, you must set the Tivoli Storage FlashCopy Manager policy to have a version limit of 2 (rather than 1) so that Tivoli Storage FlashCopy Manager does not delete the previous snapshot backup prior to creating the new backup. In this configuration, Tivoli Storage FlashCopy Manager will incorrectly show that two backup versions exist when in fact only one (the latest) really exists but if the version limit in Tivoli Storage FlashCopy Manager is set to 1, then each snapshot backup will cause a full background copy from source to target volumes.

Backing up SQL Server data

VSS Backup

A VSS Backup of SQL data uses Microsoft Volume Shadow Copy Service technology to produce an online snapshot (point-in-time consistent copies) of the data. A VSS Backup storage destination must have sufficient space available for the snapshot. The amount of space required is dependant on the VSS provider that is used.

A VSS Backup allows a snapshot of large amounts of data at once. During a VSS Backup, the Exchange or SQL 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.

VSS Backups are stored on VSS shadow volumes, which the SQL system can directly access.

If a VSS Backup is performed when the maximum number of backup versions to be retained (as specified by the Tivoli Storage FlashCopy Manager) is exceeded, the oldest backup version is expired and deleted before creating the new backup.

If a VSS Backup is performed when the maximum number of days to retain a backup (as specified by the Tivoli Storage FlashCopy Manager policy) is reached, the *inactive* backup versions older than the number of days specified are expired before creating the new backup. See “How policy is used” on page 2 for details about setting and managing policy.

Requirement: The shadow copy volume that is the storage destination of a snapshot must have sufficient space for the snapshot. The amount of space required is dependant on the VSS provider that is used.

VSS Backups expiration during VSS Backup operations

When a VSS Backup occurs, if the maximum number of backup versions to be retained (as specified by the Tivoli Storage FlashCopy Manager policy) is exceeded, the oldest backup version is expired and deleted before creating the new backup.

When a VSS Backup occurs, if the maximum number of days to retain a backup (as specified by the Tivoli Storage FlashCopy Manager policy) is reached, the *inactive* backup versions older than the number of days specified are expired before creating the new backup.

See “How policy is used” on page 2 for details about setting and managing policy.

SQL data VSS Backup characteristics

VSS Backups for SQL data have the following characteristics:

- The full backup type is supported. Log, differential, file, group, and set backup types are not supported.
- Backup granularity is at the database level only.
- Backups are managed through Tivoli Storage FlashCopy Manager policy.
- Backups are stored on local shadow volumes. The shadow copy volume that is the storage destination of a snapshot must have sufficient space for the snapshot.
- There is no automatic retry for VSS operations.
- Although it is possible for a database to have the same name as another database by using different letter cases in the name, the Tivoli Storage FlashCopy Manager command-line interface does not differentiate between the letter cases and therefore, does not recognize that two separate databases exist with the same name. This is due to the Windows operating system not recognizing case sensitivity. VSS operation errors might occur when using the Tivoli Storage FlashCopy Manager command-line interface to backup, query, restore, or delete such a database. As a result, make sure the database has a unique name.

SQL data 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.

- Have a well-defined and tested recovery plan that meets your service level objectives.
- Use single hardware LUNs for each database or group of databases that will be backed up and restored together as a unit.
- Use basic disks.
- 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 Tivoli Storage FlashCopy Manager, make sure to consult your VSS provider documentation for a complete understanding of your VSS implementation.
- Do not attempt parallel VSS Backups, which are not supported by VSS and can create problems.
- 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.

Backup strategies:

Different backup strategies are available depending on specific requirements regarding backup window and acceptable restore times.

Strategies defined by backup type

Some commonly used strategies (based upon backup type) are described as follows: Consult your Microsoft SQL Server documentation for more details on SQL Server backup strategy and planning.

Strategies defined by other considerations

Some commonly used strategies are described as follows:

Clustering:

If you use Microsoft Cluster Server or Veritas Cluster Server clustering for fail-over support, you must install Tivoli Storage FlashCopy Manager for SQL on each cluster node and configure it identically. Additional setup is required to complete the fail-over installation. You must identify a clustered SQL Server by its virtual server name and use that name in Tivoli Storage FlashCopy Manager for SQL to access that SQL Server.

Multiple SQL Servers:

If multiple instances of SQL Server are running, the additional instances are identified by name. You must use that name in Tivoli Storage FlashCopy Manager for SQL to access that SQL Server.

Various Recommendations:

- Performing a large number of full backups can result in the database log to become full. Subsequent backups will fail if this occurs. Use native SQL Server tools (if necessary) to truncate the log of your SQL databases.
- VSS Backups cannot be restored to an alternate SQL Server. This is a Microsoft SQL Server limitation.

- You cannot back up the *tempdb* database. It is a temporary database that is re-created each time the SQL Server is started.
- Regardless of the frequency of database backups, it is highly recommended that you always run **dbcc checkdb** and **dbcc checkcatalog** on a database just before backing it up to check the logical and physical consistency of the database. See your SQL Server documentation for more information on using the SQL Server database consistency checker.

Restoring SQL Server data

The Tivoli Storage FlashCopy Manager restore operations are VSS Fast Restore and VSS Instant Restore. They restore VSS Backups (SQL database files and log files) that reside on Tivoli Storage FlashCopy Manager managed storage to their original or to an alternate location.

VSS Fast Restore

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

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

- You can only restore SQL Server VSS Backups to the same SQL Server instance.
- Restore granularity is at the database level.
- Supports restoring one (or more) databases from a VSS snapshot managed by Tivoli Storage FlashCopy Manager.
- Supports restoring VSS Backups to an alternate location using the *irelocatedir* option.
- Restores can be performed in a Microsoft Cluster Server (MSCS) environment.
- Parallel VSS restore operations are not supported on Microsoft Windows 2003 and Microsoft Windows 2008.

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.

A IBM Systems Storage SAN Volume Controller, DS8000, or XIV Gen 2 storage subsystem is required to perform VSS Instant Restores.

Be aware that a VSS Instant Restore is only possible when all of the data (from the database specified for restore) resides on storage subsystems supported by the VSS Instant Restore. When performing VSS Instant Restores with SAN Volume Controller or DS8000 storage subsystems, make sure that any previous background copies (that involve the volumes being restored) are completed prior to initiating the VSS Instant Restore.

Although VSS Instant Restore is the default restore method when all SQL data specified for 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. However, a failover to VSS Fast Restore may 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.

You can only restore SQL Server VSS Backups to the same SQL Server instance.

Preparing for VSS Instant Restore:

When preparing for VSS Instant Restore, take into account VSS Instant Restore considerations such as the restore granularity and requirements for where backups must reside.

Consider the following points when planning for VSS Instant Restore:

- VSS restores support restoring one (or more) databases from a VSS snapshot backup located on local shadow volumes managed by Tivoli Storage FlashCopy Manager.
- Before you begin a VSS Instant Restore operation, you must close any applications or windows that are open.
- Restore granularity is at the database level.
- VSS requires that data must always be restored to the same drive letters and paths as existed during the original backup.
- VSS requires either an IBM XIV VSS Provider or IBM System Storage Support for Microsoft Volume Shadow Copy Service software.
- Backups must reside on the same IBM Systems Storage SAN Volume Controller, DS8000, or XIV Gen 2 storage subsystem to which they are restored.
- 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.
- Restores can be performed in a Microsoft Cluster Server (MSCS) environment.
- Parallel VSS restore operations are not supported on Microsoft Windows 2003 and Microsoft Windows 2008.

Understanding Tivoli Storage FlashCopy Manager summary information

When user preferences for content such as E-mail address, logging, and status period are specified using the Properties icon in the action pane, Tivoli Storage FlashCopy Manager uses these settings to provide this summary information:

Tasks This chart illustrates backup and restore tasks that completed successfully, with errors and with warnings.

Type of Data Protection Activity

This chart illustrates the percentage of backup and restore operations. This information is derived from data contained in the log file for Tivoli Storage FlashCopy Manager for SQL Server (tdpsql.log) or Tivoli Storage FlashCopy Manager for Exchange Server (tdpexc.log) for the specified time period.

Historical Managed Capacity (TB)

This chart illustrates the amount of data (in terabytes) that was managed during the specified time period.

Amount of Data Protection Activity (Bytes)

This chart illustrates the amount of data (in bytes) involved with the data protection activity during the specified time period.

View this information in the IBM Tivoli Storage FlashCopy Manager GUI by clicking **Summary Information** in the welcome page result view.

Scheduling tasks

Automate your data protection with Tivoli Storage FlashCopy Manager scheduling. Tivoli Storage FlashCopy Manager uses the Windows Scheduler to automate backup and restore operations.

With Tivoli Storage FlashCopy Manager scheduling operations, you can schedule tasks to run periodically. However, you cannot schedule tasks to run one time only. Once a schedule is defined, though, it can be run manually at any time by selecting the schedule and then clicking **Run** in the Action menu. For more granular control of your schedules, directly access the Windows scheduled tasks control panel or `schtasks.exe`. Consult your Microsoft documentation for further details.

All defined schedules appear in the top half of the view. Create, edit, delete, or run new schedules in the top half of the view. Use the Scheduling Wizard to guide you through the steps needed to define a local scheduled data protection task. The Scheduling Wizard is available from the Action menu.

The scheduling tasks area is divided into three segments:

- Defined schedules display in the top area. The top area contains options to create, edit, delete, or run new schedules.
- A list of all scheduled activity displays in the middle area. Select an item in this list to display the output of the scheduled operation.
- The results of the selected activity displays in the bottom area.

The scheduled history log file keeps entries for 60 days, by default. You can override this default by changing the scheduled history log prune value using the main Tivoli Storage FlashCopy Manager settings control. To access The Main Tivoli Storage FlashCopy Manager settings, in the Tree View select the computer node you want, and then from the Action menu select Properties.

To enable or disable a scheduled task, enter this command on the command line:

```
schtasks /change /tn <task name> /enable
```

or

```
schtasks /change /tn <task name> /disable
```

Chapter 4. Command-line reference: Tivoli Storage FlashCopy Manager for Exchange

The name of the Tivoli Storage FlashCopy Manager for Exchange command-line interface is **tdpexcc.exe**. This program is located (by default) in the Tivoli Storage FlashCopy Manager for Exchange installation directory (C:\Program Files\Tivoli\tsm\TDPEXchange\).

Launching the Tivoli Storage FlashCopy Manager for Exchange command-line interface

Follow these steps to launch the Tivoli Storage FlashCopy Manager for Exchange command-line interface:

1. Start the Tivoli Storage FlashCopy Manager GUI.
2. Expand the protect and recover data node.
3. In the tree view, select an Exchange node.
4. From the action menu, select **Launch Command Line**. A command window opens.
5. Run **tdpexcc.exe** from the command prompt. The command-line interface launches.

Command-line interface help

Issue the **tdpexcc ?** or **tdpexcc help** command to display help for the command-line interface.

Command-line parameter characteristics

Review these parameter characteristics before attempting a command-line operation.

- 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

For help in reading syntax diagrams, refer to "Reading syntax diagrams" on page vii.

Backup command

Use the **backup** command to perform Exchange Server storage group backups from the Exchange Server to local shadow volumes managed by Tivoli Storage FlashCopy Manager.

You must have local registry rights (for all versions of Exchange Server) to perform a Tivoli Storage FlashCopy Manager for Exchange backup.

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 is performed, the backup remains active until the backup version is deleted with the delete backup command, or expired by Tivoli Storage FlashCopy Manager 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.

See “Backup strategies” on page 15 for additional information related to the **backup** command.

Tivoli Storage FlashCopy Manager for Exchange supports the following types of VSS Backups:

Full 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

Back up the transaction logs, and if a successful backup is obtained, the Exchange Server deletes the committed log files.

Differential

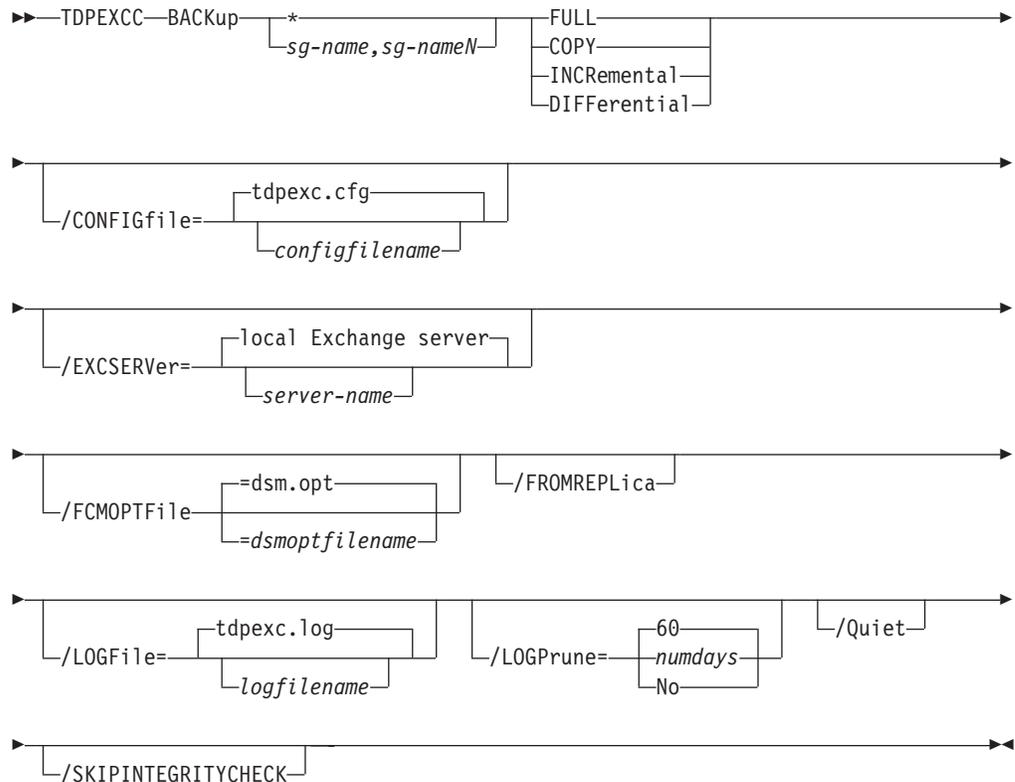
Back up the transaction logs but do NOT delete them

Copy Back up the entire storage group and transaction logs, do NOT delete the transaction logs

Attention: 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 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-name*

* Back up all storage groups.

sg-name

Back up the specified storage group. 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 backup to perform:

FULL | **COPY** | **INCRemental** | **DIFFerential**

FULL Back up the entire storage group and transaction logs, and if a successful backup is obtained, truncate the transaction logs.

COPY 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.

Attention: 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.

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 73 for descriptions of available configuration parameters.

/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.

/FCMOPTFile=*dsmoptfilename*

The **/fcmoptfile** parameter specifies the Tivoli Storage FlashCopy Manager options file to use..

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/fcmoptfile**, the default value is *dsm.opt*.
- If you specify **/fcmoptfile** but not *dsmoptfilename*, the default is also *dsm.opt*.

/FROMREPLica

Use the **/fromreplica** parameter if you are running in an Exchange Server Local Continuous Replication (LCR) or Cluster Continuous Replication (CCR) environment and want to back up the Exchange data from the replica copy.

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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage

FlashCopy Manager 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.

/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 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 managed by Tivoli Storage FlashCopy Manager storage.

Backup Exchange Examples

These output examples provide a sample of the text, messages, and process status that displays when using the **backup exchange** command.

In this example, the **tdpexcc backup exchange svc431i_stg full** command performs a full backup of storage group **svc431i_stg**. The following output is displayed:

```
Updating mailbox history on server...
Mailbox history has been updated successfully.

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

Connecting to Server as node 'MEAN_EXCH'...
Connecting to Local DSM Agent 'mean'...
Starting storage group backup...

Beginning VSS backup of 'svc431i_stg'...

Executing system command: Exchange integrity check for storage group 'svc431i_stg'
Files Examined/Completed/Failed: [ 4 / 4 / 0 ] Total Bytes: 33319

VSS Backup operation completed with rc = 0
Files Examined : 4
Files Completed : 4
Files Failed : 0
Total Bytes : 33319
```

In this example, the **tdpexcc backup exchange svc431i_stg copy** command performs a copy backup of storage group **svc431i_stg**. The following output is displayed:

```

Updating mailbox history on server...
Mailbox history has been updated successfully.

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

Connecting to Server as node 'MEAN_EXCH'...
Connecting to Local DSM Agent 'mean'...
Starting storage group backup...

Beginning VSS backup of 'svc431i_stg'...

Executing system command: Exchange integrity check for storage group 'svc431i_stg'
Files Examined/Completed/Failed: [ 4 / 4 / 0 ] Total Bytes: 33319

VSS Backup operation completed with rc = 0
Files Examined : 4
Files Completed : 4
Files Failed : 0
Total Bytes : 33319

```

In this example, the **tdpexcc backup exchange svc431i_stg diff** command performs a differential backup of storage group `svc431i_stg`. The following output is displayed:

```

Updating mailbox history on server...
Mailbox history has been updated successfully.

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

Connecting to Server as node 'MEAN_EXCH'...
Connecting to Local DSM Agent 'mean'...
Starting storage group backup...

Beginning VSS backup of 'svc431i_stg'...

Executing system command: Exchange integrity check for storage group 'svc431i_stg'
Files Examined/Completed/Failed: [ 4 / 4 / 0 ] Total Bytes: 33244

VSS Backup operation completed with rc = 0
Files Examined : 4
Files Completed : 4
Files Failed : 0
Total Bytes : 33244

```

In this example, the **tdpexcc backup exchange svc431i_stg incr** command performs an incremental backup of storage group `svc431i_stg`. The following output is displayed:

```

Updating mailbox history on server...
Mailbox history has been updated successfully.

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

Connecting to Server as node 'MEAN_EXCH'...
Connecting to Local DSM Agent 'mean'...
Starting storage group backup...

Beginning VSS backup of 'svc431i_stg'...

Executing system command: Exchange integrity check for storage group 'svc431i_stg'
Files Examined/Completed/Failed: [ 4 / 4 / 0 ] Total Bytes: 33242

VSS Backup operation completed with rc = 0
Files Examined : 4
Files Completed : 4
Files Failed : 0
Total Bytes : 33242

```

Delete Backup command

Use the **delete backup** command to delete a VSS Backup of an Exchange Server storage group.

You must have local registry rights (for all versions of Exchange Server) to perform a Tivoli Storage FlashCopy Manager for Exchange delete backup.

