

IBM Tivoli Storage FlashCopy Manager
Version 4.1

*Installation and User's Guide
for Windows*



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Note

Before you use this information and the product it supports, read the information in “Notices” on page 321.

First edition (December 2013)

This edition applies to version 4, release 1 of IBM Tivoli Storage FlashCopy Manager (product numbers 5608-ACB, 5641-A06, and 5724-X94). It also applies to all subsequent releases and modifications until otherwise indicated in new editions.

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About this publication

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

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

Since the previous edition, changes 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 database server environments.

It is assumed that you understand the following storage systems, operating systems, or applications, as applicable:

- The storage system that is used for the database:
 - Any storage devices that implement the VSS provider interface.
 - IBM System Storage® DS3000, DS4000®, DS5000
 - IBM System Storage SAN Volume Controller
 - IBM Storwize® V7000
 - IBM XIV® Storage System
 - IBM System Storage DS8000™ series
- Windows operating system
- Microsoft Volume Shadow Copy Service (VSS)
- Microsoft Exchange Server
- Microsoft SQL Server
- Active Directory

Publications

Publications for the Tivoli Storage Manager family of products are available online. The Tivoli Storage Manager product family includes IBM Tivoli Storage FlashCopy Manager, IBM Tivoli Storage Manager for Space Management, IBM Tivoli Storage Manager for Databases, and several other storage management products from IBM Tivoli.

To search across all publications or to download PDF versions of individual publications, go to the Tivoli Storage Manager information center at <http://pic.dhe.ibm.com/infocenter/tsminfo/v7r1>.

You also can find the Tivoli Storage Manager product family information centers and other information centers that contain official product documentation for current and previous versions of Tivoli products at Tivoli Documentation Central. Tivoli Documentation Central is available at [http://www.ibm.com/developerworks/community/wikis/home/wiki/Tivoli Documentation Central](http://www.ibm.com/developerworks/community/wikis/home/wiki/Tivoli%20Documentation%20Central).

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 displays entirely in uppercase letters, it cannot be truncated.	►—KEYWOrd—►◀
You can type the item in any combination of uppercase or lowercase letters.	
In this example, you can enter KEYWO, KEYWORD, or KEYWOrd.	
Symbols:	
	* Asterisk
Enter these symbols exactly as they display in the syntax diagram.	{ } Braces
	: Colon
	, Comma
	= Equal Sign
	- Hyphen
	() Parentheses
	. Period
	' Single quotation mark
	Space
	" Quotation mark
Variables:	
Italicized lowercase items (<i>var_name</i>) denote variables.	►—KEYWOrd— <i>var_name</i> —►◀
In this example, you can specify a <i>var_name</i> when you enter the KEYWORD command.	

Syntax diagram description**Example**

Repetition:

An arrow that returns to the left means you can repeat the item.

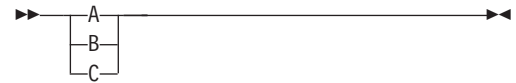


A character or space within an arrow means you must separate the repeated items with that character or space.



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.

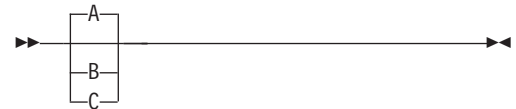


When two or more items are in a stack below the line, all of them are optional. In the second example, you can choose A, B, C, or nothing at all.



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:

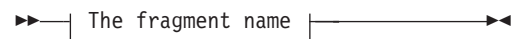
A stack of items followed by an arrow that returns to the left means you can select more than one item. In some cases, it means you can repeat a single item.

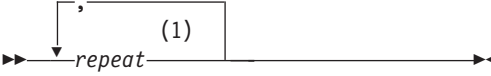


In this example, you can choose any combination of A, B, or C.

Syntax Fragments:

Some diagrams because of their length, must fragment the syntax. The fragment name is displayed between vertical bars in the diagram. The expanded fragment is displayed between vertical bars in the diagram after a heading with the same fragment name.

**The fragment name:**

Syntax diagram description	Example
<p>Footnote:</p> <p>A footnote in the diagram references specific details about the syntax that contains the footnote.</p> <p>In this example, the footnote by the arrow references the number of times you can repeat the item.</p>	 <p>Notes:</p> <p>1 Specify <i>repeat</i> as many as 5 times.</p>

What's new

Tivoli Storage FlashCopy Manager Version 4.1 contains several new features and changes.

Additional options for restoring personal storage folders

If you restore personal storage folders (.pst files), there are two options: **Restore Mail to Unicode PST file** and **Restore Mail to non-Unicode PST file**. Unicode .pst files can store messages in multiple languages, and are not limited to 2 GB of data. For non-Unicode .pst files, the file size must be less than 2 GB. For more information about restoring mailboxes and mailbox data, including .pst files, see “Restoring an Exchange Server mailbox” on page 105.

“Collecting remote diagnostic data” on page 88

Collecting diagnostic data for a remote system using Tivoli Storage FlashCopy Manager is different than collecting data for a local system. You can update the Diagnostics property page to collect the correct log and trace files for remote data collection.

“Group management, reports, and status reporting” on page 125

When you want to generate group reports and facilitate group status reporting, you can use the Management Console (MMC).

“Managing remotely” on page 11

From one Tivoli Storage FlashCopy Manager installation you can manage all of the Tivoli Storage FlashCopy Manager installations in your enterprise. You can also create groups of computers to manage. When you manage a group, the **Protect**, **Recover**, and **Automate** tabs change to **Group Dashboard**, **Group Reports**, and **Group Commands** tabs.

“Microsoft Exchange Server 2013 support” on page 26

When planning to restore Exchange Server 2013 mailboxes, there is a requirement for MAPI clients to use RPC over HTTPS (also known as Outlook Anywhere). RPC over HTTP is no longer supported. More planning information, and a link to the troubleshooting topic, is provided.

“Improving mailbox history handling” on page 52

To improve performance, mailbox history includes only the mailboxes from databases than are backed up. If you back up mailbox history with a version of FlashCopy Manager for Microsoft Exchange Server earlier than version 4.1, you can manually delete the old mailbox history. Details, including instructions, are provided.

“Restoring mailboxes on remote systems” on page 111

The process of restoring mailboxes on a remote system with Mailbox Restore Browser is a little different so specific instructions are provided in this topic. For all other mailbox restore tasks completed on remote systems, you can use the instructions provided in subsequent sections.

“Restoring mailboxes directly from Exchange database files” on page 112

With all Data Protection for Exchange configurations, administrators can complete an individual mailbox restore for an .edb file stored on a disk. For administrators who only want to complete individual mailbox restores from an .edb file on disk, the Mailbox Restore Only configuration option is available. The .edb file can come from a backup that mounted read-write

using Tivoli Storage Manager for Virtual Environments, Tivoli Storage Manager restore files, or an offline file system copy.

“Windows PowerShell and Tivoli Storage FlashCopy Manager” on page 132

The Tivoli Storage FlashCopy Manager software includes Windows PowerShell cmdlets to complement the command-line interface functions.

“Automated failover for data recovery” on page 8

If you use Tivoli Storage FlashCopy Manager with the Tivoli Storage Manager configuration, when the Tivoli Storage Manager server is unavailable, Tivoli Storage FlashCopy Manager can automatically fail over to the secondary server for data recovery.

Chapter 1. Getting started

IBM Tivoli Storage FlashCopy Manager software is designed to protect data.

How you install, configure, and use the software depends on the following items:

- Platform or operating system
- Databases
- Applications or file systems

The Tivoli Storage FlashCopy Manager product is comprised of multiple components. These components support a variety of operating systems, databases, and applications. Because of the large volume of requirements information across the product components, the hardware and software requirements are separated into multiple documents. These documents help you to find only the requirements that apply to your application environment.

When you install and configure Tivoli Storage FlashCopy Manager, the software works in conjunction with a variety of IBM and non-IBM hardware offerings that use FlashCopy technology. For the most current requirements, review the Hardware and Software Requirements technote. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

The four Tivoli Storage FlashCopy Manager components that operate in Windows environments include:

MMC Snapin and Base System Services

Provides the Management Console graphical user interface (MMC), and the file system and custom application snapshot support feature. This snapshot support feature provides a generic backup agent that can be used to create snapshots of file systems, other applications, or databases that are not explicitly supported by the other Tivoli Storage FlashCopy Manager components.

VSS Requestor

Supports the Microsoft Exchange Server, Microsoft SQL Server, and file system and custom application environments with the MMC Snapin and Base System Services component.

FlashCopy Manager for Microsoft Exchange Server

Supports Microsoft Exchange environments. When this component is installed, the following functionality is available:

- VSS backup copies can be stored locally as persistent snapshots, or stored as snapshots on the Tivoli Storage Manager server. You can also offload backups to Tivoli Storage Manager.
- Centralize policy management and scheduling.
- Complete VSS, volume-level instant restores.
- Complete individual mailbox restores.

For the data protection operations to work correctly with the Tivoli Storage Manager server, a valid license for Data Protection for Microsoft Exchange

Server must be installed in the Data Protection for Microsoft Exchange Server installation directory. This license file is named `exclclient.lic`.

FlashCopy Manager for Microsoft SQL Server

Supports Microsoft SQL environments. When this component is installed, the following functionality is available:

- Complete legacy-style (VDI) and VSS backups.
- VSS backup copies can be stored locally as persistent snapshots, or stored as snapshots on the Tivoli Storage Manager server. You can also offload backups to Tivoli Storage Manager.
- Centralize policy management and scheduling.
- Complete VSS, volume-level instant restores.

For the data protection operations to work correctly with the Tivoli Storage Manager server, a valid license for Data Protection for Microsoft SQL Server must be installed in the Data Protection for Microsoft SQL Server installation directory. This license file is named `sqlclient.lic`.

While the FlashCopy Manager for Microsoft Exchange Server and FlashCopy Manager for Microsoft SQL Server components support specific application environments, the MMC Snapin and Base System Services, and VSS Requestor components do not.

For data protection operations to work correctly with the FlashCopy Manager virtual server, a valid license file for FlashCopy Manager must be installed in the FlashCopy Manager installation directory. This license file is named `fcmlclient.lic`. During the installation process, the license file is stored in the correct directory. However, if you have trouble configuring the software, the first problem determination step is to verify that the license file is located in the correct directory.

Tivoli Storage FlashCopy Manager can be optionally integrated with the Tivoli Storage Manager product. When the two products are integrated, advanced data protection and centrally managed, policy-based administration capabilities are available for Tivoli Storage FlashCopy Manager backup images.

VSS framework

VSS provides software and hardware vendors with a common interface model for generating and managing snapshots.

The Microsoft VSS service manages and directs three VSS software components that are used during VSS operations: the VSS requestor, the VSS writer, and the VSS provider. The VSS requestor is the backup software. The VSS writer is the application software. Examples of application software include Microsoft Exchange Server and Microsoft SQL Server. The VSS provider is the specific combination of hardware and software that generates the snapshot volume.

VSS writer

The VSS writer is the application that stores data on the source volumes.

For Exchange data, the Microsoft Exchange Server contains the writer components. For SQL data, Microsoft SQL Server contains the writer components. For file system and custom application data, the Tivoli Storage Manager backup-archive client software contains the writer components.

VSS requestor

The Tivoli Storage Manager backup-archive client serves as the VSS requestor component and communicates with Microsoft VSS services to access data and create volume shadow copies. Because the Tivoli Storage Manager backup-archive client acts as the VSS interface, features such as LAN-free backup, client-side deduplication, data encryption, and data compression, are available. These feature are enabled by setting certain options defined in the backup-archive client options file.

This application initiates a snapshot operation. The application sends a command to the VSS service to create a shadow copy 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 application produces the shadow copy and also manages the volumes where the Exchange, SQL, or file system and custom application data is located. A provider can be a system provider (such as the one included with the Microsoft Windows operating system). It can also be a software provider or a hardware provider (such as one that is included with a storage system).

VSS hardware providers require installation and configuration, including the installation of all required fix packages. For instructions, see the documentation for the VSS hardware provider.

For more information about VSS technology, see the Microsoft Technical Reference document *How Volume Shadow Copy Service Works*.

VSS system provider overview

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

The VSS system provider refers to the default VSS provider that is available with Windows Server. If you are using the Windows VSS system provider, no configuration is required.

VSS software or hardware provider overview

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, review the following operational requirements that are provided to help you plan for VSS backups:

- Place database files on a separate, dedicated logical volume.
- Place logs for each database on a separate logical volume.
- Do not place non-Exchange data or non-SQL data on storage volumes that are dedicated to Exchange data or SQL data.
- When you use hardware or software snapshot providers, do not share LUNs with other applications.
- Read and follow specific installation and configuration instructions in the documentation that is provided by your VSS provider vendor.
- If you use XIV storage devices, install and configure IBM XIV Provider for Microsoft Windows Volume Shadow Copy Service (xProv) Version 2.3.0 and later.

- When a hardware provider is used, configure the disks that store Exchange or SQL data as basic disks.

For DS8000®, SAN Volume Controller, and IBM Storwize V7000 storage systems, if you enabled the incremental FlashCopy option of your VSS provider, the provider uses the same target set for each VSS snapshot request, of a source set. This usage occurs regardless of the number of backup versions that are specified or the number of target volumes that are defined in the VSS free pool. However, to use incremental refresh of the same target volumes, set the Tivoli Storage FlashCopy Manager policy to have a version limit of 1. With this version limit, the Tivoli Storage FlashCopy Manager software does not delete the previous snapshot backup before it creates the backup. In this configuration, Tivoli Storage FlashCopy Manager incorrectly shows that two backup versions exist when only the latest backup version exists. If the version limit in Tivoli Storage FlashCopy Manager is set to 1, each snapshot backup causes a full background copy from source to target volumes. In addition, to use incremental FlashCopy with DS8000, the following application is also required: IBM System Storage Support for Microsoft Virtual Disk and Volume Shadow Copy Services (IBM VSS Hardware Provider) Version 4.1 and later.

VSS backup

A VSS backup uses Microsoft Volume Shadow Copy Service technology to produce an online snapshot (point-in-time consistent copy) of data.

