Tivoli® Storage FlashCopy Manager
Version 2.2

Installation and User's Guide for Windows

IBM

SC27-2504-01

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Version 2.2

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Note
Before using this information and the product it supports, read the information in "Notices" on page 161.

Edition notice

This edition applies to version 2, release 2, modification 0 of IBM Tivoli Storage FlashCopy Manager for Windows (product number 5724-X94) and to all subsequent releases and modifications until otherwise indicated in new editions. This edition replaces SC27-2504-00.

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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 terms *Windows Server* and *Windows Server 2003 and later* refer 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
- Exchange Server 2010

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

- SQL Server 2005
- SQL Server 2008
- SQL Server 2008 R2

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

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

Who should read this publication

This publication is intended for 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

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– 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.ibmlink.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
Tivoli Storage FlashCopy Manager for UNIX and Linux: Installation and User's Guide	SC27-2503
Tivoli Storage FlashCopy Manager Messages	SC27-2505
Tivoli Storage FlashCopy Manager Quick Start Guide	CF27SML

Table 2. Related storage system publications

Publication title	Order number
IBM System Storage DS8000 Introduction and Planning Guide	GC35-0515
IBM System Storage DS8000 Messages Reference	GC26-7914
IBM System Storage DS8000 Installation Guide	GC26-7910
IBM XIV® Storage System: Concepts, Architecture, and Usage	SG24-7659
IBM XIV® Storage System (Type: 2810) Model A14 (Gen 2) Introduction and Planning Guide for Customer Configuration	GA52-1327
IBM XIV® Storage System User Manual Version 10.1	GC27-2213
IBM System Storage SAN Volume Controller Planning Guide	GA32-0551
IBM System Storage SAN Volume Controller Hardware Installation Guide	GC27-2132
IBM System Storage SAN Volume Controller Software Installation and Configuration Guide	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.ibmlink.ibm.com/publications/servlet/pbi.wss. From there, you can search a variety of available resources.

Reading syntax diagrams

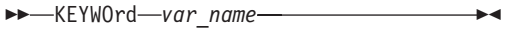
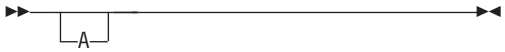
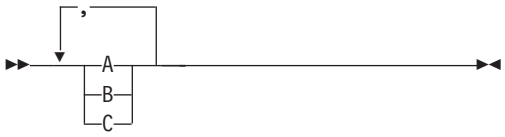
To read a syntax diagram for entering a command, follow the path of the line. Read from left to right and from top to bottom.

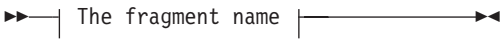
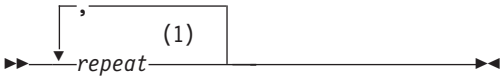
- The ►►— symbol indicates the beginning of a syntax diagram.
- The —► symbol at the end of a line indicates the syntax diagram continues on the next line.
- The ►— symbol at the beginning of a line indicates a syntax diagram continues from the previous line.
- The —►◄ symbol indicates the end of a syntax 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. You can type the item in any combination of uppercase or lowercase letters. In this example, you can enter KEYWO, KEYWORD, or KEYWOrd.	►►—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
Variables: Italicized lowercase items (*var_name*) denote variables. In this example, you can specify a *var_name* when you enter the KEYWORD command.	
Repetition: An arrow returning to the left means you can repeat the item. A character or space within an arrow means you must separate the repeated items with that character or space.	
Required Choices: When two or more items are in a stack and one of them is on the line, you *must* specify one item. In this example, you *must* choose A, B, or C.	
Optional Choice: When an item is below the line, that item is optional. In the first example, you can choose A or nothing at all. When two or more items are in a stack below the line, all of them are optional. In the second example, you can choose A, B, C, or nothing at all.	
Defaults: Defaults are above the line. The default is selected unless you override it. You can override the default by including an option from the stack below the line. In this example, A is the default. You can override A by choosing B or C. You can also specify the default explicitly.	
Repeatable Choices: A stack of items followed by an arrow returning to the left means you can select more than one item or, in some cases, repeat a single item. In this example, you can choose any combination of A, B, or C.	

Syntax 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. In this example, the footnote by the arrow references the number of times you can repeat the item.	 **Notes:** 1 Specify *repeat* as many as 5 times.

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.

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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. Ensure 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 dependent 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 snaphots 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.

Chapter 2. 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
IBM Tivoli Storage FlashCopy Manager 2.2 for UNIX and Linux: Installation and User's Guide
IBM Tivoli Storage FlashCopy Manager 2.2 Messages

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.

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Chapter 3. 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 complete 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 **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 issuing your first snapshot backups:

1. Verify that your environment meets "Tivoli Storage FlashCopy Manager" on page 8.
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, and *not* all of the components necessary for Tivoli Storage Manager are installed, the Tivoli Storage Manager configuration wizard starts.
   - If this is an upgrade installation, and no Tivoli Storage Manager license exists, and *not* all of the components necessary for a local mode are installed, a configuration wizard starts for the local mode.
   - 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:

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- Exchange Server data: `tdpexcc query tdp`
- SQL Server data: `tdpsqlc query tdp`

6. Perform a backup and restore operation.
7. After 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

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

Details of the software and operating system requirements for Tivoli Storage FlashCopy Manager can change over time. For the most up-to-date requirements, visit the Hardware and Software Requirements Web page at http://www.ibm.com/support/docview.wss?uid=swg21428707.

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: • 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) **Note:** Tivoli Storage FlashCopy Manager also supports other hardware when using the Windows System Provider or a Microsoft-compliant software or hardware VSS Provider.[5]	200 MB of free disk space on your Windows System Drive. Some of this space is used to hold the metadata files for Tivoli Storage FlashCopy Manager.
64-bit x64 architecture-based processor of sufficient capacity to run Microsoft Exchange Server or SQL Server		

Minimum software and operating system requirements

Table 5. Minimum software and operating system requirements

<table>
<tr><th>Operating System[1]</th><th>Software Application[2]</th><th>VSS Provider[5]</th></tr>
<tr><td rowspan="2">Microsoft Windows 2003 SP2 (32-bit)

Microsoft Windows 2003 R2 SP2 (32-bit)</td><td>(32-bit)
• Exchange Server 2003 SP2
• SQL Server 2005 SP3
• SQL Server 2008 SP1
• SQL Server 2008 R2</td><td rowspan="3">On DS3000, DS4000, and DS5000 storage subsystems:
• LSI VDS-VSS provider 10.60.G0.04
On DS8000 storage subsystems:
• IBM System Storage VSS Hardware Provider 4.1
On IBM System Storage SAN Volume Controller 4.2.x or 4.3.x:
• IBM System StorageVSS Hardware Provider 4.1
On IBM System Storage SAN Volume Controller 5.1:
• IBM System StorageVSS Hardware Provider 4.1
On IBM XIV Storage System Model 2810 (Gen 2):
• IBM XIV VSS Hardware Provider (xProv) 2.2.3</td></tr>
<tr><td>(64-bit)
• Exchange Server 2007 SP1[3]
• Exchange Server 2010[4]
• SQL Server 2005 SP3
• SQL Server 2008 SP1
• SQL Server 2008 R2</td></tr>
<tr><td>Microsoft Windows 2003 SP2 (x64)
Microsoft Windows 2003 R2 SP2 (x64)
Microsoft Windows 2008 (32-bit)
Microsoft Windows 2008 (x64)
Microsoft Windows 2008 R2 (x64)</td><td></td></tr>
</table>

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 2.0 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
- **4** Exchange Server 2010 requires "Update Rollup 1 for Exchange Server 2010 (976573)" and Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 download 6.5.8147.0 or later for Mailbox Restore. It supports the following versions of Windows Server:
  - Windows Server 2008 x64 editions (Standard, Enterprise, or DataCenter) and requires Service Pack 2 or later with Update Rollup 8 or later
  - Windows Server 2008 R2 x64 editions (Standard, Enterprise, or Datacenter)
- **5** When running VSS operations using VSS Hardware Providers, make sure the following hot fixes are applied:
  - Windows 2003: KB972623
  - Windows 2008: KB975831
  - Windows 2008 R2: KB977096

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 **64-bit** x64 architecture-based processor of sufficient capacity to run Microsoft Exchange Server or SQL Server	One of the following: • 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 on your Windows System Drive. Some of this space is used to hold the meta data files for Tivoli Storage FlashCopy Manager.

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[5]
Microsoft Windows 2003 SP2 (32-bit) Microsoft Windows 2003 R2 SP2 (32-bit) Microsoft Windows 2008 R2 (32-bit)	(32-bit) • Exchange Server 2003 SP2 • SQL Server 2005 SP3 • SQL Server 2008 SP1 • SQL Server 2008 R2	On DS8000 storage subsystems: • IBM System Storage VSS Hardware Provider 4.0 On IBM System Storage SAN Volume Controller 4.3.x or 5.1: • IBM System StorageVSS Hardware Provider 4.0 On IBM XIV Storage System Model 2810 (Gen 2): • IBM XIV VSS Hardware Provider (xProv) 2.2.3
Microsoft Windows 2003 SP2 (x64) Microsoft Windows 2003 R2 SP2 (x64) Microsoft Windows 2008 (32-bit) Microsoft Windows 2008 (x64) Microsoft Windows 2008 R2 (x64)	(64-bit) • Exchange Server 2007[3] • Exchange Server 2010[4] • SQL Server 2005 SP3 • SQL Server 2008 SP1 • SQL Server 2008 R2	

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
- **4** Exchange Server 2010 requires Update Rollup 1 for Exchange Server 2010 (976573) and Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 download 6.5.8147.0 or later for Mailbox Restore. It supports the following versions of Windows Server:
  - Windows Server 2008 x64 editions (Standard,.Enterprise, or Datacenter) and requires Service Pack 2 or later with Update Rollup 8 or later
  - Windows Server 2008 R2 x64 editions (Standard, Enterprise, or Datacenter)
- **5** When running VSS operations using VSS Hardware Providers, make sure the following hot fixes are applied:
  - Windows 2003: KB972623
  - Windows 2008: KB975831
  - Windows 2008 R2: KB977096

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

Do not use version 2.2.2 of the IBM XIV VSS Hardware Provider with Tivoli Storage FlashCopy Manager. There are defects in that specific version that prevent VSS Instant Restore from working properly.

Capacity planning

Information is provided to help you estimate the storage capacities that are required to install and use Tivoli Storage FlashCopy Manager.

The storage space required for Tivoli Storage FlashCopy Manager is divided into the following categories:

- Space required for the global product installation on a system
- Space required for holding Tivoli Storage FlashCopy Manager metadata
- Space required on the storage device for the actual snapshot backups

Global product installation

The space that is required for the global product installation of Tivoli Storage FlashCopy Manager depends on which components are installed:

- Tivoli Storage FlashCopy Manager Microsoft Management Console (MMC): 25 megabytes (required for all installations)
- Tivoli Storage FlashCopy Manager VSS Requestor: 300 megabytes (required for all installations)
- Tivoli Storage FlashCopy Manager for Exchange Server: 20 megabytes (required for backup and restore of Exchange Server data)
- Tivoli Storage FlashCopy Manager for SQL Server: 20 megabytes (required for backup and restore of SQL Server data)

Tivoli Storage FlashCopy Manager metadata

In addition to the space that is required for the global product installation, Tivoli Storage FlashCopy Manager uses disk space to hold vital product data that is used

to track and manage snapshots. The amount of space required is directly proportional to the number of snapshots that you maintain on the system. Ensure that there is at least 1 megabyte of available free disk space to hold the metadata for each snapshot that you plan to keep on the system.

In addition, if you are protecting an Exchange Server, Tivoli Storage FlashCopy Manager keeps mailbox history information in the metadata to support automatic mailbox restore (IMR) processing. The amount of space required for this is directly proportional to the number of mailboxes in the entire organization. Ensure that for each user mailbox in your organization, at least 50 kilobytes of disk space are free to hold the metadata.

Snapshot copies

The actual snapshot copies of your application data require the most space. The amount of space required depends on the following factors:

- VSS Provider being used and its configuration
- The total size of all source volumes that contains the application data
- The rate at which the source volumes are altered after a snapshot is taken

On SAN Volume Controller and DS8000, full snapshot copies, in principle, require the same amount of space as the corresponding source volumes. However, with the Windows System VSS Provider, space-efficient copies on SAN Volume Controller, and XIV initially require sparse space for metadata only. Their space demand increases with every block that is changed on the corresponding source volume. Accordingly, the more source volume blocks are changed, the more space is required for the target volumes that represent a snapshot copy of those applications. For more details, read the documentation for the VSS Provider being used.

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.

You are now ready to use Tivoli Storage FlashCopy Manager to perform backups and restores.

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. Click 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.

You are now ready to use Tivoli Storage FlashCopy Manager to perform backups and restores.

Installing support for additional languages

When run in a non-English environment, theTivoli Storage FlashCopy Manager setup program (`setupfcm.exe`) automatically starts the corresponding language pack setup program. The component provisioning steps in the local and Tivoli Storage Manager configuration wizards also automatically install language packs for the components based on the language for which the system is configured.

To install support for additional languages you can navigate to the language folder of each component on the Tivoli Storage FlashCopy Manager media and run the setup program. .

- FlashCopy Manager MMC Snapin
  - fcm\x64\mmc\2200\{chs | cht | deu | enu | esp | fra | ita | jpn | kor | ptb}\setup.exe
  - fcm\x86\mmc\2200\{chs | cht | deu | enu | esp | fra | ita | jpn | kor | ptb}\setup.exe
- FlashCopy Manager for Microsoft Exchange
  - fcm\x64\exc\6120\{chs | cht | deu | enu | esp | fra | ita | jpn | kor | ptb}\setup.exe
  - fcm\x86\exc\6120\{chs | cht | deu | enu | esp | fra | ita | jpn | kor | ptb}\setup.exe
- FlashCopy Manager for Microsoft SQL Server
  - fcm\x64\sql\5540\{chs | cht | deu | enu | esp | fra | ita | jpn | kor | ptb}\setup.exe
  - fcm\x86\sql\5540\{chs | cht | deu | enu | esp | fra | ita | jpn | kor | ptb}\setup.exe
- FlashCopy Manager VSS Requestor
  - fcm\x64\vss\6210\\{chs | cht | deu | enu | esp | fra | ita | jpn | kor | ptb}\setup.exe
  - fcm\x64\vss\6210\\{chs | cht | deu | enu | esp | fra | ita | jpn | kor | ptb}\setup.exe

For example, to install the French language pack for the Tivoli Storage FlashCopy Manager MMC Snapin on 64-bit Windows, issue the following command (where the media is mounted on the D drive):

```
d:\fcm\x64\mmc\2200\fra\setup.exe
```

This should be repeated for each installed Tivoli Storage FlashCopy Manager component. Note that the path segment containing numbers is version information that will change over time. For example, in FlashCopy Manager 2.2 the MMC Snapin version is listed as 2200. This value changes to match the component version delivered in each Tivoli Storage FlashCopy Manager release.

How to silently install Tivoli Storage FlashCopy Manager

A silent installation runs on its own without any user interaction.

Silent installation is typically started by running setupfcm.exe from the root folder of the Tivoli Storage FlashCopy Manager manager media. Setupfcm.exe determines whether the 32-bit or 64-bit setup program needs to be run automatically.