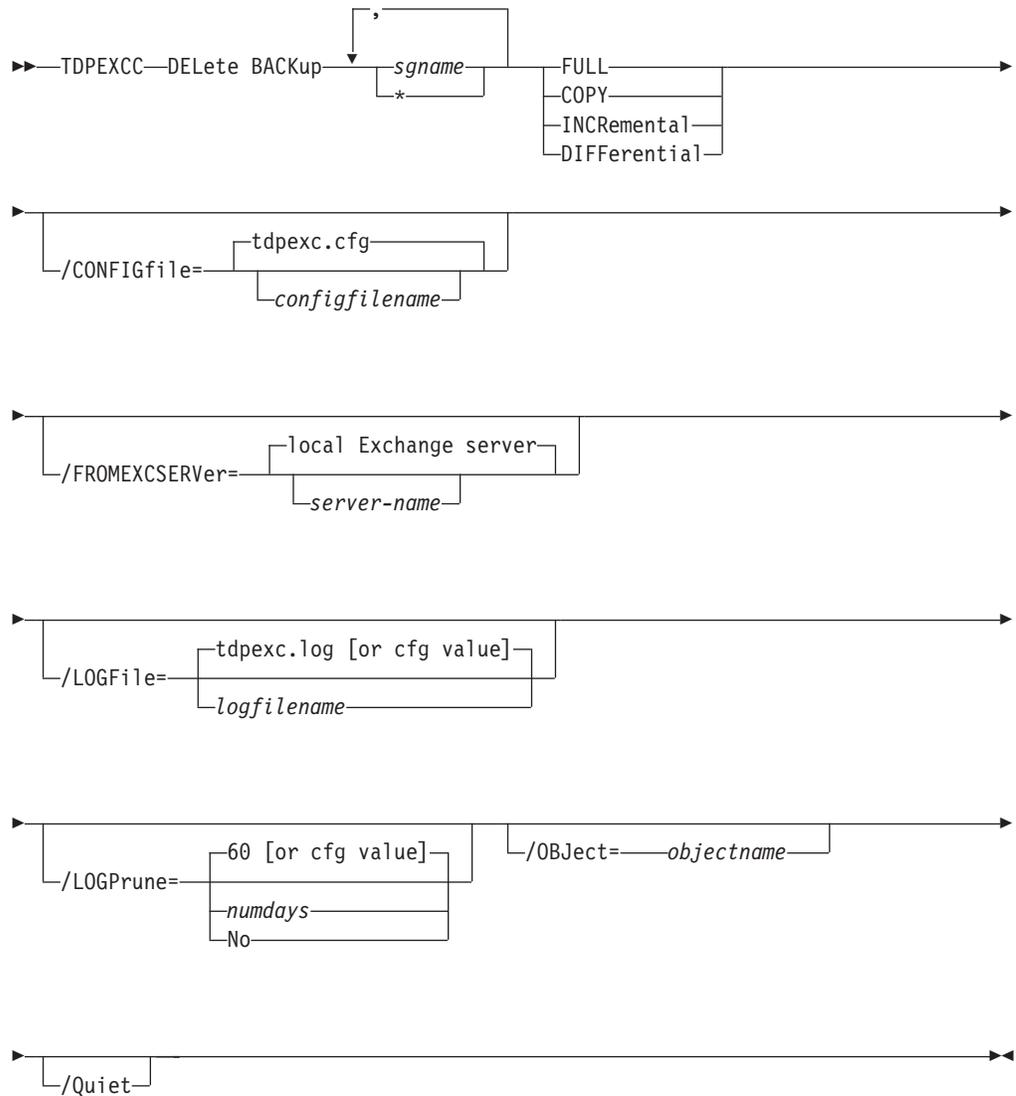
Note:

- 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 Tivoli Storage FlashCopy Manager 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.

See “Backup strategies” on page 15 for additional information related to the **delete backup** 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 73 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager for Exchange.

Use the Tivoli Storage FlashCopy Manager for Exchange **query fcm * /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.

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 : 08/12/2009 10:24:11>
VSS Delete backup operation completed with rc = 0
Files Examined   : 1
Files Completed  : 1
Files Failed     : 0
Total Bytes      : 0
```

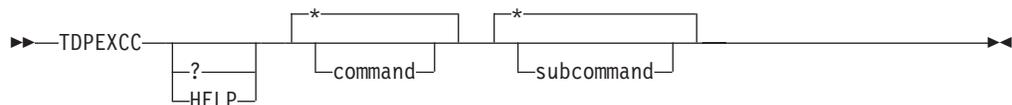
Help command

Use the **help** command to display help for Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager for Exchange **help** command.

The following optional parameters specify the help to be displayed:

***|command**

Identifies the specific Tivoli Storage FlashCopy Manager for Exchange command that is to be displayed. If the wildcard character (*) is used, help for all Tivoli Storage FlashCopy Manager for Exchange commands is displayed.

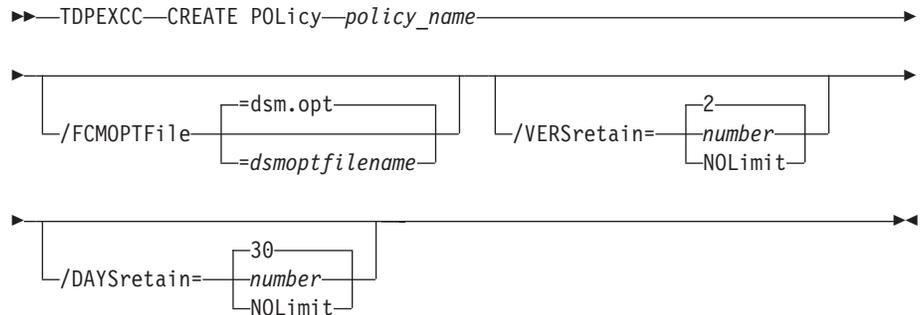
* | *subcommand*

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 Tivoli Storage FlashCopy Manager for Exchange **query** commands is displayed.

Policy commands for Tivoli Storage FlashCopy Manager for Exchange

Create Policy

This command is used to create a new policy.

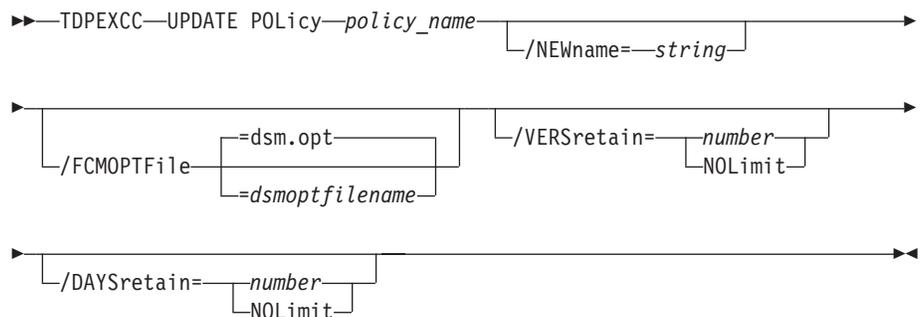


Parameters

- **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.



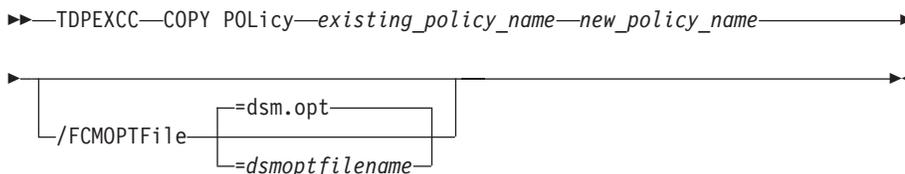
Parameters

- **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.

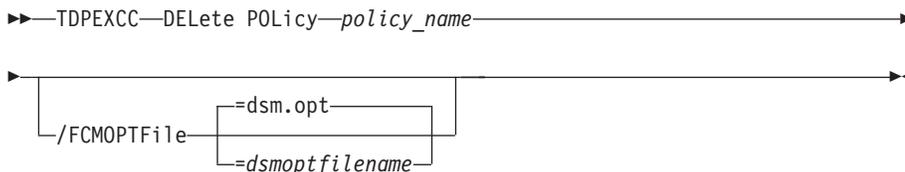


Parameters: * (required) specifies all policies are to be queried. The results of the query will be displayed as follows:

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.

Exchange Policy Examples

These output examples provide a sample of the text, messages, and process status that displays when using the **create policy** and **update policy** commands.

In this example, the **tdpexcc create policy FCMEXCHPOL1** command creates the FCMEXCHPOL1 policy. The following output is displayed:

```
CREATE policy was successful.
```

In this example, the **tdpexcc delete policy FCMEXCHPOL1** command deletes the FCMEXCHPOL1 policy. The following output is displayed:

```
DELETE policy was successful.
```

Query Exchange command

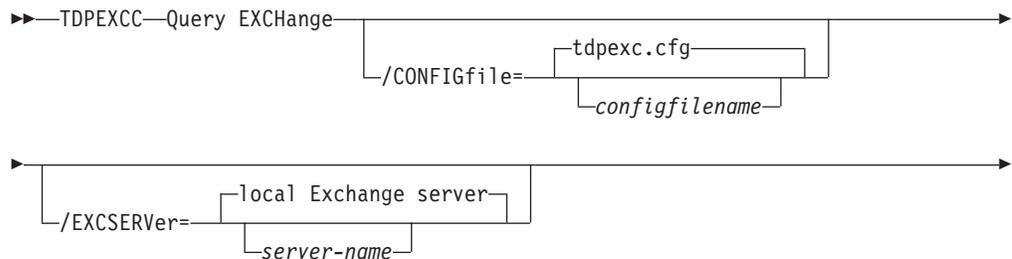
Use the **query exchange** command to query the local Exchange Server for general information.

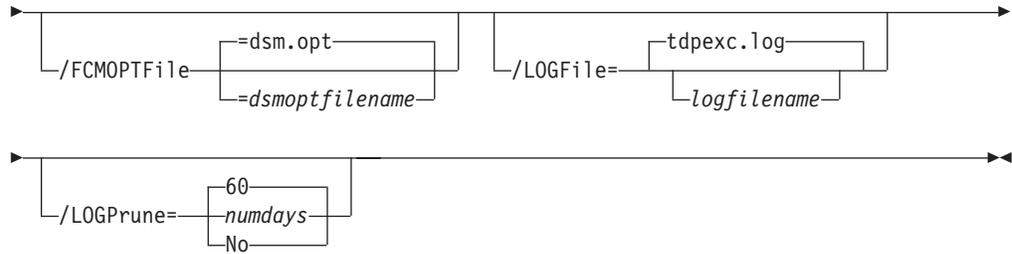
The **query exchange** command returns the following information:

- 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:
 - 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 73 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.

`/FCMOPTFile=dsmoptfilename`

The `/fcmoptfile` parameter specifies the Tivoli Storage FlashCopy Manager options file to use..

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify `/fcmoptfile`, the default value is *dsm.opt*.
- If you specify `/fcmoptfile` but not *dsmoptfilename*, the default is also *dsm.opt*.

`/LOGFile=logfilename`

Use the `/logfile` parameter to specify the name of the activity log file that

is generated by Tivoli Storage FlashCopy Manager for Exchange. The *logfile* 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 *logfile* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory. If the *logfile* 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Exchange Example

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 named MEAN. The following output is displayed:

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

Microsoft Exchange Server Information

Server Name: MEAN
Domain Name: mean.local
Exchange Server Version: 8.0.813.0 (Exchange Server 2007)

Storage Groups with Databases and Status

2nd Storage Grp Basic
Circular Logging - Disabled
Replica - None
Recovery - False
2nd MB Multiple User Online
2nd MB Single User Online

First Storage Group
Circular Logging - Disabled
Replica - None
Recovery - False
Mailbox Store Online
Mean Public Folders Online

LOGSonBASIC
Circular Logging - Disabled
Replica - None
Recovery - False
LOGSonBASIC Online

stg_local
Circular Logging - Disabled
Replica - None
Recovery - False
stg_local Online

svc431i_stg
Circular Logging - Disabled
Replica - None
Recovery - False
svc431i_mb Online

Volume Shadow Copy Service (VSS) Information

Writer Name : Microsoft Exchange Writer
Local DSMAgent Node : mean
Remote DSMAgent Node :
Writer Status : Online
Selectable Components : 5

Query FCM command

Use the **query fcm** command to display Tivoli Storage FlashCopy Manager information.

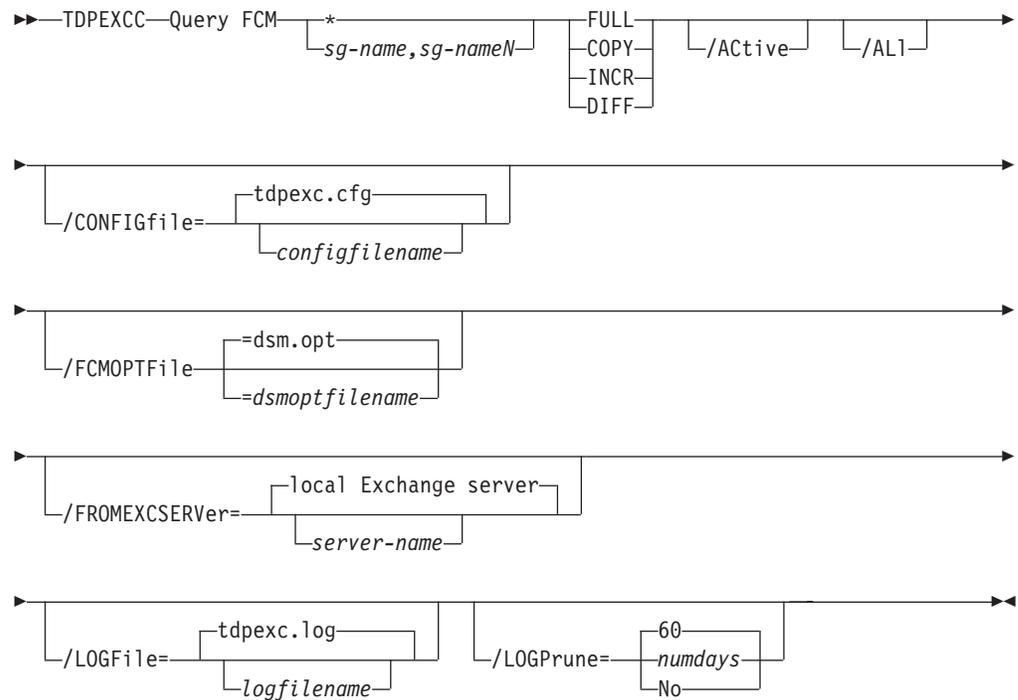
This command displays the following information:

- Compression mode
- Active policy set
- Default management class

This command can also display a list of backups that match the storage groups entered.

Query FCM syntax

Use the **query FCM** command syntax diagrams as a reference to view available options and truncation requirements.



Query FCM positional parameters

Positional parameters immediately follow the **query FCM** 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 FlashCopy Manager API and Tivoli Storage FlashCopy Manager information is displayed:

*** | dbname**

***** Query all backup objects for all databases

dbname

Query all backup objects for the specified 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 Query only full backup types

COPY Query only copy backup types

INCR Query only incremental backup types

DIFF Query only differential backup types

Query FCM optional parameters

Optional parameters follow the **query FCM** 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 Tivoli Storage FlashCopy Manager for Exchange configuration file that contains the values for the Tivoli Storage FlashCopy Manager for Exchange configuration options. See "Set command" on page 72 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 Tivoli Storage FlashCopy Manager 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"
```

/FCMOPTfile=dsmoptfilename

The **/fcmoptfile** parameter specifies the Tivoli Storage FlashCopy Manager options file to use.

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/fcmoptfile**, the default value is *dsm.opt*.
- If you specify **/fcmoptfile** but not *dsmoptfilename*, the default is also *dsm.opt*.

/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 Tivoli Storage FlashCopy Manager 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

logfile variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory.

If the *logfile* 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 FCM Example 1

This output example provides a sample of the text, messages, and process status that displays when using the **query FCM** command.

The **tdpexc query fcm *** command displays information about the Tivoli Storage FlashCopy Manager API and Tivoli Storage FlashCopy Manager. An example of the output is displayed below.

Querying for a list of database backups, please wait...

Connecting as node 'MEAN_EXCH'...

Backup List

Exchange Server : MEAN

Storage Group : First Storage Group

Backup Date	Size	S Fmt	Type	Loc	Object Name/Database Name
08/12/2009 10:24:11	18.04MB	A VSS	full	Loc	20090812102411
	6,152.00KB				Logs
	6,160.00KB				Mailbox Store
	6,160.00KB				Mean Public Folders

Storage Group : svc431i_stg

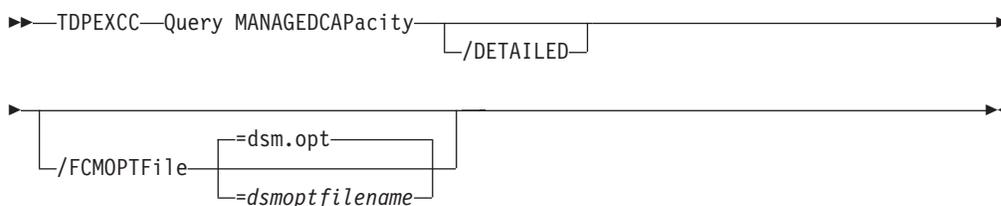
Backup Date	Size	S Fmt	Type	Loc	Object Name/Database Name
08/12/2009 10:09:51	17.02MB	A VSS	full	Loc	20090812100951
	13.01MB				Logs
	4,112.00KB				svc431i_mb
08/12/2009 10:14:06	15.01MB	A VSS	diff	Loc	20090812101406
	15.01MB				Logs
08/12/2009 10:15:28	21.02MB	A VSS	copy	Loc	20090812101528
	17.01MB				Logs
	4,112.00KB				svc431i_mb
08/12/2009 10:16:43	19.01MB	A VSS	incr	Loc	20090812101643
	19.01MB				Logs

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 Tivoli Storage FlashCopy Manager. This command is valid for all Windows platforms supported by Tivoli Storage FlashCopy Manager.



Parameters

/DETAILED

Results in a detailed listing of snapped volumes. If this option is not specified then only the total capacity is displayed.

/FCMOPTFile=*dsmoptfilename*

The */fcmoptfile* parameter specifies the Tivoli Storage FlashCopy Manager options file to use.

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify */fcmoptfile*, the default value is *dsm.opt*.
- If you specify */fcmoptfile* 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:

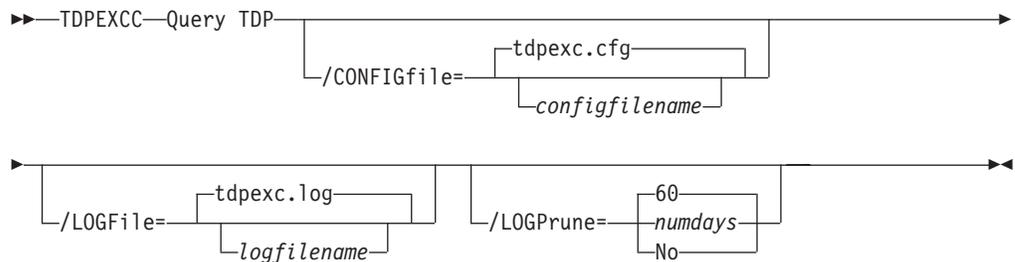
```
Total Managed Capacity : 1,019.72 MB (1,069,253,632 bytes)
Volume                : I:
Managed Capacity : 1,019.72 MB (1,069,253,632 bytes)
```

Query TDP command

Use the **query tdp** command to query a list of the current values set in the configuration file for Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 73 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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.

An example of the output in a VSS configuration is displayed below.

```
IBM Tivoli Storage FlashCopy® Manager for Exchange Preferences
-----
DATEformat ..... 1
LANGuage ..... ENU
LOCALDSMAgentnode..... mean
LOGFile ..... tdpexc.log
LOGPrune ..... 60
MOUNTWait ..... Yes
NUMBERformat ..... 1
TEMPDBRestorepath.....
TEMPLOGRestorepath.....
TIMEformat ..... 1
```

Restore command

Use the **restore** command to restore a storage group backup from local shadow volumes managed by Tivoli Storage FlashCopy Manager to an Exchange Server.

You must have local registry rights (for all versions of Exchange Server) to perform a Tivoli Storage FlashCopy Manager for Exchange restore.

VSS operations require special considerations that must be reviewed before attempting a VSS Restore. See these two sections for important guidelines:

- “VSS considerations” on page 50
- “Restoring VSS Backups into alternate locations” on page 18

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 managed by Tivoli Storage FlashCopy Manager storage. You can issue a **tdpexcc query fcm * /all** command to obtain a list of all the active and inactive backup objects.

Note: If the **tdpexcc restore sname 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.

- 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. 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>

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.

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.