VSS backups eliminate the need for the server or file system to be in backup mode for an extended period of time. The length of time to perform the snapshot is usually measured in seconds, not hours. In addition, a VSS backup allows a snapshot of large amounts of data at one time because the snapshot works at the volume level.

VSS backups can be stored on local VSS shadow volumes, or, when integrated with Tivoli Storage Manager, in Tivoli Storage Manager server storage. Both of these storage destinations require that sufficient space be available for the snapshot.

When sufficient space is available for the snapshot, VSS backups stored locally on VSS shadow volumes are directly accessible by the system.

Restoring locally managed VSS backups is fast because the data is not transferred from Tivoli Storage Manager server storage over the network.

When you run VSS backups and store data on Tivoli Storage Manager server storage, sufficient space is temporarily required on local snapshot volumes. This space is used to hold the snapshot until transfer to the Tivoli Storage Manager server is complete. After the data transfer to the server is complete, the snapshot volume is released. The space can be reused.

If you also store VSS backup locally, in addition to Tivoli Storage Manager server storage, and the maximum number of local backup versions to be maintained is reached, the oldest local backup version expires to create the new snapshot for the backup to Tivoli Storage Manager server storage. The maximum number of local backup version to be maintained is set in the Tivoli Storage Manager policy.

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

For data backed up to both VSS shadow volumes and Tivoli Storage Manager server storage, a local snapshot backup is run and the data on the local snapshot volume is sent to the Tivoli Storage Manager server. The local snapshot volume is retained as a local backup after the transfer to the Tivoli Storage Manager server is complete.

VSS backup management

VSS backups have characteristics that affect backup management tasks.

Backups can be stored on local shadow volumes, Tivoli Storage Manager server storage, or both locations. Different policy settings can be defined for each backup location.

Databases that are going to be backed up, queried, restored, or deleted must have unique names. If a database has the same name as another database, but the capitalization of letters is different, the software does not differentiate between the letter cases. The software reports an error in this situation.

When using Tivoli Storage FlashCopy Manager to backup Exchange Server data, the following characteristics are true of VSS backups:

- Backups provide an Exchange Server database integrity check function, but do not provide an Exchange Server database zeroing function.
- Full, copy, differential, and incremental backup types are supported.
- For stand-alone and Tivoli Storage Manager configurations, Exchange Server Database Availability Group (DAG) databases can be backed up under a common DAG node name, regardless of which DAG member runs the backup. The backup can be from an active or passive copy. When you back up data to a common node, the backups are managed by a common policy, and the user can restore to any Exchange Server. In a stand-alone configuration there is one caveat: You cannot back up from server 1 and restore to server 2. This scenario requires a Tivoli Storage Manager configuration.

When using Tivoli Storage FlashCopy Manager to backup SQL data, the following characteristics are true of VSS backups:

- Backups can be run in a supported Microsoft Windows Failover Clustering or Veritas Cluster Server (VCS) environment.
- The full and copy-only full backup types are supported. Log, differential, file, group, and set backup types are not supported.

For custom application and file system data, backup granularity is at the file system (volume) level. Drives and mount points are both supported. In addition, backups can be run in a supported Microsoft Windows Failover Clustering or Veritas Cluster Server (VCS) environment.

Offloaded VSS backups

An offloaded backup uses another system to move the data to the Tivoli Storage Manager server.

This type of backup shifts the backup load from the production system to another system. An offloaded VSS backup requires a VSS hardware provider that supports transportable shadow copy volumes is installed on the production and secondary systems.

VSS restore

A VSS restore process restores VSS backups that are stored on a Tivoli Storage Manager server to the original location.

For Microsoft Exchange and Microsoft SQL servers, restore granularity is at the database level. Instant restores are at the volume level.

For file system and custom application data, restore granularity is at the volume level. When the restore of file system and custom application data occurs, all files from the VSS snapshot backup are restored to their original location.

You can use a VSS restore process to restore one or more databases from a VSS snapshot backup on Tivoli Storage Manager server storage.

VSS fast restore

A VSS fast restore operation restores data from a local snapshot. When the VSS fast restore operation runs, it overwrites any files that exist at the time of the snapshot on the original source location. The file is overwritten with the version stored on the snapshot. This overwriting occurs even if the data is marked read-only.

The following characteristics are true of VSS fast restores:

- For Exchange Server VSS backups, full, copy, incremental, and differential backup types can be restored.
- Restore granularity is at the database level. For custom application and file system data, however, restore granularity is at the file system level. In addition, all files from the custom application and file system data backup are restored to their original location. The VSS fast restore operation overwrites any file on the original source location (that existed at the time of the snapshot) with the version stored on the snapshot. This operation is done, even if the file is marked read-only.
- You can restore only SQL Server VSS backups to the same SQL Server instance.
- SQL Server VSS backups can be restored to an alternate location by using the **/relocatedir** option.
- Supports restoring a VSS backup to an alternate database.
- VSS supports restoring one (or more) databases or file systems from a VSS snapshot backup that are on local shadow volumes that are managed by Tivoli Storage FlashCopy Manager.
- For SQL, custom application, and file system data, restores can be run in supported Microsoft Windows Failover Clustering environments.
- In a stand-alone environment, you cannot back up a database from one DAG member and restore it to a different DAG member.
- In a Tivoli Storage Manager configuration, backups of a database from one DAG member to **LOCAL** can be restored only to the system that created the backup.

VSS instant restore

A VSS instant restore operation restores data by using a hardware-assisted restore method. A FlashCopy operation is an example of a hardware-assisted restore method.

For Exchange data, the key component of producing a VSS instant restore is the speed with which the application can become operational with the data that is stored on local shadow volumes. Even though the data is restored relatively quickly, the transaction logs must be replayed after the restore. The time of recovery for the Exchange database increases as the number of logs to be replayed increases.

VSS instant restore is the VSS restore method that is used for local VSS backups of the SAN-attached volumes from SAN Volume Controller, DS8000, Storwize V7000, or XIV. The VSS instant restore process requires a VSS hardware provider. The supported levels for the hardware storage systems and all the requirements are provided in the documentation of the corresponding VSS hardware provider. For Exchange data, VSS instant restore of differential and incremental backups is not supported.

A VSS instant restore is only possible when all of the data from the database, or custom application and file system that is specified for a restore is stored on storage subsystems that are supported by the VSS instant restore. VSS instant restore can also be disabled so that Tivoli Storage FlashCopy Manager uses VSS fast restore instead.

When you perform VSS instant restore operations, make sure that any previous background copies that involve the volumes that are being restored are completed before you initiate the VSS instant restore. However, this check is not necessary for XIV, SAN Volume Controller, or Storwize V7000 with space-efficient target volumes.

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

- A restore into an alternate location.
- A restore into an Exchange recovery database.
- The **restorefiles** command is issued.

VSS instant restore is the default restore method when all data specified for a restore is on storage subsystems that are 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, VSS instant restore processing fails without a failover to VSS fast restore. An error can be a pending background copy on the storage subsystem, a failure to start the FlashCopy operation on the snapshot provider system, or other hardware error.

SQL Server VSS backups can only be restored into the same SQL Server instance from which they were backed up. This limitation is a Microsoft SQL Server limitation.

When you plan for VSS instant restore, use the following considerations:

- (DS8000, SAN Volume Controller, Storwize V7000) Requires IBM System Storage Support for Microsoft Volume Shadow Copy Service software. XIV has separate VSS provider software.
- Backups can only be restored to the same DS8000, SAN Volume Controller, XIV, or Storwize V7000 storage subsystem from which they are backed up.

The list of devices that support instant restore is maintained online at <http://www.ibm.com/support/docview.wss?uid=swg21455924>.

Thin provisioning support

Thin provisioning or the ability to allocate less physical storage than the declared size of a logical storage volume is available with supported hardware. A thinly provisioned volume is referred to as a space-efficient (SE) volume.

The complete list of supported hardware for a space-efficient FlashCopy is available online at <http://www.ibm.com/support/docview.wss?uid=swg21455924>.

SAN Volume Controller and Storwize V7000 provide FlashCopy restore from SE target volumes and from fully allocated target volumes for which the background copy of the VSS backup is not yet completed. In addition, the hardware supports a restore from fully allocated target volumes for which the background copy of the VSS backup has completed. You can retain multiple FlashCopy images of a source volume as backup generations at a much reduced storage cost. You do not have to allocate the full size of the source volume for each backup generation.

For SE target volumes, the SAN Volume Controller and Storwize V7000 hardware architectures minimize the space that is required to maintain multiple snapshots of the same source volume. Target volumes are placed into a cascade where each target is dependent on changes that are recorded in target volumes of subsequent snapshots. For example, assume that four VSS snapshots are created of a source volume. S is the source and T1 through T4 are the targets. T1 is the first, chronologically, and T4 is 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.

Automated failover for data recovery

If you use Tivoli Storage FlashCopy Manager with the Tivoli Storage Manager configuration, Tivoli Storage FlashCopy Manager can automatically fail over to the secondary server for data recovery when there is an outage on the Tivoli Storage Manager server.

The Tivoli Storage Manager server that Tivoli Storage FlashCopy Manager connects to for backup services is called the *primary server*. If the primary server is set up for node replication, the client node data on the primary server can be replicated to another Tivoli Storage Manager server, which is the *secondary server*.

Depending on your configuration, the following nodes must be set up for replication on the primary server:

- Tivoli Storage FlashCopy Manager node
- Backup-archive client node (also called the DSM agent node)
- Remote DSM agent node (for offloaded backups to the primary server)
- DAG node (for backups of databases in an Exchange Server Database Availability Group (DAG))
- AlwaysOn node (for backups of availability databases in an AlwaysOn Availability Group on SQL Server 2012)

During normal operations, connection information for the secondary server is automatically sent to Tivoli Storage FlashCopy Manager from the primary server. The secondary server information is saved to the client options file (`dsm.opt`). No manual intervention is required by you to add the information for the secondary server.

Each time the backup-archive client logs on to the server for backup services, it attempts to contact the primary server. If the primary server is unavailable, the backup-archive client automatically fails over to the secondary server. In failover mode, you can restore data that was replicated to the secondary server. When the primary server is online again, the backup-archive client automatically fails back to the primary server the next time the backup-archive client connects to the server.

You can confirm that Tivoli Storage FlashCopy Manager has failed over by looking for entries about the secondary server in the following log files:

- For Tivoli Storage FlashCopy Manager for Exchange, check the following files:
 - `Tivoli\tsm\TDPExchange\dsierror.log`
 - `Tivoli\tsm\baclient\dsmerror.log`
- For Tivoli Storage FlashCopy Manager for SQL, check the following files:
 - `Tivoli\tsm\TDPSQL\dsierror.log`
 - `Tivoli\tsm\baclient\dsmerror.log`
- For Tivoli Storage FlashCopy Manager file system and custom applications, check the following files:
 - `Tivoli\flashcopymanager\dsierror.log`
 - `Tivoli\tsm\baclient\dsmerror.log`

Requirements: To ensure that automated client failover can occur, Tivoli Storage FlashCopy Manager must meet the following requirements:

- Tivoli Storage FlashCopy Manager must be at the V4.1 level.
- The primary server, secondary server, and backup-archive client must be at the V7.1 level.
- The primary and secondary servers must be set up for node replication.
- The following nodes must be configured for replication with the `replstate=enabled` option in each node definition on the server:
 - Tivoli Storage FlashCopy Manager node
 - Backup-archive client node
 - Remote DSM agent node for offloaded backups
 - DAG node, if applicable
 - AlwaysOn node, if applicable

- Before the connection information for the secondary server can be sent to Tivoli Storage FlashCopy Manager, the following processes must occur:
 - You must back up data at least one time to the primary server.
 - The following nodes must be replicated at least one time to the secondary server:
 - Tivoli Storage FlashCopy Manager node
 - DAG node, if applicable
 - AlwaysOn node, if applicable

Restriction: The following restrictions apply to Tivoli Storage FlashCopy Manager during failover:

- Any operation that requires data to be stored on the Tivoli Storage Manager server, such as backup operations, are not available. You can use only data recovery functions, such as restore or query operations.
- Schedules are not replicated to the secondary server. Therefore, schedules are not run while the primary server is unavailable.
- If the primary server goes down before or during node replication, the most recent backup data is not successfully replicated to the secondary server. The replication status of the file space is not current. If you attempt to restore data in failover mode and the replication status is not current, the recovered data might not be usable. You must wait until the primary server comes back online before you can restore the data.
- For more information about the failover capabilities of Tivoli Storage Manager components, see <http://www.ibm.com/support/docview.wss?uid=swg21649484>.

For more information about automated client failover with the Tivoli Storage Manager backup-archive client, see *Automated client failover configuration and use* in the Tivoli Storage Manager information center (http://pic.dhe.ibm.com/infocenter/tsminfo/v7r1/topic/com.ibm.itsm.client.doc/c_cfg_autoclientfailover.html).

Chapter 2. Planning

Tivoli Storage FlashCopy Manager software can be installed, configured, and used on a local system or while running on a virtual machine. From one Tivoli Storage FlashCopy Manager installation you can manage all of the Tivoli Storage FlashCopy Manager installations in your enterprise.

Before you begin

To remotely manage systems, Microsoft Windows PowerShell Version 3.0 is required. The Windows PowerShell software must be installed and enabled on all Tivoli Storage FlashCopy Manager installations that you want to manage. For information about downloading, installing, and enabling Windows PowerShell, see the following Microsoft documentation. At the time of publication, the following website is available: <http://www.microsoft.com/en-us/download/details.aspx?id=34595> .

About this task

The additional planning information provided in this section describes the applications, devices, and Microsoft Volume Shadow Copy Service (VSS) guidelines for your Tivoli Storage FlashCopy Manager for Windows environment. Tivoli Storage FlashCopy Manager functionality, like hardware snapshot exploitation and VSS instant restore, depend on the VSS hardware provider support required for your configuration.

The Tivoli Storage FlashCopy Manager for Windows software does not control the VSS hardware provider. The VSS hardware provider is controlled by the hardware vendor. For more details about the VSS hardware provider that is required for your configuration, see the documentation provided by the hardware vendor.

Managing remotely

To manage remote Tivoli Storage FlashCopy Manager installations, enable Windows PowerShell Remoting.