1. Navigate directly to the location of the appropriate setup program: For example, starting from the root folder of the Tivoli Storage FlashCopy Manager media, this command installs the x64 version of Tivoli Storage FlashCopy Manager:

   ```
   cd fcm\x64\mmc\2200\enu
   ```

2. Run the setup.exe file with the following options:

   ```
   setup.exe /s /v"INSTALLDIR=\"C:\Program Files\Tivoli\" ADDLOCAL=\"Client\"
   TRANSFORM=1033.mst REBOOT=ReallySuppress /qn /l*v
   \"C:\Program Files\Tivoli\flashcopymanager\Provisioning\FcmProvisioning.log\""
   ```

   Note that the setup command should be issued using a single line.

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.

Uninstalling Tivoli Storage FlashCopy Manager

Information is provided to help you to remove Tivoli Storage FlashCopy Manager completely from a computer.

Tivoli Storage FlashCopy Manager installs a number of components. These components can easily be removed using the Windows Add/Remove Programs application in the Windows control panel. Any files, registry keys, or Windows services created by FlashCopy manager remain after the components are removed, and these items must be removed manually.

Following are the steps to completely remove Tivoli Storage FlashCopy Manager from a computer. After this procedure is performed, all Tivoli Storage FlashCopy Manager data is removed, and restores of the data are longer possible. Adjust the path in the example as needed for your environment. You must be logged into a Windows account with administrator privileges.

NOTE: this procedure assumes a default Tivoli Storage FlashCopy Manager configuration. If you have installed any additional Tivoli Storage FlashCopy Manager-related services, you will need to adjust the set of commands to remove them as well. You can use the command `dsmcutil list` to display installed services.

1. Copy any files that you want to keep from the folders under the installation folder (e.g. `C:\Program Files\tivoli`) to a safe location.
2. Ensure that no FlashCopy manager components are running.
3. Run the following commands:
   a. `cd /d "c:\program files\tivoli\tsm\baclient"`(If necessary, replace `c:\program files\tivoli` with the correct installation folder.)
   b. `dsmcutil remove /name:"TSM Client Acceptor"`
   c. `dsmcutil remove /name:"TSM Remote Client Agent"`
4. From the Windows Control panel, open Add or Remove Programs on Windows Server 2003 or Programs and Features on Windows Server 2008.
5. Uninstall the following items if they are listed:
   - IBM Tivoli Storage FlashCopy Manager
   - IBM Tivoli Storage FlashCopy Manager - CHS
   - IBM Tivoli Storage FlashCopy Manager - CHT
   - IBM Tivoli Storage FlashCopy Manager - DEU
   - IBM Tivoli Storage FlashCopy Manager - ESP
   - IBM Tivoli Storage FlashCopy Manager - FRA
   - IBM Tivoli Storage FlashCopy Manager - ITA
   - IBM Tivoli Storage FlashCopy Manager - JPN
   - IBM Tivoli Storage FlashCopy Manager - KOR
   - IBM Tivoli Storage FlashCopy Manager - PTB

- IBM Tivoli Storage Manager Client
- IBM Tivoli Storage Manager Client - Chinese(PRC)
- IBM Tivoli Storage Manager Client - Chinese(Taiwan)
- IBM Tivoli Storage Manager Client - French
- IBM Tivoli Storage Manager Client - German
- IBM Tivoli Storage Manager Client - Italian
- IBM Tivoli Storage Manager Client - Japanese
- IBM Tivoli Storage Manager Client - Korean
- IBM Tivoli Storage Manager Client - Portuguese(Brazil)
- IBM Tivoli Storage Manager Client - Spanish
- IBM Tivoli Storage Manager for Databases - MS SQL
- IBM Tivoli Storage Manager for Databases - MS SQL - CHS
- IBM Tivoli Storage Manager for Databases - MS SQL - CHT
- IBM Tivoli Storage Manager for Databases - MS SQL - DEU
- IBM Tivoli Storage Manager for Databases - MS SQL - ESP
- IBM Tivoli Storage Manager for Databases - MS SQL - FRA
- IBM Tivoli Storage Manager for Databases - MS SQL - ITA
- IBM Tivoli Storage Manager for Databases - MS SQL - JPN
- IBM Tivoli Storage Manager for Databases - MS SQL - KOR
- IBM Tivoli Storage Manager for Databases - MS SQL - PTB
- IBM Tivoli Storage Manager for Mail - MS Exchange
- IBM Tivoli Storage Manager for Mail - MS Exchange - CHS
- IBM Tivoli Storage Manager for Mail - MS Exchange - CHT
- IBM Tivoli Storage Manager for Mail - MS Exchange - DEU
- IBM Tivoli Storage Manager for Mail - MS Exchange - ESP
- IBM Tivoli Storage Manager for Mail - MS Exchange - FRA
- IBM Tivoli Storage Manager for Mail - MS Exchange - ITA
- IBM Tivoli Storage Manager for Mail - MS Exchange - JPN
- IBM Tivoli Storage Manager for Mail - MS Exchange - KOR
- IBM Tivoli Storage Manager for Mail - MS Exchange - PTB

6. Run the following commands to remove files from the file system:
   - `cd /d c:\`
   - `rd /s adsm.sys`
   - `cd /d "c:\program files\tivoli"` (If necessary, replace `c:\program files\tivoli` with the correct installation folder.)
   - `rd /s flashcopymanager`
   - `rd /s tsm`
7. Run the following command:`req query hklm\software\ibm` A list of registry keys displays. For example:

```
HKEY_LOCAL_MACHINE\software\ibm\ADSM
HKEY_LOCAL_MACHINE\software\ibm\FlashCopyManager
HKEY_LOCAL_MACHINE\software\ibm\GSK7
KEY_LOCAL_MACHINE\software\ibm\GSK8
```

8. Run the following commands:
   a. `reg delete HKLM\SOFTWARE\IBM\ADSM`

b. `reg delete HKLM\SOFTWARE\IBM\FLASHCOPYMANAGER`

9. If the entries HKEY_LOCAL_MACHINE\software\ibm\GSK7 and HKEY_LOCAL_MACHINE\software\ibm\GSK8 were output in step 7, and you are certain that no other applications are using IBM GSKIT, run the following commands:
   a. `reg delete HKLM\software\ibm\GSK7`
   b. `reg delete HKLM\software\ibm\GSK8`
10. Issue the following commands to remove any Tivoli Storage FlashCopy Manager user configuration files. This command must be repeated for any user accounts configured with Tivoli Storage FlashCopy Manager:
    a. Change to the following directory:

       ```
       cd %userprofile%\appdata\local\microsoft_corporation
       ```

       and enter this command:

       ```
       dir _fmux*
       ```

    b. Remove each folder that begins with _fmux. Make sure to enclose the folder name in quotation marks ("). For example:

       ```
       rd/s  "_FmUx,_Version=2.1.0.0,_C_Path_rusomschqavk3w2upyovnjyl331z5qn3"
        rd/s  "_FmUx,_Version=2.2.0.0,_C_Path_rusomschqavk3w2upyovnjyl331z5qn3"
       ```

Tivoli Storage FlashCopy Manager is now uninstalled from your computer.

Chapter 4. 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

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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 (xProv) 2.2.3. However, do not use version 2.2.2 of the IBM XIV VSS Hardware Provider with Tivoli Storage FlashCopy Manager. There are defects in that specific version that prevent VSS Instant Restore from working properly.
- If you are using a different VSS provider, consult the documentation provided with your VSS 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.

Exchange Server versioning

Certain Tivoli Storage FlashCopy Manager functions vary based upon the version of Exchange Server in your environment.

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

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

Continuous replication backups on Exchange Server

Continuous replication backups are an effective use of Exchanger Server 2007 and Exchange Server 2010 features.

Important:

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

This replication technology does not apply to Exchange Server 2003.

Replication on Exchange Server 2007

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

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

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

Replication on Exchange Server 2010

Database Availability Groups (DAG) are the new Exchange Server high availability feature for Exchange 2010. Database Mobility and Availability Groups replace LCR, CCR, and SCR replication features. They provide for enhanced data and service availability and automatic recovery from failures. DAG implementations are similar to the Exchange Server 2007 CCR structure, but with some differences. Database copies are mirrored on any node within the DAG. The active copy can also be moved to other nodes. You can create a backup from the active copy or from any passive copy within the DAG that contains a database copy.

Tivoli Storage FlashCopy Manager includes the following functions for Exchange Server 2010 DAGs:

- Querying of DAG database copies and their status

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

Consider these requirements when using Tivoli Storage FlashCopy Manager with Exchange Server 2010 DAGs:

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

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

Database Availability Group backup best practices

Perform backups for replicated database copies from the same Exchange Server. Additionally, perform backups on the passive database copies, so as not to increase the load on the production Exchange Server.

Following are the recommended best practices for backup:

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

Database Availability Group restore best practices

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

Following are the recommended best practices for restore:

- Perform restores to the active database copy.
- For recovering DAG database backups to alternate Exchange servers, follow the specialized steps that are documented in “Restoring VSS Backups into alternate locations” on page 29.

For detailed instructions on performing a recovery of a DAG database, see “Restoring a Database Availability Group database copy on Exchange Server 2010” on page 31

on page 31.

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.
- In the case of Exchange Server 2003 and Exchange Server 2007 data, place databases files for each storage group on their own dedicated logical volume.
- Place logs for each storage group (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010) 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 or database LUNs with other storage groups or databases, or other 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.
- Do not use version 2.2.2 of the IBM XIV VSS Hardware Provider with Tivoli Storage FlashCopy Manager. There are defects in that specific version that prevent VSS Instant Restore from working properly.

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 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

Tivoli Storage FlashCopy Manager backs up storage groups (Exchange Server 2003 and Exchange Server 2007) and databases (Exchange Server 2010) using Microsoft Volume Shadow Copy Service (VSS) technology.

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 for Exchange Server 2003 and Exchange Server 2007 is at the storage group level only. Backup granularity for Exchange Server 2010 is at the database 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 only.
- Restore into a Recovery Database is supported on Exchange Server 2010 only.
- 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 because it uses 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. Therefore, 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.

- Consider using DAG database copies on Exchange Server 2010 in accordance with Microsoft recommendations.
- 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 on Exchange Server 2007 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.
- Be cautious 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 (Exchange Server 2003 and 2007) or on the databases (Exchange Server 2010) of the Exchange Server.
- Do not mix incremental and differential backups.
- To help protect your Exchange Server and potentially reduce the frequency of backup operations, consider using Exchange Server LCR or CCR replication technology (Exchange Server 2007) or DAG database replication technology (Exchange Server 2010). Refer to your Microsoft documentation for details regarding these technologies.
- If you are using Exchange Server 2010, consider using DAG database replication technologies. Refer to your Microsoft documentation for details regarding this technology.
- When running a backup operation under Exchange Server 2003, if a VSS incremental or differential backup is attempted when a full backup is required (for example, if the storage group is new or a new database was added to an existing storage group), the VSS backup will fail. When this situation is detected, immediately run a full backup on the storage group to resolve the situation.

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.
- Supports restoring an Exchange Server 2010 VSS Backup to an alternate database.
- Restores can be performed in a Microsoft Cluster Server (MSCS) environment.
- Parallel VSS restore operations are not supported on Microsoft Windows Server 2003 and later.

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, a best practice is to make sure that any previous background copies (that involve the volumes being restored) are completed prior to initiating the VSS Instant Restore. However, this check is not necessary for XIV or SAN Volume Controller with space-efficient target volumes. VSS Instant Restore of differential and incremental backups is not supported.

Tivoli Storage FlashCopy Manager Version 2.2 supports VSS Instant Restore operations when multiple backup versions exist on SAN Volume Controller 5.1 space-efficient target volumes. However, in this situation, VSS Instant Restore

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

When performing a VSS Instant Restore on Exchange Server 2003 and Exchange Server 2007, 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) on Exchange Server 2007.
- A VSS restore into the Recovery Database (RDB) on Exchange Server 2010.
- A VSS restore into a relocated or alternate storage group on Exchange Server 2007.
- A VSS restore from an LCR replica backup (on Exchange Server 2007) 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 and copy 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 might have files or handles open on the volumes being restored.
- 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 Server 2003 and later.

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. An Exchange Server 2010 database backup or DAG active or passive database copy backup can be restored into a Recovery Database or into an alternate (or relocated) database.

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

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

VSS Instant Restore in a Cluster Continuous Replication environment

A Cluster Continuous Replication (CCR) environment on Exchange Server 2007 requires that specific tasks be performed when using VSS Instant Restore.

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

- Only use CCR replicas in accordance with Microsoft recommendations.
- CCR is available with Exchange Server 2007. This task is not available on Exchange Server 2003 or Exchange Server 2010. However, consider using DAG database restores for Exchange Server 2010.

- A VSS Instant Restore of a CCR replica can only be restored into the active copy of the storage group. 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 Server data" on page 145. 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.

Restoring a Cluster Continuous Replication database copy on Exchange Server 2007

This procedure assumes that you have already backed up your storage group.

Follow these steps to restore a replicated database copy in a Cluster Continuous Replication (CCR) environment. You can perform some of these steps using either the Exchange Management Console or the Exchange Management Shell commands, which are provided below in parentheses.

1. Make the mailbox server active that hosts the storage group that you want to restore (Move-ClusteredMailboxServer).
2. Suspend replication of the copies of the storage group. Perform this step on both the passive CCR and the passive SCR nodes (Suspend-StorageGroupCopy).
3. Dismount the database in the storage group (Dismount-Database). If you are using the GUI, the databases are automatically dismounted for you.
4. Restore the database and logs using the Data Protection for Microsoft Exchange Server command line or the GUI. If you want databases to be mounted automatically after the restore, use the **/MOUNTDAtabases** command line option, or click **Mount Databases After Restore** in the Restore panel.
5. Mount the restored database (Mount-Database). Omit this step if the database was mounted automatically in the previous step.
6. Verify the health of the storage group before you update or reseed to replicated database copies.
7. Update or reseed replicated storage group on the passive node and on any SCR nodes (Update-StorageGroupCopy).
8. If necessary, make the mailbox server active that hosts the restored storage group (Move-ClusteredMailboxServer).
9. Check the health of the CCR copies (Get-ClusteredMailboxServerStatus).

Restoring a Database Availability Group database copy on Exchange Server 2010

This procedure assumes that you have already backed up your database.

Follow these steps to restore a replicated database copy in a Database Availability Group (DAG). You can perform some of these steps using either the Exchange Management Console or the Exchange Management Shell commands, which are provided below in parentheses.

1. Make the database active that you want to restore (Move-ActiveMailboxDatabase).
2. Suspend replication of the all passive copies of the database (Suspend-MailboxCopy).
3. Dismount the active mailbox database (Dismount-Database).
4. Restore the database and logs using the Tivoli Storage FlashCopy Manager command line or GUI.
5. If not performed in Step 4, mount the active mailbox database (Mount-Database).
6. Verify the health of the database before you update or reseed to replicated database copies.
7. Update or reseed all replicas (Update-MailboxDatabaseCopy). This step avoids potential transaction log synchronization problems that might arise if replication were resumed directly.
8. Move the active database to the desired server (Move-ActiveMailboxDatabase).

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.
- Do not use version 2.2.2 of the IBM XIV VSS Hardware Provider with Tivoli Storage FlashCopy Manager. There are defects in that specific version that prevent VSS Instant Restore from working properly.