Tivoli Storage FlashCopy Manager for Exchange supports the following types of restore:

Full Restore a Full type backup

Copy Restore a Copy type backup

Incremental

Restore an Incremental type backup

Differential

Restore a Differential type backup

VSS considerations

Be aware of these considerations when performing VSS Fast Restore and VSS Instant Restores.

Unless otherwise specified, "VSS restores" refers to VSS Fast Restore and VSS Instant Restore:

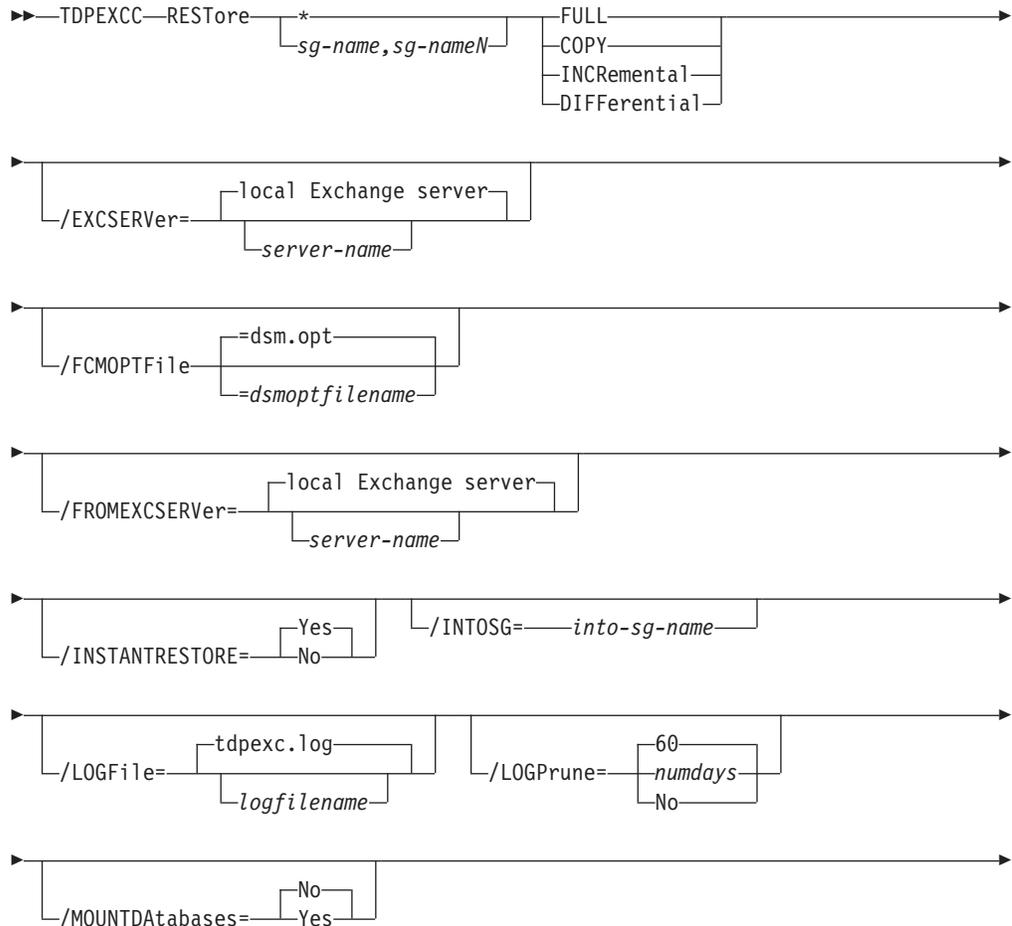
The following characteristics are true of VSS restores:

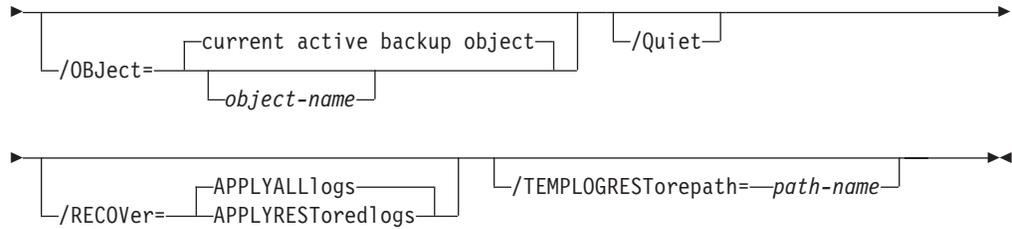
- Full, copy, differential and incremental backup types can be restored.
- Supports restoring one (or more) storage groups from a VSS snapshot backup located on storage managed by Tivoli Storage FlashCopy Manager.
- Restores can be performed in a Microsoft Cluster Server (MSCS) or Veritas Cluster Server (VCS) environment.
- Parallel VSS Fast Restore or VSS Instant Restore operations are not supported on Microsoft Windows 2003 and Microsoft Windows 2008.
- Be aware that all VSS restores of CCR and LCR replicas 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.

- VSS restores ignore the Recovery Storage Group and are placed directly into the production database unless the *intosg* 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.
- If */mountdatabases=yes* is specified during a VSS restore, all databases in the storage group that is being restored are dismounted.
- 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 Instant Restore from local shadow volumes is performed, the bytes transferred will display "0". When a VSS Fast Restore is performed, the bytes transferred will display the actual size.

Restore syntax

Use the **restore** command syntax diagrams as a reference to view available options and truncation requirements.





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-name*

* Restore all storage groups sequentially.

sg-name

Restore the specified storage group. 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**

FULL Restore a Full type backup

COPY

Restore a Copy type backup

INCRemental

Restore an Incremental type backup

DIFFerential

Restore a Differential type backup

Restore optional parameters

Optional parameters follow the **restore** command and positional parameters.

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name of the Tivoli Storage FlashCopy Manager for Exchange configuration file that contains the values for the Tivoli Storage FlashCopy Manager for Exchange configuration options. See “Set command” on page 72 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 Tivoli Storage FlashCopy Manager 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 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.

/FCMOPTFile=dsmoptfilename

The **/fcmoptfile** parameter specifies the Tivoli Storage FlashCopy Manager options file to use..

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/fcmoptfile**, the default value is *dsm.opt*.
- If you specify **/fcmoptfile** but not *dsmoptfilename*, the default is also *dsm.opt*.

/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 an IBM Systems Storage SAN Volume Controller, DS8000, or XIV Gen 2 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 storage group files, log files, and the checkpoint file are the only data overwritten on the source volumes.

When performing VSS Instant Restores with DS8000 or SAN Volume Controller 4.2.x or 4.3.x, 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. VSS Instant Restore of differential and incremental backups is not supported.

In a CCR environment, suspend the storage group copy before performing the VSS Instant Restore. After the VSS Instant Restore completes, resume the storage group copy.

/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
```

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
```

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=*logfile*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager for Exchange.

The *logfile* 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 *logfile* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory.

If the *logfile* 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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>

/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 Tivoli Storage FlashCopy Manager for Exchange.

Use the Tivoli Storage FlashCopy Manager for Exchange **query fcm /all** command to view the names of active and inactive backup objects.

If the **tdpexcc restore sname 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.

/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 choosing this option for a restore, your next backup **MUST** be a full or copy backup.

When restoring multiple backup objects, the **/recover** option should be used on the restore of the last object.

/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 Tivoli Storage FlashCopy Manager for Exchange configuration file. The default Tivoli Storage FlashCopy Manager for Exchange configuration file is *tdpexc.cfg*.

If you do not specify the **/templogrestorepath** parameter, and the TEMPLOGRESTOREPATH value does not exist in the Tivoli Storage FlashCopy Manager for Exchange configuration file, the TEMP environment variable value is used.

Attention:

When performing a **full** or **copy** 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.

Restore Examples

These output examples provide a sample of the text, messages, and process status that displays when using the **restore exchange** command.

In this example, the **tdpexcc restore svc431i_stg full /mountdatabases=yes /recover=applyalllogs** command restores a full backup of storage group svc431i_stg, mounts the databases after the restore operation completes, and replays the restored-transaction log entries and the current active-transaction log entries. The following output is displayed:

```
Starting Microsoft Exchange restore...
Beginning VSS restore of 'svc431i_stg'...
Starting snapshot restore process. This process may take several minutes.
VSS Restore operation completed with rc = 0
  Files Examined   : 0
  Files Completed  : 0
  Files Failed     : 0
  Total Bytes      : 0
Recovery being run. Please wait. This may take a while...
```

In this example, the **tdpexcc restore svc431i_stg copy /mountdatabases=yes /recover=applyalllogs** command restores a copy backup of storage group svc431i_stg, mounts the databases after the restore operation completes, and replays the restored-transaction log entries and the current active-transaction log entries. The following output is displayed:

```
Starting Microsoft Exchange restore...
Beginning VSS restore of 'svc431i_stg'...
Starting snapshot restore process. This process may take several minutes.
VSS Restore operation completed with rc = 0
  Files Examined   : 0
  Files Completed  : 0
  Files Failed     : 0
  Total Bytes      : 0
Recovery being run. Please wait. This may take a while...
```

In this example, the **tdpexcc restore svc431i_stg diff /mountdatabases=yes /recover=applyalllogs** command restores a differential backup of storage group svc431i_stg, mounts the databases after the restore operation completes, and replays the restored-transaction log entries and the current active-transaction log entries. The following output is displayed:

```

Starting Microsoft Exchange restore...

Beginning VSS restore of 'svc431i_stg'...

Restoring 'svc431i_stg' using file-level copy from a snapshot volume.

    Files Examined/Completed/Failed: [ 15 / 15 / 0 ]    Total Bytes: 15730425

VSS Restore operation completed with rc = 0
Files Examined    : 15
Files Completed   : 15
Files Failed      : 0
Total Bytes       : 15730425

Recovery being run. Please wait. This may take a while...

```

In this example, the **tdpexcc restore svc431i_stg incr /mountdatabases=yes /recover=applyallogs** command restores an incremental backup of storage group `svc431i_stg`, mounts the databases after the restore operation completes, and replays the restored-transaction log entries and the current active-transaction log entries. The following output is displayed:

```

Starting Microsoft Exchange restore...

Beginning VSS restore of 'svc431i_stg'...

Restoring 'svc431i_stg' using file-level copy from a snapshot volume.

    Files Examined/Completed/Failed: [ 19 / 19 / 0 ]    Total Bytes: 19925205

VSS Restore operation completed with rc = 0
Files Examined    : 19
Files Completed   : 19
Files Failed      : 0
Total Bytes       : 19925205

Recovery being run. Please wait. This may take a while..

```

Restorem mailbox command

Use the **restorem mailbox** command to restore mailbox-level data or mailbox-item-level data from Tivoli Storage FlashCopy Manager for Exchange backups.

The following information provides details about this command:

- Use the **restorem mailbox** command with Exchange Server 2007.
For Exchange Server 2003, the **restorem mailbox** command does not apply. If any backups exist, they will be ignored by this command.
- You can use the **restorem mailbox** command with VSS Backups stored on local shadow volumes.
- Use the **restorem mailbox** command or the mailbox restore operation in the GUI to restore mailbox-level data or mailbox-item-level data. Some features of the **restorem mailbox** 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
 - 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 Tivoli Storage FlashCopy Manager for Exchange you can restore multiple mailboxes with the same mailbox restore 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 Tivoli Storage FlashCopy Manager for Exchange mailbox restore tasks on Exchange Server 2007

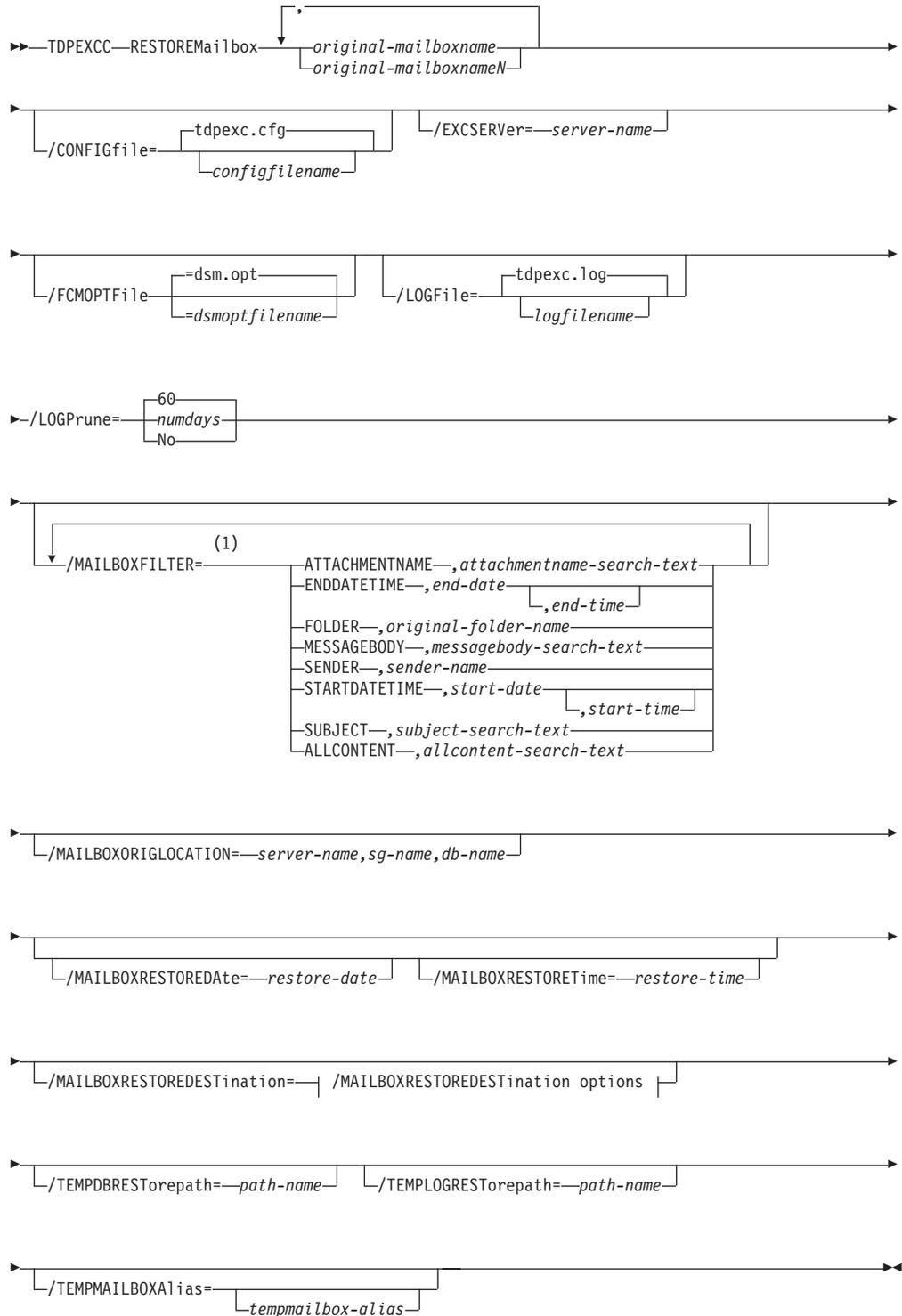
Review these prerequisites before you perform mailbox restore tasks on Exchange Server 2007:

- 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 or later (MAPI) is installed on the Exchange server that you will use to perform the mailbox restore operations.

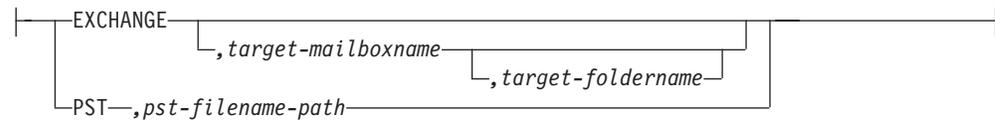
The amount of time needed to complete the restore process depends on the size of the mailbox databases, the network speed, and the number of mailboxes to process.

Restorem mailbox syntax

Use the **restorem mailbox** 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.

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.

Restoremailbox optional parameters

Optional parameters follow the **restoremailbox** command and positional parameters.

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name of the Tivoli Storage FlashCopy Manager for Exchange configuration file that contains the values for the Tivoli Storage FlashCopy Manager for Exchange configuration options. See “Set command” on page 72 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 Tivoli Storage FlashCopy Manager 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.

/FCMPTFile=*dsmoptfilename*

The **/fcmoptfile** parameter specifies the Tivoli Storage FlashCopy Manager options file to use..

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/fcmoptfile**, the default value is *dsm.opt*.
- If you specify **/fcmoptfile** but not *dsmoptfilename*, the default is also *dsm.opt*.

/LOGFile=*logfile*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager for Exchange.

The *logfile* 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 *logfile* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory.

If the *logfile* 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage

FlashCopy Manager 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*

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 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. Tivoli Storage FlashCopy Manager for Exchange 6.1 (and later) maintains mailbox location history.

Attention: A restoremailbox operation from a backup taken with Tivoli Storage FlashCopy Manager 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 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:

```
TDPEXC RESTOREMAILBOX annjones /MAILBOXORIGLOCATION=serv1,sg1,mbdb1  
/MAILBOXRESTOREDAt=12/31/2007  
/MAILBOXRESTOREDESTination=PST,c:\team99\rcvr.pst
```

/MAILBOXRESTOREDAt=*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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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_acctmng" in the target mailbox "mary brown":

```
restoremailbox "andrew baker","sally wood"  
/mailboxrestoredest=exchange,"mary brown",previous_acctmng
```

The restored mailbox messages are placed in folders copied from the original mailboxes using the following folder structure:

```
mary brown (target mailbox)  
  >-previous_acctmng (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 Accts (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 Tivoli Storage FlashCopy Manager 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 Olaf (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.

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\"
```

/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 Tivoli Storage FlashCopy Manager for Exchange configuration file is *tdpexc.cfg*. If the TEMPDBRESTOREPATH value does not exist in the Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager for Exchange configuration file is *tdpexc.cfg*. If you do not specify the **/templogrestorepath** parameter and the TEMPLOGRESTOREPATH value does not exist in the Tivoli Storage FlashCopy Manager 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.

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 Tivoli Storage FlashCopy Manager for Exchange configuration file is *tdpexc.cfg*. If the TEMPMAILBOXALIAS value does not exist in the Tivoli Storage FlashCopy Manager 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.

Restore Mailbox Examples

These output examples provide a sample of the text, messages, and process status that displays when using the **restore mailbox** command.

In this example, the **tdpexcc restoremailbox administrator** command restores mailbox administrator. The following output is displayed:

```

Starting Microsoft Exchange restore...

Querying Exchange storage group and database information...
Querying mailbox information...
Connecting as node 'MEAN_EXCH'...
Connecting to Local DSM Agent 'mean'...
Preparing Exchange Recovery Storage Group...
Performing mailbox restore using closest available backup.
Connecting to node 'MEAN_EXCH'...
Connecting to Local DSM Agent 'mean'...
Starting Microsoft Exchange restore...

Beginning VSS restore of 'Logs', 'Mailbox Store'...

Restoring 'First Storage Group' using file-level copy from a snapshot volume.

Files Examined/Completed/Failed: [ 8 / 8 / 0 ] Total Bytes: 12608440

VSS Restore operation completed with rc = 0
Files Examined : 8
Files Completed : 8
Files Failed : 0
Total Bytes : 12608440

Querying Exchange Recovery Storage Group...

Checking Active Directory entries...
Restoring mailbox 'Administrator (Administrator)' to original location...

Mailbox restore completed successfully with 0 items restored.

Removing Exchange Recovery Storage Group...