About this task

Enabling Windows PowerShell Remoting is a task outside the scope of the Tivoli Storage FlashCopy Manager documentation. For reference, the following PowerShell cmdlets are provided.

- In most environments, to enable remote management for Tivoli Storage FlashCopy Manager installations, you can use the following cmdlet:
`Enable-PSRemoting -force`
- If you are using FlashCopy Manager for Microsoft Exchange Server, enable Windows PowerShell Remoting with Credential Security Support Provider (CredSSP) authentication. For example, you can use the following cmdlets:
 1. On the primary system, enter the following command:
`enable-wsmancredssp -role client -delegatecomputer remote_computername`
 2. On each remote system that runs Microsoft Exchange, enter the following command:

- ```
enable-wsmancredssp -role server
```
- Verify Windows PowerShell Remoting is configured correctly using the following cmdlets:
    - `invoke-command -computername remoteservername -scriptblock {pwd} -Credential $creds`
    - `invoke-command -computername remoteservername -scriptblock {pwd} -Credential $creds -Authentication Credssp`
  - Add the Tivoli Storage FlashCopy Manager servers to the trusted hosts list by entering the following command:
 

```
Set-Item WSMan:\localhost\Client\TrustedHosts -Value remote_server_name -Force
```
  - After you make configuration changes, restart the winrm service by entering the following commands:
 

```
Restart-Service winrm
```

To remotely manage Tivoli Storage FlashCopy Manager installations, complete the following steps to add remote systems:

## Procedure

1. In the navigation tree, select **IBM Tivoli Storage FlashCopy Manager**.
2. From the Management Console, in the Actions pane, click **Manage Computers**.
3. From the Manage Computers window, verify the local system is listed in both the Tree Nodes and Computers panes.
4. From the Tree Nodes pane, click the add icon. The icon is green and resembles the symbol for addition.
5. Type the name and description for the new tree node.
6. From the Computers pane, click the add icon. The computers you add are associated with the tree node that you are creating. If you add only one computer, the tree node type can be either **Dashboard** or **Group**. If you add more than one computer, the tree node type is **Group**. If you add only one computer, from the Tree Nodes pane, you can toggle between the **Dashboard** and **Group** types.
7. Type the system name and a description. For systems that are not in the domain, provide the fully-qualified address.

Alternatively, to select a system based on another system in the domain or to read a list of computers from a file, on the Computers pane, click **Import**. Clicking **Import** displays a dialog called Add Computers. From the Add Computers dialog, there are two tabs: **Active Directory** and **Import**. To complete the Add Computers dialog window entries, complete the following steps:

- a. For the **Active Directory** tab, there are several fields to complete:

### Domain

The current domain is displayed. The domain cannot be changed.

### Location

The organizational unit used to search for computers. The default value is displayed.

**Name** By default, the wildcard character (\*) is displayed. You can leave the default value or enter a specific name.

### Account

The current account is displayed. If you want to use a different

account, click **Search** to search the domain for other computers. The **Search** is enabled only when the **Location** and **Name** fields have values.

- b. For the **Import** tab, browse to find a comma-separated values (.CSV) file that contains computer entries. After you find a .CSV file and click **Import**, the contents of the .CSV file are read as entries are added to the list. The following .CSV file is an example of a valid .CSV file for the import activity:

```
NewNode1,Group1,CurrentUser,Test node 1
NewNode2
NewNode3,,Description of NewNode3
NewNode4,Group2,CurrentUser,Test node 4
```

The first column (the node name) is required. The other columns of data are optional. The list is processed by position. For the group, if a group does not exist, the group is created.

8. From the Computers pane, click **Test Connection**. The test status is reported in the **Message** column of the Computers table.
9. Click **OK** to close the Manage Computers window.
10. Verify the tree node is listed in the navigation tree. The remote node does not have all of the functionality available for local systems. For example, entries for learning, online support, and favorite links are not displayed.

For tree node type **Dashboard**, the main window displays the **Protect**, **Recover**, and **Automate** tabs. For tree node type **Group**, the main window displays the **Group Dashboard**, **Group Reports**, and **Group Commands** tabs.

## What to do next

After you add systems, you can remove (delete) the systems. You can also select the system to edit the properties, including tree node type, that you entered when you added the system. If you want to change the order of the systems displayed in the navigation tree, from the Manage Computers window there are GUI controls that you can use to change the order.

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## Capacity planning

The storage space that is required for Tivoli Storage FlashCopy Manager can be divided into several categories.

The storage space categories are identified in the following list:

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

## Product installation

The space that is required for the product installation of Tivoli Storage FlashCopy Manager depends on which components are installed. Space requirements also change because of maintenance updates and the addition of operating system, application, and other software currency support. For the most current requirements, review the Hardware and Software Requirements technote that is associated with the level of your Tivoli Storage FlashCopy Manager. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents*

website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. Follow the link to the requirements technote for your specific release or update level.

When planning for installation, depending on the data that you want to protect, the following components are required:

- The Tivoli Storage FlashCopy Manager Management Console (MMC) and the VSS Requestor are required. When you install the software by running the `setupfcm.exe` file, you install the MMC. The VSS Requestor is automatically installed for all installations.
- Tivoli Storage FlashCopy Manager for Exchange Server is required for the backup and restore of Exchange Server data.
- Tivoli Storage FlashCopy Manager for SQL Server is required for backup and restore of SQL Server data.

## **Tivoli Storage FlashCopy Manager metadata**

Tivoli Storage FlashCopy Manager uses disk space to store product data that is used to track and manage snapshots. The amount of space that is required is directly proportional to the number of snapshots that you maintain on the system. Ensure that there is at least 1 MB of available free disk space to hold the metadata for each snapshot that you plan to keep on the system.

### **Configuration with only Tivoli Storage FlashCopy Manager**

If you are protecting an Exchange Server, Tivoli Storage FlashCopy Manager keeps mailbox history information in the metadata to support individual mailbox restore (IMR) processing. The amount of space that is required for this activity is proportional to the number of mailboxes and log files in the entire organization. Ensure that for each user mailbox in your organization, at least 50 KB of disk space are available to hold the metadata.

### **Configuration with Tivoli Storage Manager and Tivoli Storage FlashCopy Manager**

If you are protecting an Exchange Server, Tivoli Storage FlashCopy Manager keeps mailbox history information that is stored on the Tivoli Storage Manager server. In this scenario, there are no disk space requirements for Tivoli Storage FlashCopy Manager.

## **Snapshot copies**

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

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

On SAN Volume Controller, DS8000, and Storwize V7000 storage devices, full snapshot copies require the same amount of space as the corresponding source volumes. Full snapshots are the standard type of FlashCopy. However, with the Windows System VSS provider, space-efficient copies on SAN Volume Controller and the XIV system initially require only sparse space for metadata. The space demand of the snapshot copies increases with every block that is changed on the corresponding source volume. 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 that is available for

the VSS provider that is being used.

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## VSS backup planning requirements

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

Consider the following requirements when you plan for VSS backups:

- Custom application and file system data VSS backups are only available for NTFS and ReFS volumes.
- Make sure to review optimal practice recommendations by Microsoft for your level of Exchange Server.
- Ensure that you have a well-defined and tested recovery plan that meets your service level objectives.
- Use single hardware LUNs for log and system files.
- Use single hardware LUNs for the database files.
- Use basic disks.
- If you plan to keep some VSS snapshot backups on local shadow volumes only, make sure to consider the VSS provider-specific implementation and configuration options when you set up your strategy. For example, if your VSS hardware provider supports a full-copy snapshot versus a copy-on-write (COW) snapshot mechanism, full-copy type implementations have greater disk storage requirements. However, full-copy type implementations 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 process 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.
- If you run parallel VSS backups, stagger the start of the backups by at least ten minutes. This interval ensures that the snapshot operations do not overlap. If you do not stagger the snapshots, errors can occur. In addition, configure the parallel instance backups so they do not take snapshots of the same volumes. Ensure that parallel backups do not make a snapshot of the same LUN.
- Do not place multiple volumes on the same LUN. Microsoft advises that you configure a single volume, single partition, and single LUN as 1 to 1 to 1. Do not set the `ASNODENAME` option in the `dsm.opt` file when you use Tivoli Storage FlashCopy Manager. Setting `ASNODENAME` can cause VSS backups and VSS restores to fail.

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## IBM System Storage requirements

Specific database, log, file, and LUN settings are required for IBM System Storage.

The DS8000, SAN Volume Controller, Storwize V7000, and XIV storage subsystems require these settings when you plan for VSS backups:

- Place database files on a separate and dedicated logical volume.
- Place logs on a separate logical volume.
- When you use hardware snapshot providers, make sure the database LUNs are dedicated to only one database or application.
- If you delete a LOCAL snapshot that is stored on a SAN Volume Controller or Storwize V7000 Space Efficient volume (SEV) that has multiple dependent targets, you must delete them in the same order in which you created them. 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.

- (SAN Volume Controller and Storwize V7000 only) If you use multiple target FlashCopy mappings, a mapping can stay in the copying state after all the source data is copied to the target. This situation can occur if mappings that were started earlier and use the same source disk are not yet fully copied. Because of this situation, initiate local backups for SAN Volume Controller and Storwize V7000 storage subsystems at intervals greater than the time required for the background copy process to complete.

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## Tivoli Storage FlashCopy Manager with SAN Volume Controller and Storwize V7000

Tivoli Storage FlashCopy Manager exploitation of SAN Volume Controller and Storwize V7000 FlashCopy capabilities on Windows are dependent on the Volume Shadow Copy Service (VSS) hardware provider for SAN Volume Controller and Storwize V7000.

Configuration of the VSS provider for SAN Volume Controller and Storwize V7000 controls what type of FlashCopy is run when a VSS snapshot is requested. It also controls the behavior that results when you use VSS snapshots.

The VSS provider that supports SAN Volume Controller and Storwize V7000 has the following characteristics:

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

In this scenario, deleting the VSS snapshot removes it from the VSS inventory, but the FlashCopy relationship remains with the SAN Volume Controller and Storwize V7000. A subsequent VSS snapshot of the same source volume results in an incremental refresh of the target volume.

- When the VSS provider is configured to use space-efficient target volumes - specifically, when the background copy rate is set to zero - the following is true:
  - The deletion of a VSS snapshot, that is represented by a target volume in a cascade, also causes all target volumes that are dependent on the volume that is being deleted (that is, the target volumes that were created earlier) to be deleted. For example, the deletion of a snapshot that is represented by target volume *T2* in the sample cascade *S -> T4 -> T3 -> T2 -> T1* causes *T2* and *T1* to be deleted. The cascade *S -> T4 -> T3* remains after the deletion.

When you manually delete backups on the SAN Volume Controller and Storwize V7000 space-efficient target volumes, and multiple backup versions exist, the backup that is being deleted, and any older backups that contain the same volumes are deleted. The deletion might not occur 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 that is being restored and to all newer targets in the cascade. For example, the restore of a snapshot that is represented by target volume *T3* in the sample cascade *S -> T4 -> T3 -> T2 -> T1* causes *T4* and *T3* to be deleted. The cascade *S -> T2 -> T1* remains after the restore.



One exception to this pattern is that a FlashCopy restore from an space-efficient target that is the only target in the cascade is not destructive.

- If an space-efficient target volume runs out of space to hold the data from changed blocks on the source volume, that target volume and all target volumes that are dependent on that target volume go offline and render those backup versions unusable.

A space-efficient backup version is defined by a FlashCopy to an space-efficient target volume that has a background copy rate of zero. The use of space-efficient target volumes with the autoexpand option that is enabled and a background copy rate set to greater than zero does not create space-efficient backup versions. The target volumes grow to the allocated size of the source volumes when the background copy completes.

Given these characteristics, the following requirements apply to Tivoli Storage FlashCopy Manager support of SAN Volume Controller and Storwize V7000:

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

A transition from fully allocated targets to space-efficient targets is accommodated by treating fully allocated targets as if they were space-efficient when the background copy rate is set to 0.

- When you use space-efficient backup versions:
  - Do not mix persistent and nonpersistent VSS snapshots. Use of a nonpersistent VSS snapshot that follows 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 it preserves local snapshot backup versions. The settings `backupdestination=LOCAL` and `backupdestination=TSM` are mutually exclusive. Do not use both in a backup strategy.

- Enable autoexpand for the space-efficient target volumes to avoid out-of-space conditions.
- Allocate enough space for space-efficient target volumes to hold 120 percent of the data that is expected to change on the source volume in the time between snapshots. For example, if a database changes at a rate of 20 percent per day, VSS backups are done every six hours, and a steady rate of change throughout the day is assumed, the expected change rate between snapshots is 5 percent of the source volume (20/4). Therefore, the allocated space for the space-efficient target volumes is to be 1.2 times 5 percent equal to 6 percent 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 that are based on the defined policy to ensure that deletion is done in the correct order. This process avoids deletion of more backup versions than expected.

## Instant restore

Tivoli Storage FlashCopy Manager supports VSS instant restore operations when multiple backup versions exist on SAN Volume Controller and Storwize V7000 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 for the VSS instant restore operation to complete successfully. The backups that included the deleted snapshots are deleted from storage. This destructive restore operation occurs only when VSS instant restore operations occur in an environment where Tivoli Storage FlashCopy Manager manages multiple backup versions on SAN Volume Controller and Storwize V7000 space-efficient target volumes.

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

## More guidelines for SAN Volume Controller and Storwize V7000 environments

There are additional guidelines you can use when protecting data in SAN Volume Controller and Storwize V7000 environments. For example, you can change the background copy rate to have the background copies complete more quickly.

The default background copy rate is 50. This value minimizes impact to response time for host system I/O, but it might not complete background copies as quickly as you want. Increasing the background copy rate that is 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 action can significantly lengthen response times to I/O from host systems.