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 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 because 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 byTivoli Storage FlashCopy Manager.
- Supports restoring VSS Backups to an alternate location using the ***/relocatedir*** option.
- Restores can be performed in a Microsoft Cluster Server (MSCS) environment.
- Parallel VSS restore operations are not supported on Microsoft Windows Server 2003 and later.

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, a best practice is to make sure that any previous background copies (that involve the volumes being restored) are completed prior to initiating the VSS Instant Restore. However, this check is not necessary for XIV or SAN Volume Controller with space-efficient target volumes.

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 Server 2003 and later.

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.

By default, Tivoli Storage FlashCopy Manager schedules run using Windows System Account permissions. If a schedule requires different Windows permissions, select **Run as** and enter the appropriate account and password.

All defined schedules appear in the top half of the view. Create, edit, enable, disable, 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, enable, disable, 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.

Chapter 5. SAN Volume Controller 5.1 FlashCopy support

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

SAN Volume Controller version 5.1 introduces an important new capability in its copy services related to use of SE volumes as FlashCopy targets. Although prior releases of SAN Volume Controller supported use of SE target volumes, it was not possible until version 5.1 to do a FlashCopy restore from SE target volumes, or from fully allocated target volumes, when a background copy of all blocks from source to target had not completed. The enhanced copy services in SAN Volume Controller 5.1 allow FlashCopy restore from SE target volumes as well as from fully allocated target volumes for which the background copy of the VSS backup has not yet completed. This enhancement in the SAN Volume Controller copy services is exploited by Tivoli Storage FlashCopy Manager, beginning with version 2.2. It is now possible to retain multiple FlashCopy images of a source volume as backup generations at a much reduced storage cost, since it is not necessary to allocate the full size of the source volume for each backup generation, while still maintaining the ability to do instant restore using FlashCopy from the SE target volumes.

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

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

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

The following sections provide guidance and recommendations for effective use of Tivoli Storage FlashCopy Manager with SAN Volume Controller 5.1.

Use of FlashCopy Manager with SAN Volume Controller

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

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

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

  In this case, deletion of the VSS snapshot removes the snapshot from the VSS inventory, but the FlashCopy relationship remains on the SAN Volume Controller, so that a subsequent VSS snapshot of the same source volume will result in an incremental refresh of the target volume.
- When the VSS provider is configured to use SE target volumes - specifically, when the background copy rate is set to zero - the following is true:
  - Deletion of a VSS snapshot represented by a target volume in a cascade causes all target volumes dependent on the volume being deleted (in other words, the target volumes that were created earlier) also to be deleted. For example, deletion of a snapshot represented by target volume *T2* in the sample cascade *S -> T4 -> T3 -> T2 -> T1* causes *T2* and *T1* to be deleted, and the cascade *S -> T4 -> T3* to remain after the deletion.

    Important: When you manually delete backups on SAN Volume Controller 5.1 space-efficient target volumes, and multiple backup versions exist, the backup being deleted as well as any older backups that contain the same volumes are deleted. Please take note that the deletion might not be performed until the next snapshot operation.
  - A FlashCopy restore of the source volume from a target volume in a cascade of multiple target volumes is destructive to the target volume being restored, as well as to all newer targets in the cascade. For example, restore of a snapshot represented by target volume *T3* in the sample cascade *S -> T4 -> T3 -> T2 -> T1* causes *T4* and *T3* to be deleted, and the cascade *S -> T2 -> T1* to remain after the restore.

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

Note: An *SE backup version* is defined by a FlashCopy to an SE target volume that has a background copy rate of zero. Use of SE target volumes with "autoexpand" enabled and a background copy rate greater than zero does not create *SE backup versions*, because the target volumes grow to the allocated size of the source volumes when the background copy completes.

Given these characteristics, the following requirements and recommendations apply to FlashCopy Manager support of SAN Volume Controller 5.1:

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

  A transition from fully allocated targets to SE targets is accommodated by treating fully allocated targets as if they were SE when the background copy rate is set to 0.
- When using SE backup versions:

– Do not mix persistent and nonpersistent VSS snapshots. Use of a nonpersistent VSS snapshot following one or more persistent snapshots causes the older persistent snapshots to be deleted when the nonpersistent snapshot is deleted.

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

SAN Volume Controller

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

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

Use Cases / Objectives	SVC Settings	VSS Provider Settings	FlashCopy Manager Settings	Comments
- production application data resides on standard volumes - keep 14 snapshot backup versions - use minimum storage space for snapshot backup versions. Full physical copy not required - perform 2 VSS backups per day	- create 14 SE target volumes for each source volume to be protected - enable autoexpand for the SE target volumes - Add the SE target volumes to the VSS free pool	- set background copy rate = 0	- set policy to retain 14 local backup versions - schedule snapshot backups as desired using backupdestination = local	- once 14 VSS backups have been done, the 15th VSS backup will cause the oldest backup to be deleted and will reuse that target set.

Table 8. Snapshot restore and delete behavior on 5.1 space-efficient target volumes (continued)

Use Cases / Objectives	SVC Settings	VSS Provider Settings	FlashCopy Manager Settings	Comments
- production application data resides on standard volumes - keep 1 snapshot backup version - use minimum storage space for snapshot backup versions. Full physical copy not required - perform 1 VSS backup per day and also send the backup to TSM	- create 2 SE target volumes for each source volume to be protected - enable autoexpand for the SE target volumes - Add the SE target volumes to the VSS free pool	- set background copy rate = 0	- set policy to retain 2 local backup versions - schedule snapshot backups as desired using backupdestination = both	- set policy for local snapshot backups to retain N+1 backup versions so that N snapshot backups are available for restore. Otherwise, a local backup version may not be available should a VSS backup fail after the prior backup was deleted
- production application data resides on standard volumes - keep 1 snapshot backup version - full physical copy is required - minimize overhead of background copies - perform 1 VSS backup per day and also send the backup to TSM	- create one standard target vol for each source vol to be protected - add standard target volumes to the VSS free pool	- use default background copy rate (50) - configure to use Incremental FC	- set policy to retain 1 local backup version - schedule snapshot backups as desired using backupdestination = both	- When using INCR FC, the VSS provider will not delete the single snapshot target set even though FlashCopy Manager will delete the prior VSS snapshot before creating a new one
- production application data resides on standard volumes - keep 2 snapshot backup versions - full physical copies are required for local backup versions - perform VSS backups every 12 hours with one backup daily sent to TSM	- create 3 standard target vols for each source vol to be protected - add standard target volumes to the VSS free pool	- use default background copy rate (50)	- set policy to retain 3 local backup versions - schedule VSS backups as follows: - backupdestination = local at 11:00 - backupdestination = both at 23:00	- set policy for local snapshot backups to retain N+1 backup versions so that N snapshot backups are available for restore.
- production application data resides on standard volumes - keep 4 snapshot backup versions - use minimum storage space for snapshot backup versions. Full physical copy not required - perform VSS backups every 6 hours with one backup daily sent to TSM	- create 5 SE target vols for each source vol to be protected - enable autoexpand for the SE target volumes - add SE target volumes to the VSS free pool	- set background copy rate = 0	- set policy for local snapshot backups to retain 5 local backup versions - schedule VSS backups as follows: - backupdestination = local at 06:00, 12:00 and 18:00 - backupdestination = both at 00:00	- set policy to retain N+1 backup versions so that N snapshot backups are available for restore

Table 8. Snapshot restore and delete behavior on 5.1 space-efficient target volumes (continued)

Use Cases / Objectives	SVC Settings	VSS Provider Settings	FlashCopy Manager Settings	Comments
- production application data resides on SE volumes - keep 2 snapshot backup versions - full physical copies are required for local backup versions - perform VSS backups every 6 hours with one backup daily sent to TSM	- create 3 SE target vols for each source vol to be protected - allocate same percentage of real storage as for source volumes - add SE target volumes to the VSS free pool	- use default background copy rate (50)	- set policy to retain 3 local backup versions - schedule VSS backups as follows: - backupdestination = local at 06:00, 12:00 and 18:00 - backupdestination = both at 00:00	- set policy for local snapshot backups to retain N+1 backup versions so that N snapshot backups are available for restore - allows thin provisioning for both source and target vols and lets them grow together

Using space-efficient target volumes with SAN Volume Controller 5.1

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

Tivoli Storage FlashCopy Manager Version 2.1 limited VSS Instant Restore operations to only one snapshot backup version on SAN Volume Controller 5.1 space-efficient target volumes. File-level copy restore is used for all other situations. Tivoli Storage FlashCopy Manager Version 2.2 supports VSS Instant Restore operations when multiple backup versions exist on SAN Volume Controller 5.1 space-efficient target volumes. However, in this situation, VSS Instant Restore accesses snapshot volumes that contain dependent FlashCopy relationships. The snapshot volumes that create the dependency are typically backups that are created after the snapshot that is being restored. These snapshot volumes are removed in order for the VSS Instant Restore operation to complete successfully. As a result, the backups that included the deleted snapshots are removed from storage. This destructive restore operation only occurs when VSS Instant Restore operations occur in an environment where Tivoli Storage FlashCopy Manager manages multiple backup versions on SAN Volume Controller 5.1 space-efficient target volumes.

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

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

Table 9. Snapshot restore and delete behavior on SAN Volume Controller 5.1 space-efficient target volumes

Snapshots on space-efficient volumes	Snapshot to be restored	Snapshot deleted
s1, s2, s3, s4	s1	s1, s2, s3, s4
s1, s2, s3, s4	s4	s4

Table 9. Snapshot restore and delete behavior on SAN Volume Controller 5.1 space-efficient target volumes (continued)

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

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

Verifying snapshot creation

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

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

```
C:\Program Files\IBM\Hardware Provider for VSS-VDS>ibmvcfg list infc -l
Provider Type is SVC Pegasus.
Listing flashcopy relationship(s)...
                                                
```

- Do not mix FlashCopy COPY and NOCOPY backups in FlashCopy mappings.
- Do not mix fully-allocated and space-efficient VDisks (used for backup targets) in the VSS_FREE pool.
- If the protected data resides on SAN Volume Controller 5.1 volumes, and the VDisks in the VSS_FREE pool are space efficient, then VSS Instant Restore from multiple backups is possible. However, the VSS Instant Restore operation in this environment is destructive.
- The Windows host must be attached to an SAN Volume Controller 5.1 cluster. The volumes assigned to the Windows host must be participating in the SAN Volume Controller 5.1 cluster.
- Make sure that IBM VSS hardware provider version 4.1 (or later) is installed. This provider must be configured to accommodate multiple backup versions on SAN Volume Controller 5.1 space-efficient target volumes.
- Multiple snapshots on SAN Volume Controller 5.1 space-efficient VDisks are not supported for single-copy cluster (SCC) environments. These SCC environments include Microsoft Cluster Server (MSCS) and Veritas Cluster Server (VCS) environments. Multiple snapshots are not supported because VSS snapshots are not automatically identified as "cluster aware."

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

- You can create a NOCOPY FlashCopy to a space-efficient target. However, protection from physical failures to the source volume is not provided.

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

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

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

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

Additional considerations when using SAN Volume Controller

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

Chapter 6. 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 graphical user interface (GUI).
2. Expand the protect and recover data node.
3. In the tree view, select an Exchange node.
4. From the action menu, click **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.

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Backup command

Use the **backup** command to perform Exchange Server backups of storage groups (Exchange Server 2003 and Exchange Server 2007) or databases (Exchange Server 2010) 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.
- When running Exchange Server 2010 backups, the Exchange database file size may increase due to increase database commitments that are triggered by backup operations. This is a Microsoft Exchange server standard behavior.

See "Backup strategies" on page 26 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 (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010) 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.

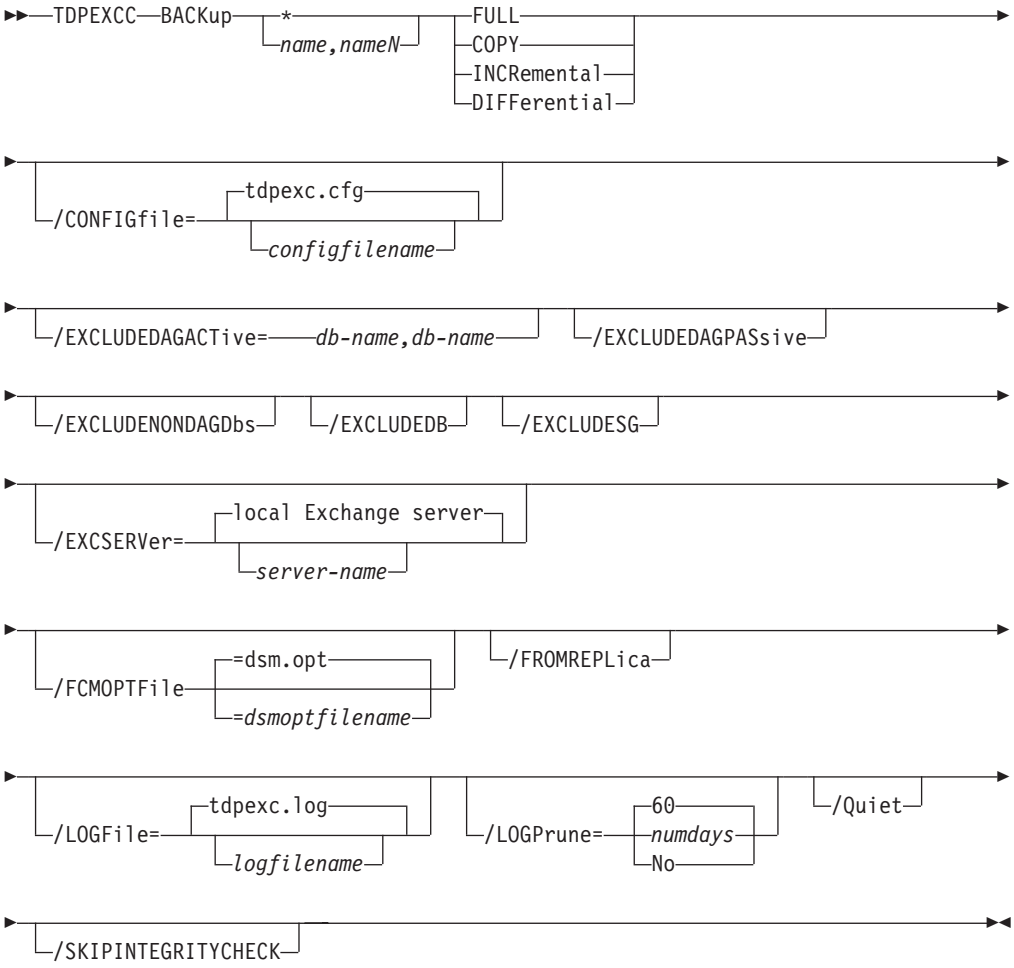
Differential
Back up the transaction logs but do NOT delete them

Copy Back up the entire storage group and transaction logs, and 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:

*** | *name***

* Back up all storage groups (Exchange Server 2003 or 2007) or databases (Exchange Server 2010).

name Back up the specified storage group (Exchange Server 2003 or 2007) or database (Exchange Server 2010). Multiple entries are separated by commas. If separated by commas, make sure there is no space between the comma and the name. If any storage group or database name contains commas or blanks, enclose the 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 or database, and the transaction logs, and if a successful backup is obtained, truncate the transaction logs.