```

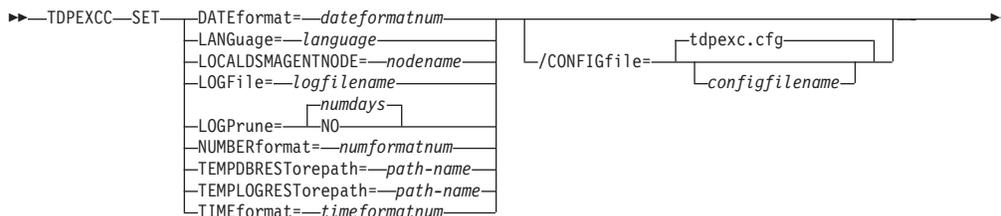
Set command

Use the **set** command to set the Tivoli Storage FlashCopy Manager for Exchange configuration parameters defined in the Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager for Exchange configuration file. You can set only one value for each **tdpexcc set** command run:

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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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=*logfile*

Use the LOGFile positional parameter to specify the name of the activity log file generated by Tivoli Storage FlashCopy Manager for Exchange. The Tivoli Storage FlashCopy Manager for Exchange activity log records significant events, such as completed commands and error messages.

The *logfile* 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 *logfile* variable can include a fully-qualified path. However, if no path is specified, the log file is assigned to the Tivoli Storage FlashCopy Manager 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.

NUMBERformat=*fntnum*

Use the NUMBERformat positional parameter to specify the format you want to use to display numbers.

The *fntnum* 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

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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 localdsmagentnode=mean** command sets the node *mean* as the node name of the local machine that performs the backups. An example of the output is displayed below.

Specify the node name of the local machine that performs the VSS backups.

```
FMX5054I The preference has been set successfully.
```

Chapter 5. Command-line reference: Tivoli Storage FlashCopy Manager for SQL

The name of the Tivoli Storage FlashCopy Manager command-line interface is **tdpsqlc.exe**. This program is located (by default) in the Tivoli Storage FlashCopy Manager installation directory (C:\Program Files\Tivoli\tsm\TDPSQL).

Launching the Tivoli Storage FlashCopy Manager command-line interface

Follow these steps to launch the Tivoli Storage FlashCopy Manager command-line interface:

1. Start the Tivoli Storage FlashCopy Manager GUI.
2. Expand the protect and recover data node.
3. In the tree view, select a SQL Server node.
4. From the action menu, select **Launch Command Line**. A command window opens.
5. Run **tdpsqlc.exe** from the command prompt. The command-line interface launches.

Command-line interface help

Issue the **tdpsqlc ?** or **tdpsqlc help** command to display help for the command-line interface.

Command-line parameter characteristics

The Tivoli Storage FlashCopy Manager command line parameters have the following characteristics

- Do not include a slash or dash before positional parameters.
- Begin optional parameters with a forward slash (/) or a dash (-).
- You may place multiple optional parameters per command invocation in any order *after* positional parameters.
- You may abbreviate keywords. Minimum abbreviations are indicated in upper case in the syntax diagrams.
- All SQL names of databases or parts of databases are case-sensitive.
- Separate parameters with at least one space.
- Some keyword parameters may require a value; separate values from their keywords with an equal sign. (=).
- If a parameter's value includes spaces or special characters, enclose the value in double quotes.
- You can use positional and optional parameters only once per command invocation unless otherwise specified.

Where repeatable syntax appears, separate multiple values with commas as indicated in the following:



Use the wildcard asterisk (*) following the command to select all instances on the server of database names or file names.

For help in reading syntax diagrams, refer to “Reading syntax diagrams” on page vii.

Backup command

Use the **backup** command to back up one (or more) SQL databases from the SQL Server to Tivoli Storage FlashCopy Manager.

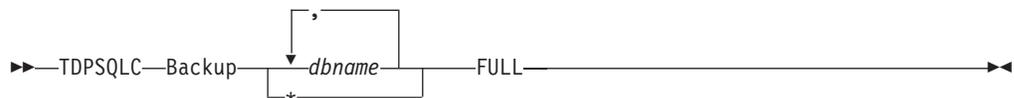
You can enter the * character to backup all databases. You can specify more than one database at once for multiple database and transaction log backups.

Considerations:

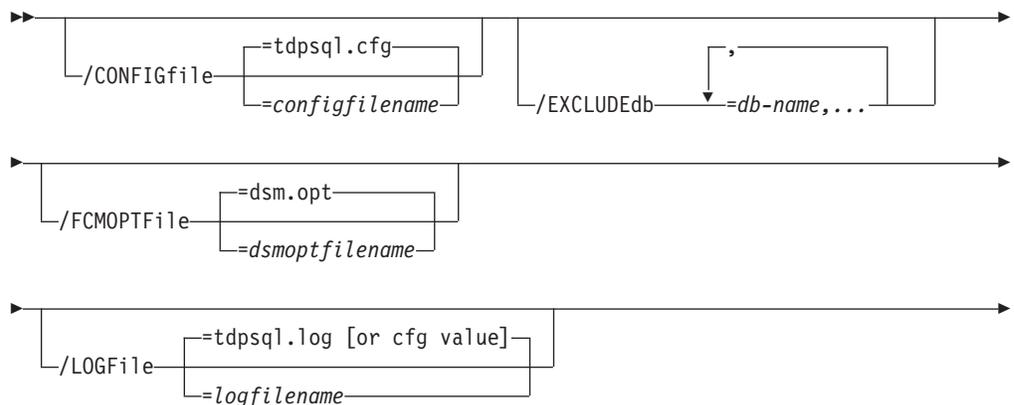
- You cannot back up or restore the **tempdb** database because it is created by SQL server each time the server is started.
- The user id used by Tivoli Storage FlashCopy Manager to log on to the SQL server must have the SQL Server SYSADMIN fixed server role.
- You can use the TRANSACT-SQL database consistency checker statement DBCC CHECKDB ('DBNAME') to verify the integrity of the SQL databases before you back them up.

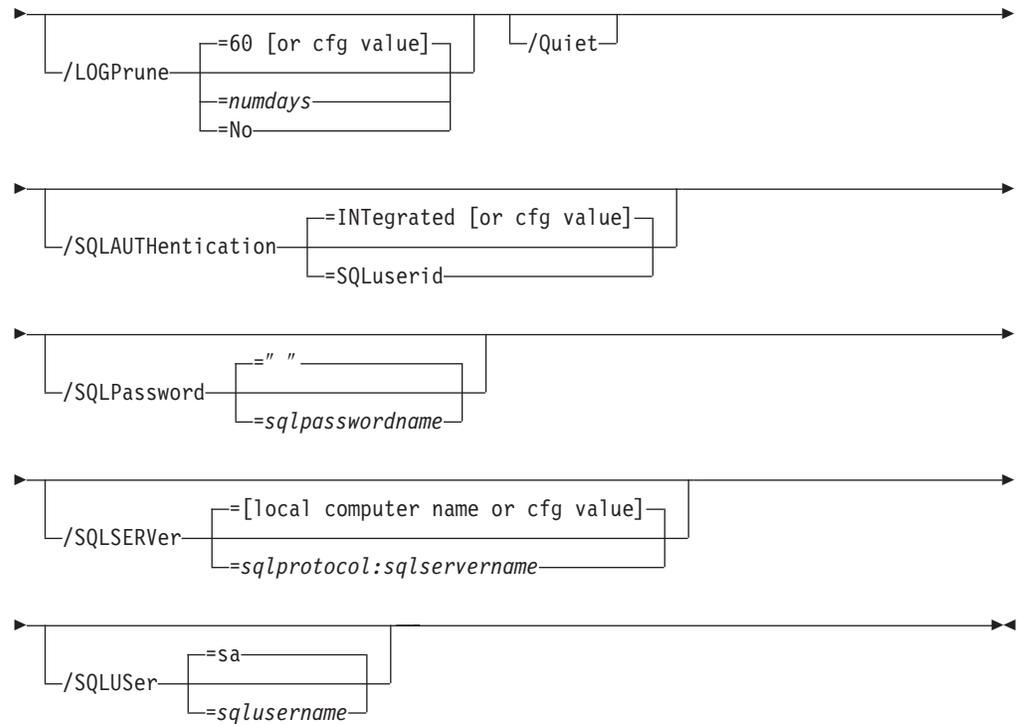
Backup syntax

Use the **backup** command syntax diagrams as a reference to view available options and truncation requirements.



Backup Optional Parameters:





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:

* | *dbname*

- * Back up all databases. Use caution when specifying the wildcard character (*) as Microsoft warns not to back up more than a few dozen databases in a single command due to SQL Server limitations.

dbname

Back up the specified database. Multiple entries are separated by commas. If separated by commas, make sure there is no space between the comma and the database name. If any database contains commas or blanks, enclose the database name in double quotation marks.

The following positional parameter specifies the type of backup to perform:

FULL A **full** VSS database backup contains all of the contents of a SQL server database (database files, log files, full-text index files, and FILESTREAM files).

Backup optional parameters

Optional parameters follow the **backup** command and positional parameters.

/CONFIGfile=*configfilename*

The **/configfile** parameter specifies the name of the Tivoli Storage FlashCopy Manager configuration file, which contains the values for the Tivoli Storage FlashCopy Manager configurable options. See “Set command” on page 109 for details on the file’s contents.

Considerations:

- *configfilename* can include a fully qualified path. If *configfilename* does not include a path, it uses the directory where Tivoli Storage FlashCopy Manager is installed.
- If *configfilename* includes spaces, place it in double quotes.
- If you do not specify **/configfile**, the default value is *tdpsql.cfg*.

/EXCLUDEdb=*db-name,...*

The **/excludedb** parameter specifies the name of the databases to exclude from the backup operation.

/FCMPTFile=*dsmoptfilename*

The **/fcmoptfile** parameter specifies the Tivoli Storage FlashCopy Manager options file to use..

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/fcmoptfile**, the default value is *dsm.opt*.
- If you specify **/fcmoptfile** but not *dsmoptfilename*, the default is also *dsm.opt*.

/LOGFile=*logfile*

The **/logfile** parameter specifies the name of the activity log that is generated by Tivoli Storage FlashCopy Manager. This activity log records significant events such as completed commands and error messages. The Tivoli Storage FlashCopy Manager activity log is distinct from the SQL Server error log. The *logfile* variable identifies the name to be used for the activity log generated by Tivoli Storage FlashCopy Manager.

Considerations:

- If the specified file does not exist, it is created. If it does exist, new log entries are appended to the file.
- The file name can include a fully-qualified path; however, if you specify no path, the file is written to the directory where Tivoli Storage FlashCopy Manager is installed.
- You cannot turn Tivoli Storage FlashCopy Manager activity logging off. If you do not specify **/logfile**, log records are written to the default log file. The default log file is *tdpsql.log*.
- When using multiple simultaneous instances of Tivoli Storage FlashCopy Manager 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

The **/logprune** parameter prunes the Tivoli Storage FlashCopy Manager activity log and specifies how many days of entries are saved. By default, log pruning is enabled and performed once each day Tivoli Storage FlashCopy Manager is executed; however, this option allows you to disable log pruning or explicitly request a prune of the log for one command run even if the log file has already been pruned for the day. The *numdays* variable represents the number of days to save log entries. By default, 60 days of log entries are saved in the prune process.

Considerations:

- If you specify *numdays*, it can range from 0 to 9999. A value of 0 deletes all entries in the Tivoli Storage FlashCopy Manager activity log file except for the current command entries.
- If you specify **/logprune**, its value is used instead of the value stored in the Tivoli Storage FlashCopy Manager configuration file. Specifying this parameter does not change the value in the configuration file.
- Changes to the value of the **timeformat** or **dateformat** parameter can result in an undesired pruning of the Tivoli Storage FlashCopy Manager log file. If you are running a command that may prune the log file and the value of the **timeformat** or **dateformat** parameter has changed, perform one of the following to prevent undesired pruning of the log file:
 - Make a copy of the existing log file.
 - Specify a new log file with the **/logfile** parameter or **logfile** setting.

/Quiet This parameter prevents status information from being displayed. This does not affect the level of information written to the activity log.

/SQLAUTHentication=INTEgrated | SQLuserid

This parameter specifies the authorization mode used when logging on to the SQL server. The **integrated** value specifies Windows authentication. The user id you use to log on to Windows is the same id you will use to log on to the SQL server. This is the default value.

Use the **sqluserid** value to specify SQL Server user id authorization. The user id specified by the **/sqluserid** parameter is the id you will use to log on to the SQL server. Any SQL user id must have the SQL Server SYSADMIN fixed server role.

/SQLPassword=*sqlpasswordname*

This parameter specifies the SQL password that Tivoli Storage FlashCopy Manager uses to log on to the SQL server that objects are backed up from or restored to.

Considerations:

- Using this parameter means that you are using SQL Server authentication. The SQL Server and the SQL user id for this password must both be configured for SQL Server authentication.
- If you do not specify **/sqlpassword**, the default value is blank (" ").
- If you specify **/sqlpassword** but not *sqlpasswordname*, the default is also blank (" ").

- This parameter is ignored if you use the `/sqlauth=integrated` parameter with it.

`/SQLSERVER=sqlprotocol:sqlservername`

The `/sqlserver` parameter specifies the SQL server that Tivoli Storage FlashCopy Manager logs on to. The `sqlprotocol` variable specifies the communication protocol to use. You can specify one of the following protocols:

- `lpc`: Use Shared Memory protocol.
- `np`: Use Named Pipes protocol.
- `tcp`: Use Transmission Control protocol.
- `via`: Use Virtual Interface Architecture protocol.

If no protocol is specified, Tivoli Storage FlashCopy Manager logs on to the SQL server according to the first protocol that becomes available.

Considerations:

- The default value is the value specified by the SQL server configurable option in the Tivoli Storage FlashCopy Manager configuration file. This is initially the local computer name.
- If you specify `/sqlserver` but not `sqlservername`, the local computer name is used.
- The following two shortcuts are accepted as the local computer name: `.` (`local`) These are a period or the word `local` within parentheses.
- If the SQL server is a member of a fail-over cluster, the `CLUSTERNODE` option must have the value `YES`.
- You must specify the name if the SQL server is not the default instance or is a member of a fail-over cluster.
- The format of `sqlservername` depends on what type of instance it is and whether it is clustered or not:

Format	Instance?	Clustered?	Name required?
<code>local-computername</code>	default	no	no
<code>local-computername\ instancename</code>	named	no	yes
<code>virtualservername</code>	default	yes	yes
<code>virtualservername\ instancename</code>	named	yes	yes

localcomputername

The network computer name of the computer the SQL server and Tivoli Storage FlashCopy Manager reside on. The TCP/IP host name may not always be the same.

instancename

The name given to the named instance of SQL Server specified during installation of the instance.

virtualservername

The name given to the clustered SQL Server specified during clustering service setup. This is not the cluster or node name.

`/SQLUSER=sqlusername`

The `/sqluser` parameter specifies the name that Tivoli Storage FlashCopy Manager uses to log on to the SQL server.

Considerations:

- Using this parameter means that you are using SQL Server authentication. The SQL Server and the SQL user id for this password must both be configured for SQL Server authentication.
- The SQL user id must have the SQL server SYSADMIN fixed server role.
- If you do not specify */sqluser*, the default is **sa**.
- If you specify */sqluser* but not *sqlusername*, the default is also **sa**.
- This parameter is ignored if you use the */sqlauth=integrated* parameter with it.

Backup examples

These output examples provide a sample of the text, messages, and process status that displays when using the **backup** command.

In this example, the **tdpsqlc backup** command performs a full backup of database xivdb1. The following output is displayed:

```
Connecting to SQL Server, please wait...

Connecting as node 'POOH_SQL'...
Connecting to Local DSM Agent 'POOH'...

Starting SQL database backup...

Beginning VSS backup of 'xivdb1'...

Files Examined/Completed/Failed: [ 4 / 4 / 0 ] Total Bytes: 40767

VSS Backup operation completed with rc = 0
Files Examined : 4
Files Completed : 4
Files Failed : 0
Total Bytes : 40767
```

Delete Backup command

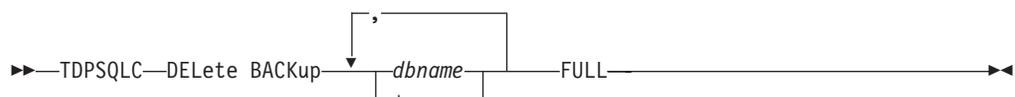
Use the **delete backup** command to delete a VSS Backup of a SQL Server database.

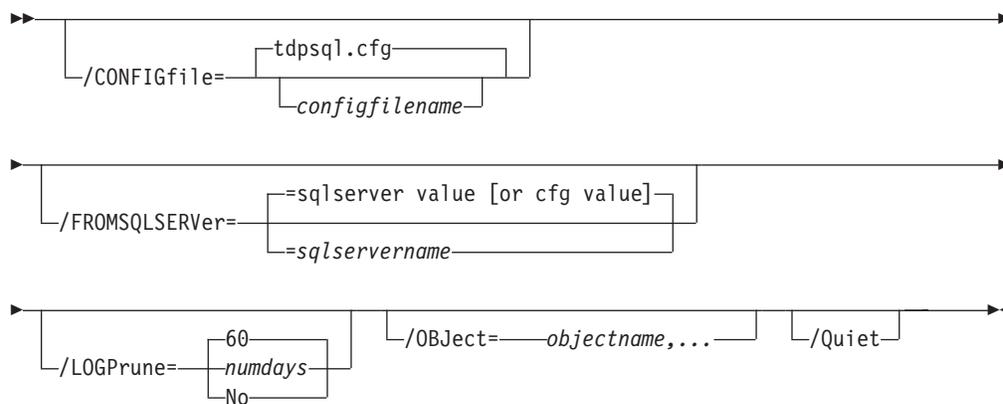
You must have local registry rights (for all versions of SQL Server) to perform a Tivoli Storage FlashCopy Manager for SQL delete backup.

See “Backup strategies” on page 21 for additional information related to the **delete backup** 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:

* | *dbname*

* Delete the active backups of all databases.

dbname

Delete a backup of the specified database. The active backup is deleted unless you specify a different backup with the **/object** optional parameter.

Multiple entries are separated by commas. If separated by commas, make sure there is no space between the comma and the database name. If any database name contains commas or blanks, enclose the database name in double quotation marks.

The following positional parameter specifies the type of delete backup to perform:

FULL Delete full type backups.

CAUTION:

- Be careful to delete only the desired 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 Tivoli Storage FlashCopy Manager for SQL 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 Tivoli Storage FlashCopy Manager for SQL installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is **tdpsql.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 73 for descriptions of available configuration parameters.

/FROMSQLSERVER=server-name

Use the **/fromsqlserver** parameter to specify the name of the SQL Server where the original backup was performed. This parameter is necessary only when the name of the SQL server to delete from, as determined by the **/sqlserver** parameter, is different from the name of the SQL server that the backup objects were created from. The default value is the **/sqlserver** value or the value set in the Tivoli Storage FlashCopy Manager configuration file.

Considerations:

- If the two SQL server names are different, you must use this parameter even if **/fromsqlserver** was a non-clustered default instance.

/LOGFile=logfilename

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager for SQL.

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 Tivoli Storage FlashCopy Manager for SQL installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpsql.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, *tdpsql.log*.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Tivoli Storage FlashCopy Manager for SQL 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 Tivoli Storage FlashCopy Manager for SQL 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 Tivoli Storage

FlashCopy Manager for SQL 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 names of backup objects you want to delete. The object name uniquely identifies each backup object and is created by Tivoli Storage FlashCopy Manager for SQL.

Use the Tivoli Storage FlashCopy Manager for SQL **query fcm * /all** command to view the names of all available backup objects. This parameter specifies that only particular backup objects for the specified SQL databases and backup object type be deleted. The **objectname** variable specifies the names of the backup objects you want to delete. The object name uniquely identifies each backup object and is created by Tivoli Storage FlashCopy Manager for SQL.