You can review the following guidelines before you attempt backup operations:

- Determine whether to use space-efficient or fully allocated backup targets before you issue a backup operation. Provision enough target volumes in the SAN Volume Controller VSS\_FREE volume group for as many of the backup versions you require. If you use fully allocated target volumes, their capacity size must match the size of the source volumes.
- If space-efficient virtual disks (VDisks) are used for backup targets, set the IBM VSS provider background copy value to zero by issuing the `ibmvcfg set backgroundCopy 0` command. To activate the changes, restart the IBM VSS system service after you issue the command. For more details about configuring the IBM VSS Hardware Provider for space-efficient target volumes, make sure to read the appropriate VSS-related content in the SAN Volume Controller or Storwize V7000 documentation.
- Do not mix COPY and NOCOPY FlashCopy relationships from the same source volume or volumes.
- Do not mix fully allocated and space-efficient VDisks (used for backup targets) in the VSS\_FREE pool.
- If the protected data is on SAN Volume Controller or Storwize V7000 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.

- For FlashCopy Manager for Microsoft SQL Server, the Windows host must be attached to a SAN Volume Controller or Storwize V7000 cluster. The volumes that are assigned to the Windows host must be participating in the SAN Volume Controller or Storwize V7000 cluster.
- Make sure that IBM VSS hardware provider is installed. This provider must be configured to accommodate multiple backup versions on SAN Volume Controller or Storwize V7000 space-efficient target volumes.

These guidelines apply specifically to NOCOPY FlashCopy backups on SAN Volume Controller or Storwize V7000:

- 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 documentation for important information about these two issues:

- IBM VSS hardware provider prerequisites (for example, Microsoft VSS hotfixes).
- Configuration instructions for creating FlashCopy mappings of NOCOPY backups on SAN Volume Controller or Storwize V7000.

Space-efficient target volumes go offline when their capacity limit is exceeded. As a result, the current backup and all older backups (which are not reached FULL\_COPY status) are lost. To avoid this situation, use the AUTOEXPAND option when you create space-efficient targets. This option allocates more physical storage to prevent space-efficient target volumes that are going offline.

---

## Policy management

With Tivoli Storage FlashCopy Manager software you can configure and manage storage management policies for backups.

Policy definitions are only applicable when you use a stand-alone configuration. If Tivoli Storage FlashCopy Manager is configured to use the Tivoli Storage Manager server, the policy definitions are defined on the Tivoli Storage Manager server. VSS policy bindings are still managed locally.

Tivoli Storage FlashCopy Manager uses a policy to determine how backups are retained. With Tivoli Storage FlashCopy Manager, you can create, change, and view policies, and set binding policy 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 that there is enough available storage space that is 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 that is required is dependent on the VSS provider that is used.

## How backups expire based on policy

Backups expire based on Tivoli Storage FlashCopy Manager policy.

*Expiration* is the process by which SQL Server, Exchange Server, or custom application and file system backup objects are identified for deletion. Their expiration date is passed or the maximum number of backup versions that are to be retained is reached.

The data value depends on the business needs that are identified by the recovery point objective (RPO) and the recovery time objective (RTO) of your enterprise. For example, legal, operational, and application requirements affect how data must be protected to meet these RPO and RTO demands. With Tivoli Storage FlashCopy Manager you can specify the number of snapshot backups to retain and the length of time to retain them.

Backups can expire during the query, backup, or restore operation of a Tivoli Storage FlashCopy Manager session.

A number of backup copies are retained. When the maximum number of backup copies is reached, the oldest backup expires and is deleted. The maximum number of backup copies is specified in the Tivoli Storage FlashCopy Manager policy.

A backup copy is retained for a maximum number of days. The maximum number of days that a backup can be retained is specified in the Tivoli Storage FlashCopy Manager policy.

## Creating policy binding statements

Policy binding statements associate Microsoft SQL Server, Microsoft Exchange Server, and custom application and file system backups to a management policy.

### About this task

Specify policy binding statements to use for binding snapshots to a policy.

For SQL Server and Exchange Server backups, you can specify policy binding statements by using the Management Console 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. Policy binding is available in environments with or without a Tivoli Storage Manager server.

For Exchange Data Availability Groups (DAG), all the DAG members that share the DAG node must use the same VSS policy.

Use the same policy binding method for SQL Server, Exchange Server, or custom application and file system backups. Define a policy statement in the respective configuration file. A custom application or file system statement identifies the name of the volume or mount point directory (component) instead of the name of the database (object name).

For custom application and file system backups, policy binding statements are stored in the Tivoli Storage FlashCopy Manager configuration file. The default is `fcmcfg.xml` and must be modified only with the Management Console or the **FCMCLI UPDATE VSSPOLICY**, **FCMCLI INSERT VSSPOLICY**, or **FCMCLI DELETE VSSPOLICY** commands.

For custom application and file system data, the following sample command inserts a new VSS policy binding statement at the position that is specified by the **SEQnumber** parameter:

```
FCMCLI INSERT VSSPOLICY "* L:\mountdir FULL LOCAL MC1Q11" /SEQnumber=2
```

The following items in the quotation marks represent the policy definition:

- Server name = \*
- Component = L:\mountdir
- Backup type= FULL
- Backup destination = LOCAL
- Management class = MC1Q11

The following excerpt is from the appropriate Data Protection for SQL or Data Protection for Exchange configuration file:

|           | <i>server name</i> | <i>object name</i> | <i>backup type</i> | <i>backup dest</i> | <i>mgmt class</i> |
|-----------|--------------------|--------------------|--------------------|--------------------|-------------------|
| VSSPOLICY | *                  | "Accounting"       | FULL               | LOCAL              | MC_1              |
| VSSPOLICY | SERVER_3           | "Human Resources"  | INCR               | LOCAL              | MC_6              |

## Setting local backup policy

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

### Before you begin

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. The amount of space that is required is dependent on the VSS provider that is used.

When connected to a Tivoli Storage Manager server, the backup policy is defined by the server. When configured in stand-alone mode, you can define the backup policy.

### About this task

Follow these steps to create and manage your local backup policies. For information about how to create and manage policy with Tivoli Storage Manager, see the Tivoli Storage Manager documentation.

### Procedure

1. Start the Management Console.
2. In the tree view, click IBM Tivoli Storage Manager.
3. Select an **Exchange Server**, **SQL Server**, or **File System** instance.
4. In the **Action** pane, click **Properties**. The properties for the selected instance are displayed.
5. From the list of available property pages, select **Policy Management**. The existing local policies are displayed.
6. Add, delete, or update local policies for data retention. To edit a policy field, double-click. To specify no limit on the number of snapshots to keep or the

number of days to keep a snapshot, enter NL. When you add a policy, specify a unique policy name. If a unique policy name is not entered, the policy is not saved.

7. Click **Save**. After you add a policy, you can bind an object to that policy. Updates to existing, bound policies are saved, but do not take effect until the next backup is run.
8. Optional: Use the **VSS Policy Binding** property page to bind snapshots to new policies.
9. Optional: Verify new or updated policies and bindings.
  - a. Run one or more test backups.
  - b. On the **Recover** tab, verify the management classes that are bound to your test backups.

## Binding backups to a policy

A backup policy determines how backup versions are retained. You can add, update, delete, or change the processing order of existing binding statements.

### Procedure

1. From the Management Console, select an Exchange, SQL, or File System instance from the tree view.
2. On the **Protect** tab, click **Properties** in the Action pane.
3. From the list of available property pages, select **VSS Policy Binding**.
4. Add, update, delete, or change the processing order of existing binding statements. You can use a wildcard character (\*) to represent all characters. For example, in the **Server** field, enter the wildcard character (\*) to bind the policy to all Exchange servers, all SQL Servers, or all custom application and file system data.
5. Optional: To change the processing order, use **Move Up** and **Move Down**. VSS policies are processed from the bottom up and processing stops at the first match. To ensure that more specific statements are processed, the more general statements must be listed before the more specific statements. If the general statements are listed after the more specific statements, the more general specifications match the target before the more specific specifications are processed.
6. Save any new or changed binding statement.
7. Optional: Verify new or updated policies and bindings.
  - a. Run one or more test backups.
  - b. On the **Recover** tab, verify the management classes that are bound to your test backups.

## VSSPOLICY statements when changing backup types

When you change from legacy backups to VSS backups, pay attention to the VSSPOLICY statements that are set for the backup.

For VSS backups, VSSPOLICY statements are used to associate VSS backups with management classes. These VSSPOLICY statements are entered in the configuration file (for examples, `tdpexc.cfg` and `fcmcfg.xml`).

A configuration file can include multiple VSSPOLICY statements. The configuration file is read from the bottom up. If you are familiar with the Tivoli Storage Manager backup-archive client configuration file, the VSSPOLICY



statements in the `tdpexc.cfg` and `fcmlfg.xml` files are read like the `INCLUDE` statements that are configured in the `dsm.opt` file.

There are two conditions where the default management class for the policy domain is used. One condition is if there are no `VSSPOLICY` statements included in the configuration file. The other condition is if the `VSSPOLICY` statements do not match the type of backup that is set up. Backup expiration parameters for the default management class might differ from the settings that are used for preexisting legacy backups. For example, the backup expiration period might be set to 30 days. This setting means that after 30 days, the backup is deleted. Check the parameters to verify the backups expire according to the business needs of your environment.

Any policy changes that are entered in the `tdpexc.cfg` and `fcmlfg.xml` files require that you restart the Tivoli Storage Manager Client Acceptor Daemon (CAD), Tivoli Storage Manager Remote Client Agent (DSMAgent), and the Tivoli Storage Manager Scheduler Service for Exchange. If the DSMAgent service state is set to Manual (Started), stop the service. The DSMAgent service starts when a VSS backup is initiated. If the service is started and you change the policy settings, the policy settings do not take effect until you restart the service.

## Sample VSSPOLICY statements

The following code sample presents the syntax of a `VSSPOLICY` statement:

```
VSSPOLICY srv name db-name backup-type backup-dest mgmtclass
```

The Exchange server name is defined by the `srv name` variable. You can enter the wildcard character (\*) to match all Microsoft Exchange servers.

The database name is defined by the `db-name` variable. You can enter the wildcard character (\*) to match all Microsoft Exchange server groups. Because the name can include a space, use the quotation marks to encapsulate the database name.

The `backup-type` variable specifies the backup type. For example, specify `FULL`, `COPY`, or the wildcard character (\*) to match all backup types.

The `backup-dest` variable specifies the backup destination. The options are `TSM` to back up to Tivoli Storage Manager, `LOCAL` for a backup to a local disk, or the wildcard character (\*) to match both backup types.

The `mgmtclass` variable specifies the Tivoli Storage Manager management class that is used to bind the types of specified backups.

The following code sample presents an example of a `VSSPOLICY` statement. This code sample is part of the sample configuration file that is included with the software that you installed. In this example, the `VSSPOLICY` statement is commented out. To make the `VSSPOLICY` statement effective, uncomment the `VSSPOLICY` statement by removing the initial asterisk character (\*).

```

* Sample VSSPOLICY Statements
* -----
* These statements are used to bind VSS backup to specific TSM
* Server management classes. Adjust the statements to meet your
* needs and remove the leading asterisks to make them operational.
* Note: Matching of these policy bindings are from the bottom up.

* Server Database Name BU Type BU Dest. Mgmt Class
* -----
VSSPOLICY * * FULL TSM IUG_TSM
VSSPOLICY * * COPY TSM IUG_TSM_COPY
VSSPOLICY * * COPY LOCAL IUG_COPY
VSSPOLICY * * FULL LOCAL IUG_LOCAL
VSSPOLICY * "HR" FULL LOCAL MCLASS3
VSSPOLICY SERVER1 "ACT" * LOCAL MCLASS2
VSSPOLICY SERVER1 "SG 1" * TSM IUG1

```

In this example, the following policy rules are specified:

- Any VSS backups of the *DB 1* database on the Exchange server *SERVER1* to Tivoli Storage Manager are bound to the management class *IUG1*.
- Any VSS backups of the *ACT* database on the Exchange server *SERVER1* to *LOCAL* are bound to the management class *MCLASS2*.
- Full VSS backups of the *HR* database on any Exchange server to *LOCAL* are bound to the management class *MCLASS3*.
- Full VSS backups of any other database on any other Exchange server to *LOCAL* are bound to the management class *IUG\_LOCAL*.
- Copy VSS backups of any other database on any other Exchange server to *LOCAL* are bound to the management class *IUG\_COPY*.
- Copy VSS backups of any other database on any other Exchange server to Tivoli Storage Manager are bound to the management class *IUG\_TSM\_COPY*.
- Full VSS backups of any other database on any other Exchange server to Tivoli Storage Manager are bound to the management class *IUG\_TSM*.
- This policy is complete. Any type of backup matches a rule because of the wildcard VSSPOLICY statements at the top of the file. Use these types of statements so that you explicitly state what management class is used.

## Protection for Microsoft Exchange Server data

Tivoli Storage FlashCopy Manager helps protect and manage Exchange Server environments by facilitating the backup, restore of, and recovery of Exchange Server data.

Exchange Server 2010 and later provides Database Availability Groups (DAGs). A DAG consists of mailbox servers that provide recovery from database, server, or network failures. DAGs provide continuous replication and continuous mailbox availability.



## Backup strategies

Depending on your specific requirements that regard the 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 and backup considerations that are recommended by Microsoft. Refer to your Exchange Server documentation for this information.

See the following information about 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 databases of the Exchange Server.
- Do not mix incremental and differential backups.

## Replication backups on Exchange Server

Database Availability Groups (DAG) provide for enhanced data and service availability and automatic recovery from failures. 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.

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. With Tivoli Storage FlashCopy Manager software, you can complete the following tasks:

- Query DAG database copies, including status.
- Manage full, copy, incremental, and differential backups of active and passive databases within a DAG.
- Query all DAG database copy backups.
- Restore all DAG database copy backups.
- Restore into an active database, from either active or passive database copy backups.
- Restore into a recovery or alternate database.
- Individual Mailbox Restore (IMR) from a DAG database copy backup.
- Delete DAG database copy backups.

When you implement the Tivoli Storage FlashCopy Manager software to protect data that is stored by Exchange Server DAGs, refer to the following list of requirements:

- When you back up to **LOCAL**, the restore, delete, and automatic expire operations can be completed only on the Exchange Server where the backup was taken.
- Restores must be done on an active database copy.

## Database Availability Group backup best practices

Complete backups for replicated database copies from the same Exchange Server. Additionally, complete backups on the passive database copies. When you backup passive database copies, you do not increase the load on the production Exchange Server.