COPY Back up the entire storage group or database, and the transaction logs, and 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: (Exchange Server 2003 or 2007) All databases within a storage group must be mounted at the time of the backup operation. If any database within a storage group is not mounted, the storage group is skipped and, therefore not backed up. In addition, the transaction logs will NOT be truncated.

Backup optional parameters

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

/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 97 for descriptions of available configuration parameters.

ERASEexistinglogs=No/Yes
The **/eraseexistinglogs** parameter directs Tivoli Storage FlashCopy Manager to erase the existing transaction log files for the database being restored, before it restores the specified database(s). If you do not erase existing data, any existing transaction logs could be reapplied when the Exchange databases are mounted. If you do not specify this parameter, existing transaction logs are not erased. This parameter is valid only when restoring a FULL or COPY VSS backup of Exchange Server storage groups or databases.

You can specify:

Yes Use volume level snapshot restore for a VSS Backup that resides on local shadow volumes if the backup exists on volumes that support it. This is the default.

No Use file level copy to restore the files from a VSS Backup that resides on local shadow volumes. Note that bypassing volume-level copy means that Exchange database files, log files, and the checkpoint file are the only data overwritten on the source volumes.

/EXCLUDEDAGACTive

(Exchange Server 2010) Use the **/excludedagactive** parameter to exclude the Exchange Server 2010 databases from backup if they belong to a Database Availability Group and are an active database copy.

/EXCLUDEDAGPASsive

(Exchange Server 2010) Use the **/excludedagpassive** parameter to exclude the Exchange Server 2010 databases from backup if they belong to a Database Availability Group and are a passive database copy.

/EXCLUDENONDAGDbs

(Exchange Server 2010) Use the **/excludenondagdbs** parameter to exclude the Exchange Server 2010 databases from backup if they do not belong to a Database Availability Group.

/EXCLUDEDB=*db-name1,db-nameN,...*

(Exchange Server 2010) Use the **/excludedb** parameter to exclude the specified Exchange Server 2010 databases from the backup operation. If the database names are separated by commas, make sure there are no spaces between the commas and the database names. If any database name contains commas or blanks, enclose the database name in quotation marks. Wildcard characters (*) are not supported.

/EXCLUDESG=*sg-name1,sg-nameN,...*

(Exchange Server 2003 and Exchange Server 2007) Use the **/excludesg** parameter to exclude storage groups from the backup operation. If the storage group names are separated by commas, make sure there are no spaces between the commas and the storage group names. If any storage group name contains commas or blanks, enclose the storage group name in quotation marks. Wildcard characters (*) are not supported.

/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 2007 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 (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010).

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

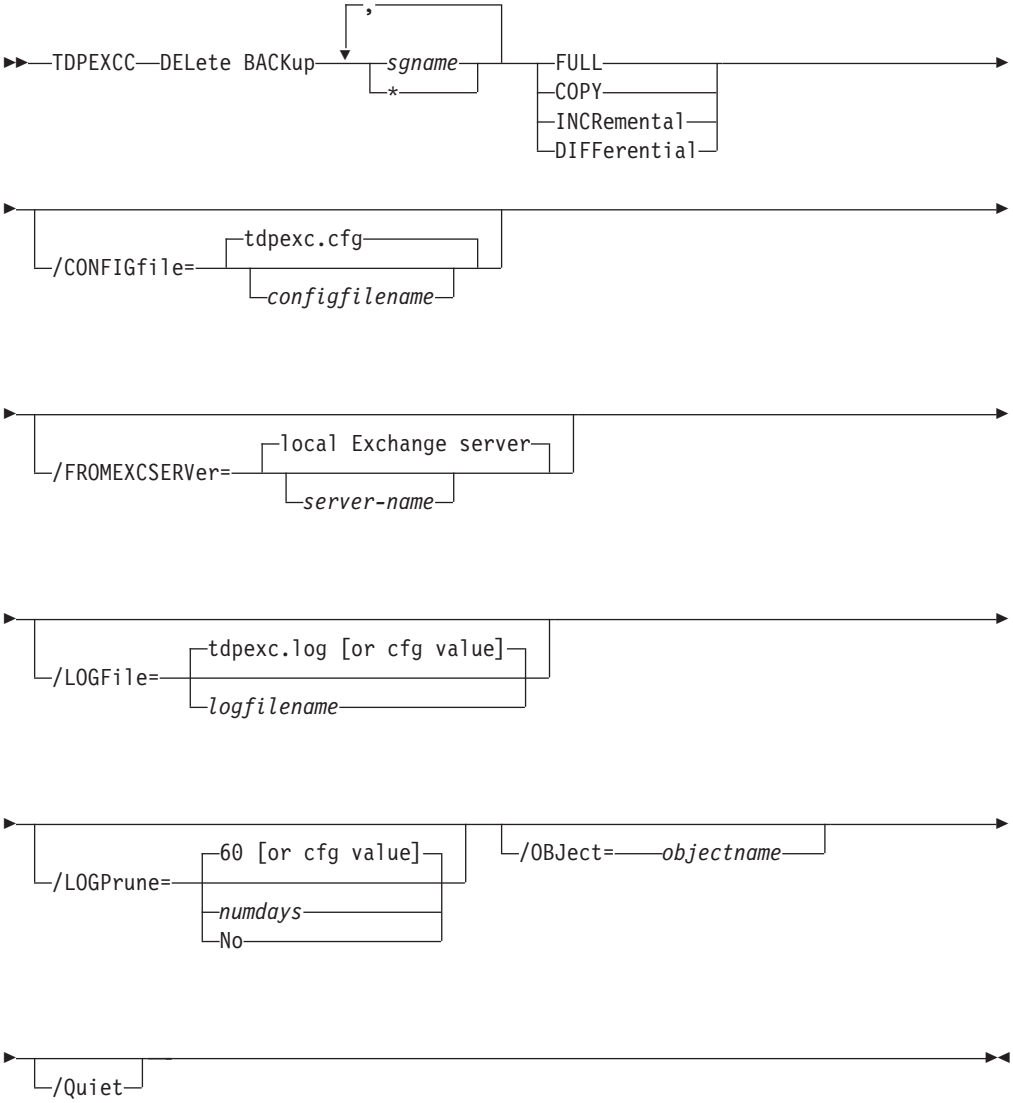
Note:

- 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.
- If you delete multiple LOCAL snapshots that are stored on SAN Volume Controller (SVC) 5.1 Space Efficient volumes (SEV), you must do so in the same order in which you created them. That is, you must delete the oldest one first, followed by the second oldest, and so on. Failure to delete them in this order can cause removal of other snapshots of the same source.

See “Backup strategies” on page 26 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 97 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
```

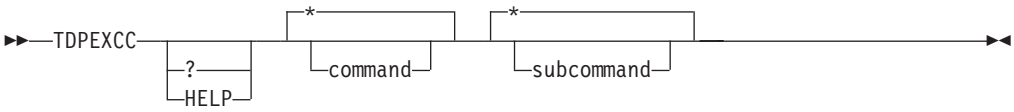
Help command

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.

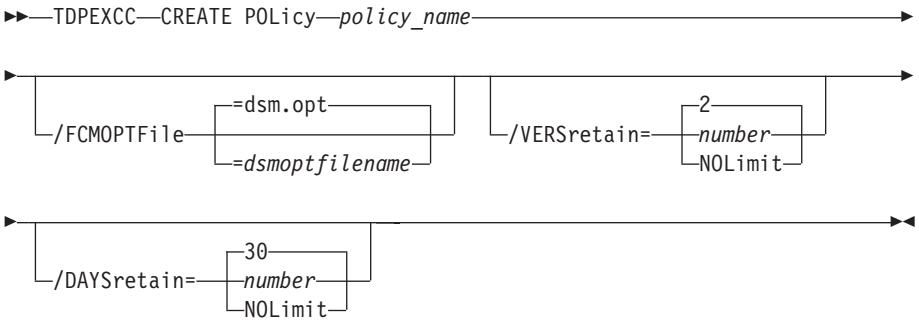
*|*subcommand*

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.

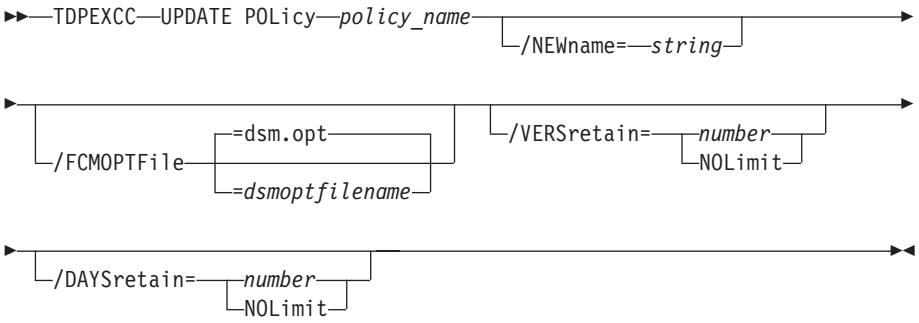


Parameters

- **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.



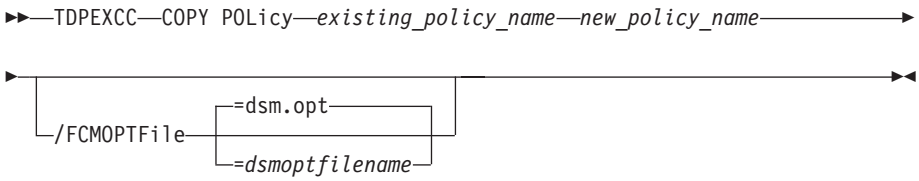
Parameters

- **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

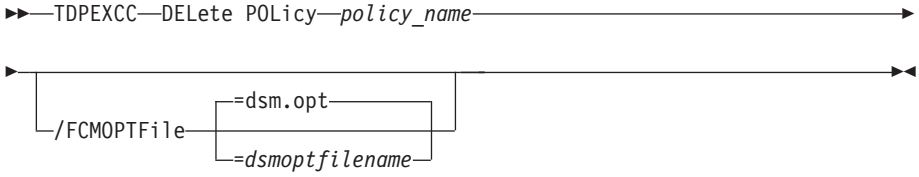
This command is used to list the attributes of a policy.

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

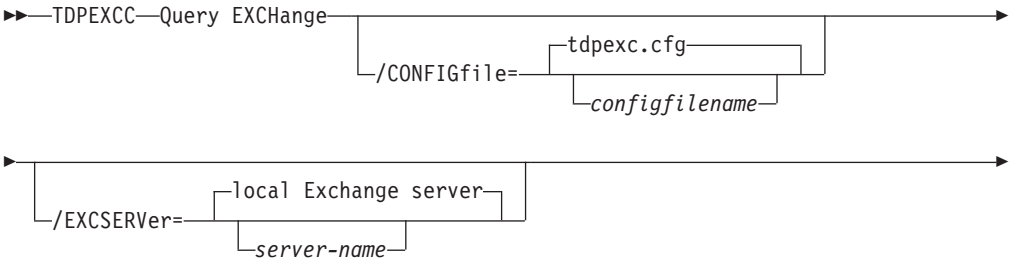
Use the **query exchange** command to query the local Exchange Server for general information.

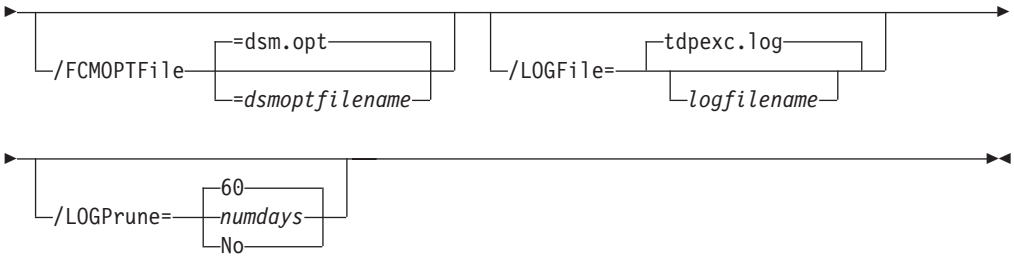
The **query exchange** command returns the following information:

- Exchange Server name and version
- Domain name
- Names of all storage groups (Exchange Server 2003 and Exchange Server 2007) and databases
- Status (online, offline) of all storage groups (Exchange Server 2003 and Exchange Server 2007) and databases
- Recovery Storage Group status
- Circular logging status (enabled, disabled) of all storage groups (Exchange Server 2003 and Exchange Server 2007) or databases (Exchange Server 2010)
- 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 97 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 *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 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.

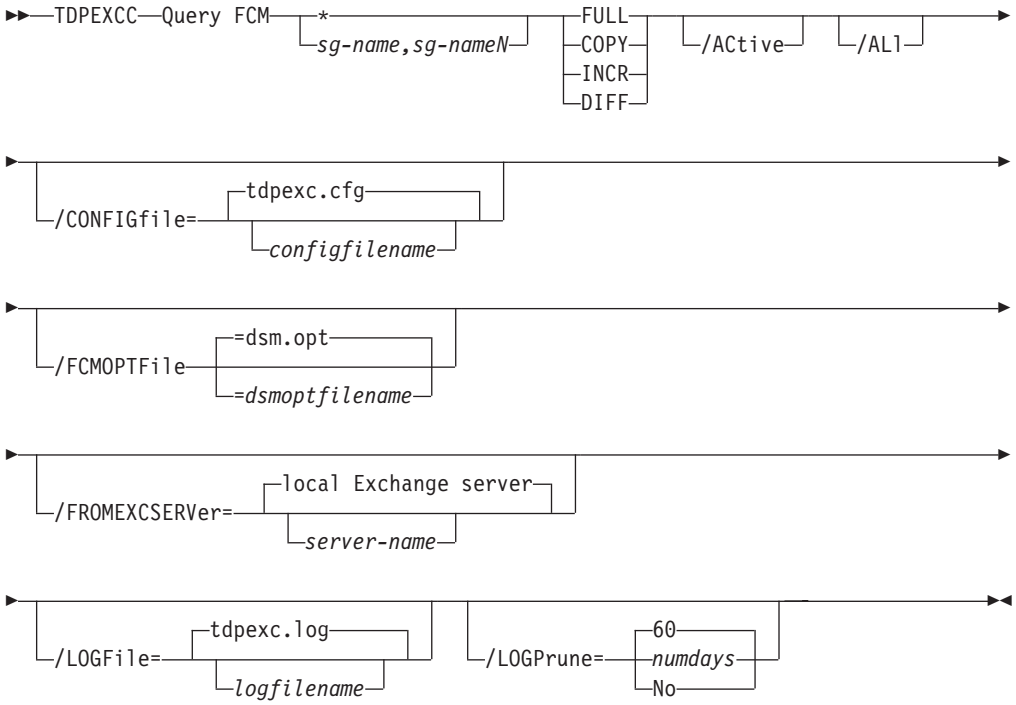
This command displays the following information:

- Compression mode
- Active policy set
- Default management class

This command can also display a list of backups that match the storage groups (Exchange Server 2003 and Exchange Server 2007) or databases (Exchange Server 2010) 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 96 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

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**

UUse the **/logprune** parameter to disable log pruning or to explicitly request that the log be pruned for one command run. By default, log pruning is enabled and performed once per day. The *numdays* variable represents the number of days to save log entries. By default, **60** days of log entries are saved in the pruning process. You can use the 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

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

The **tdpexcc 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.

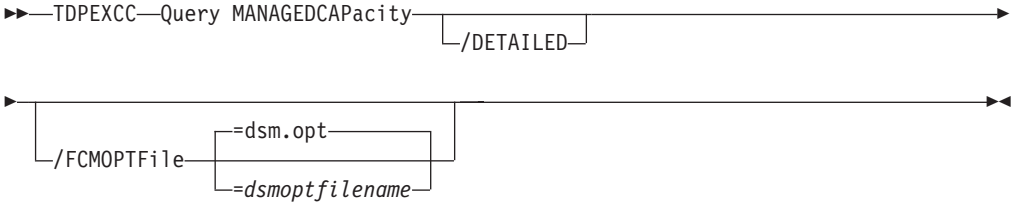
```
Querying for a list of database backups, please wait...