/Quiet This parameter prevents status information from being displayed. This does not affect the level of information written to the activity log.

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 **tdpsqlc delete backup xivdb1 full** command deletes a full backup of database **xivdb1**. The following output is displayed:

```
Connecting to SQL Server, please wait...

Querying for Backups ....

Backup(s) to be deleted:
<xivdb1 : VSS : full : 08/10/2009 10:03:29>
VSS Delete backup operation completed with rc = 0
Files Examined   : 1
Files Completed  : 1
Files Failed     : 0
Total Bytes      : 0
```

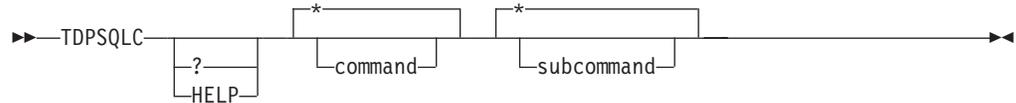
Help command

Use the **help** command to display help for Tivoli Storage FlashCopy Manager for SQL 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 positional parameters

Positional parameters immediately follow the **help** command. There are no optional parameters with this command.

Use the help command to display the syntax of all or selected Tivoli Storage FlashCopy Manager commands using a textual notation.

Help uses the following notation:

- [*a*] *a* is optional; *a* may occur zero or one time
- {*a* | *b*} select either *a* or *b*, but not both
- {*a* } + *a* must occur at least one time
- {*a* } * *a* may occur zero or more times
- (*a*) comments that are not part of the command

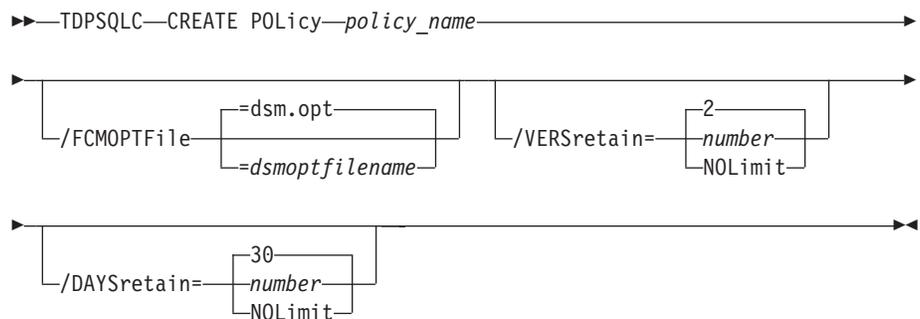
UPPERCASE

minimum abbreviation (which you can also enter in lowercase)

Policy commands for Tivoli Storage FlashCopy Manager for SQL

Create Policy

This command is used to create a new policy.



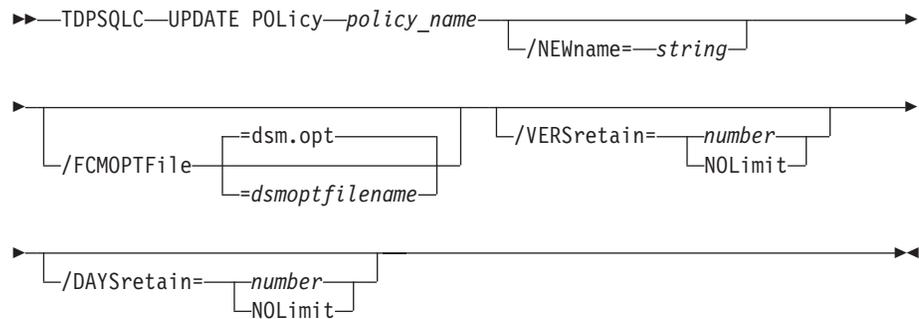
Parameters

- **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 the retention parameters of an existing policy.

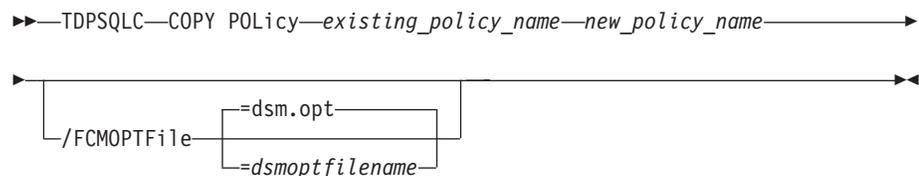


Parameters

- **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.



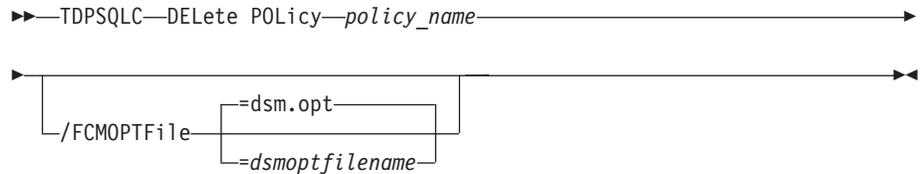
Parameters: * (required) specifies all policies are to be queried. The results of the query will be displayed as follows:

Connecting to SQL 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 FCM command

Use the **query fcm** command to display Tivoli Storage FlashCopy Manager information.

This command displays the following information:

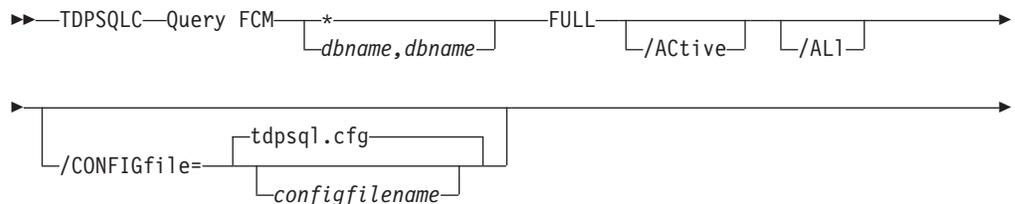
- Compression mode
- Active policy set
- Default management class

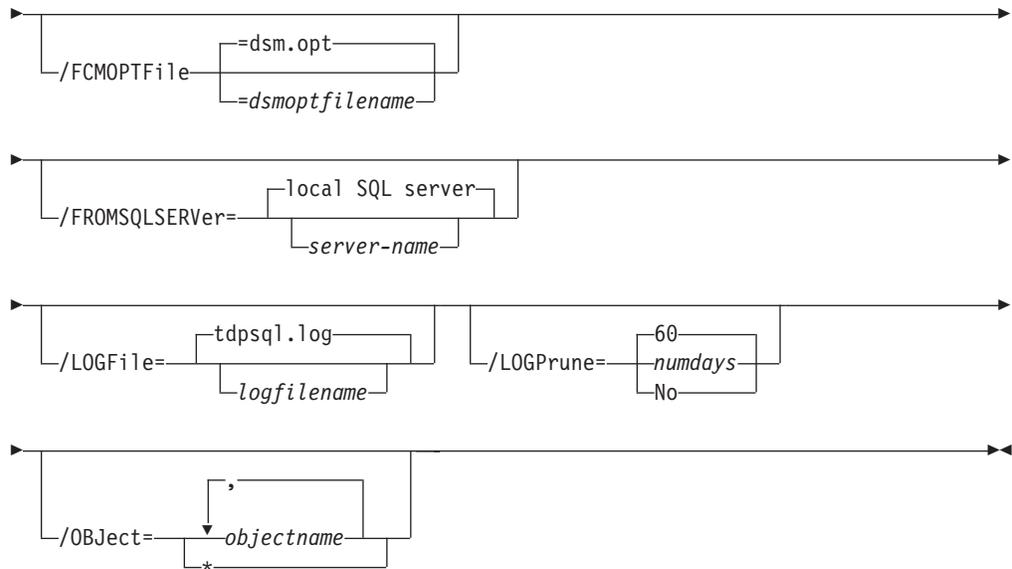
This command can also display a list of backups that match the databases entered.

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 FCM syntax

Use the **query FCM** command syntax diagrams as a reference to view available options and truncation requirements.





Query FCM positional parameters

Positional parameters immediately follow the **query FCM** 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 FlashCopy Manager API and Tivoli Storage FlashCopy Manager information is displayed:

* | *dbname*

* Query all backup objects for all databases

dbname

Query all backup objects for the specified 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 Query only full backup types

COPY Query only copy backup types

INCR Query only incremental backup types

DIFF Query only differential backup types

Query FCM optional parameters

Optional parameters follow the **query FCM** 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*

The **/configfile** parameter specifies the name of the Tivoli Storage

FlashCopy Manager for SQL configuration file, which contains the values for the Tivoli Storage FlashCopy Manager configurable options. See “Set command” on page 109 for details on the file’s contents.

Considerations:

- The *configfilename* variable can include a fully qualified path. If *configfilename* does not include a path, it uses the directory where Tivoli Storage FlashCopy Manager for SQL is installed.
- If *configfilename* includes spaces, enclose it in double quotation marks.
- If you do not specify **/configfile**, the default value is *tdpsql.cfg*.
- If you specify **/configfile** but not *configfilename*, the default value *tdpsql.cfg* is used.

/FCMPTFile=dsmoptfilename

The **/fcmoptfile** parameter specifies the Tivoli Storage FlashCopy Manager options file to use..

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/fcmoptfile**, the default value is *dsm.opt*.
- If you specify **/fcmoptfile** but not *dsmoptfilename*, the default is also *dsm.opt*.

/FROMSQLSERVER=sqlservername

For **query FCM**, the **/fromsqlserver** parameter specifies the SQL server that backup objects were backed up from. This parameter is necessary only when the name of the SQL server to query, as determined by the **/sqlserver** parameter, is different from the name of the SQL server that the backup objects were created from. The default value is the **/sqlserver** value or the value set in the Tivoli Storage FlashCopy Manager for SQL configuration file.

Considerations:

- If the two SQL server names are different, you must use this parameter even if **/fromsqlserver** was a non-clustered default instance.
- After you restore a SQL database to a different SQL server, the logins of the SQL database may not match the logins for the different SQL server. If appropriate, you can use the SQL stored procedure `SP_CHANGE_USERS_LOGIN` to find and correct such SQL login mismatches.

/LOGFile=logfilename

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager for SQL installation directory.

If the *logfile* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpsql.log"
```

You cannot turn Tivoli Storage FlashCopy Manager for SQL activity logging off. If you do not specify **/logfile**, log records are written to the default log file. The default log file is *tdpsql.log*.

Attention: When using multiple simultaneous instances of Tivoli Storage FlashCopy Manager for SQL 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 Tivoli Storage FlashCopy Manager for SQL 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.

If you specify **no**, the log file is not pruned during this command.

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 Tivoli Storage FlashCopy Manager 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*,...

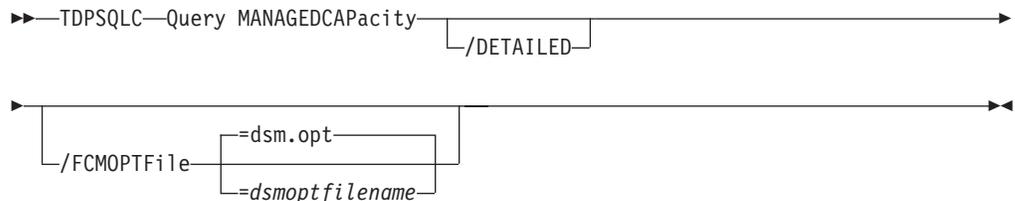
For **restore** and **inactivate** operations, **/object** specifies that only particular backup objects for the specified SQL databases and backup object type (if specified) be restored or inactivated. For **query** operations, **/object** includes particular objects and object types in the display. The *objectname* variable specifies the names of the backup objects you want to restore or inactivate. The object name uniquely identifies each backup object and is created by Tivoli Storage FlashCopy Manager. Use **query** to view the names of backup objects. You can use * as a wildcard character in *objectname* to replace zero or more characters for each occurrence. Specifying only the wildcard character indicates all backup objects of the specified SQL databases and backup object type.

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 Tivoli Storage FlashCopy Manager. This command is valid for all Windows platforms supported by Tivoli Storage FlashCopy Manager.



Parameters

/DETAILED

Results in a detailed listing of snapped volumes. If this option is not specified then only the total capacity is displayed.

/FCMOPTFile=dsmoptfilename

The **/fcmoptfile** parameter specifies the Tivoli Storage FlashCopy Manager options file to use.

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/fcmoptfile**, the default value is *dsm.opt*.
- If you specify **/fcmoptfile** but not *dsmoptfilename*, the default is also *dsm.opt*.

SQL Server 2005 example

Query the total managed capacity of SQL Server 2005 data represented in the local inventory with a detailed listing of snapped volumes. In this example there is a total of 1.25 TB of managed capacity. The detailed output shows that there are two snapshots of volumeid_1 and one snapshot of volumeid_2. Each unique volume is only counted once so the total adds up to 1.25 TB. “tdpsqlc query managedcapacity /detailed”:

```
Managed Capacity: 1.25 TB
```

```
Volume: volumeid_1  
Snapshot: snapshotid_1  
Managed Capacity: 0.50 TB  
Volume: volumeid_2  
Snapshot: snapshotid_1  
Managed Capacity: 0.75 TB
```

```
Volume: volumeid_1  
Snapshot: snapshotid_2  
Managed Capacity: 0.50 TB
```

SQL Server 2008 example

Query the total managed capacity of SQL Server 2008 data represented in the local inventory with a detailed listing of snapped volumes. “tdpsqlc query managedcapacity /detailed”:

```
Total Managed Capacity : 63.99 GB (68,706,877,440 bytes)
```

```
Volume      : H:  
Managed Capacity : 16.00 GB (17,176,719,360 bytes)
```

```
Volume      : I:  
Managed Capacity : 16.00 GB (17,176,719,360 bytes)
```

```
Volume      : Q:  
Managed Capacity : 16.00 GB (17,176,719,360 bytes)
```

```
Volume      : N:  
Managed Capacity : 16.00 GB (17,176,719,360 bytes)
```

Query SQL command

The **query sql** command queries the local SQL Server to return general information and status about the SQL server, databases, and VSS components.

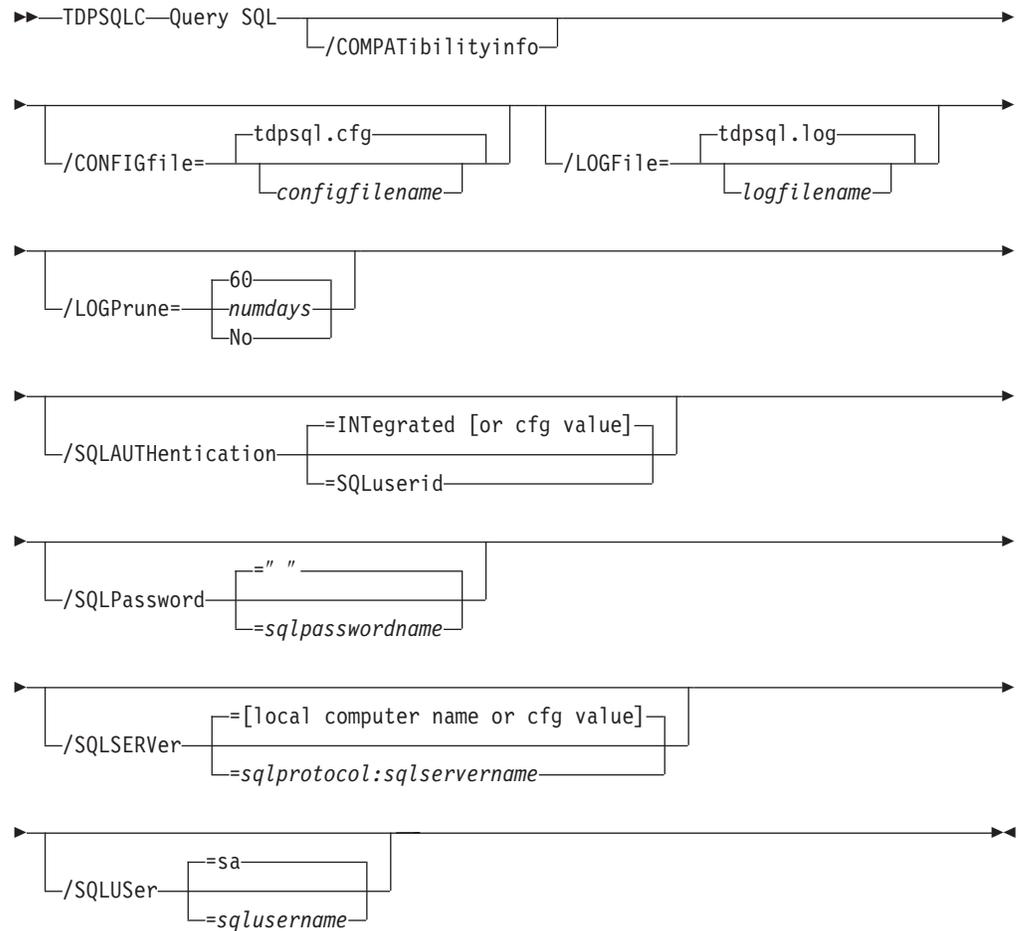
Use the **query sql** command to return the following information:

- SQL server information:
 - SQL server name and version
 - Database name
 - Database data space allocated
 - Database space used
 - Database log space allocated
 - Database log space used
 - Database options set (SELECT INTO / BULK COPY, TRUNCATE LOG ON CHECKPOINT, etc.)
- VSS information:
 - Writer Name
 - Local DSMAgent Node
 - Remote DSMAgent Node
 - Writer Status (online, offline)
 - Number of selectable components
- If you specify */compatibilityinfo*:

- Server clustering state
- Database compatibility level

Query SQL syntax

Use the **query sql** command syntax diagrams as a reference to view available options and truncation requirements.



Query SQL positional parameters

Positional parameters immediately follow the **query** command and precede the optional parameters.

Specify one of the following when issuing a Tivoli Storage FlashCopy Manager for SQL **query** command:

Query SQL *|dbname,...

This displays information about the current SQL server. The *dbname* variable specifies databases on the current SQL server to display information about.

Query SQL optional parameters

Optional parameters follow the **query sql** command and positional parameters.

/COMPATibilityinfo

For **query** operations, this parameter displays information related to the compatibility of a backup object with a SQL server. Certain SQL Server configuration options must be compatible before you can restore a backup object to a SQL server. When you specify this parameter, SQL and Tivoli Storage FlashCopy Manager for SQL configuration information is listed to help determine if a backup object is correct for a SQL server, or to help in problem determination.

Considerations:

- Compatible generally means identical. However, if you use a binary sort order for both the SQL server and the backup object, the code pages may be different, although the interpretation of individual character values may result in different characters being displayed or printed.

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager for SQL configuration file that contains the values to use for a **query sql** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Tivoli Storage FlashCopy Manager for SQL 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 110 for descriptions of available configuration parameters.

/LOGFile=*logfile*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager for SQL. The *logfile* 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 *logfile* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for SQL installation directory. If the *logfile* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpsql.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, *tdpsql.log*. The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Tivoli Storage FlashCopy Manager for SQL 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 Tivoli Storage FlashCopy Manager for SQL 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 Tivoli Storage FlashCopy Manager for SQL 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.

/SQLAUTHentication=INTEgrated | SQLuserid

This parameter specifies the authorization mode used when logging on to the SQL server. The **integrated** value specifies Windows authentication. The user id you use to log on to Windows is the same id you will use to log on to the SQL server. This is the default value. Use the **sqluserid** value to specify SQL Server user id authorization. The user id specified by the **/sqluserid** parameter is the id you will use to log on to the SQL server. Any SQL user id must have the SQL Server SYSADMIN fixed server role.

/SQLPassword=sqlpasswordname

This parameter specifies the SQL password that Tivoli Storage FlashCopy Manager uses to log on to the SQL server that objects are backed up from or restored to.

Considerations:

- Using this parameter means that you are using SQL Server authentication. The SQL Server and the SQL user id for this password must both be configured for SQL Server authentication.
- If you do not specify **/sqlpassword**, the default value is blank (" ").
- If you specify **/sqlpassword** but not *sqlpasswordname*, the default is also blank (" ").
- This parameter is ignored if you use the **/sqlauth=integrated** parameter with it.

/SQLSERVer=sqlprotocol:sqlservername

The **/sqlserver** parameter specifies the SQL server that Tivoli Storage FlashCopy Manager logs on to. The *sqlprotocol* variable specifies the communication protocol to use. You can specify one of the following protocols:

- *lpc*: Use Shared Memory protocol.
- *np*: Use Named Pipes protocol.
- *tcp*: Use Transmission Control protocol.
- *via*: Use Virtual Interface Architecture protocol.

If no protocol is specified, Tivoli Storage FlashCopy Manager logs on to the SQL server according to the first protocol that becomes available.

Considerations:

- The default value is the value specified by the SQL server configurable option in the Tivoli Storage FlashCopy Manager configuration file. This is initially the local computer name.
- If you specify */sqlserver* but not *sqlservername*, the local computer name is used.
- The following two shortcuts are accepted as the local computer name: . (local) These are a period or the word *local* within parentheses.
- If the SQL server is a member of a fail-over cluster, the CLUSTERNODE option in the Tivoli Storage FlashCopy Manager options file must have the value YES.
- You must specify the name if the SQL server is not the default instance or is a member of a fail-over cluster.
- The format of *sqlservername* depends on what type of instance it is and whether it is clustered or not:

Format	Instance?	Clustered?	Name required?
<i>local-computername</i>	default	no	no
<i>local-computername\instancename</i>	named	no	yes
<i>virtualservername</i>	default	yes	yes
<i>virtualservername\instancename</i>	named	yes	yes

localcomputername

The network computer name of the computer the SQL server and Tivoli Storage FlashCopy Manager reside on. The TCP/IP host name may not always be the same.

instancename

The name given to the named instance of SQL Server specified during installation of the instance.

virtualservername

The name given to the clustered SQL Server specified during clustering service setup. This is not the cluster or node name.

/SQLUSER=sqlusername

The **/sqluser** parameter specifies the name that Tivoli Storage FlashCopy Manager uses to log on to the SQL server.

Considerations:

- Using this parameter means that you are using SQL Server authentication. The SQL Server and the SQL user id for this password must both be configured for SQL Server authentication.
- The SQL user id must have the SQL server SYSADMIN fixed server role.
- If you do not specify **/sqluser**, the default is **sa**.
- If you specify **/sqluser** but not *sqlusername*, the default is also **sa**.
- This parameter is ignored if you use the **/sqlauth=integrated** parameter with it.

Query SQL example

This output example provides a sample of the text, messages, and process status that displays when using the **query SQL** command.

In this example, the **tdpsqlc query sql** command queried the local SQL Server to return general information and status about the SQL server, databases, and VSS components. The following output is displayed:

```
Connecting to SQL Server, please wait...

SQL Server Information
-----

SQL Server Name ..... POOH
SQL Server Version ..... 10.0.1600 (SQL Server 2008)

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

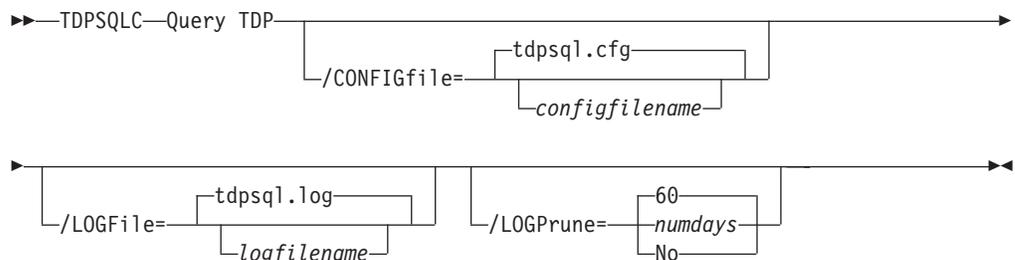
Writer Name           : SqlServerWriter
Local DSMAGENT Node   : POOH
Remote DSMAGENT Node  :
Writer Status         : Online
Selectable Components : 13
```

Query TDP command

Use the **query tdp** command to query a list of the current values set in the configuration file for Tivoli Storage FlashCopy Manager for SQL.

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 Tivoli Storage FlashCopy Manager for SQL 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 Tivoli Storage FlashCopy Manager for SQL installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is **tdpsql.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 110 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 Tivoli Storage FlashCopy Manager for SQL.

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 Tivoli Storage FlashCopy Manager for SQL installation directory.

If the *logfilename* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

```
/LOGFile="c:\Program Files\mytdpsql.log"
```

If the **/logfile** parameter is not specified, log records are written to the default log file, *tdpsql.log*.

The **/logfile** parameter cannot be turned off, logging always occurs.

When using multiple simultaneous instances of Tivoli Storage FlashCopy Manager for SQL 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 Tivoli Storage FlashCopy Manager for SQL 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 Tivoli Storage FlashCopy Manager for SQL 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.

In this example, the **tdpsqlc query tdp** command queried a list of the current values set in the configuration file for Tivoli Storage FlashCopy Manager. The following output is displayed:

```
IBM Tivoli Storage FlashCopy Manager configuration settings
-----
CONFIGfile.....configfilename      default: tdpsql.cfg
LOGFile ..... tdpsql.log
LOGPrune ..... 60
```

Restore command

Use this command to restore one (or more) SQL databases from storage managed by Tivoli Storage FlashCopy Manager to a SQL server.

Considerations:

- Make sure to review “VSS command-line considerations” before attempting any type of VSS Restore operation.
- You cannot restore SQL databases currently in use. By placing SQL databases to be restored in single-user mode, you can avoid attempting such restores. If you are restoring the master database, you *must* start the SQL server in single-user mode by using the -m SQL SERVER startup option.

Note:

1. The single user of the SQL databases or server must be the same user that Tivoli Storage FlashCopy Manager uses to log on to the SQL server for the restore.
 2. SQL Enterprise Manager, SQL Server Application Client, and other SQL Server services can be users of databases and the SQL server.
- The user used by Tivoli Storage FlashCopy Manager to log on to the SQL server must have the SQL Server SYSADMIN fixed server role.
 - You can use the TRANSACT-SQL database consistency checker statement DBCC CHECKDB ('DBNAME') to verify the integrity of the restored SQL databases.

VSS command-line considerations

Be aware of the following considerations when performing VSS restores. :

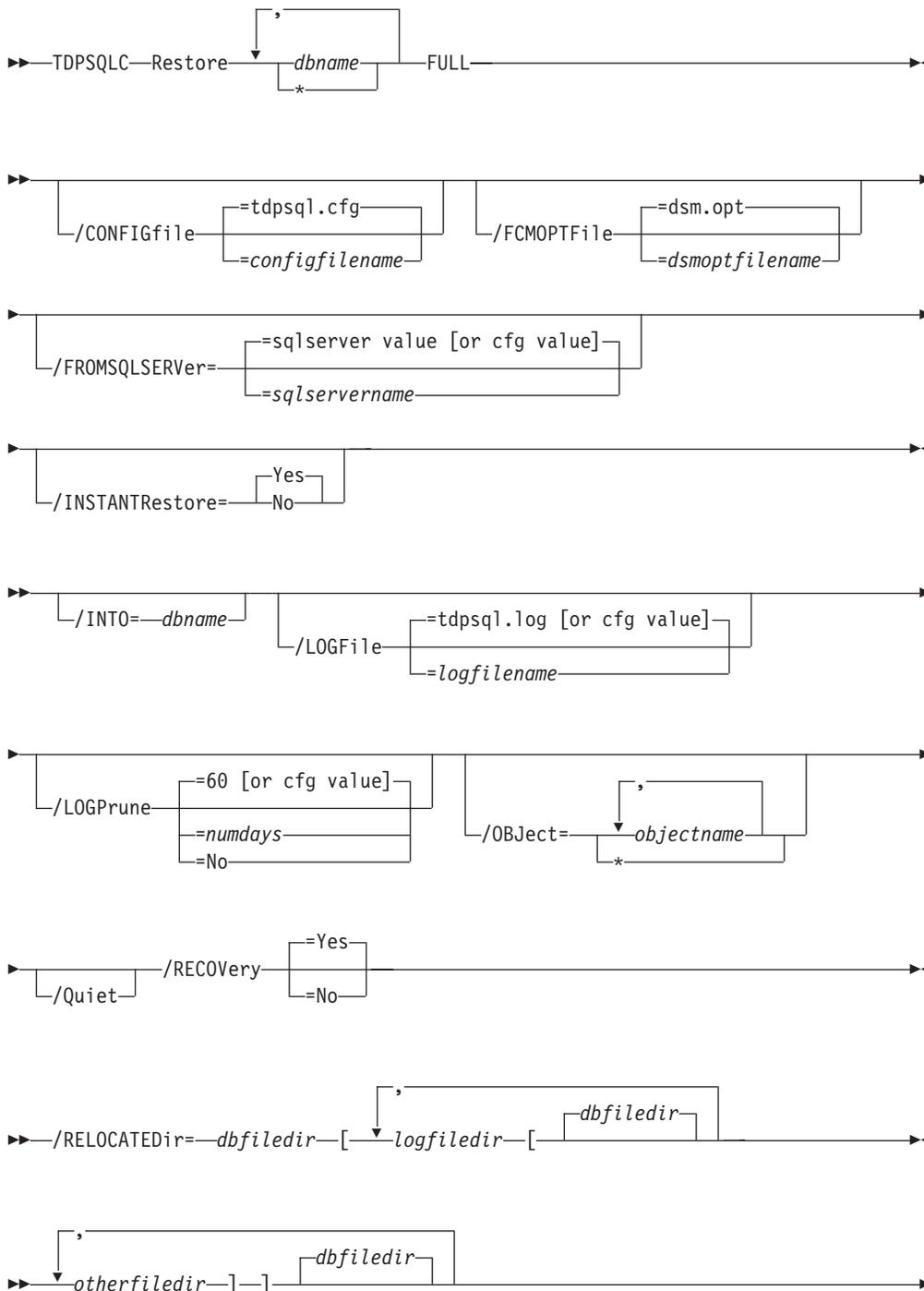
- Parallel VSS Fast Restore or VSS Instant Restore operations are not supported on Microsoft Windows 2003 and Microsoft Windows 2008.
- A VSS Instant Restore overwrites the entire contents of the source volumes. However, you can avoid overwriting the source volumes by specifying **/instantrestore=no**. This parameter setting bypasses volume-level copy and uses file-level copy instead to restore the files from a VSS Backup that resides on local shadow volumes. It is recommended that the source volume contain only the SQL database.
- Be aware that when a VSS Instant Restore from local shadow volumes is performed, the files and bytes transferred will display “0”. When a VSS Fast Restore is performed, the files and bytes transferred will display the actual number of files and their size.

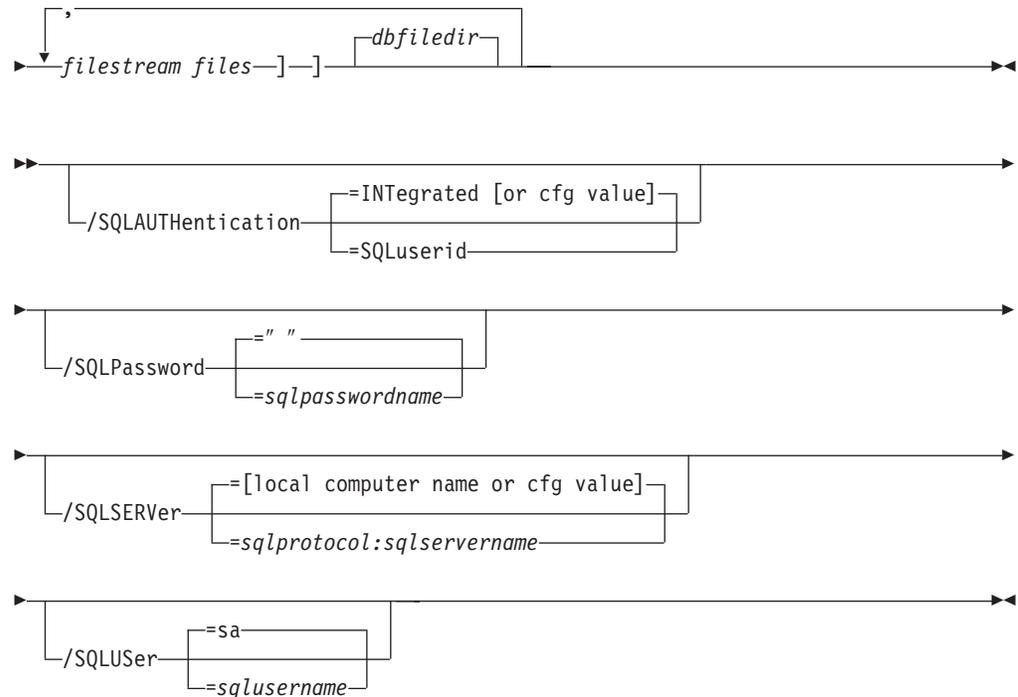
- When performing VSS Instant Restores on DS8000 and SAN Volume Controller, background copies that involve the volumes being restored are completed prior to initiating the VSS Instant Restore.
- Cross-SQL server restores are not supported by Microsoft.

Restore syntax

Use the **restore** command syntax diagrams as a reference to view available options and truncation requirements.

Syntax





Restore positional parameters

Positional parameters immediately follow the **restore** command and precede the optional parameters.

FULL This option restores all full database backup objects for the SQL databases you specify.

Restore optional parameters

Optional parameters follow the **restore** command and positional parameters.

The following are detailed descriptions of each of the optional parameters:

/CONFIGfile=*configfilename*

The **/configfile** parameter specifies the name of the Tivoli Storage FlashCopy Manager configuration file, which contains the values for the Tivoli Storage FlashCopy Manager configurable options. See “Set command” on page 109 for details on the contents of the file.

Considerations:

- *configfilename* can include a fully qualified path. If *configfilename* does not include a path, it uses the directory where Tivoli Storage FlashCopy Manager is installed.
- If *configfilename* includes spaces, place it in double quotes.
- If you do not specify **/configfile**, the default value is *tdpsql.cfg*.
- If you specify **/configfile** but not *configfilename*, the default value *tdpsql.cfg* is used.

/FCMOPTFile=*dsmoptfilename*

The **/fcmoptfile** parameter specifies the Tivoli Storage FlashCopy Manager options file to use..

Considerations:

- The *dsmoptfilename* variable can include a fully qualified path. If you do not include a path, the Tivoli Storage FlashCopy Manager installation directory is used.
- If the *dsmoptfilename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/fcmoptfile**, the default value is *dsm.opt*.
- If you specify **/fcmoptfile** but not *dsmoptfilename*, the default is also *dsm.opt*.

/FROMSQLSERVER=sqlservername

For **restore**, the **/fromsqlserver** parameter specifies the SQL server that backup objects were backed up from. This parameter is necessary only when the name of the SQL server to restore to, as determined by the **/sqlserver** parameter, is different from the name of the SQL server that the backup objects were created from. Use **/fromsqlserver** for **query FCM** commands, but use **/sqlserver** for **query SQL** commands. The default value is the **/sqlserver** value or the value set in the Tivoli Storage FlashCopy Manager configuration file.

Considerations:

- If the two SQL server names are different, you must use this parameter even if **/fromsqlserver** was a non-clustered default instance.

/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 an IBM Systems Storage SAN Volume Controller, DS8000, or XIV Gen 2 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 SQL database files and log files are the only data overwritten on the source volumes.

When performing VSS Instant Restores on DS8000 or SAN Volume Controller 4.2.x or 4.3.x, you must make sure that any previous background copies (that involve the volumes being restored) are completed prior to initiating the VSS Instant Restore.

/INTO=dbname

For **restore** operations, **/into** specifies the SQL server database that you want a backup object restored into. This parameter is necessary only when the name of the SQL server database to restore into is different from the backup object database name.

Considerations:

- When you specify **/into**, wildcards (*) may not appear in either the command *dbname* variable or the **/into dbname** variable.
- There must be exactly one item in the **/into dbname** variable list as well as in the command *dbname* list.

- Make sure to use the **/relocatedir** parameter when specifying **/into dbname**.

/LOGFile=logfilename

The **/logfile** parameter specifies the name of the activity log that is generated by Tivoli Storage FlashCopy Manager. This activity log records significant events such as completed commands and error messages. The Tivoli Storage FlashCopy Manager activity log is distinct from the SQL Server error log. The *logfilename* variable identifies the name to be used for the activity log generated by Tivoli Storage FlashCopy Manager.

Considerations:

- If the specified file does not exist, it is created. If it does exist, new log entries are appended to the file.
- The file name can include a fully-qualified path; however, if you specify no path, the file is written to the directory where Tivoli Storage FlashCopy Manager is installed.
- You cannot turn Tivoli Storage FlashCopy Manager activity logging off. If you do not specify **/logfile**, log records are written to the default log file. The default log file is *tdpsql.log*.
- When using multiple simultaneous instances of Tivoli Storage FlashCopy Manager 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

The **/logprune** parameter prunes the Tivoli Storage FlashCopy Manager activity log and specifies how many days of entries are saved. By default, log pruning is enabled and performed once each day Tivoli Storage FlashCopy Manager is executed; however, this option allows you to disable log pruning or explicitly request a prune of the log for one command run even if the log file has already been pruned for the day. The *numdays* variable represents the number of days to save log entries. By default, 60 days of log entries are saved in the prune process.

Considerations:

- If you specify *numdays*, it can range from 0 to 9999. A value of 0 deletes all entries in the Tivoli Storage FlashCopy Manager activity log file except for the current command entries.
- If you specify **no**, the log file is not pruned during this command.
- If you do not specify **/logprune**, the default value is that specified by the *logprune* configurable option in the Tivoli Storage FlashCopy Manager configuration file. This is initially 60.
- If you specify **/logprune**, its value is used instead of the value stored in the Tivoli Storage FlashCopy Manager configuration file. Specifying this parameter does not change the value in the configuration file.
- You can specify **/logprune** without specifying *numdays* or **no**; in this case, the default 60 is used.
- Changes to the value of the **timeformat** or **dateformat** parameter can result in an undesired pruning of the &agentname; log file. If you are running a command that may prune the log file and the value of the **timeformat** or **dateformat** parameter has changed, perform one of the following to prevent undesired pruning of the log file:

- Make a copy of the existing log file.
- Specify a new log file with the **/logfile** parameter or **logfile** setting.

/OBJECT=* | objectname,...

For **restore** and **inactivate** operations, **/object** specifies that only particular backup objects for the specified SQL databases and backup object type (if specified) be restored. For **query** operations, **/object** includes particular objects and object types in the display. The *objectname* variable specifies the names of the backup objects you want to restore or inactivate. The object name uniquely identifies each backup object and is created by Tivoli Storage FlashCopy Manager. Use **query** to view the names of backup objects.

Considerations:

- If you do not specify restore, only the *active* backup object is included in the restore.
- You can use * as a wildcard character in *objectname* to replace zero or more characters for each occurrence. Specifying only the wildcard character indicates all backup objects of the specified SQL databases and backup object type.

/Quiet The **/quiet** parameter omits displaying status information from the command. However, the information is appended to the Tivoli Storage FlashCopy Manager activity log.

/RECOVER=Yes | No

For **restore** operations, **/recovery** specifies whether or not you want to make additional restores to a SQL database that is not on a standby SQL server. A restored database cannot be used until the **/recovery=yes** parameter is administered to the database. You can specify:

Yes (default)

Whenever you make a sequence of restores to a SQL database and the current restore is the final restore in the sequence, or is the only restore to a SQL database. This informs the SQL server the restore is complete and ready for uncompleted transactions to be rolled back.

No Whenever you make a sequence of restores to a SQL database and the current restore is not the final restore in the sequence.

Considerations:

- Not specifying this option automatically rolls back incompleted transactions for the database.

Note:

1. Tivoli Storage FlashCopy Manager sorts the restore objects by database name, and, within database name, by backup time stamp from earliest to latest. A **query FCM** command will also display this order.

/RELOCATEDir=dbfiledir [,logfiledir [,otherfiledir] [,filestream files]]

The **/relocatedir** parameter specifies the new destination locations in which to restore the backed up SQL databases, logs, and SQL Server full-text index files.

The *dbfiledir* variable specifies the directory location of the SQL database you want to relocate. Note that if the *logfiledir* and/or *otherfiledir* variables are not specified, the logs and SQL Server full-text index files are restored to the directory specified by *dbfiledir*.

The *logfiledir* variable specifies the directory location of the SQL log files you want to relocate. Note that if the *logfiledir* variable is not specified, the SQL log files are restored to the directory specified by *dbfiledir*.

The *otherfiledir* variable specifies the directory location of the SQL Server full-text index files you want to relocate. Note that if the *otherfiledir* variable is not specified, the SQL Server full-text index files are restored to the directory specified by *dbfiledir*.

The *filestream files* variable specifies the directory location of the SQL Server FILESTREAM data files you want to relocate. Note that if the *filestream files* variable is not specified, the SQL Server FILESTREAM data files are restored to the directory specified by *dbfiledir*. This is available for SQL Server 2008 only.

/SQLAUTHentication=INTEgrated | SQLuserid

This parameter specifies the authorization mode used when logging on to the SQL server. The **integrated** value specifies Windows authentication. The user id you use to log on to Windows is the same id you will use to log on to the SQL server. This is the default value. Use the **sqluserid** value to specify SQL Server user id authorization. The user id specified by the **/sqluserid** parameter is the id you will use to log on to the SQL server. Any SQL user id must have the SQL Server SYSADMIN fixed server role.

/SQLPassword=sqlpasswordname

This parameter specifies the SQL password that Tivoli Storage FlashCopy Manager uses to log on to the SQL server that objects are backed up from or restored to.

Considerations:

- Using this parameter means that you are using SQL Server authentication. The SQL Server and the SQL user id for this password must both be configured for SQL Server authentication.
- If you do not specify **/sqlpassword**, the default value is blank (" ").
- If you specify **/sqlpassword** but not *sqlpasswordname*, the default is also blank (" ").

Note: This parameter is ignored if you use the **/sqlauth=integrated** parameter with it.

/SQLSERVER=sqlprotocol:sqlservername

The **/sqlserver** parameter specifies the SQL server that Tivoli Storage FlashCopy Manager logs on to. For **restore** operations, this is the SQL server that backup objects are restored to. However, if the backup objects were created from a different SQL server name, you must use the **/fromsqlserver** parameter. Use **/sqlserver** for the **query SQL** and **backup** commands, but use **/fromsqlserver** for **query FCM** commands. The *sqlprotocol* variable specifies the communication protocol to use. You can specify one of the following protocols:

- *lpc*: Use Shared Memory protocol.
- *np*: Use Named Pipes protocol.
- *tcp*: Use Transmission Control protocol.
- *via*: Use Virtual Interface Architecture protocol.

If no protocol is specified, Tivoli Storage FlashCopy Manager logs on to the SQL server according to the first protocol that becomes available.

Considerations:

- The default value is the value specified by the SQL server configurable option in the Tivoli Storage FlashCopy Manager configuration file. This is initially the local computer name.
- If you specify */sqlserver* but not *sqlservername*, the local computer name is used.
- The following two shortcuts are accepted as the local computer name: . (local) These are a period or the word *local* within parentheses.
- If the SQL server is a member of a fail-over cluster, the CLUSTERNODE option must have the value YES.
- You must specify the name if the SQL server is not the default instance or is a member of a fail-over cluster.
- The format of *sqlservername* depends on what type of instance it is and whether it is clustered or not:

Format	Instance?	Clustered?	Name required?
<i>local-computername</i>	default	no	no
<i>local-computername\instancename</i>	named	no	yes
<i>virtualservername</i>	default	yes	yes
<i>virtualservername\instancename</i>	named	yes	yes

localcomputername

The network computer name of the computer the SQL server and Tivoli Storage FlashCopy Manager reside on. The TCP/IP host name may not always be the same.

instancename

The name given to the named instance of SQL Server specified during installation of the instance.

virtualservername

The name given to the clustered SQL Server specified during clustering service setup. This is not the cluster or node name.

/SQLUSER=sqlusername

The */sqluser* parameter specifies the name that Tivoli Storage FlashCopy Manager uses to log on to the SQL server.

Considerations:

- Using this parameter means that you are using SQL Server authentication. The SQL Server and the SQL user id for this password must both be configured for SQL Server authentication.
- The SQL user id must have the SQL server SYSADMIN fixed server role.
- If you do not specify */sqluser*, the default is **sa**.
- If you specify */sqluser* but not *sqlusername*, the default is also **sa**.

Note: This parameter is ignored if you use the */sqlauth=integrated* parameter with it.

Restore output examples

These output examples provide a sample of the text, messages, and process status that displays when using the **restore** command.

In this example, the **tdpsqlc restore xivdb1 full** command restores a full backup of database xivdb1. The following output is displayed:

```
Connecting to SQL Server, please wait...
Querying for Backups ....
Starting Sql database restore...

Beginning VSS restore of 'xivdb1'...

Starting snapshot restore process. This process may take several minutes.

VSS Restore operation completed with rc = 0
Files Examined   : 3
Files Completed  : 3
Files Failed     : 0
Total Bytes      : 40,712
```

Set command

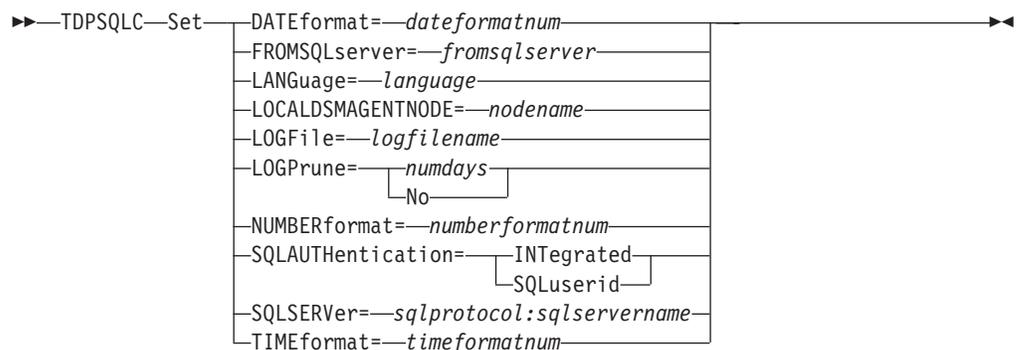
Put your short description here; used for first paragraph and abstract.

Use the **set** command to change the values for the Tivoli Storage FlashCopy Manager configurable parameters and options. The values are saved in a configuration file. The default file is `tdpsql.cfg`. Configuration values can also be set in the GUI **Edit** menu bar item.

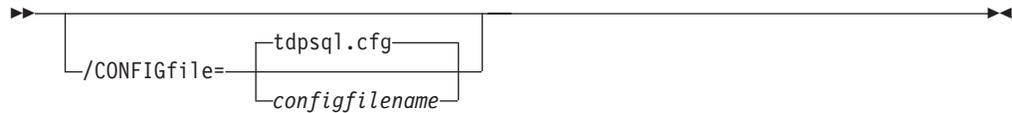
Note: If a configuration file is not specified, the `tdpsql.cfg` values are used, and a default configuration file is created with just the *lastprunedate* value. If an invalid or non-existent file is specified, the default values are used.

Set syntax

Use the **set** command syntax diagrams as a reference to view available options and truncation requirements.



Set Optional Parameters:



Set positional parameters

Positional parameters immediately follow the **set** command and precede the optional parameters.

To set default values in the Tivoli Storage FlashCopy Manager configuration file, specify one of the following when issuing a **set** command.

DATEformat=*dateformatnum*

The *dateformat* parameter selects the format you want to use to display dates.

The *dateformatnum* variable can range from 1 to 5. The initial value is 1. The number values specify the following formats:

- 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 Tivoli Storage FlashCopy Manager log file (tdpsql.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 SQL.
- Specify a new log file with the **/logfile** parameter.

FROMSQLSERVer=*sqlservername*

The **fromsqlserver** parameter specifies the SQL server that backup objects were backed up from. This parameter is necessary only when the name of the SQL server to restore to, as determined by the **sqlserver** parameter, is different from the name of the SQL server that the backup objects were created from. Use **fromsqlserver** for **query FCM**, but use **sqlserver** for **query SQL** commands. The default value is the **sqlserver** value or the value set in the Tivoli Storage FlashCopy Manager configuration file.

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=*logfile*

The **logfile** parameter specifies the name of the activity log that is generated by Data Protection for SQL. The activity log records significant events such as completed commands and error messages. This log is distinct from the SQL Server error log. The *logfile* variable identifies the name to be used for the activity log generated by Tivoli Storage FlashCopy Manager.

Considerations:

- If the specified file does not exist, it is created. If it does exist, new log entries are appended to the file.
- The file name can include a fully-qualified path; however, if you specify no path, the file is written to the directory where Data Protection for SQL is installed.
- You cannot turn Tivoli Storage FlashCopy Manager activity logging off. If you do not specify **/logfile**, log records are written to the default log file. The default log file is `tdpsql.log`.

LOGPrune=*numdays* | **No**

The **logprune** parameter prunes the Tivoli Storage FlashCopy Manager activity log and specifies how many days of entries to save. By default, log pruning is enabled and performed once each day Tivoli Storage FlashCopy Manager is executed; however, this option allows you to disable log pruning. The *numdays* variable represents the number of days to save log entries.

Considerations:

- If you specify *numdays*, it can range from 0 to 9999. The initial value is 60. A value of 0 deletes all entries in the Data Protection for SQL activity log file except for the current command entries.
- If you specify **no**, the log file is not pruned.

NUMBERformat=*numberformatnum*

The **numberformat** parameter specifies the format of the numbers displayed by Data Protection for SQL. The *numberformatnum* variable can range from 1 to 6. The initial value is 1. The number values specify the following formats:

1	1,000.00
2	1,000,00
3	1 000,00
4	1 000.00
5	1.000,00

SQLAUTHentication=INTEgrated | SQLuserid

This parameter specifies the authorization mode used when logging on to the SQL server. The **integrated** value specifies Windows NT or Windows 2000 authentication. The user id you use to log on to Windows is the same id you will use to log on to the SQL server. This is the default value. Use the **sqluserid** value to specify SQL Server user id authorization. The user id specified by the **sqluserid** parameter is the id you will use to log on to the SQL server. That user id must have the SQL Server SYSADMIN fixed server role.

SQLSERVER=sqlprotocol:sqlservername

The **sqlserver** parameter specifies the SQL server that Tivoli Storage FlashCopy Manager logs on to. This is the SQL server that backup objects are restored to. However, if the backup objects were created from a different SQL server name, you must use the **fromsqlserver** parameter. Use **sqlserver** for the **query SQL** command. The *sqlprotocol* variable specifies the communication protocol to use. You can specify one of the following protocols:

- *lpc*: Use Shared Memory protocol.
- *np*: Use Named Pipes protocol.
- *tcp*: Use Transmission Control protocol.
- *via*: Use Virtual Interface Architecture protocol.

If no protocol is specified, Tivoli Storage FlashCopy Manager logs on to the SQL server according to the first protocol that becomes available.

TIMEformat=timeformatnum

The **timeformat** parameter specifies the format of the times displayed by Data Protection for SQL. The *timeformatnum* variable can range from 1 to 4. The initial value is 1. The number values specify the following formats:

- | | |
|---|-------------|
| 1 | 23:00:00 |
| 2 | 23,00,00 |
| 3 | 23.00.00 |
| 4 | 11:00:00A/P |

Changes to the value of the **timeformat** parameter can result in an undesired pruning of the Tivoli Storage FlashCopy Manager log file (tdpsql.log by default). You can avoid losing existing log file data by performing one of the following:

- After changing the value of the **timeformat** parameter, make a copy of the existing log file before running Tivoli Storage FlashCopy Manager.
- Specify a new log file with the **/logfile** parameter.

Set optional parameters

Optional parameters follow the **set** command and positional parameters.

/CONFIGfile=*configfilename*

The **/configfile** parameter specifies the name of the Tivoli Storage FlashCopy Manager configuration file, which contains the values for the Tivoli Storage FlashCopy Manager configurable options.

Considerations:

- *configfilename* can include a fully qualified path. If *configfilename* does not include a path, it uses the directory where Tivoli Storage FlashCopy Manager is installed.
- If *configfilename* includes spaces, place it in double quotes.
- If you do not specify **/configfile**, the default value is *tdpsql.cfg*.
- If you specify **/configfile** but not *configfilename*, the default value *tdpsql.cfg* is used.

Set output examples

These output examples provide a sample of the text, messages, and process status that displays when using the **set** command.

The following specifies the *mutalisk* server as the default SQL server in the configuration file.

Command:

```
tdpsqlc set sqlserver=mutalisk
```

Output:

```
FMY5054I The configuration option was set successfully.
```

Chapter 6. Using the graphical user interface with Exchange Server data

Information is provided regarding how to use the Tivoli Storage FlashCopy Manager GUI to protect Exchange Server data.

Configuring user preferences

Use these interfaces to customize your IBM Tivoli Storage FlashCopy Manager configuration preferences.

The initial Tivoli Storage FlashCopy Manager configuration wizard (that automatically started when the Management Console was initially launched) is the only configuration task required in order to perform a backup. The interfaces described in this section customize preferences such as activity logging or how languages and information display. They are not required to perform a backup.

Be aware of the backup strategy, resource needs, policy settings, and hardware environment capabilities so that you configure these preferences to values that enhance IBM Tivoli Storage FlashCopy Manager features.

1. Start the IBM Tivoli Storage FlashCopy Manager GUI by going to Start -> All Programs -> FlashCopy Manager Management Console.
2. From the File Menu, click **Edit -> Configuration** or click the Configuration settings icon. Click the appropriate tab to set the IBM Tivoli Storage FlashCopy Manager preferences.

Determining managed storage capacity

Tracking the capacity of currently managed storage assists during license renewal.

Typically there is a difference between the capacity used by Exchange Server data and the capacity of the volume that contains that data. For example, a set of Exchange Server databases might require a capacity of 1 GB and reside on a 10 GB volume. When a snapshot of the volume is performed, the IBM Tivoli Storage FlashCopy Manager managed capacity measurement is 10 GB.

1. Click **Utilities -> Managed capacity**. A dialog appears that displays the total managed capacity residing on local shadow volumes.
2. Click on the **Details** button to view a list of the volumes (that contain backups) and their respective managed capacity.
3. Click **OK** to close this dialog.

Setting local backup policy

Local backup policy determines how different backup versions are retained on local shadow volumes.

To manage local policy from the IBM Tivoli Storage FlashCopy Manager, select **Utilities -> Local Policy Management**.

- Create or copy a policy by performing these steps:
 1. Specify a unique name in the **Policy** field. To copy a policy, select the name of the policy, enter a new name, and click **Create**.
 2. Specify the number of backup versions to retain on local shadow volumes in the **Number of snapshot versions to keep** field. You can specify a number from 1 to 9999. Check the **No Limit** box in order to retain as many backup versions as allowed by available storage space. The default value is 2 backup versions.
 3. Specify the number of days to retain backup versions on local shadow volumes in the **Days to keep a snapshot version** field. You can specify a number from 0 to 9999. Check the **No Limit** box in order to retain the backup versions for as long as possible as allowed by available storage space. The default value is 30 days.
 4. Click **Create** to complete the operation.
- Update or rename an existing policy by performing these steps:
 1. Select the name of the policy to be updated in the **Policy** list. To rename the policy, enter a new name in the **Policy** field.
 2. Update the number of backup versions to retain on local shadow volumes in the **Number of snapshot versions to keep** field. You can specify a number from 0 to 9999. Check the **No Limit** box in order to retain as many backup versions as allowed by available storage space. The default value is 2 backup versions.
 3. Update the number of days to retain backup versions on local shadow volumes in the **Days to keep a snapshot version** field. You can specify a number from 0 to 9999. Check the **No Limit** box in order to retain the backup versions for as long as possible as allowed by available storage space. The default value is 30 days.
 4. Click **Update**. Updates to the policy are applied immediately.
- Delete an existing policy by selecting the name of the policy in the **Policy** and click **Delete**.

Binding VSS Backups to a policy

VSS policy determines how backups are managed and retained.

You can add, update, delete, or change the processing order of existing binding statements. Select **Utilities -> VSS Policy Binding**. The Tivoli Storage FlashCopy Manager VSS Policy Binding window opens and existing binding statements are displayed.

VSS policies are processed from the bottom up and processing stops at the first match. To ensure that more specific statements 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. Use the **Move Up** and **Move Down** buttons to modify the processing order.

- Add a new policy binding statement by performing these steps:
 1. Enter the name of the Exchange Server or the wildcard character (*) in the **Server** field.
 2. Enter the name of the Exchange Server storage group, or enter the wildcard character (*) in the **Storage Group** field. You can also select a storage group from the **Storage Group** list.
 3. Select the backup type in the **Backup Type** list or enter the wildcard character (*).
 4. Select the name of the policy in the **Policy** list.
 5. Click **Add**.
 6. Click **Save changes** to complete the operation.
- Update an existing policy binding statement by performing these steps:
 1. Select a VSS binding statement from the statement list. All corresponding fields populate when a statement is selected.
 2. To update the storage group, enter the name of the storage group or enter the wildcard character (*) in the **Storage Group** field. You can also select a storage group from the **Storage Group** list.
 3. To update the backup type, select a different backup type in the **Backup Type** list or enter the wildcard character (*).
 4. To update the policy, select the name of the policy in the **Policy** list.
 5. Click **Update**.
 6. Click **Save changes** to complete the operation.
- Delete an existing policy binding statement by performing these steps:
 1. Select a VSS binding statement from the statement list.
 2. Click **Delete**.
 3. Click **Save changes** to complete the operation.

Backing up Exchange storage groups

Perform these tasks to back up Exchange Server 2003 and 2007 storage groups using Microsoft Volume Shadow Copy Service (VSS) technology.

To perform backup and restore tasks, IBM Tivoli Storage FlashCopy Manager must be operating in an account that meets these permission requirements:

- **Exchange Server 2003:** IBM Tivoli Storage FlashCopy Manager must be operating in an account with membership in the Domain Admins group. By default, Windows adds the Domain Admins group to other security groups, such as the local Administrators group. If these default settings change, the account must be manually added to these other groups.
 - **Exchange Server 2007:** IBM Tivoli Storage FlashCopy Manager 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 and Exchange Recipient Administrators groups. If these default settings change, the account must be manually added to these other groups.
1. Start the IBM Tivoli Storage FlashCopy Manager GUI.
 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.

3. Select the type of backup to perform with the **Backup Types** list. You can perform a full, copy, copy without integrity check, incremental, or differential backup with the VSS Backup method.
4. If you are running in an Exchange Server 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.
5. Click **Backup** to begin the backup operation.

Deleting VSS Backups

Remove a VSS Backup object when user-defined policy management settings has failed to delete specified backups.

Do not use this procedure for typical delete tasks as VSS Backups are automatically deleted based on user-defined policy management settings. This procedure is necessary for those deletions that are outside the scope of standard policy management deletions. In addition, this task should be performed with caution and only as a last resort.

1. Start the IBM Tivoli Storage FlashCopy Manager GUI.
2. Click the Restore tab.
3. In the View menu, click **Show All Objects** to display active and inactive backup objects.
4. Select the storage group that contains the backup to be deleted. The available backups display in a list to the right side of the tree.
5. Right-mouse click on the backup object and select **Delete Backup** in the pop-up menu. A dialog displays asking you to confirm the deletion.
 - Click **Yes** to delete the backup object.
 - Click **No** to stop the deletion process and return to the Tree View.

CAUTION:

At completion of a delete backup operation, the view content refreshes and all object selections clear.

Restoring Exchange storage groups

Perform these tasks to restore Exchange Server 2003 and Exchange Server 2007 storage groups.

Ensure your system meets these requirements, and that you review the following information:

- IBM Tivoli Storage FlashCopy Manager must be operating in an account that meets these permission requirements:
 - **Exchange Server 2003:** IBM Tivoli Storage FlashCopy Manager must be operating in an account with membership in the Domain Admins group. By default, Windows adds the Domain Admins group to other security groups, such as the local Administrators group. If these default settings change, the account must be manually added to these other groups.
 - **Exchange Server 2007:** 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 and Exchange Recipient Administrators groups. If these default settings change, the account must be manually added to these other groups.

- VSS restores to the Recovery Storage Group are *not* supported by Microsoft with Exchange Server 2003.
 - When you restore a storage group, data that exists in the storage group is overwritten and is no longer available after the restore is complete.
1. Start the IBM Tivoli Storage FlashCopy Manager GUI.
 2. Click the Restore tab.
 3. From the Tree View, select the Exchange server storage group to restore. To restore a particular database, first highlight the storage group in the Tree View. Then select the database to be restored in the List View. The List View displays information about your backups. To restore all available storage groups, select the Exchange server in the Tree View.
 4. 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, right-mouse click the selected storage group. A pop-up menu displays. Click **Restore Into** and select the storage group name that you want to restore into from the list. Note the following characteristics:
 - This feature is only available with Exchange Server 2007 or later.
 - If you are restoring data into a relocated storage group, choose the storage group 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. Specify the necessary Restore Options in the Restore window.
6. Click **Restore** to begin the restore operation.

Restoring a mailbox (or mailbox items) on Exchange Server 2007

This procedure describes how to restore a mailbox or items from a mailbox on Exchange Server 2007.

Review these prerequisites before attempting a restore operation:

- IBM Tivoli Storage FlashCopy Manager 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 and Exchange Recipient Administrators groups. If these default settings change, the account must be manually added to these other groups.
- The account must have an active Exchange mailbox in the domain.
- Temporary space is needed to accommodate the mailbox database during restore operations. Specify this temporary space from the File Menu by clicking **Edit -> Configuration -> General Tab** or click the Configuration settings icon to set these two options:
 - **Temporary Log Restore Path**

– **Temporary Database Restore Path**

If a directory is not specified, the database files are restored into a directory specified by the environment variable TEMP.

- On Windows Server 2008, Microsoft Exchange Server Messaging API (MAPI) Client and Collaboration Data Objects 1.2.1 or later must be installed on the machine on which the Exchange server is running. If a recovery server is being used, the MAPI must be installed on both the production Exchange server and the optional recovery server.
1. Start the IBM Tivoli Storage FlashCopy Manager GUI.
 2. From the File Menu, click **Utilities -> Mailbox Restore** or click the Mailbox Restore icon.
 3. Select a mailbox to be restored from the **Mailbox Name** list. Type the first letters of a user name to narrow the search results. You can restore data from multiple mailboxes by selecting each mailbox to be restored from the **Mailbox Name** list. Click **Add** to add the selected mailbox or mailboxes to be restored. Only mailboxes in the Active Directory are displayed in the **Mailbox Name** list. To restore data from a deleted mailbox, type the complete mailbox display name or mailbox alias in the **Mailbox Name** field, and then click **Add**.
 4. (Optional) By default, IBM Tivoli Storage FlashCopy Manager restores the most current backup available for the specified mailbox. If you want to restore data to a different point in time, use the **Backup Date** and **Backup Time** options to select an earlier point in time. By default, also restores the entire mailbox. You can use the **Item-Level Mailbox Filters** to identify individual messages to restore.
 5. Select one of the following restore destinations:
 - **Restore items to the Exchange Server**
 - **Restore items to the Exchange Server into an alternate mailbox and folder**
 - **Restore items to .PST file**
 6. Click **Restore** to begin the restore process. The amount of time that is needed to complete the restore process depends on the size of the mailbox databases, the network speed, and the number of mailboxes to process.

Chapter 7. Using the graphical user interface with SQL Server data

Information is provided regarding how to use the Tivoli Storage FlashCopy Manager GUI to protect SQL Server data.

Configuring user preferences

Use these interfaces to customize your IBM Tivoli Storage FlashCopy Manager configuration preferences.

The initial Tivoli Storage FlashCopy Manager configuration wizard (that automatically started when the Management Console was initially launched) is the only configuration task required in order to perform a backup. The interfaces described in this section customize preferences such as activity logging or how languages and information display. They are not required to perform a backup.

Be aware of the backup strategy, resource needs, policy settings, and hardware environment capabilities so that you configure these preferences to values that enhance IBM Tivoli Storage FlashCopy Manager features.

1. Start the IBM Tivoli Storage FlashCopy Manager GUI by going to Start -> All Programs -> FlashCopy Manager Management Console.
2. From the File Menu, click **Edit** -> **Configuration** or click the Configuration settings icon. Click the appropriate tab to set the IBM Tivoli Storage FlashCopy Manager preferences.

Determining managed storage capacity

Tracking the capacity of currently managed storage assists during license renewal.

Typically there is a difference between the capacity used by SQL Server data and the capacity of the volume that contains that data. For example, a set of SQL Server databases might require a capacity of 1 GB and reside on a 10 GB volume. When a snapshot of the volume is performed, the IBM Tivoli Storage FlashCopy Manager managed capacity measurement is 10 GB.

1. From the File Menu, click **Utilities** -> **Managed capacity**. A dialog appears that displays the total managed capacity residing on local shadow volumes.
2. Click on the **Details** button to view a list of the volumes (that contain backups) and their respective managed capacity.
3. Click **OK** to close this dialog.

Setting local backup policy

Local backup policy determines how different backup versions are retained on local shadow volumes.

To manage local policy from the IBM Tivoli Storage FlashCopy Manager, select **Utilities -> Local Policy Management**.

- Create or copy a policy by performing these steps:
 1. Specify a unique name in the **Policy** field. To copy a policy, select the name of the policy, enter a new name, and click **Create**.
 2. Specify the number of backup versions to retain on local shadow volumes in the **Number of snapshot versions to keep** field. You can specify a number from 1 to 9999. Check the **No Limit** box in order to retain as many backup versions as allowed by available storage space. The default value is 2 backup versions.
 3. Specify the number of days to retain backup versions on local shadow volumes in the **Days to keep a snapshot version** field. You can specify a number from 0 to 9999. Check the **No Limit** box in order to retain the backup versions for as long as possible as allowed by available storage space. The default value is 30 days.
 4. Click **Create** to complete the operation.
- Update or rename an existing policy by performing these steps:
 1. Select the name of the policy to be updated in the **Policy** list. To rename the policy, enter a new name in the **Policy** field.
 2. Update the number of backup versions to retain on local shadow volumes in the **Number of snapshot versions to keep** field. You can specify a number from 0 to 9999. Check the **No Limit** box in order to retain as many backup versions as allowed by available storage space. The default value is 2 backup versions.
 3. Update the number of days to retain backup versions on local shadow volumes in the **Days to keep a snapshot version** field. You can specify a number from 0 to 9999. Check the **No Limit** box in order to retain the backup versions for as long as possible as allowed by available storage space. The default value is 30 days.
 4. Click **Update**. Updates to the policy are applied immediately.
- Delete an existing policy by selecting the name of the policy in the **Policy** and click **Delete**.

Binding VSS Backups to a policy

VSS policy determines how backups are managed and retained.

You can add, update, delete, or change the processing order of existing binding statements. Select **Utilities -> VSS Policy Binding**. The Tivoli Storage FlashCopy Manager VSS Policy Binding window opens and existing binding statements are displayed.

VSS policies are processed from the bottom up and processing stops at the first match. To ensure that more specific statements 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. Use the **Move Up** and **Move Down** buttons to modify the processing order.

- Add a new policy binding statement by performing these steps:
 1. Enter the name of the SQL Server or the wildcard character (*) in the **Server** field.
 2. Enter the name of the SQL Server database, or enter the wildcard character (*) in the **Database** field. You can also select a database from the **Database** list.
 3. Select the backup type in the **Backup Type** list or enter the wildcard character (*).
 4. Select the name of the policy in the **Policy** list.
 5. Click **Add**.
 6. Click **Save changes** to complete the operation.
- Update an existing policy binding statement by performing these steps:
 1. Select a VSS binding statement from the statement list. All corresponding fields populate when a statement is selected.
 2. To update the database, enter the name of the database or enter the wildcard character (*) in the **Database** field. You can also select a database from the **Database** list.
 3. To update the backup type, select a different backup type in the **Backup Type** list or enter the wildcard character (*).
 4. To update the policy, select the name of the policy in the **Policy** list.
 5. Click **Update**.
 6. Click **Save changes** to complete the operation.
- Delete an existing policy binding statement by performing these steps:
 1. Select a VSS binding statement from the statement list.
 2. Click **Delete**.
 3. Click **Save changes** to complete the operation.

Backing up SQL Server data

Perform these tasks to back up SQL server data using Microsoft Volume Shadow Copy Service (VSS) technology.

Ensure your system meets these requirements, and that you review the following information:

- IBM Tivoli Storage FlashCopy Manager must be operating in an account that meets these permission requirements:
 - **SQL Server 2005:** IBM Tivoli Storage FlashCopy Manager must be operating in an account with membership in the Domain Admins group. By default, Windows adds the Domain Admins group to other security groups, such as the local Administrators group. If these default settings change, the account must be manually added to these other groups.
 - **SQL Server 2008:** IBM Tivoli Storage FlashCopy Manager must be operating in an account with membership in the SQL Organization Administrators group. By default, Windows adds the SQL Organization Administrators group to other security groups, such as the local Administrators and SQL Recipient Administrators groups. If these default settings change, the account must be manually added to these other groups.
- 1. Start the IBM Tivoli Storage FlashCopy Manager GUI. If you are running IBM Tivoli Storage FlashCopy Manager in an MSCS, you *must* invoke the GUI with the `/sqlserver` parameter from the IBM Tivoli Storage FlashCopy Manager command line. The Backup Databases window opens.

2. From the Tree View, select one or more databases to back up.
3. Click **Backup** to begin the backup operation.

Related tasks

“Restoring SQL Server data”

“Deleting VSS Backups”

Deleting VSS Backups

Remove a VSS Backup object when user-defined policy management settings has failed to delete specified backups.

Do not use this procedure for typical delete tasks as VSS Backups are automatically deleted based on user-defined policy management settings. This procedure is necessary for those deletions that are outside the scope of standard policy management deletions. In addition, this task should be performed with caution and only as a last resort.

1. Start the IBM Tivoli Storage FlashCopy Manager GUI.
2. Click the Restore Databases tab.
3. Select the **Show Active and Inactive** checkbox to display all backup objects.
4. Select the database whose backup is to be deleted. The available backups display in a list to the right side of the tree.
5. Right-mouse click on the backup object and select **Delete Backup** in the pop up menu. A dialog displays asking you to confirm the deletion.
 - Click **Yes** to delete the backup object.
 - Click **No** to stop the deletion process and return to the Tree View.

CAUTION:

At completion of a delete backup operation, the view content refreshes and all object selections clear.

Restoring SQL Server data

This procedure describes how to restore SQL data.

Review the “Restore considerations” on page 125 before doing any type of VSS restore. When you restore a database, keep in mind that data which exists in the database is overwritten and is no longer available after the restore is complete.

1. Open the IBM Tivoli Storage FlashCopy Manager GUI. If you are running IBM Tivoli Storage FlashCopy Manager in an MSCS, you *must* invoke the GUI with the *!sqlserver* parameter from the IBM Tivoli Storage FlashCopy Manager command line.
2. Click the Restore Databases tab. The restore view opens.
3. Expand the tree view to the left of the SQL Server from which you want to restore a backup. Check the **Show Active and Inactive** checkbox if you want to display inactive backup objects in addition to active backup objects.
4. Expand the tree view to the left of the SQL Server that you want to restore from. The tree expands and shows the databases available for restore processing.
5. Select the check box in the tree view to the left of the database that you want to restore. The database expands to show the types of backups available for restore.

6. Click the selection box in the tree view to the left of the log backup that you want to restore. The selection box changes to show the backup objects that are now selected.
7. Right-mouse click on the backup object to view a menu that contains the following restore options:
 - **Restore Into:** Select this option to specify the database into which you want to restore a backup. If you are restoring multiple databases with the Restore Into option, right-click each database (in the list to the right side of the tree) and click Restore Into in the pop-up menu. Specify where the database will be restored in the dialog that displays.
 - **Relocate:** Select this option to restore the SQL database files, log files, and other related files into a location that is different from where the data was originally backed up. Enter a location in the directory selection window. You must specify a directory for this option to be valid.
 - **Disable VSS Instant Restore:** Select this option to avoid overwriting the source volumes, or if you are restoring a single database from a VSS Backup that resides on local VSS shadow volumes that contain more than one database.
8. Click **Restore**. The Restore Progress window opens.
9. Click **OK** to complete the restore.

Related tasks

“Backing up SQL Server data” on page 123

“Deleting VSS Backups” on page 124

Restore considerations

These characteristics should be considered before performing a restore operation.

Unless otherwise specified, *restore* refers to the VSS restore types VSS Fast Restore and VSS Instant Restore. A restore operation requires that you be aware of these factors:

- VSS restore of the master database (**msdb**) must be performed offline. Therefore, the associated SQL Server instance must be stopped before performing the restore. Attempting to restore a master database that is online will fail. Such an attempt can also disable subsequent VSS Backup and VSS restore operations until the SQL Server VSS Writer service is recycled.
- 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. It is recommended that the source volume contain only the SQL database.
- When performing a VSS Instant Restore, there is no check to verify that any other data (including other SQL databases specified for restore) is present on the volume. Before performing a VSS restore operation that will utilize the VSS Instant Restore function, verify that there is no other data on the volumes being restored. If you want to avoid overwriting the source volumes, or if you are restoring a single database from a VSS Backup that resides on local VSS shadow volumes that contain more than one database, make sure to select the Disable VSS Instant Restore option.

Related tasks

“Backing up SQL Server data” on page 123

“Restoring SQL Server data” on page 124

“Deleting VSS Backups” on page 124

“Configuring user preferences” on page 115

Chapter 8. Diagnostic tasks

Diagnostic-related files and system information is displayed in a centralized location to assist with diagnostic tasks.

Diagnosing VSS issues

Test VSS snapshots on your system.

The wizard performs persistent and non-persistent snapshot testing on Windows Server 2008 or later.

Follow these steps to test persistent and non-persistent VSS snapshots:

1. Select Start -> Tivoli Storage FlashCopy Manager -> Management Console.
2. Click Diagnostics in the results pane of the welcome page. Click the VSS Diagnostics icon in the action pane. The diagnostics wizard opens, a list of volumes are displayed, and the status of each test is displayed when it is completed.
3. Select the volumes to test and click Next. Click Show VSS Information to view details about the VSS providers, writers, and snapshots available on your system. The results of the persistent and non-persistent snapshot testing displays as Passed or Failed.
4. Review the results of the snapshot testing and click Next. The final results of the persistent and non-persistent snapshot testing display as Success or Unsuccessful.
 - If testing status is a success, click Finish and exist the wizard.
 - If testing status is not successful, click Previous and review information in the Rule dialog.

Return to the Tivoli Storage FlashCopy Manager Management Console and begin backup operations.

E-mail support files

Send diagnostic information to IBM support personnel.

The E-mail Support Files is a dialog that collects all detected configuration, option, system information, trace, and log files. It also collects information about services, operating systems, and application versions. The dialog then compresses and attaches these files in an E-mail.

Follow these steps to send diagnostic information to IBM support personnel:

1. Select Start -> Tivoli Storage FlashCopy Manager -> Management Console.
2. Click Diagnostics in the results pane of the welcome page. Click the E-Mail Support files icon in the action pane.
3. Enter the required information in the various fields and click Done. The information is sent to the designated support personnel and the dialog closes.

Return to the Tivoli Storage FlashCopy Manager Management Console and begin backup operations.

Online IBM support

Integrated Web content is provided.

Search for the most current information regarding Tivoli Storage FlashCopy Manager product support at this Web site: <http://www.ibm.com/software/tivoli/products/storage-flashcopy-mgr/>

Enter the search term, such as an authorized program analysis report (APAR) number, release level, or operating system to narrow the search criteria for your support need.

Viewing system information

View scripts that provide information on system components such as Tivoli Storage FlashCopy Manager-related Windows Services, Windows Event Log entries, and Volume Shadow Copy Service (VSS) information.

The System Information View is extensible. This flexibility allows customized scripts to be added and shared. To add your own scripts, click **New** in the action pane (when System Information is selected in the tree pane) or copy your scripts directly into the `...\tivoli\flashcopymanager\scripts` directory.

Tivoli Storage FlashCopy Manager uses the file type extension to determine how to run the script. As a result, make sure your scripts follow these extension requirements:

- PowerShell scripts: *filename.ps1*
- Windows Management Instrumentation (WMI) scripts: *filename.wmi*
- Tivoli Storage Manager scripts: *filename.tsm*

Viewing trace and log files

View files used during troubleshooting tasks.

Tivoli Storage FlashCopy Manager uses several components. Each component resides in its own directory along with their respective troubleshooting files. The Trace and Log Files view brings these files into a central location for easy viewing. For example (default values provided):

- IBM VSS
 - IBMVDS.log
 - IBMVss.log
- Tivoli Storage FlashCopy Manager
 - installation directory: `c:\program files\tivoli\flashcopymanager`
 - TraceFm.trc
 - TraceUx.trc
 - TraceManagedCapacityHistory.trc
 - TraceSchedLaunch.trc
 - VssProvisioning.log
- Tivoli Storage FlashCopy Manager for SQL
 - installation directory: `C:\Program Files\Tivoli\TSM\TDPSql`
 - dserror.log

- tdpsql.log
- Tivoli Storage FlashCopy Manager for Exchange
 - installation directory: C:\Program Files\Tivoli\TSM\TDPEXchange
 - dserror.log
 - tdpexc.log
- VSS Requestor
 - installation directory: C:\Program Files\Tivoli\TSM\baclient
 - dsmerror.log

Click on the trace or log file to be viewed. The contents of the file displays in the bottom of the results pane. Use the Tool bar icons to create, save, edit, or E-mail a file.

Appendix. Accessibility features for Tivoli Storage FlashCopy Manager

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features of Tivoli Storage FlashCopy Manager are described in this topic.

Accessibility features

The following list includes the major accessibility features in Tivoli Storage FlashCopy 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 information center, and its related publications, are accessibility-enabled.

Keyboard navigation

The Tivoli Storage FlashCopy 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).

Tivoli Storage FlashCopy Manager follows AIX[®] operating system conventions for keyboard navigation and access.

Vendor software

Tivoli Storage FlashCopy 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 FlashCopy 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/>.

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