Use the following suggestions when you back up databases:

- Perform backups from a passive database copy to avoid increasing the load on the active databases.

- Schedule all DAG members with a copy of the database to back up the database at the same time. In addition, specify the `/MINIMUMBACKUPINTERVAL` parameter. When you specify this parameter, only one backup is taken per backup cycle.
- Optionally, use the `/EXCLUDENONDAGDBS` command-line backup option to exclude the databases that are not part of the DAG.
- Use the `/EXCLUDEDAGPASSIVE`, `/EXCLUDEDAGACTIVE`, or `/EXCLUDENONDAGDBS` command-line backup options to exclude certain databases from backup processing. You can also use the `/MINIMUMBACKUPINTERVAL` and `/PREFERDAGPASSIVE` backup options.
- When there are two or more healthy database copies, the integrity check can be skipped by using the `/SKIPINTEGRITYCHECK` flag.

## Database Availability Group restore best practices

Microsoft requires that you run 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. After the restore is complete, you can move the active database copy back to the passive state.

Use the following suggestions when you restore databases:

- Perform restores to the active database copy.
- For recovering DAG database backups to alternate Exchange servers, follow the specialized steps that are documented in “Restore VSS backups into other locations” on page 27.

## Microsoft Exchange Server 2013 support

When planning to restore Exchange Server 2013 mailboxes, there is a requirement for MAPI clients to use RPC over HTTPS (also known as Outlook Anywhere). With Exchange Server 2013, Microsoft does not support RPC over HTTP.

When planning to protect Microsoft Exchange Server 2013 data, use the following list to verify your environment is set up correctly:

- Use Exchange 2013 CU2 or later and the correct MAPI download. These software requirements are documented in the Hardware and Software Requirements technote. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.
- Verify that in the Exchange environment you can open the current administrator’s mailbox in Outlook or Outlook Web App.
- Verify that in the Exchange environment you can open the target mailbox in Outlook or Outlook Web App.
- (Optional) Use MFCMapi to verify your MAPI configuration. To complete this verification, a link to a Microsoft blog post is provided <http://blogs.msdn.com/b/dvespa/archive/2013/05/27/omniprof.aspx>. If MFCMapi cannot connect to Exchange, Tivoli Storage FlashCopy Manager cannot connect to Exchange either.

If your environment is configured correctly, mailbox restore works as with previous versions of Microsoft Exchange Server. If you experience problems, for troubleshooting information, see Chapter 7, “Troubleshooting,” on page 139.

## Preparing for VSS instant restores

VSS instant restores support restores of one or more databases from a VSS snapshot backup on local shadow volumes that are managed by Tivoli Storage FlashCopy Manager. Restore granularity is at the volume level.

### About this task

For a VSS instant restore, full and copy backup types can be restored. For SQL, custom application, and file system data, VSS instant restores can be run in a Microsoft Failover Clustering environment. Parallel VSS restore operations are not supported on Microsoft Windows Server.

### Procedure

1. Verify that the VSS requirement for either an IBM XIV Provider for Microsoft Windows Volume Shadow Copy Service or System Storage Support for Microsoft Volume Shadow Copy Service software is met.
2. Verify that the backups are on the same IBM Systems Storage SAN Volume Controller, DS8000, the XIV system, or IBM Storwize V7000 storage subsystem to which they are restored.
3. Verify that the data is going to be restored to the same drive letter and paths that are used during the original backup.
4. Close applications or windows that might have files or handles open on the volumes that are being restored.

## Restore VSS backups into other locations

You can restore an Exchange Server database backup or a DAG database backup into other locations.

An Exchange Server database backup or DAG active or passive database copy backup can be restored into a recovery database or into another database. You can also restore the database backup into a relocated database. This restore capability is known as a *restore into* scenario. Running any type of restore into function automatically disables VSS instant restore.

## Restoring an Exchange Server database

You can restore an Exchange Server database in the event of data loss or corruption.

### Before you begin

To complete a database restore, Tivoli Storage FlashCopy Manager must be operating in an account with membership in the Organization Management group.

### About this task

When you restore a database on Exchange Server, data that exists in the database is overwritten. The data is not available after restore processing is complete. Instant Restore processing overwrites all files on the destination file system.

For database backups in an Exchange Server Database Availability Group (DAG) configuration, because all database copies are backed up by using a single DAG

node, you can restore a database regardless of which DAG member the database is backed up from. Local backups must be restored on the node where the backup is completed.

Ensure that you are set up to use the DAG node name (DAGNODE). You can set up the DAG node name in the **DAG Node** field in the TSM Node Names page of the Tivoli Storage Manager configuration wizard. Alternatively, you can set up the node name in the **Back up DAG databases to common node** field in the General properties page for your Exchange workload.

In a stand-alone configuration, you cannot back up a database from one DAG member and restore it to a different DAG member. However, backups from the same node are still managed with the same policy, regardless of whether the database was active or passive at the time of the backup.

In a Tivoli Storage Manager configuration, backups of a database from one DAG member to local can be restored only to the system that created the backup. However, backups to Tivoli Storage Manager can be restored on any Exchange server in the DAG.

When you complete the following steps to restore Exchange Server data, one of the terms that is used is *restore into*. When you use the *restore into* options, you restore data to another target destination. The data is not restored to the original source destination.

## Procedure

To restore Exchange Server data, complete the following steps:

1. From the Management console, click **Recover Data** in the welcome page.
2. In the **Recover** tab for the Exchange instance, select **View: Database Restore**. Use the results pane to browse the databases available for restore. The following features are available:
  - Filter: Use the filter options to narrow the list of databases in the result pane.
    - a. Click **Show Filter Options** and **Add Row**.
    - b. Click the down arrow in the **Column Name** field and select an item to filter. You can filter by database **Name**, **Restore Into**, **From DB Copy**, **Backup Type**, **Backup Method**, **Backup Location**, **Backup Date**, **Size (in GB)**, **Instant Restore Supported**, **Management Class**, and **Server**.

For database backups in the Exchange Server Database Availability Group environment, the **Server** column displays the name of the Database Availability Group and the server that made the backup in this format:

```
DAGNAME\SERVERNAME
```

Where DAGNAME is the name of the Database Availability Group, and SERVERNAME is the name of the server (Database Availability Group member) that created the backup.

For example:

```
TSM DAG4\AVOCADO
```
- c. Select an operator in the **Operator** field.
- d. Specify a value to filter on in the **Value** field.
- e. In you want to filter on more items, click **Add Row**.

- f. Click **Apply Filter** to filter your databases.
- Backups: Select the database to restore. You can click **Active Backups** to show only active backups, or click **All Backups** to show both active and inactive backups.
- Search: Use the **Search** field to filter the databases.
- Refresh: Click **Refresh** to update the view with your changes.
 

If you applied a filter, the objects on the server that match the filter or search criteria are listed in the **Recover** tab. The status area indicates the number of items that match the criteria n of x displayed, where n equals the number of objects that match the filter criteria, and x is the number of objects that are retrieved from the server. For example, "5 of 20 displayed." If you specify refresh options to further narrow your results, and click **Refresh** again, the objects on the server that match the filtered and refresh options are displayed. Each time that you click **Refresh**, another query is run against the Tivoli Storage Manager server.
- 3. In the **Recover** tab for the Exchange instance, select one or more backups to restore. If the **AutoSelect** option is set to **True** in the Restore Options view, more backups necessary to restore the most recent backup are selected for you. If you do not want more selections that are made for you, set **AutoSelect** to **False**.
- 4. Verify the restore options. If the restore options are not displayed, click **Show Restore Options**.
- 5. (Optional) Choose a mode for the current task:
  - **Run Interactively**: Click this item to run the current task interactively. This selection is the default.
  - **Run Scheduled**: Click this item to convert the current action into a scheduled task. When you select this item, the schedule wizard begins, complete with the command that is required to complete the task.
- 6. Start the restore operation:
  - To restore the backup, right-click that backup name and select **Restore** or click **Restore** in the Action pane to begin the restore operation.
  - To restore the backup into another location, right-click and select **Restore Into** to specify a target location for the restore operation. A window opens for you to specify the database to restore into. Select the name of a database into which a VSS backup is restored. To restore into a recovery database (RDB) or alternate database, an RDB or alternate database must exist before you attempt the restore operation. Any type of **Restore Into** processing automatically disables VSS instant restore.

VSS instant restore is only available for full or copy type backups that are on the disk devices that support this type of restore. During the VSS instant restore operation, the drive or volume where the database is located must not be accessed by any other process or application.

---

## Planning protection for Microsoft SQL Server data

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

### Backup strategies

Different backup strategies are available depending on specific requirements that regard the backup window and acceptable restore times.

Read the following information about commonly used backup strategies, which are based on the backup type. Consult your Microsoft SQL Server documentation for more details on SQL Server backup strategy and planning.

#### Clustering

If you use Microsoft Failover Clustering or Veritas Cluster Server clustering for failover support, you must install Tivoli Storage FlashCopy Manager for SQL on each cluster node and configure it identically. More setup is required to complete the failover 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.

#### Other strategies

- Running many full backups can result in the SQL database log to become full. Subsequent backups fail if this situation occurs. Use basic SQL Server tools (if necessary) to truncate the log of your SQL databases.
- Running legacy log backups to a Tivoli Storage Manager server also truncates the SQL database log files.
- VSS Backups cannot be restored to an alternate SQL Server. This condition is a Microsoft SQL Server limitation.
- You cannot back up the **tempdb** database. It is a temporary database that is created each time the SQL Server is started.
- Regardless of the frequency of database backups, run **dbcc checkdb** and **dbcc checkcatalog** on a database before you back it up to verify the logical and physical consistency of the database. For more information about using the SQL Server database consistency checker, see your SQL Server documentation.

## Preparing for VSS instant restore

Before you begin a VSS instant restore operation, you must close any applications or windows that are open.

### About this task

VSS requires that data must always be restored to the same drive letters and paths as existed during the original backup. Backups must be on the same IBM Systems Storage SAN Volume Controller, DS8000, the XIV system, or IBM Storwize V7000 storage subsystem to which they are restored. VSS restore operations support restoring one or more databases from a VSS snapshot backup on local shadow volumes that are managed by Tivoli Storage FlashCopy Manager.

Microsoft hotfix KB 952790 is required when you run VSS instant restore operations in a Windows Server non-cluster environment.

For SQL, custom application, and file system data, restores can be run in a Microsoft Windows Failover Clustering environment. Parallel VSS restore operations are not supported on Microsoft Windows Server.

## Considerations for using Tivoli Storage FlashCopy Manager for SQL in a Windows Failover Cluster environment

Tivoli Storage FlashCopy Manager supports SQL Server 2012 running in a Windows Failover Cluster environment.

Consider the following information before you use Tivoli Storage FlashCopy Manager to protect SQL Server 2012 databases in a Windows Failover Cluster environment. References to the SQL Server pertain to the virtual SQL Server name in a Windows Failover Cluster environment.

Cluster setup considerations:

- A Windows Failover Cluster environment is required for AlwaysOn Availability Groups.
- A SQL Server instance must be installed on a node in a Windows Failover Cluster environment. The cluster node must be online.
- Each availability replica of an availability group must be on a different node in the same Windows Failover Cluster environment.

Installation and configuration considerations:

- Install Tivoli Storage FlashCopy Manager on all nodes from where you intend to run backup and restore operations.
- When you use shared disk clusters, install Tivoli Storage FlashCopy Manager on all nodes on a disk that is local to each node and not on a shared cluster disk.
- Use the configuration wizard to register an AlwaysOn Node on the Tivoli Storage Manager server. The AlwaysOn Node manages backups of availability databases. This node is a shared node that allows backups and restores of availability databases from any replica.
- Databases that are not in an availability group are backed up under the standard Tivoli Storage FlashCopy Manager node name. To migrate your database backups to the AlwaysOn node, an option is available for you to back up all databases to the AlwaysOn node.



- Use identical configurations in the Tivoli Storage FlashCopy Manager options file when you configure Tivoli Storage FlashCopy Manager on each node of the cluster.
- If you are using the Tivoli Storage Manager scheduler for automating backups, install the scheduler service on each node of the cluster to enable failover support.

Operational considerations:

- The Tivoli Storage Manager server treats backups as coming from a single SQL Server (the virtual server) regardless of which node of the cluster was backed up.
- When you run a VSS full backup on a secondary replica, the copy-only type of backup is used to take the snapshot.
- Legacy full backups of availability databases on secondary replicas are copy-only. The copy-only option is not automatically used with log backups because log backups that truncate logs are supported on secondary replicas.
- Because of a limitation with the SQL Server, you cannot restore a VSS backup to an alternate instance. VSS backups must be restored on the same SQL Server instance where the snapshot was taken.

## AlwaysOn Availability Groups

Microsoft SQL Server 2012 uses AlwaysOn Availability Groups to provide high availability and disaster recovery capabilities.

Tivoli Storage FlashCopy Manager protects availability databases in an AlwaysOn Availability Group and AlwaysOn Failover Cluster Instances. It provides high availability and disaster recovery at the SQL Server database level and SQL Server instance level.

### Backups of availability databases

Tivoli Storage FlashCopy Manager backs up and restores each availability database as a single object, regardless of which availability replica is used for backup and restore operations.

An AlwaysOn Availability Group can contain a set of primary databases and one to four copies of the set of primary databases, called secondary databases. Databases in an availability group are called availability databases, and they fail over together as a group.

An AlwaysOn Availability Group requires SQL Server instances on Windows Failover Cluster nodes. An availability group can have a number of replicas. For example, availability group *1* might have replicas *node1*, *node2*, and *node3*.

A cluster node might be an availability replica for one or more availability groups. For example, *node1* might be a replica for availability group *1* and another availability group. For the secondary replica, *read-only* is an option that can be set at the availability group level.

The AlwaysOn Node is used to manage backups of availability databases. When you work in a Tivoli Storage Manager environment, the AlwaysOn Node is to be common in a Windows Failover Cluster. This presence enables the management of backups of an availability database in a single location, regardless of the replica that is used to perform the backup.



The following types of VSS backup operations are supported:

- Full VSS backups of the primary availability replica
- VSS copy-only full backups of availability replicas

For all backup operations of secondary availability replicas, the secondary replicas must be in the synchronized or synchronizing state.