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
-------------------  ----------- - ---- ----   --- -------------------------
02/12/2010 10:24:11      18.04MB A VSS  full   Loc 20100212102411
                      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
-------------------  ----------- - ---- ----   --- -------------------------
02/12/2010 10:09:51      17.02MB A VSS  full   Loc 20100212100951
                         13.01MB                  Logs
                      4,112.00KB                  svc431i_mb
02/12/2010 10:14:06      15.01MB A VSS  diff   Loc 20100212101406
                         15.01MB                  Logs
02/12/2010 10:15:28      21.02MB A VSS  copy   Loc 20100212101528
                         17.01MB                  Logs
                      4,112.00KB                  svc431i_mb
02/12/2010 10:16:43      19.01MB A VSS  incr   Loc 20100212101643
                         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:

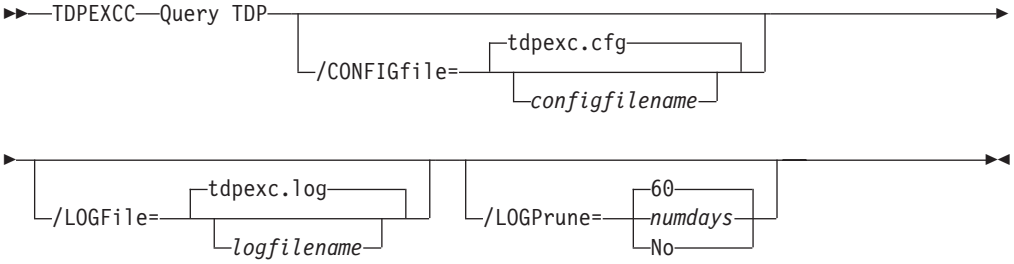
```
Total Managed Capacity : 1,019.72 MB (1,069,253,632 bytes)

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 97 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 (Exchange Server 2003 and Exchange Server 2007) or database backup (Exchange Server 2010) 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 74
- "Restoring VSS Backups into alternate locations" on page 29

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 byTivoli 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 sgname incr` command is entered (without the **/object** parameter) to restore multiple active incremental backups, all multiple active incremental backups are restored sequentially. The **/object** parameter is used to restore only one incremental backup at a time.
- Use the **/eraseexistinglogs** parameter to direct the program to erase the existing transaction log files for the database before it restores the database. If you do not specify this option, existing transaction logs are not erased, and might be reapplied when the Exchange databases are mounted. This parameter is only valid when you restore a FULL or COPY VSS backup of Exchange Server storage groups (Exchange Server 2007) or databases (Exchange Server 2010).
- (Exchange Server 2003 and Exchange Server 2007) 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 (Exchange Server 2003 and Exchange Server 2007) or backup (Exchange Server 2010) and you want the database or databases 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 (Exchange Server 2003 and Exchange Server 2007) or Recovery Database restore (Exchange Server 2010). You must specify ***/recover***=*applyrestoredlogs* when restoring a mailbox database to a Recovery Storage Group or Recovery Database. Otherwise, the restore operation may fail.
- If you are restoring a CCR database, after the restore completes successfully, the cluster database is mounted successfully. However, due to a Microsoft Exchange Server 2007 limitation, the database resources are not brought online. You must bring the database resources online using the Microsoft Cluster Administrator interface. See the following Microsoft Knowledge Base article for details regarding this limitation: http://support.microsoft.com/kb/938442/en-us

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.

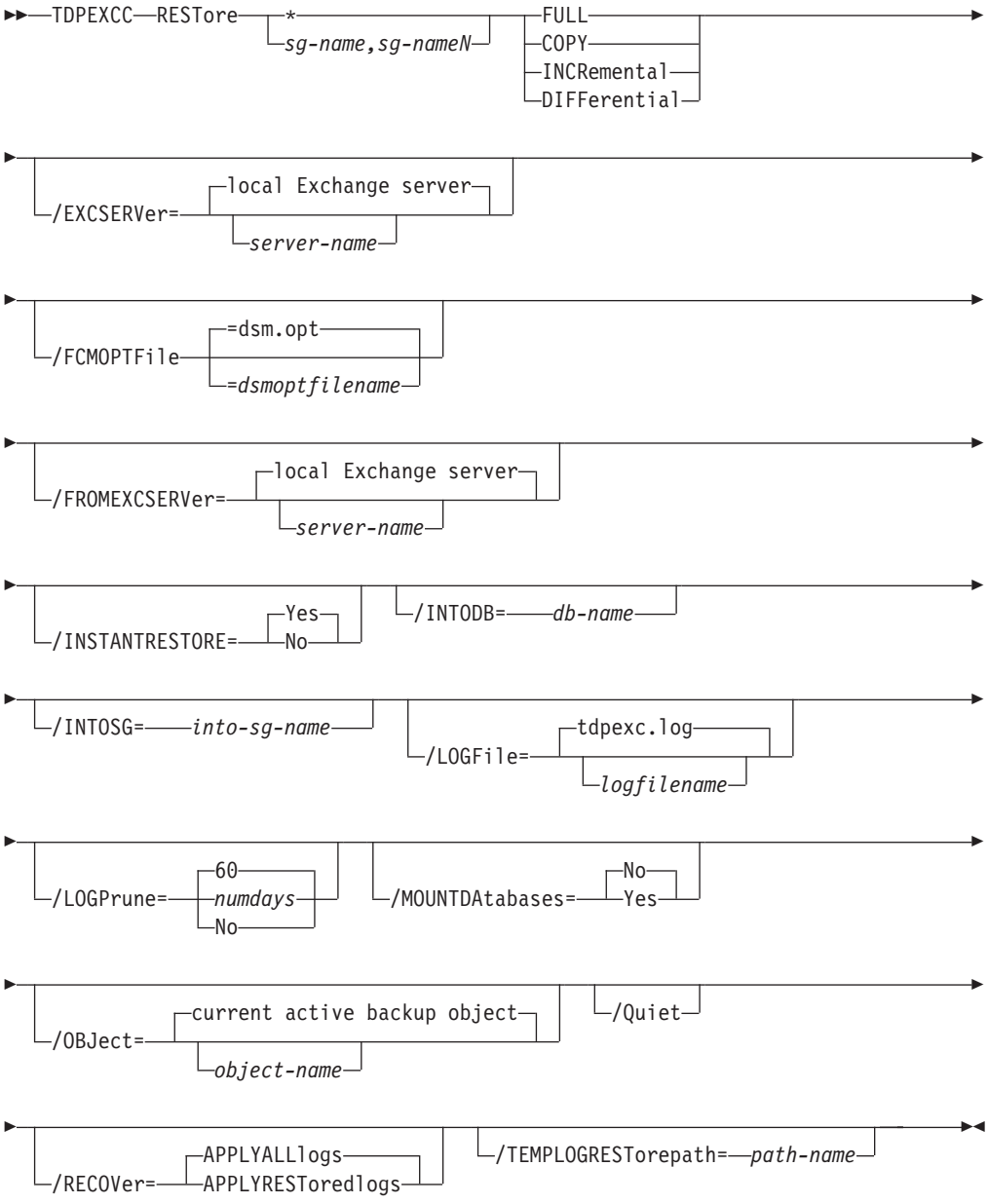
Unless otherwise specified, "VSS restores" refers to VSS Fast Restore and VSS Instant Restore:

The following characteristics are true of VSS restores:

- Full, copy, differential and incremental backup types can be restored.
- You can restore one or more storage groups (Exchange Server 2003 and Exchange Server 2007) or databases (Exchange Server 2010) from a VSS snapshot backup located on storage managed by Tivoli Storage FlashCopy Manager.
- You can perform restores 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 Server 2003 and later.
- All VSS restores of CCR and LCR replicas can only be restored into the running instance (primary, recovery, or alternate) of a storage group (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010). Microsoft does not support VSS restores into a replica instance.
- VSS restores ignore the Recovery Storage Group or Recovery Database, 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 (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010) that is being restored are mounted after restore.
- 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.
- For guidelines on restoring into a an Exchange Server 2007 CCR or an Exchange Server 2010 DAG environment, see “VSS Instant Restore in a Cluster Continuous Replication environment” on page 29, “Restoring a Cluster Continuous Replication database copy on Exchange Server 2007” on page 30, and “Restoring a Database Availability Group database copy on Exchange Server 2010” on page 31

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 96 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 (Exchange Server 2003 and Exchange Server 2007) or database copy (Exchange Server 2010) before performing the VSS Instant Restore. After the VSS Instant Restore completes, resume the storage group or database copy.

/INTODB=*db-name*

(Exchange Server 2010) Use the **/intodb** parameter to specify the name of the Exchange Server 2010 database into which the VSS Backup will be restored. The database name must be specified with the *db-name* variable.

For example, if RDB is the name of the database into which the VSS Backup will be restored, the command line entry is as follows:

```
TDPEXCC RESTore Maildb1 FULL /INTODB=RDB
```

However, when restoring a database that has been relocated (system file path, log file path, or database file path), you must specify the same database name as the one you are restoring. For example, if Maildb5 is the name of the relocated database that is being restored, the command-line entry is as follows:

```
TDPEXCC RESTore Maildb5 FULL /INTODB=Maildb5
```

Considerations

- There is no default value.
- In order to restore into a Recovery Database (RDB) or alternate database, an RDB or alternate database must already exist before attempting the restore operation.
- The **/intodb** parameter is only available with Exchange Server 2010 VSS restore operations.

/INTOSG=*sg-name*

(Exchange Server 2007) 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 *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 is 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 is 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.
- The **/intosg** parameter is only available with Exchange Server 2007 VSS restore operations.

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by 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 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, after the restore completes successfully, the cluster database is mounted successfully. However, due to a Microsoft Exchange Server 2007 limitation, the database resources are not brought online. You must bring the database resources online using the Microsoft Cluster Administrator interface. See the following Microsoft Knowledge Base article for details regarding this limitation: http://support.microsoft.com/kb/938442/en-us

/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 sgname incr` command is entered (without the **/object** parameter) to restore multiple active incremental backups, all multiple active incremental backups are restored sequentially. The **/object** parameter is used to restore only one incremental backup at a time.

/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. With Exchange Server 2003 or Exchange Server 2007 data, 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 (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010). If the value is the same, the storage group or database 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=applyalllogs** 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..
```

Restoremailbox command

Use the **restoremailbox** 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 **restoremailbox** command with Exchange Server 2007 or Exchange Server 2010.

  For Exchange Server 2003, the **restoremailbox** command does not apply. If any backups exist, they will be ignored by this command.
- You can use the **restoremailbox** command with VSS Backups stored on local shadow volumes.
- Use the **restoremailbox** command or the mailbox restore operation in the GUI to restore mailbox-level data or mailbox-item-level data. Some features of the **restoremailbox** command are only available on the command-line interface:
  - Use the command line interface when you must use the ***/mailboxoriglocation*** parameter to specify the server, the database, and (for Exchange Server 2007) the storage group 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

Review these prerequisites before you perform mailbox restore tasks on Exchange Server 2007 or Exchange Server 2010:

- 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 Tivoli Storage FlashCopy Manager 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

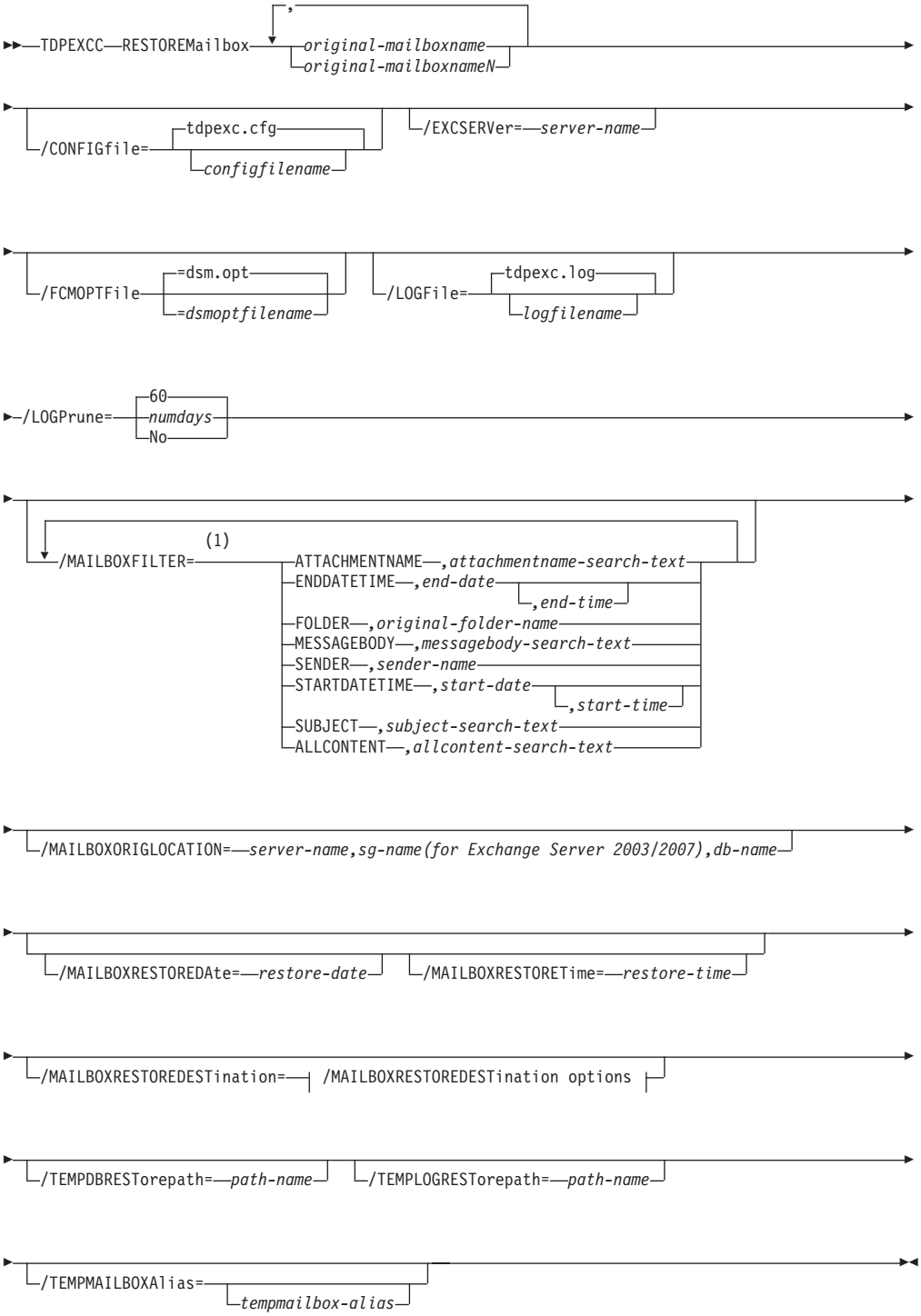
    If you choose to not enter a path, the default value of TEMPLOGRESTorepath is the value of the TEMP environment variable.

  Attention: The temporary restore locations *must* have enough space to restore the entire restored databases and log files.
- (Exchange Server 2007) Verify that Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 level 6.5.8147.0 or later is installed on the Exchange server that you will use to perform the mailbox restore operations.
- (Exchange Server 2010) Verify that Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 level 6.5.8147.0 or later is installed on the Exchange server that you will use to perform the mailbox restore operations.

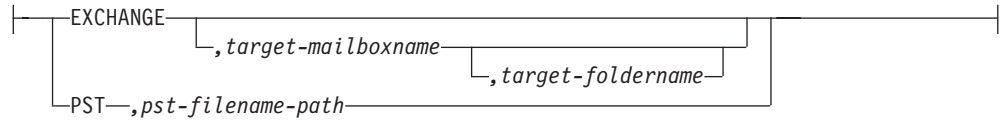
The amount of time needed to complete the restore process depends on the size of the mailbox databases, the network speed, and the number of mailboxes to process.

Restoremailbox syntax

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



/MAILBOXRESTOREDESTination options:



Notes:

1 You can specify the /MAILBOXFILTER parameter multiple times; however, you must specify each /MAILBOXFILTER subparameter only once.

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 96 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.

/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 *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 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager 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(for Exchange Server 2003/2007),db-name*

Use the **/mailboxoriglocation** parameter to specify the Exchange Server, the database, and (for Exchange Server 2003 and 2007) the storage group 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. (Exchange Server 2003 and 2007 only.)

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.

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 the conditions:

- The mailbox to be restored has been moved (the mailbox is not located in the same server, the same storage group (in Exchange Server 2003 and 2007), and the same database where the mailbox resided at the time of backup).
- The mailbox to be restored has been deleted and the restore destination is to an alternate mailbox or to a .pst file.

For example:

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

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

/MAILBOXRESTOREDATe=*restore-date*

Use the **/mailboxrestoredate** parameter with or without the **/mailboxrestoretime** parameter to establish a date and time to restore mailbox data from. A mailbox is restored from the earliest backup taken *after* the date and time established by the **/mailboxrestoredate** and the

/mailboxrestoretime parameters. Specify the appropriate date in the *restore-date* variable; use the same format that you selected with the DATEFORMAT option in the 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.

In the target mailbox, the specified folder (in the target mailbox) contains a subfolder (designated by the original-mailbox alias name). In the subfolder are sub-subfolders that contain the restored mailbox messages. These sub-subfolders have the folder structure of the original mailbox.

target-mailboxname

Specify the target mailbox-alias or the target mailbox-display name. The target mailbox must be an active mailbox.

If the *target-mailboxname* variable includes spaces, enclose the entry in double quotation marks.

target-foldername

The *target-foldername* variable specifies the mailbox folder in the target mailbox to restore mailbox messages to. If you specify the *target-mailboxname* variable and the target mailbox is not the original mailbox, you must specify a folder name.

If the mailbox folder specified by the *target-folder-name* variable does not exist in the target mailbox, a folder with the *target-folder-name* will be created in the target mailbox.

The target folder contains one subfolder for each original-mailbox that is restored (designated by each original-mailbox alias). In each subfolder are the folders from the original mailbox that contain the restored mailbox messages. If you have not specified the **/mailboxfilter** parameter, the target folder that you specified contains, within the subfolder designated by the original mailbox alias, all the folders that are in the mailbox that you are restoring from. If you have specified the **/mailboxfilter** parameter, the subfolder within the folder that you specified contains only the folders with messages that match the filter criteria.

If the *target-foldername* variable includes spaces, enclose the entire *target-foldername* variable entry in double quotation marks. For example:

```
/MAILBOXRESTOREDESTination=EXCHANGE,Kerry,"temp folder"
```

When restoring multiple mailboxes with the same **restoremailbox** command, and you specify a target folder, each original-mailbox is restored to the target folder in the target mailbox. The target folder contains one subfolder for each original-mailbox that is restored (designated by each original mailbox alias). In each subfolder are the folders from the original mailbox that contain the restored mailbox messages.

For example, this **restoremailbox** operation restores mailboxes "andrew baker" and "sally wood" to the folder "previous_acctmngr" in the target mailbox "mary brown":

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

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

```
mary brown (target mailbox)
          >-previous_acctmngr     (specified folder)
          |    >-abaker           (original-mailbox1 alias)
          |    | >-Inbox      (restored folder from mailbox1)
          |    | >-Outbox     (restored folder from mailbox1)
          |    | >-My Accts   (restored folder from mailbox1)
          |    >-swood            (original-mailbox2 alias)
          |    | >-Inbox      (restored folder from mailbox2)
          |    | >-Outbox     (restored folder from mailbox2)
          |    | >-New Accnts (restored folder from mailbox2)
```

PST,*pst-filename-path*

Use `/mailboxrestoredestination=PST,pst-filename-path` to restore mailbox data to an Exchange Server personal folders (.pst) file. The mailbox data that is restored is in non-Unicode format.

You can include the *pst-filename-path* variable to specify the destination where the restoremailbox operation will write the .pst file. The *pst-filename-path* can be either a fully qualified path to a .pst file or a directory path. If you do not specify a path, the .pst file is written to the current directory.

- You can specify *pst-filename-path* as a fully qualified path to a .pst file to restore all mail to that .pst file.

  ```
  TDPEXCC RESTOREMAILBOX gclark
    /mailboxrestoredestination=PST,c:\mb\dept54\vpo.pst
  ```

  Requirement: The .pst directory must exist before using the **restoremailbox** command. The .pst file will be created if it does not exist.

  If you are restoring more than one mailbox and you specify a fully qualified path to a .pst file, all the mailbox data will be restored to the one .pst file specified. Inside the pst file, the top level folder will be the mailbox-alias-name, with the rest of the mailbox folders below it.
- You can specify *pst-filename-path* as a directory path to have 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 Olef (barneyo)` are restored and the specified directory path is `c:\finance`, all mailboxes are restored into the `c:\finance` directory as shown:

  ```
  c:\finance\john1.pst
  c:\finance\oblong.pst
  c:\finance\barneyo.pst
  ```

Requirements: The .pst directory must exist before using the **restoremailbox** command.

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 Tivoli Storage FlashCopy Manager 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 (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010).

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 Tivoli Storage FlashCopy Manager 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 (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010) used for recovery. If the value is the same, the storage group or database 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 Tivoli Storage FlashCopy Manager 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...
```

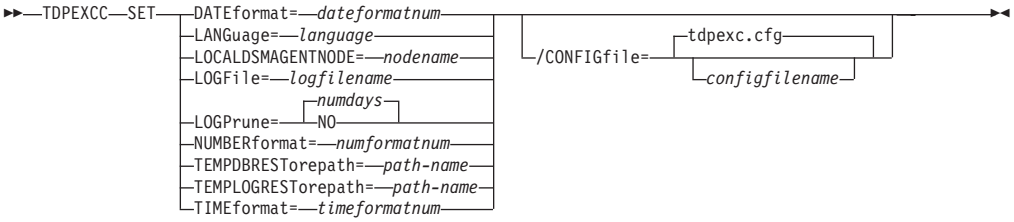
Set command

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=*logfilename*

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 *logfilename* variable identifies the name of the activity log file. If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is assigned to the 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=*fmtnum*

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

The *fmtnum* variable displays numbers using one of the following formats. Select the format number that corresponds to the format you want to use.

1 n,nnn.dd. This is the default.

2 n,nnn,dd.

3 n nnn,dd

4 n nnn.dd

5 n.nnn,dd

6 n'nnn,dd

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 (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010).

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 (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010) 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 7. 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, click **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:

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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.

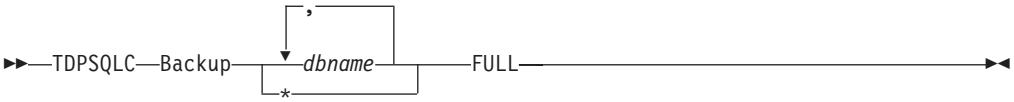
You can enter the * character to backup all databases. You can specify more than one database at once for multiple database and transaction log backups.

Considerations:

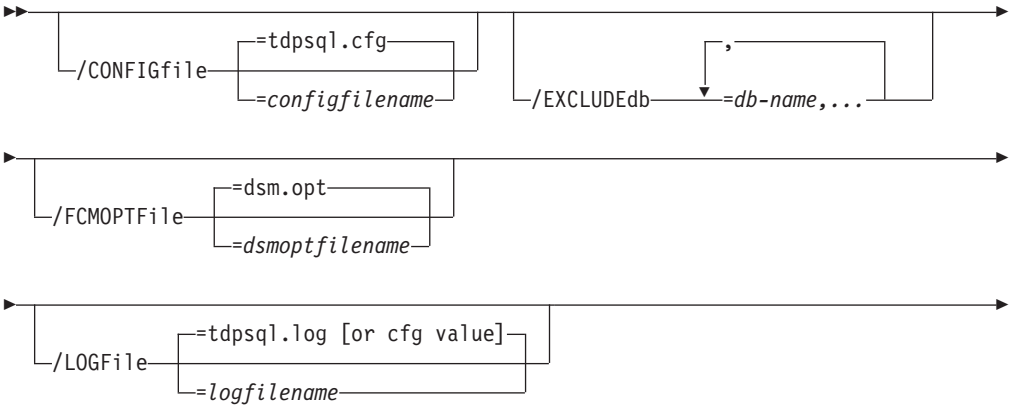
- You cannot back up or restore the **tempdb** database because it is created by SQL server each time the server is started.
- The user id used by Tivoli Storage FlashCopy Manager to log on to the SQL server must have the SQL Server SYSADMIN fixed server role.
- You can use the TRANSACT-SQL database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

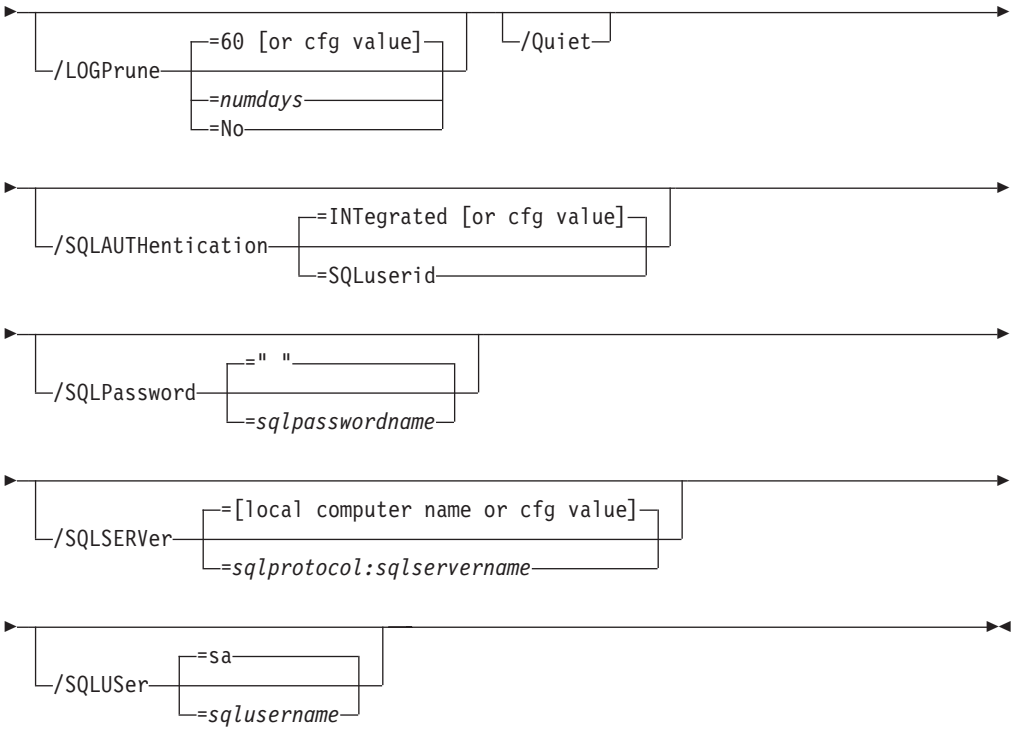
Backup syntax

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, such as database files, log files, full-text index files (SQL Server 2005), and FILESTREAM files (SQL Server 2008 and SQL Server 2008 R2).

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 134 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.

/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*

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 **/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?
local-computername	default	no	no
local-computername\ *instancename*	named	no	yes
virtualservername	default	yes	yes
virtualservername\ *instancename*	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.

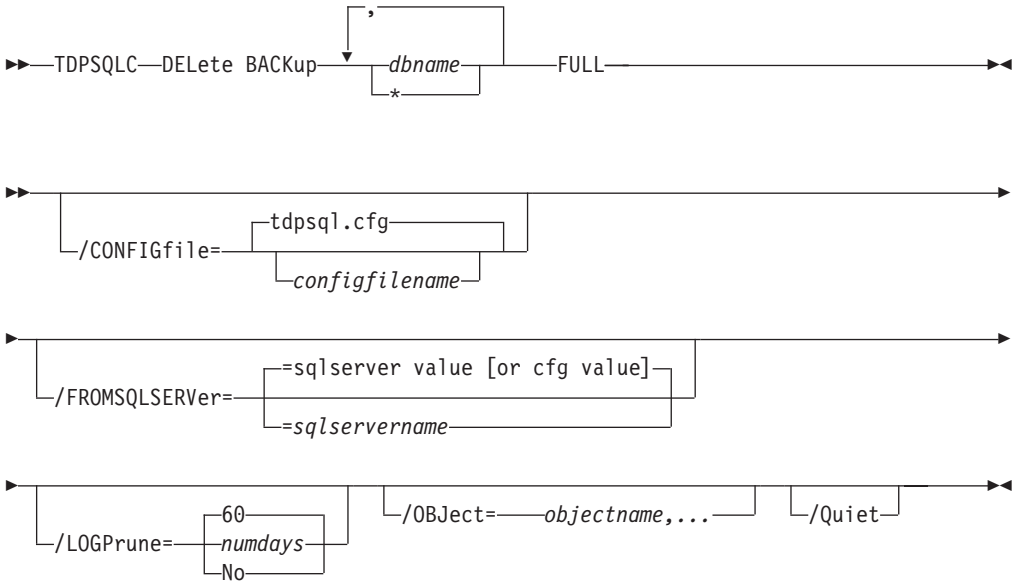
You must have local registry rights (for all versions of SQL Server) to perform a Tivoli Storage FlashCopy Manager for SQL delete backup.

If you delete multiple LOCAL snapshots that are stored on SAN Volume Controller (SVC) 5.1 Space Efficient volumes (SEV), you must do so in the same order in which you created them. That is, you must delete the oldest one first, followed by the second oldest, and so on. Failure to delete them in this order can cause removal of other snapshots of the same source.

See “Backup strategies” on page 34 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 97 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 SQLinstallation 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 SQLto 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 : 02/10/2010 10:03:29>
VSS Delete backup operation completed with rc = 0
   Files Examined   : 1
   Files Completed  : 1
   Files Failed     : 0
   Total Bytes      : 0
```

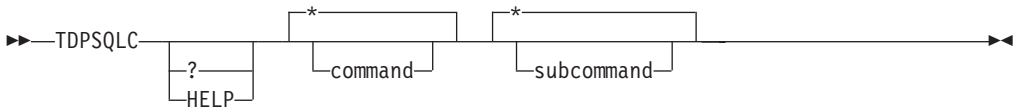
Help command

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

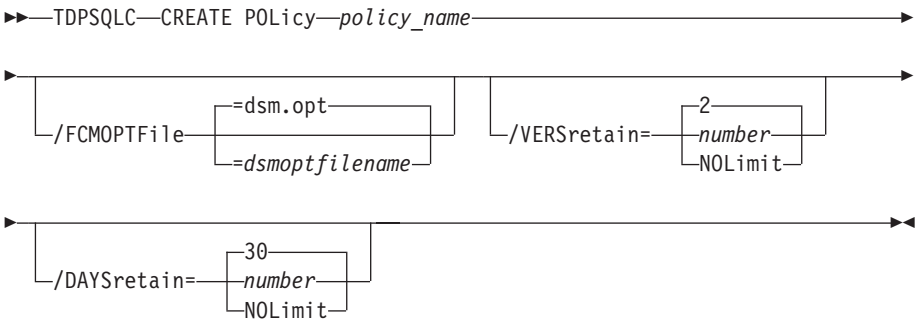
(*a***)** comments that are not part of the command

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.