To assist with scheduling and load balancing, scheduled backup preference settings of availability groups are also available.

### **Restores of availability databases**

Depending on how availability databases are backed up, legacy restore and VSS restore operations are available to restore the availability databases on primary or secondary availability replicas.

There are some restrictions with restoring availability databases:

#### **Legacy restore**

You can restore an availability database on either a primary or secondary replica.

During the restore process, the restored database is removed from the availability group. When a database is removed from the availability group, the database becomes a local database on that replica. The database is restored as a local database. After this restore is complete, manually add the database back to the availability group. However, before you add the database to the availability group, verify that the data on all replicas is transactionally consistent.

To verify data is transactionally consistent, verify that the backup copy contains data and transaction log records. Full backups and differential backups contain data and transaction log records so that the restored database is transactionally consistent.

After you verify that the data is transactionally consistent, the database can be added to the availability group.

#### **VSS restore**

Because of a SQL Server limitation, you cannot restore a VSS backup to an alternative SQL server instance. Therefore, VSS backups must be restored to the same SQL server instance where the snapshot was taken.

## **Deployment of Tivoli Storage FlashCopy Manager for SQL on Windows Server Core**

If you are protecting Microsoft SQL Server 2012 and later databases, you can install and use Tivoli Storage FlashCopy Manager on Windows Server 2008 R2 Server Core SP1 and later.

Server Core is a minimal and low-maintenance server environment where you can run the minimum services necessary to maintain Windows Server 2008 and later. You can install and operate Tivoli Storage FlashCopy Manager in this minimal server environment.

Because of the minimal environment, unless you use the Tivoli Storage FlashCopy Manager remote management support, only the command-line interface is available for Tivoli Storage FlashCopy Manager on Windows Server Core. Also, if you use Windows Installer (MSI) to install Tivoli Storage FlashCopy Manager, only

the unattended mode is supported.

---

## Planning protection for custom application and file system data

Tivoli Storage FlashCopy Manager helps to protect and to manage environments by facilitating the backup, restore, and recovery of custom application and file system data.

### About this task

When a Tivoli Storage FlashCopy Manager local backup operation begins, the first step initiates the reconciliation process. The copies of the snapshot that are valid for expiration, and local snapshots that have been deleted are reconciled.

From the Tivoli Storage Manager server database, the value of VSS data container `VSSDC_xx` is identified. The mapping to target storage volume is identified in the `adsm.sys` folder. The default location for this folder is the installation path used by the Tivoli Storage Manager backup-archive client.

After a successful reconciliation, the metadata that is stored on the Tivoli Storage Manager server is deleted, the target storage volume is reused for the new snapshot, and the `TargetSetsState` file is updated with the current mapping.

In the `x:\adsm.sys\vss_staging` directory, the `LSM_REP_LOG_VOL_SNAP` and `.TsmFmDatabases` subfolders are vital to operations correctly completing and Tivoli Storage FlashCopy Manager has no mechanism to rebuild them. Do not manually delete these folders.

As a best practice, regularly back up these folders. If the folders become damaged and unusable, restore the latest copy. When the `TargetSetsState` has a mapping entry, the reconciliation process can detect the inconsistency between `TargetSetsState` and metadata that is stored on the Tivoli Storage Manager server, and synchronize. For example, if there is an orphan `VSSDC_xx` value in the Tivoli Storage Manager server and the value does not exist in `TargetSetsState`, reconciliation deletes the orphan metadata from the Tivoli Storage Manager server.

## Enhanced support in an environment with Tivoli Storage Manager server

Tivoli Storage FlashCopy Manager functions vary based on the custom application and file system data is installed in your environment.

Tivoli Storage FlashCopy Manager provides VSS Backup capability for data that is on Windows file systems. This function gives you the ability to manage persistent snapshots of the volumes on your system. In addition, Tivoli Storage Manager integration for custom application and file system support provides the following capabilities:

- VSS snapshots of file systems can be done when the backup destination set to TSM and BOTH. (The BOTH option includes TSM and LOCAL.) For backups with backup destination TSM or BOTH, a VSS snapshot is created of the drive letter or mount point that is selected. The backup is sent to the Tivoli Storage Manager server as an image-level backup of the VSS snapshot.
- Offloaded backups with backup destination TSM or BOTH from a secondary system to Tivoli Storage Manager server storage pools.

- Enhanced final backup summary statistics from the command-line interface and Management Console (MMC) graphical user interface with information about client-side deduplication, compression, encryption, and other options.
- Enhanced query output from the command-line interface and MMC graphical user interface with information about client-side deduplication, compression, and encryption usage.
- Unified view of available file system backup version on both a local snapshot and when data is stored on a Tivoli Storage Manager server.
- Restore backups that are sent to Tivoli Storage Manager server pools at a file system, drive level. The restore is an image restore.
- Restore backups that are sent to Tivoli Storage Manager server to an alternate location, different local drive letter, or mount point, and restore to an alternate server.

The VSS backups are managed as backup versions by Tivoli Storage FlashCopy Manager management policies. VSS backups remain available for VSS Instant Restore or VSS Fast Restore operations. When Tivoli Storage Manager server is available in the environment, optionally use the Tivoli Storage Manager backup-archive client to create file-level backups of your file system or custom application data in the Tivoli Storage Manager storage pools.

To import VSS snapshots only when needed, verify that the VSS provider supports transportable snapshots. To use the command-line interface for the mount command with remote options, verify that the VSS provider supports transportable snapshots and configure Windows PowerShell Remoting.

## Configuration parameters for Tivoli Storage Manager

After Tivoli Storage FlashCopy Manager for Windows is registered to Tivoli Storage Manager, several parameters must be configured. o

You can use the configuration wizard to set the parameters. Before you start the wizard, work with the Tivoli Storage Manager administrator to identify the node name, password, and the communications method with the appropriate parameters to connect to the Tivoli Storage Manager server. If you use the configuration wizard, when you complete the wizard, you can start a backup and restore of the data. If you do not want to use the wizard, you can manually configure the software.

The configuration parameters are stored in an options file located, by default, in the installation directory. The default options file name is `dsm.opt`. Edit the `dsm.opt` file by using a text editor. When you set configuration parameters for Tivoli Storage Manager, make sure that the Tivoli Storage FlashCopy Manager options file (`dsm.opt`) and the backup-archive client options file (also `dsm.opt`) specify the same Tivoli Storage Manager server.

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

### **NODename**

The Tivoli Storage Manager node name is the unique name by which Tivoli Storage Manager recognizes the system that is running Tivoli Storage FlashCopy Manager.

### **COMMethod**

This option specifies the communication protocol to use between the Tivoli Storage FlashCopy Manager node with the Tivoli Storage Manager server.

Tivoli Storage FlashCopy Manager supports the same set of communication protocols that are supported by other Tivoli Storage Manager clients on Windows operating systems. Depending on the chosen **COMMethod** the connectivity parameters for that **COMMethod** must be specified as well.

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

#### **PASSWORDAccess**

When you use this option, there are two settings: *generate* and *prompt*. The default value is *generate*. After you complete the configuration wizard, you can edit the `dsm.opt` to change the setting to *prompt*.

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

#### **TCPServeraddress**

When you complete the configuration wizard, the value that you enter for the TCP server address is used as the setting for this option.

#### **TCPPort**

When you complete the configuration wizard, the value that you enter for TCP port is used as the setting for this option.

#### **HTTPport**

After you complete the configuration, edit the `dsm.opt` file to specify the HTTP port. The default value is *1581*.

#### **CLUSTERnode**

When you use this option, there are two settings: *yes* and *no*. To run the software in a cluster-aware mode, in the DSMAGENT options files, the **CLUSTERnode** option must be set to *no*. This *no* setting must be present even in a clustered environment. For the Tivoli Storage FlashCopy Manager options file, this option can be set to *yes*. For more information about configuring in clustered environments, see “Configure clustered environments” on page 65.

The following options are not required and are only applicable for VSS backups sent to the Tivoli Storage Manager server. You can use these options to turn on features for data that is sent to the Tivoli Storage Manager server. When you use these options, you must update the backup-archive client options file that is used as the Local DSMAGENT Node and the Remote DSMAGENT Node.

#### **DEDUPLICATION**

Client-side data deduplication is used by the Tivoli Storage Manager API to remove redundant data during backup and archive processing before the data is transferred to the Tivoli Storage Manager server. Specify whether the Tivoli Storage Manager API deduplicates data before you send it to the Tivoli Storage Manager server. You can specify *Yes* or *No*. The default value is *No*. The value of the deduplication option for Tivoli Storage FlashCopy Manager applies only if the Tivoli Storage Manager administrator allows client-side data deduplication.

When both deduplication and **ENABLELANFree** options are specified, the deduplication option is ignored. A warning is also sent to the log file.

You can turn on client-side data deduplication by adding **DEDUPLICATION YES** to the `dsm.opt` file and by making sure that the deduplication prerequisites are met.

#### **ENABLELANFree**

If you are equipped to run in a LAN-free environment, this option allows Tivoli Storage FlashCopy Manager to run in a LAN-free environment. To perform a LAN-free file system VSS backup to Tivoli Storage Manager server with Tivoli Storage FlashCopy Manager, specify **ENABLELANFree yes** in the DSMAGENT (VSS requestor) options file.

#### **ENABLECLIENTENCRYPTKEY**

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

For VSS backups, specify the encryption options in the backup-archive client options file that is used as the Local DSMAGENT Node. If the environment is configured for VSS offloaded backups, you must also specify the encryption options in the backup-archive client options file that is used as the Remote DSMAGENT Node. Review the encryption information available in the client documentation before you attempt to encrypt your databases.

#### **COMPRESSIon**

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

- CPU usage is higher on the system where Tivoli Storage FlashCopy Manager software is running.
- Network bandwidth usage is lower because fewer bytes are sent.
- Storage usage on the Tivoli Storage Manager server is reduced.

You might want to specify **COMPRESSIon yes** if any of the following conditions exist:

- The network adapter has a data overload.
- Communications between Tivoli Storage FlashCopy Manager and Tivoli Storage Manager server are over a low-bandwidth connection.
- There is heavy network traffic.

It might be better to specify **COMPRESSIon no** in the following cases:

- The system that runs Tivoli Storage FlashCopy Manager has a CPU overload; the added CPU usage can impact other applications that include the server. You can monitor CPU and network resource usage by using the Performance Monitor program included with Windows.

- You are not constrained by network bandwidth; in this case, you can achieve the best performance by leaving **COMPRESSION** *no* and enabling hardware compaction on the tape drive, which also reduces storage requirements.

The Tivoli Storage Manager administrator can override the compression option setting for the Tivoli Storage FlashCopy Manager node. The node must be registered or updated by specifying, on the Tivoli Storage Manager server side, that a particular node:

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

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

If you are running Tivoli Storage FlashCopy Manager on a Microsoft Windows Failover Clustering or Veritas Cluster Server, the options files on each cluster node must be identical. You can create extra Tivoli Storage FlashCopy Manager options files to point to other Tivoli Storage Manager servers. You might also want to create more than one, each with different parameters, to use with a single Tivoli Storage Manager server.

### Scripts for automated processing

To prepare custom application and file systems for volume-level snapshots, preprocessing (**PRESNAPSHOTCMD**) and postprocessing (**POSTSNAPSHOTCMD**) scripts can be used.

Use these scripts to prepare and resume the application before and after snapshot creation. If specified, these scripts run when they process a backup operation. For example, you can use the **PRESNAPSHOTCMD** script to quiesce an application and the **POSTSNAPSHOTCMD** to resume it.

## Custom application and file system backup scenarios

Backup scenarios are dependent on your specific requirements that regard backup window and the location of your custom application and file system data.

### Creating a VSS snapshot backup

These steps outline the tasks that are required to back up custom application and file system data to local shadow volumes:

1. If you are backing up an application, stop (or suspend) the custom application and file system. You can do this task automatically by specifying the **/presnapshotcmd** parameter with the **fcml backup** command. Or, in the Tivoli Storage FlashCopy Manager GUI, use the PreSnapshotCmd option in the Protect window.
2. Create the backup by specifying the **fcml backup** command. Or, in the Tivoli Storage FlashCopy Manager user interface, click **Full Backup to Local** option in the Action window.



VSS snapshot backups can also be sent to the Tivoli Storage Manager server storage pools by specifying **BackupDestination TSM**, or **BOTH** from either the command-line interface (with the **fccli backup** command) or Tivoli Storage FlashCopy Manager user interface. The VSS snapshot data is sent to the Tivoli Storage Manager server as an image-level backup.

3. If you are backing up an application, restart or resume the application. You can do this task automatically by specifying the **/postsnapshotcmd** parameter with the **fccli backup** command. Or, in the Tivoli Storage FlashCopy Manager graphical user interface, use the **PostSnapshotCmd** option in the **Protect** window.

## Creating a file-level backup to the Tivoli Storage Manager server

These steps outline the tasks that are required to create a file-level backup:

1. Create a VSS snapshot backup.
2. Mount the VSS snapshot backup.
3. Create a file-level backup to the Tivoli Storage Manager server by issuing a Tivoli Storage Manager backup-archive client command. Use the incremental, selective, or archive command with the **snapshotroot** option. The **snapshotroot** option does not provide any facilities to take a volume snapshot, only to manage data that is created by a volume snapshot.
4. Unmount the VSS snapshot backup.

## Custom application and file system restore scenarios

Restore scenarios are dependent on your specific requirements that regard acceptable restore times and the location of your custom application and file system data.

### Restoring the entire volume from a snapshot

These steps outline the tasks that are required to restore custom application and file system data from local shadow volumes:

1. Stop or suspend the custom application. For a file system, close any open handles to that file system.
2. Restore from a VSS backup by specifying the **fccli restore** command with the **/INSTANTRestore=yes** parameter (VSS instant restore) or **/instantrestore=no** parameter (VSS fast restore). Or, in the Tivoli Storage FlashCopy Manager GUI, select the VSS backup in the **Recover** window and click **Restore** in the **Action** window (VSS fast restore). For a VSS instant restore, select the **InstantRestore** option in the **Restore Options** pane and then click **Restore**.
3. Complete any actions that are required to achieve a correct state of the custom application and file system files.
4. If necessary, restart or resume the custom application.

### Restoring individual files from a snapshot

These steps outline the tasks that are required to restore individual files from a custom application and file system data VSS backup on local shadow volumes:

1. Mount the VSS backup.
2. If necessary, stop or suspend the custom application.
3. Issue the Windows **COPY** or **XCOPY** command or use a tool, for example, Windows Explorer, to copy the files from the VSS backup to your preferred location.

4. If necessary, complete any actions that are required to achieve a correct state of the custom application.
5. If necessary, restart or resume the custom application.
6. Unmount the VSS backup.

## Restoring individual files from the Tivoli Storage Manager server

The following steps outline the tasks that are required to restore individual files from a custom application and file system data VSS backup on Tivoli Storage Manager storage.

1. If necessary, stop or suspend the custom application.
2. From the Tivoli Storage Manager server, issue a Tivoli Storage Manager backup-archive client restore command to restore specific files to the Tivoli Storage Manager server.
3. If necessary, restart or resume the custom application.

## Restoring the entire volume from VSS image sent to Tivoli Storage Manager server pools

To restore custom application and file system data that is sent from Tivoli Storage FlashCopy Manager to Tivoli Storage Manager server pools when the **/BACKUPDESTination** parameter is set to either TSM or BOTH options, complete the following steps. The data is sent as an image backup of the VSS snapshot data during backup operations. The restore is a volume-level restore.

1. Stop or suspend the custom application. For a file system, close open handles to the file system.
2. Restore from a VSS backup that is sent to Tivoli Storage Manager by entering the **fmcli restore** command with the **/BACKUPDESTination=TSM** parameter. Alternatively, from the Tivoli Storage Manager graphical user interface, go to the Recover window. Select the VSS backup. The **Backup Location** column indicates that the VSS backup is from the Tivoli Storage Manager. From the Actions area, click **Restore**.

When you restore a VSS backup from a Tivoli Storage Manager server, regardless of the **INSTANTRESTORE** parameter setting, the restore operation completes with a volume-level restore.

An image-level backup cannot be restored to the volume where the Tivoli Storage Manager backup-archive client is running. To work around this issue, install the Tivoli Storage Manager backup-archive client on the system drive. The same type of failure can occur if an application database, for example, a SQL database, is created under the volume that is trying to be restored.

Microsoft VSS technology requires the file system to be of type NTFS or ReFS. FAT, FAT32, and RAW file systems are not supported.

File system and custom application VSS restores from Tivoli Storage Manager server are volume image-level restores. This type of restore might result in any shadow copies created with a system provider for the volume that is being restored to become invalid and deleted. This issue occurs when the shadow storage for the volume sits within the volume. During the volume image-level restore, this shadow storage data is overwritten and the shadow copies are invalidated. A workaround for this issue is to allocate the shadow storage on a different volume. For example, use the **vssadmin** tool, by using the **Add ShadowStorage** command:



```
vssadmin Add ShadowStorage /For=D: /On=F: /MaxSize=your size
```

## Restoring VSS backups into other locations

You can restore custom application and file system data from a VSS backup into an alternate volume. This restore capability is known as a *restore into* scenario. When the backup is stored in the Tivoli Storage Manager server, the restore into option is available. When the backup is stored on only the local disk, the restore into option is not available. When you use the restore into option, the alternate location size must be the same size as the source volume.

## Archiving the backup to tape with third-party software

You can mount, unmount, and query backup from remote systems. In addition, you can give a user the ability to view, recover, and allow third-party software to access files from the backup. To complete these tasks, the Tivoli Storage FlashCopy Manager command-line interface is used to mount the VSS snapshots to servers. When you allow third-party software to archive the backup to tape, the following scenario can be used:

1. *Server A* has a Microsoft Exchange database and Tivoli Storage FlashCopy Manager installed. Tivoli Storage FlashCopy Manager is running on *Server A* to perform regular backups.
2. *Server B* has Tivoli Storage FlashCopy Manager installed, along with a third-party tape archive utility. Using the mount command with remote options, *Server B* can be directed to remotely mount the backups that are created by *Server A*. The third-party tape archive utility archives the backups to tape.



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## Chapter 3. Installing and upgrading

Tivoli Storage FlashCopy Manager wizards guide you through the installation, upgrade, and configuration of Tivoli Storage FlashCopy Manager. After you complete the setup and configuration wizards, your system is ready to back up and restore data.

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

### **Setup wizard**

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

### **Standalone configuration wizard**

Use this wizard to configure Tivoli Storage FlashCopy Manager to manage snapshot backups as a standalone computer.

### **Tivoli Storage Manager configuration wizard**

Use this wizard to configure Tivoli Storage FlashCopy Manager in an environment that is integrated with Tivoli Storage Manager. This integration provides data protection and centrally managed, policy-based administration.

### **Mailbox restore only configuration wizard**

Use this wizard to configure Tivoli Storage FlashCopy Manager to restore mailboxes from mounted EDB files. Extra data protection features are not available. This configuration is ideal when you have a specific task to complete and do not want the additional Tivoli Storage FlashCopy Manager software functions.

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## Prerequisites for Tivoli Storage FlashCopy Manager for Windows

The installation and configuration wizards automatically verify many of the prerequisites as part of the wizard verification process. However, some prerequisites cannot be automatically verified.

The host bus adapter (HBA) or multipath I/O (MPIO) software that is required for your VSS provider are examples of prerequisites that cannot be automatically verified. As a result, ensure that your system meets the minimum hardware, software, and operating system requirements before you install Tivoli Storage FlashCopy Manager.

For the most current requirements, review the Hardware and Software Requirements technote that is associated with the level of your Tivoli Storage FlashCopy Manager. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

### **Virtualization environment**

Information about using virtualization environments by Tivoli Storage FlashCopy Manager is documented at <http://www.ibm.com/support/docview.wss?uid=swg21433737>.

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## Installing Tivoli Storage FlashCopy Manager for Windows

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

### Before you begin

Before you begin, verify that your environment meets the hardware and software prerequisites. For the most current requirements, review the Hardware and Software Requirements technote that is associated with the level of your Tivoli Storage FlashCopy Manager. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

### Procedure

Complete the following steps to install Tivoli Storage FlashCopy Manager:

1. Log on with administrator credentials and complete the following steps:
  - a. Insert the Tivoli Storage FlashCopy Manager product DVD into the DVD drive. If autorun is enabled, the installation dialog starts automatically. Otherwise, select **Start > Run**, and specify: `x:\setupfcm.exe` where *x* is your DVD drive. Click **OK**.
  - b. Follow the installation instructions.
  - c. Click **Finish** to complete the installation of Tivoli Storage FlashCopy Manager.
2. Configure Tivoli Storage FlashCopy Manager by using the configuration wizard.
  - a. Start the Management Console. Click **Start > All Programs > Tivoli Storage FlashCopy Manager > FlashCopy Manager Management Console**. When you start the Management Console, a welcome page is displayed. If Tivoli Storage FlashCopy Manager is not configured, the configuration wizard starts.
  - b. If the configuration wizard does not start automatically, go to **IBM Tivoli Storage Manager > Dashboard > Manage > Configuration > Wizards** in the tree view, and select one of the following wizards:
    - Standalone configuration wizard
    - Tivoli Storage Manager configuration wizard
    - Mailbox restore only configuration wizardClick **Start** in the Actions pane.
  - c. In the configuration wizard, select the applications to protect, verify requirements, provision, and configure.
3. After you complete the configuration wizard, verify that everything is properly configured by selecting each workload instance in the tree view and completing the following steps:
  - a. Click the **Automate** tab.
  - b. Click **Open** in the toolbar.
  - c. Type `verify`. The following three file names are listed.
    - `verify_sql.txt`
    - `verify_exc.txt`
    - `verify_fs.txt`

The `verify_fs.txt` file is used with the Management Console (MMC) graphical user interface and is part of the base product installation.

- d. Select and open the file that matches the workload.
- e. Click **Run** in the toolbar.

When the commands run with no warnings or errors, the configuration is verified.

The `verify_sql.txt` file contains the following commands:

```
query tdp
query tsm
query sql
```

The `verify_exc.txt` file contains the following commands:

```
query tdp
query tsm
query exchange
```

The `verify_fs.txt` file contains the following commands:

```
query component
query config
```

4. Back up and restore a set of test data. Refine your configuration settings as necessary.
5. Define the policy settings and scheduled operations.

---

## Installing Tivoli Storage FlashCopy Manager by using the silent installation method

You can use a silent installation to install Tivoli Storage FlashCopy Manager without any user interaction.

### Before you begin

Before you begin, verify that your environment meets the hardware and software prerequisites.

For the current requirements, review the Hardware and Software Requirements technote that is associated with the level of your Tivoli Storage FlashCopy Manager. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. Follow the link to the requirements technote for your specific release or update level.

### Procedure

1. Go 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\4100\enu
```

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

```
setupfcm.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"
```

This setup command must be issued by using a single line of text.

**Requirement:** Setting the `rebootyesno` option to `No` applies only to the installation of the Tivoli Storage FlashCopy Manager software. The installation package includes a number of prerequisites that is installed by Tivoli Storage FlashCopy Manager. Ensure that all the prerequisites are installed before you start the silent installation, then set the `rebootyesno` option to `No` so that no system restart is required after the silent installation process finishes.

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## Installing software for more languages

When run in an environment other than English, the Tivoli Storage FlashCopy Manager setup program (`setupfcm.exe`) automatically starts the corresponding language pack setup program. The component provisioning steps in the stand-alone and Tivoli Storage Manager configuration wizards also install language packs automatically for the components that are based on the language for which the system is configured.

### About this task

To enable the software for more languages, go to the language folder of each component on the Tivoli Storage FlashCopy Manager media and run the setup program.

### Procedure

- To install another language for FlashCopy Manager MMC Snap-in and Base System Services, run the following command:
  - (64 bit): `fcm\x64\mmc\4100\{chs|cht|deu|enu|esp|fra|ita|jpn|kor|ptb}\setup.exe`
  - (32 bit): `fcm\x86\mmc\4100\{chs|cht|deu|enu|esp|fra|ita|jpn|kor|ptb}\setup.exe`
- To install another language for Tivoli Storage FlashCopy Manager for Exchange, run the following command:
  - `fcm\x64\exc\7100\{chs|cht|deu|enu|esp|fra|ita|jpn|kor|ptb}\setup.exe`
- To install another language for Tivoli Storage FlashCopy Manager for SQL, run the following command:
  - (64 bit): `fcm\x64\sql\7100\{chs|cht|deu|enu|esp|fra|ita|jpn|kor|ptb}\setup.exe`
  - (32 bit): `fcm\x86\sql\6400\{chs|cht|deu|enu|esp|fra|ita|jpn|kor|ptb}\setup.exe`
- To install another language for the Tivoli Storage FlashCopy Manager VSS Requestor, run the following command:
  - (64 bit): `fcm\x64\vss\7100\{chs|cht|deu|enu|esp|fra|ita|jpn|kor|ptb}\setup.exe`
  - (32 bit): `fcm\x86\vss\7100\{chs|cht|deu|enu|esp|fra|ita|jpn|kor|ptb}\setup.exe`

### Example

For example, install the French language pack for the FlashCopy Manager MMC Snap-in and Base System Services on 64-bit Windows. Issue the following command (where the media is mounted on the D drive):

```
d:\fcm\x64\mmc\4100\fra\setup.exe
```

Rerun the preceding command for each installed Tivoli Storage FlashCopy Manager component. The path segment that contains numbers is version information that changes over time. For example, the FlashCopy Manager MMC Snap-in and Base System Services version is listed as 4100. This value changes to match the component version that is delivered in each Tivoli Storage FlashCopy Manager release.

---

## Installing Tivoli Storage FlashCopy Manager for SQL on Windows Server Core

If you are protecting Microsoft SQL Server 2012 and later service packs data in a Windows Server Core environment, you can use the setup wizard to install Tivoli Storage FlashCopy Manager for SQL.

### Before you begin

Before you begin, verify that your environment meets the hardware and software prerequisites.

For the most current requirements, review the Hardware and Software Requirements technote that is associated with the level of your Tivoli Storage FlashCopy Manager for SQL. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

### Procedure

Follow these instructions to install Tivoli Storage FlashCopy Manager for SQL on Windows Server Core from a DVD:

1. Log on as an administrator.
2. Install Tivoli Storage FlashCopy Manager for SQL by using the setup wizard.
  - a. Insert the Tivoli Storage FlashCopy Manager for SQL product DVD into your DVD drive.

If autorun is enabled, the installation dialog starts automatically when the DVD loads. Otherwise, select **Start > Run**, and at the prompt, specify: `x:\setup.exe`, where `x:` is your DVD drive, and click **OK**.
  - b. Follow the installation instructions that are displayed on the screen.
  - c. Click **Finish** to complete the installation. If prompted, restart your system.

### What to do next

You are ready to configure Tivoli Storage FlashCopy Manager for SQL.

You can also do an unattended installation of Tivoli Storage FlashCopy Manager for SQL on Windows Server Core.

---

## Installing Tivoli Storage FlashCopy Manager for SQL silently on Windows Server Core

If you are protecting Microsoft SQL Server 2012 or later data in a Windows Server Core environment, you can use silent installation methods to install Tivoli Storage FlashCopy Manager.

### About this task

You can use either the setup program or the Windows installer (MSI) program for the unattended installation of Tivoli Storage FlashCopy Manager.

## Installing Tivoli Storage FlashCopy Manager for SQL silently on Windows Server Core with the setup program

If you are protecting Microsoft SQL Server 2012 data on Windows Server Core, you can use the **setup** program (setup.exe) to silently install Tivoli Storage FlashCopy Manager for SQL.

### Before you begin

The Tivoli Storage FlashCopy Manager for SQL setup program is on the installation media (where x: is your DVD drive):

- (32-bit) x:\fcm\x86\mmc\4100\enu\setup.exe
- (64-bit) x:\fcm\x64\mmc\4100\enu\setup.exe

Tivoli Storage FlashCopy Manager for SQL must be installed from an account that is a member of the local Administrators group for the system on which the SQL server is running.

The following command is an example that specifies the target directory, the features, language transform, start suppression, and logging. Specify the command on a single line from a Run as Administrator command prompt window.