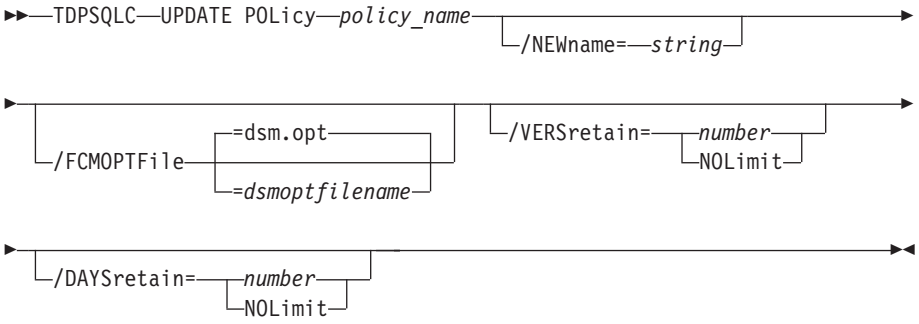


Parameters

- **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.

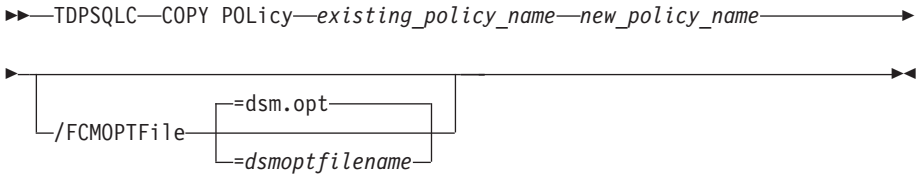


Parameters

- **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

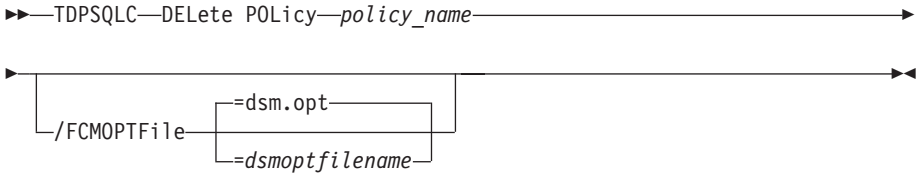
This command is used to list the attributes of a policy.

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:

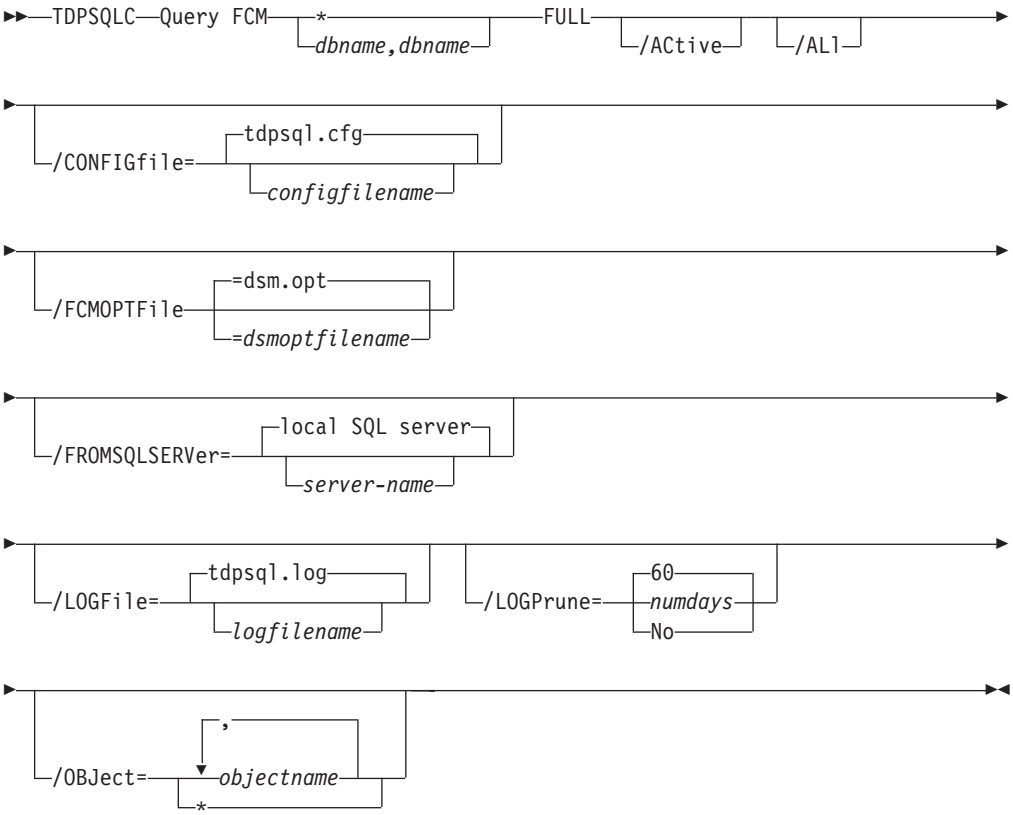
- Compression mode
- Active policy set
- Default management class

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 134 for details on the content of the file.

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.

/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 **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 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"
```

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 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*,...

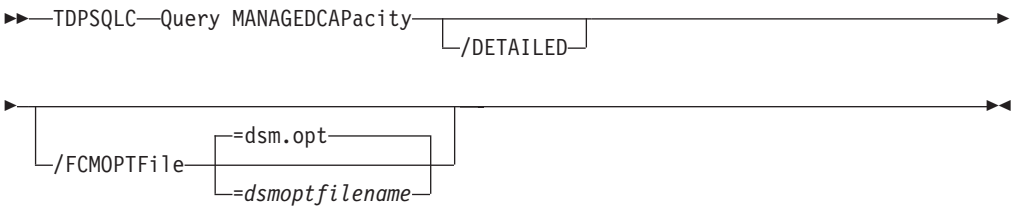
For **restore** and **inactivate** operations, **/object** specifies that only particular backup objects for the specified SQL databases and backup object type (if specified) be restored or inactivated. For **query** operations, **/object** includes particular objects and object types in the display. 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.

Command: `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.

Command: `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

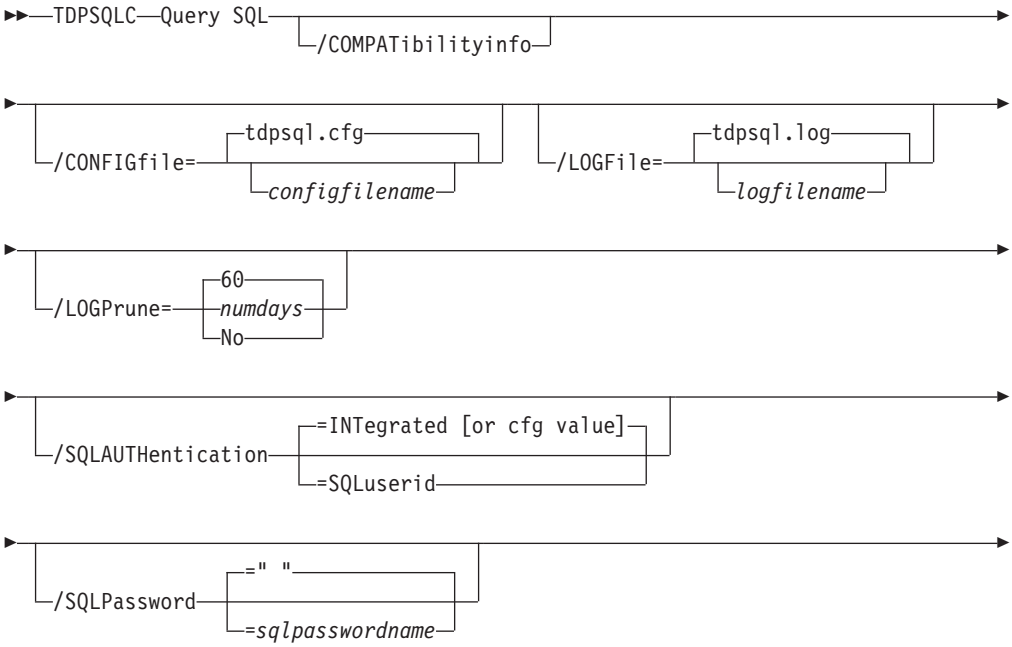
The **query sql** command queries the local SQL Server to return general information and status about the SQL server, databases, and VSS components.

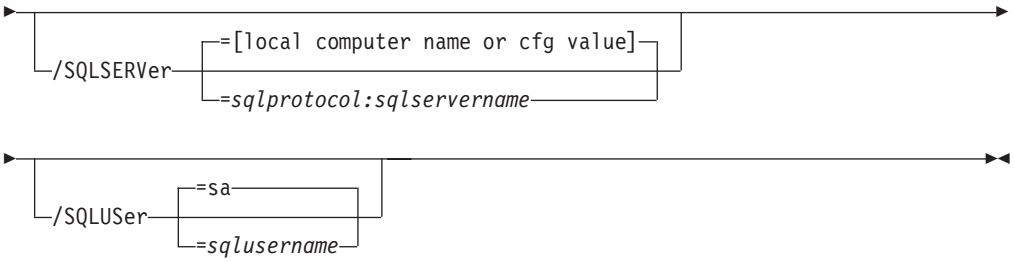
Use the **query sql** command to return the following information:

- 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 ***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 135 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.

/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?
local-computername	default	no	no
local-computername\ *instancename*	named	no	yes
virtualservername	default	yes	yes
virtualservername\ *instancename*	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:

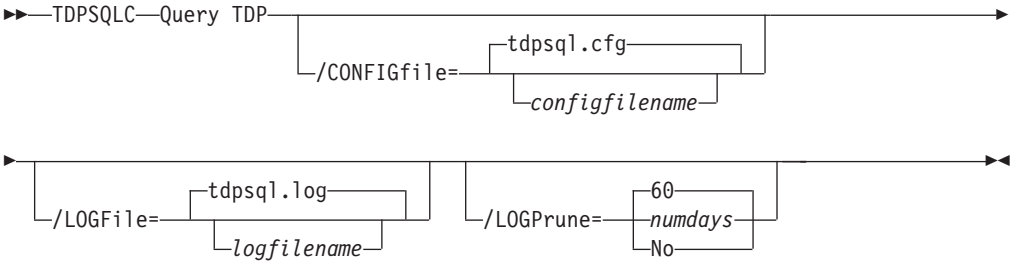
```
Connecting to SQL Server, please wait...

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 135 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" on page 126 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

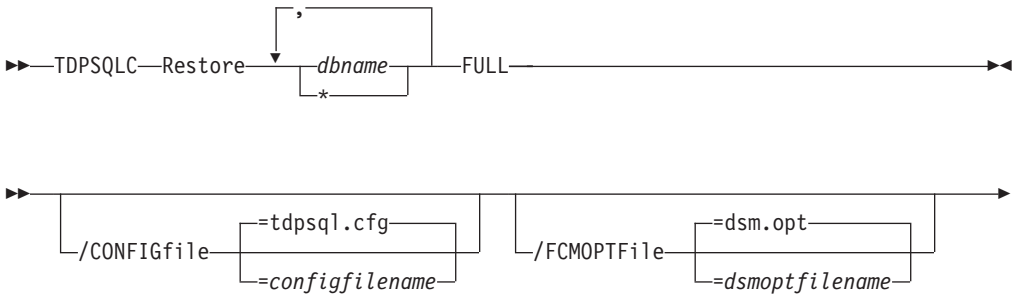
Be aware of the following considerations when performing VSS restores. :

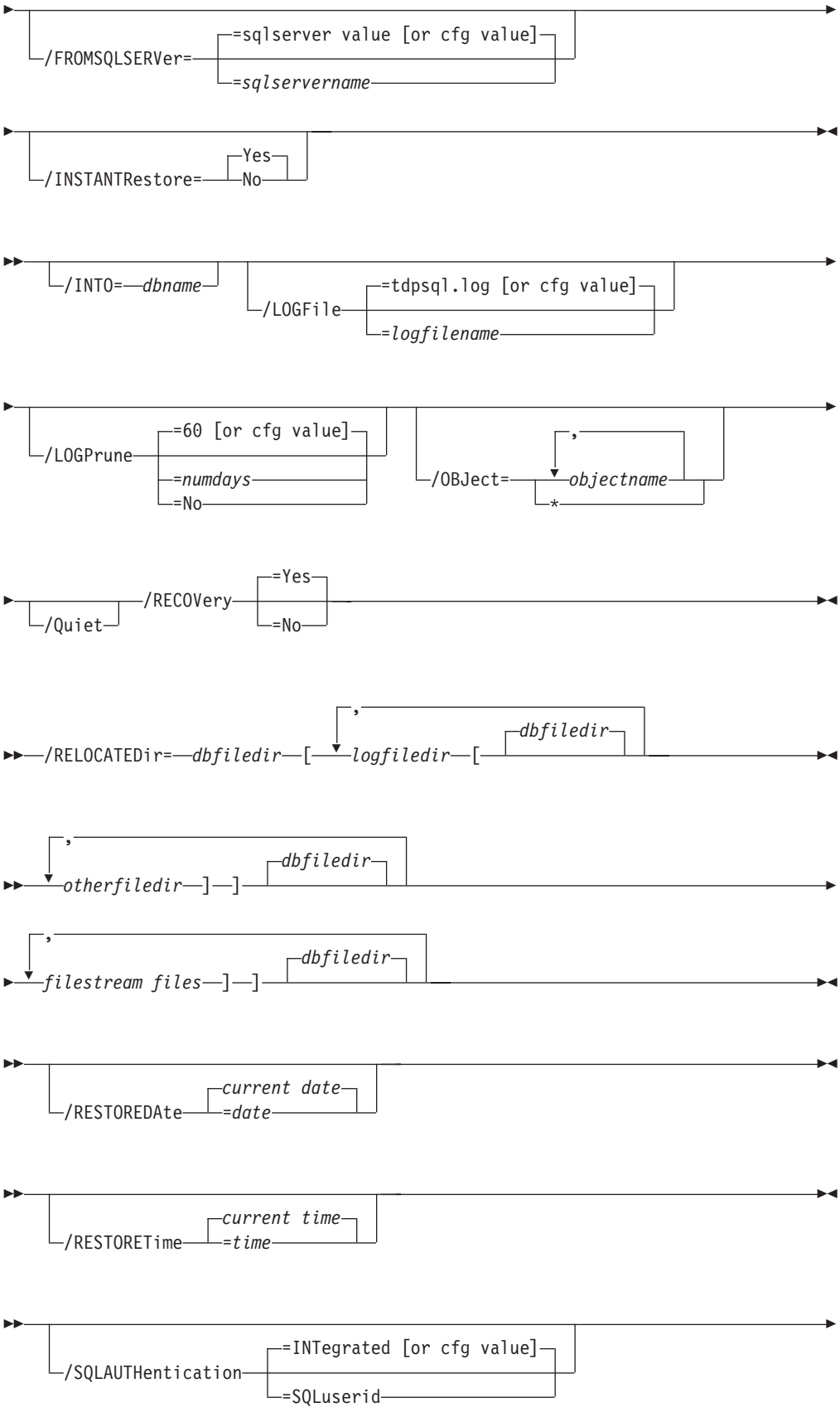
- Parallel VSS Fast Restore or VSS Instant Restore operations are not supported on Microsoft Windows Server 2003 and later.
- A VSS Instant Restore overwrites the entire contents of the source volumes. However, you can avoid overwriting the source volumes by specifying **/instantrestore**=*no*. This 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.

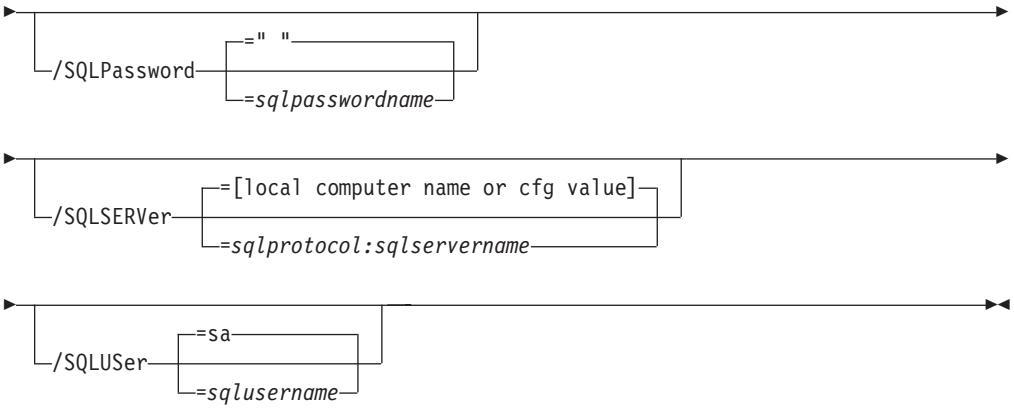
Restore syntax

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

Syntax




/FROMSQLSERVer=
=sqlserver value [or cfg value]
=sqlservername
/INSTANTRestore=
Yes
No
/INTO=dbname
/LOGFile
=tdpsql.log [or cfg value]
=logfilename
/LOGPrune
=60 [or cfg value]
=numdays
=No
/OBJect=
objectname
*
/Quiet
/RECOVery
=Yes
=No
/RELOCATEDir=dbfiledir[
logfiledir[
dbfiledir
otherfiledir]]
dbfiledir
filestream files]]
dbfiledir
/RESTOREDAte
current date
=date
/RESTORETime
current time
=time
/SQLAUTHentication
=INTegrated [or cfg value]
=SQLuserid



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 134 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 ensure that any previous background copies (that involve the volumes being restored) are completed before initiating the VSS Instant Restore.

For guidelines on restoring into a an Exchange Server 2007 CCR or an Exchange Server 2010 DAG environment, see "VSS Instant Restore in a Cluster Continuous Replication environment" on page 29, "Restoring a Cluster Continuous Replication database copy on Exchange Server 2007" on page 30, and "Restoring a Database Availability Group database copy on Exchange Server 2010" on page 31

/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 actvity log records significant events such as completed commands and error messages. The Tivoli Storage FlashCopy Manager actvity 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.

/RECOVery=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***[** *,logiledir* **[** *,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 (SQL Server 2005). FILESTREAM files are included for SQL Server 2008 and SQL Server 2008 R2.

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 (SQL Server 2008 and SQL Server 2008 R2) 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.

/RESTOREDATe=*date*

The **/restoredate** parameter specifies a date to which the database identified by *dbname* is to be recovered. The date value must be specified in the same date format defined in the Tivoli Storage FlashCopy Manager preferences file. If **/restoredate** is not specified but **/restoretime** is specified, the **/restoredate** value is the current date. It can only be specified when restoring a full database backup. The **/restoretime** parameter cannot be used to restore file, group, and set backups.

/RESTORETime=*time*

The **/restoretime** parameter specifies the time of day to which the database identified by *dbname* is to be recovered. The time value must be specified in the same time format defined in the Tivoli Storage FlashCopy Manager preferences file. If **/restoretime** is not specified but **/restoredate** is specified, the **/restoretime** is the current time. It can only be specified when restoring a full database backup. The **/restoretime** parameter cannot be used to restore file, group, and set backups.

/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?
local-computername	default	no	no
local-computername\ *instancename*	named	no	yes
virtualservername	default	yes	yes
virtualservername\ *instancename*	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

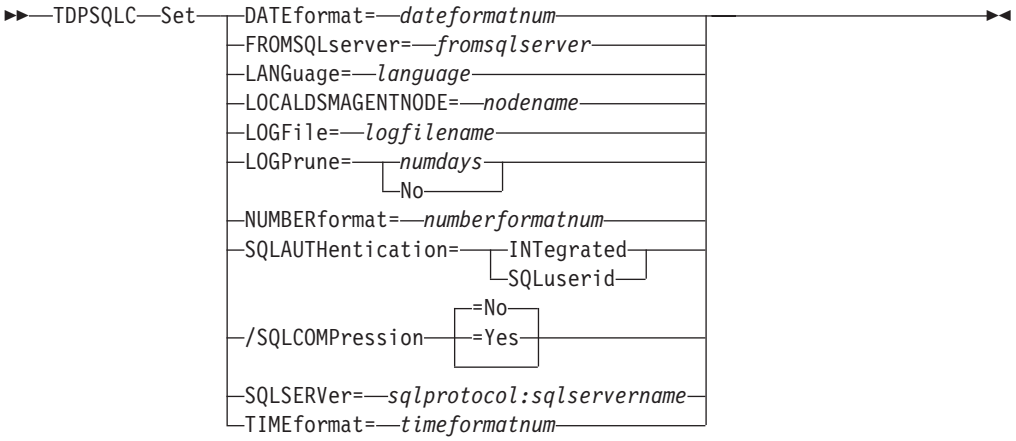
Use the **set** command to set the Tivoli Storage FlashCopy Manager for SQL configuration parameters defined in the Tivoli Storage FlashCopy Manager for SQL configuration file, ***tdpsql.cfg*** by default.

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.

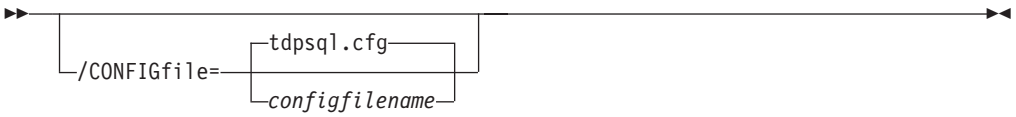
Note: If a configuration file is not specified, the tdpsql.cfg values are used, and a default configuration file is created with just the ***lastprunedate*** value. If an invalid or non-existent file is specified, the default values are used.

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 7. The initial value is 1. The number values specify the following formats:

1 MM/DD/YYYY.

2 DD-MM-YYYY.

3 YYYY-MM-DD.

4 DD.MM.YYYY.

5 YYYY.MM.DD.

6 YYYY/MM/DD.

7 DD/MM/YYYY.

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 Tivoli Storage FlashCopy Manager.
- 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=*logfilename*
The **logfile** parameter specifies the name of the activity log that is generated by Tivoli Storage FlashCopy Manager. The activity log records significant events such as completed commands and error messages. This 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.

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 Tivoli Storage FlashCopy Manager 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 Tivoli Storage FlashCopy Manager. 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

6 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 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 Tivoli Storage FlashCopy Manager. 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.

/SQLCOMPression=Yes | No

The **/sqlcompression** parameter specifies whether SQL compression is applied. If you do not specify /sqlcompression, the default value ***No*** is used.

This parameter is only applicable on systems running SQL Server 2008 or later. For SQL Server 2008, backup compression is only supported on Enterprise Edition. SQL Server 2008 R2, backup compression is supported on Standard, Enterprise, and Datacenter editions.

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 8. Using the graphical user interface with Exchange Server data

Information is provided about 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 **Details** to view a list of the volumes (that contain backups) and their respective managed capacity.
3. Click **OK** to close this dialog.

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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, click **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. Click **Utilities -> VSS Policy Binding**. The Tivoli Storage FlashCopy Manager VSS Policy Binding dialog box opens, displaying existing binding statements.

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 **Move Up** and **Move Down** 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. (Exchange Server 2003 and Exchange Server 2007) 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. (Exchange Server 2010) Enter the name of the Exchange Server database, or enter the wildcard character (*) in the **Database** field. You can also select a database from the **Database** list.
  4. Select the backup type in the **Backup Type** list or enter the wildcard character (*).
  5. Select the name of the policy in the **Policy** list.
  6. Click **Add**.
  7. 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. (Exchange Server 2003 and Exchange Server 2007) 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. (Exchange Server 2010) 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.
  4. To update the backup type, select a different backup type in the **Backup Type** list or enter the wildcard character (*).
  5. To update the policy, select the name of the policy in the **Policy** list.
  6. Click **Update**.
  7. 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 Server data

Perform these tasks to back up Exchange Server data 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.
- **Exchange Server 2010**: IBM Tivoli Storage FlashCopy Manager must be operating in an account with membership in the Organization Management group.

  Note: When running Exchange Server 2010 backups, the Exchange database file size may increase due to increase database commitments that are triggered by backup operations. This is a Microsoft Exchange server standard behavior.

1. Start the IBM Tivoli Storage FlashCopy Manager GUI.
2. From the Tree View, select one or more storage groups (Exchange Server 2003 and Exchange Server 2007) or databases (Exchange Server 2010) to back up. You can also select one or more storage groups or databases 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. (Optional) This step varies based on your version of Exchange Server.
   - **Exchange Server 2007**: If you are running in an Exchange Server 2007 Local Continuous Replication (LCR) or Cluster Continuous Replication (CCR) environment and you want to back up data from the replica copy, click **From replica, if available** in the Backup window. For CCR copies, you must run the backup while logged in to the secondary node of the cluster that contains the replica copy. Microsoft does not support back up operations to Standby Continuous Replication (SCR) replicated databases.
   - **Exchange Server 2010**: If you are running in an Exchange Server 2010 Database Availability Group (DAG) environment, you can back up an active database copy or passive database copy. View the copy status in the `DAG Status` column in the Backup window.
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 (Exchange Server 2003 and Exchange Server 2007) or database (Exchange Server 2010) that contains the backup to be deleted. The available backups display in a list to the right side of the tree.

5. Right-click on the backup object and click **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 Server data

Perform these tasks to restore Exchange Server data.

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.
  - **Exchange Server 2010**: IBM Tivoli Storage FlashCopy Manager must be operating in an account with membership in the Organization Management group.
- VSS restores to the Recovery Storage Group are *not* supported by Microsoft with Exchange Server 2003.
- When you restore a storage group (Exchange Server 2003 and Exchange Server 2007) or a database (Exchange Server 2010), data that exists in the storage group or database is overwritten and is no longer available after the restore is complete.

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 (Exchange Server 2003 and 2007) or database (Exchange Server 2010) to restore. To restore a particular database in a storage group, 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. (Optional) This step varies based on your version of Exchange Server.
   - **Exchange Server 2007**: If you want to restore an Exchange Server 2007 storage group (that was backed up using VSS) into the Recovery Storage Group, an alternate storage group, or into a relocated storage group:
     a. Right-click the selected storage group.
     b. Click **Restore Into** in the pop-up menu and select the storage group name that you want to restore into from the list.

- **Exchange Server 2010**: If you want to restore an Exchange Server 2010 database (that was backed up using VSS) into the Recovery Database, an alternate database, or into a relocated database:
  a. Right-click the selected database.
  b. Click **Restore Into** in the pop-up menu and select the database name that you want to restore into from the list.

  Note the following characteristics:
  - If you are restoring data into a relocated storage group, choose the storage group with the same name as the one that you are restoring. With Exchange Server 2010 data, you can restore a database into a database with a different name.
  - 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 or Exchange Server 2010

This procedure describes how to restore a mailbox or items from a mailbox on Exchange Server 2007 or Exchange Server 2010.

Review these prerequisites before attempting a restore operation:

- **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.
- **Exchange Server 2010**: IBM Tivoli Storage FlashCopy Manager must be operating in an account with membership in the Organization Management group. In addition, the Client Access Server Role must be configured to run Mailbox Restore operations.
- 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.
- (Exchange Server 2007) Make sure that Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 level 6.5.8147.0 or later is installed on the Exchange server that you will use to perform the mailbox restore operations.

- (Exchange Server 2010) On Windows Server 2008, make sure that Microsoft Exchange Server MAPI Client and Collaboration Data Objects 1.2.1 level 6.5.8147.0 or later is installed is installed on the Exchange server that you will use to perform the mailbox restore operations.

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**
     - Enter the name of the mailbox to be restored in the **Mailbox** field.
     - Enter the name of the folder where the mailbox will be restored in the **Folder** field.
   - **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.

Restoring a Cluster Continuous Replication database copy (Exchange Server 2007) or a Database Availability Group copy (Exchange Server 2010)

Instructions on restoring a Cluster Continuous Replication database copy (Exchange Server 2007) or a Database Availability Group copy (Exchange Server 2010) are provided.

1. For instructions on restoring a Cluster Continuous Replication database copy, see "Restoring a Cluster Continuous Replication database copy on Exchange Server 2007" on page 30.
2. For instructions on restoring a Database Availability Group copy, see "Restoring a Database Availability Group database copy on Exchange Server 2010" on page 31.

Chapter 9. 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 **Details** to view a list of the volumes (that contain backups) and their respective managed capacity.
3. Click **OK** to close this dialog.

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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, click **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. Click **Utilities -> VSS Policy Binding**. The Tivoli Storage FlashCopy Manager VSS Policy Binding dialog box opens, displaying existing binding statements.

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 **Move Up** and **Move Down** 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 and SQL Server 2008 R2**: 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 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. Click **Show Active and Inactive** 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 click **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 153 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-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 151

"Deleting VSS Backups" on page 152

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 151

"Restoring SQL Server data" on page 152

"Deleting VSS Backups" on page 152

"Configuring user preferences" on page 141

Chapter 10. 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. Click 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. Click 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.

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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
  - dsierror.log

- tdpsql.log
- Tivoli Storage FlashCopy Manager for Exchange
  - installation directory: C:\Program Files\Tivoli\TSM\TDPExchange
  - dsierror.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.

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.

Tivoli Storage FlashCopy Manager follows Linux® operating system conventions for keyboard navigation and access.

Tivoli Storage FlashCopy Manager follows Solaris 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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IBM and accessibility

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