```
x:\fcm\x64\mmc\4100\enu\setup.exe /s /v"INSTALLDIR="C:\Program Files\Tivoli\
ADDLOCAL="Client" TRANSFORM=1033.mst REBOOT=ReallySuppress /qn /l*v
"C:\Program Files\Tivoli\FlashCopyManager\logs\fcm.log"
```

The following list identifies a few additional facts to remember when completing this installation process:

- You must place a backslash (\) before each quotation mark that is within an outer set of quotation marks (").
- For a single-line command, press **Enter** only when all the parameters are entered.
- You must place quotation marks (") around the following text:
  - A directory path that contains spaces.
  - An argument that specifies multiple features. Although you must use quotation marks around the complete argument, you must still place a backslash before each internal quotation mark.
- All features that are listed in a custom installation must be listed after the **addlocal** option.
- Setting the **rebootyesno** option to *No* applies only to the installation of the Tivoli Storage FlashCopy Manager for SQL software. The installation package includes a number of prerequisites that are installed by Tivoli Storage FlashCopy Manager for SQL. Ensure that all the prerequisites are installed before you start



the silent installation, then set the **rebootyesno** option to *No* so that no system restart is required after the silent installation process finishes.

**Tip:** For the most current requirements, review the Hardware and Software Requirements technote that is associated with the level of your Tivoli Storage FlashCopy Manager for SQL program. This technote is available in the *TSM for Databases - All Requirements Documents* website, at <http://www.ibm.com/support/docview.wss?uid=swg21218747>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

## What to do next

You are ready to configure Tivoli Storage FlashCopy Manager for SQL.

## Installing Tivoli Storage FlashCopy Manager for SQL silently on Windows Server Core with MSI

If you are protecting Microsoft SQL Server 2012 data on Windows Server Core, use the Windows Installer (MSI) program, `msiexec.exe`, to silently install Tivoli Storage FlashCopy Manager.

### Before you begin

Tivoli Storage FlashCopy Manager must be installed from an account that is a member of the local Administrators group for the system on which the SQL server is running.

**Important:** Unlike `setup.exe`, the `msiexec.exe` program does not install any prerequisites. When you use `msiexec.exe`, you must install all prerequisites manually.

For the most current requirements, review the Hardware and Software Requirements technote that is associated with the level of your Tivoli Storage FlashCopy Manager. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

### About this task

The following example shows how to use **msiexec** to install the Tivoli Storage FlashCopy Manager. Enter the **msiexec** command on a single line from a Run as Administrator command prompt window.

```
msiexec /i "x:\fcm\aaa\mmc\3200\enu\IBM Tivoli Storage FlashCopy Manager.msi"
RebootYesNo="No" Reboot="ReallySuppress" ALLUSERS=1
INSTALLDIR="c:\program files\tivoli" ADDLOCAL="Client"
TRANSFORMS="x:\fcm\aaa\mmc\3200\enu\1033.mst" /qn /!v "c:\temp\log_fcm.log"
```

Where *x*: is your DVD drive, and *aaa* is either x86 or x64.

## What to do next

### Important:

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

- An argument that specifies multiple features. Although you must use quotation marks around the complete argument, you must still place a backslash before each internal quotation mark.
- All features that are listed in a custom installation must be specified after the **addlocal** option.

You are ready to configure Tivoli Storage FlashCopy Manager.

---

## Upgrading

You can upgrade from a previous version of the software.

### About this task

Upgrading the software is a three-step process:

#### Procedure

1. Download the updates.
2. To install the updates, run `setupfcm.exe`.
3. Start the Management Console by clicking **Start > All Programs > Tivoli FlashCopy Manager > FlashCopy Manager Management Console**. When you start the Management Console after you install the updates, the configuration wizard automatically starts. The configuration wizard guides you through the process of provisioning and installing the remaining files.

Depending on the software licenses found on the system, the configuration process varies. The wizard provides instructions to guide you through the process.

If the configuration wizard does not start automatically, click **IBM Tivoli Storage Manager** in the tree view, and click **Configuration**. Then, double-click **Wizards**.

### What to do next

After you upgrade Tivoli Storage FlashCopy Manager, local backups that are created with an earlier version of the software must be restored, mounted, and unmounted. To accomplish this action, use the upgraded version of the software. If an older version of the software is used, errors occur.

## Migration considerations

Migration from earlier versions of Tivoli Storage FlashCopy Manager is supported.

After you upgrade and configure from the older version of Tivoli Storage FlashCopy Manager to the newer version, use VSS restore for local VSS backups that were originally created with the older version of the software. .

If you used a previous version of Tivoli Storage FlashCopy Manager in a Microsoft clustering environment and you upgrade to a newer version of Tivoli Storage FlashCopy Manager, any existing backups that are completed on cluster disks do not count toward the maximum number of versions. New backups for clustered disks that are completed with the newer version of Tivoli Storage FlashCopy Manager are managed logically for the cluster. Except for the active backup, older backups eventually expire. When you no longer must retain the active backup, the active backup must be deleted by using the **delete backup** command. The existing backups are restorable.

## Migration considerations for backups to a DAG node

If you are migrating from a version earlier than Tivoli Storage FlashCopy Manager V3.2, when you configure Tivoli Storage FlashCopy Manager to back up databases in an Exchange Server Database Availability Group (DAG) to a common DAG node, all DAG databases are backed up with the new DAG node name, and no longer with the previous Data Protection node name.

After migration, the first backup must be a full backup. To be successful, understand how to manage the backups from previous versions of Tivoli Storage FlashCopy Manager.

Do not mix backups that were created with previous versions of Tivoli Storage FlashCopy Manager with new backups that are created by using the DAG node. To separate the backups, keep the previous backups under the previous Data Protection node name that is defined in the `dsm.opt` file in the `C:\Program Files\Tivoli\tsm\TDPEXchange` directory, and use a new DAG node name to store the new backups. If you want to view or restore one of the backups that is stored under the previous node name, you must change the Tivoli Storage FlashCopy Manager configuration. Over time, when the old backups are no longer useful, manually delete them.

To view and restore backups that are stored under the previous Data Protection node name:

1. Remove the **DAG Node** by using the General properties page, configuration wizard, or the **set** command on the command-line interface.
2. Restart or refresh the Management Console or command-line interface.
3. Click the **Recover** tab in the Management Console, or run a `tdpexcc query tsm *` command. Since the **DAG Node** parameter is not set, Tivoli Storage FlashCopy Manager lists the backups that are stored under the Tivoli Storage FlashCopy Manager node.
4. Proceed to restore one or more of the listed backups.

To manually delete old backups that are stored under the previous Data Protection node name:

1. Remove the **DAG Node** by using the General properties page, configuration wizard, or the **set** command on the command-line interface.
2. Restart or refresh the Management Console or command-line interface.
3. Click the **Recover** tab in the Management Console, or run a `tdpexcc query tsm *` command. Since the **DAG Node** parameter is not set, Tivoli Storage FlashCopy Manager lists the backups that are stored under the Tivoli Storage FlashCopy Manager node.
4. Delete the backups that are expired.

## Improving mailbox history handling

To improve performance, mailbox history includes only the mailboxes from databases that are backed up.

### About this task

If you back up mailbox history with a version of Tivoli Storage FlashCopy Manager earlier than version 4.1, you can manually delete the old mailbox history. FlashCopy Manager for Microsoft Exchange Server backs up a new set of mailbox history data.

With the new mailbox history data, you can experience better performance when backing up mailbox history. It is also easier to find the mailbox when you restore a mailbox. And, when you retrieve mailbox history, the mailbox names can be displayed in multiple languages.

Deleting the old mailbox history is not required and mailbox history cannot be deleted in a stand-alone configuration. If you delete the old mailbox history data, you lose the location history information for the deleted and moved mailboxes in the backup copies created by earlier versions of FlashCopy Manager for Microsoft Exchange Server. When you restore deleted or moved mailboxes from the old backup copies, you have to specify the **/MAILBOXORIGLOCATION** parameter. After the old backup copies expire, mailbox history works without needing to specify the **/MAILBOXORIGLOCATION** parameter.

If you delete old mailbox history data, save a backup copy before completing the deletion task. You can use the backup copy when you need location information for the deleted and moved mailboxes.

If you delete the old mailbox history, the command you use is a delete filespace command. If you do not enter the command correctly, all previous backups, including backups of Exchange 2010 data, may be deleted.

### Procedure

1. Enter the following command to save the mailbox history to a file:

```
tdpexcc q tsm /showmailboxinfo > E:\MyMailboxHistory.txt
```

Keep this file for reference. If you need to restore a mailbox from the old backup copies, and the mailbox location changes before the time of deleting mailbox history, use the **/MAILBOXORIGLOCATION** parameter to restore the mailbox.

2. Complete the following steps to delete the old mailbox history information from the Tivoli Storage Manager server.
  - a. Launch Tivoli Storage Manager command-line administrative interface, `dsmadm.exe`.
  - b. Log on to the Tivoli Storage Manager server.
  - c. Enter the following command to query the filespace name:

```
Query Filespace node_name file_space_name
```

The format of the filespace name for mailbox history is `DomainName\MAILBOXINFO`. For example, the following command queries the filespace for the mailbox history for the `CXCLAB_EXC` node. The `node_name` is the **DAGNODE** name, or the Exchange node name when the **DAGNODE** is not being used.

```
tsm: FCM>QUERY FILESPACE CXCLAB_EXC *MAILBOXINFO
```

The following results are displayed:

| Node Name  | Filespace Name             | FSID | Platform     | Filespace Type | Is Filespace Unicode? | Capacity | Pct Util |
|------------|----------------------------|------|--------------|----------------|-----------------------|----------|----------|
| CXCLAB_EXC | cxcserver.-com\MAILBOXINFO | 52   | TDP MSE-xchg | API:ExcData    | No                    | 0 KB     | 0.0      |

3. Enter the following command to delete the filesystem for the old mailbox history:

```
DELEte Filespace node_name file_space_name\MAILBOXINFO
```

For example, the following command deletes the filesystem for the mailbox history for the *CXCLAB\_EXC* node:

```
tsm: FCM>DELETE FILESPACE CXCLAB_EXC cxcserver.com\MAILBOXINFO
```

## Transitioning standard SQL databases to the AlwaysOn node

You can specify the **/USEALWAYSONnode** parameter with the **backup** command to back up standard SQL databases to the file space for the AlwaysOn node. This transition can make it easier for you to manage all your database backups under a single node name.

### About this task

If you want to regularly back up standard SQL databases to the file space for the AlwaysOn node, you can use the **set** command.

The AlwaysOn node name is required when you configure Tivoli Storage FlashCopy Manager in a SQL Server 2012 environment. It is not necessary to specify the AlwaysOn node name during each backup, query, or restore operation of an availability database.

The AlwaysOn node does not affect where standard databases are backed up. The standard databases continue to be backed up to the Tivoli Storage FlashCopy Manager node unless the **/USEALWAYSONnode** option is specified.

For example, issue the following command to back up your standard SQL databases to the file space for the AlwaysOn node:

```
TDPSQLC Backup *|dbname[,dbname,...] Full /USEALWAYSONnode
```

You can use the wildcard character (\*) to back up all databases, or specify a list of database names that are separated by commas.

For example:

```
TDPSQLC Backup standard_db01,standard_db02 Full /USEALWAYSONnode
```

---

## Uninstalling Tivoli Storage FlashCopy Manager

When you install Tivoli Storage FlashCopy Manager, a number of components are saved to your system. These components can be removed by using the Windows **Add or Remove Programs** or **Programs and Features** in the Windows control panel. Any files, registry keys, or Windows services that are created by Tivoli Storage FlashCopy Manager that remain must be removed manually.

### Before you begin

You must be logged in to a Windows account with administrator privileges to complete this task.

### About this task

Use the following steps to completely remove Tivoli Storage FlashCopy Manager from a computer. After this procedure is done, all Tivoli Storage FlashCopy Manager data is removed. Adjust the path in the example as needed for your environment.

### Procedure

1. Copy any files that you want to keep from the `c:\Program Files\Tivoli` directory and its subdirectories to a different directory. For example, you might have configuration files that you want to save.
2. Delete any Tivoli Storage FlashCopy Manager scheduled tasks:
  - a. Select the **Scheduling** node in the Tivoli Storage FlashCopy Manager tree view.
  - b. Select each scheduled task that is listed in the Schedules section of the results pane and click **Delete**.
3. Stop any Tivoli Storage FlashCopy Manager components that are running.
4. Delete any existing Tivoli Storage FlashCopy Manager snapshots by issuing the **DELETE BACKUP** command.
5. Enter the following commands. You can use the command `dsmcutil list` to display any additionally installed Tivoli Storage FlashCopy Manager services. This procedure assumes a default Tivoli Storage FlashCopy Manager configuration.
  - 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 Remote Client Agent"`  
  
**Important:** Remove the TSM Remote Client Agent before you remove the TSM Client Acceptor, or the TSM Client Acceptor cannot be removed.
  - c. `dsmcutil remove /name:"TSM Client Acceptor"`
6. From the **Control Panel** window, open **Add or Remove Programs** or **Programs and Features**.
7. 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
8. Find the files and remove them from the file system. Run the following commands:
- `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`



9. Enter the following command:  
`reg query hklm\software\ibm`

A list of registry keys are displayed. For example:

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

10. Enter the following commands from a Run as Administrator command prompt window.
- Enter this command if you want to completely remove the Tivoli Storage Manager backup-archive client from your system: `reg delete HKLM\SOFTWARE\IBM\ADSM` You can uninstall Tivoli Storage FlashCopy Manager, but continue to use Tivoli Storage Manager backup-archive client.
  - `reg delete HKLM\SOFTWARE\IBM\FLASHCOPYMANAGER`
11. Before you enter the following commands, verify that these two required conditions exist:
- The entries `HKEY_LOCAL_MACHINE\software\ibm\GSK7` and `HKEY_LOCAL_MACHINE\software\ibm\GSK8` were included in the command output that is shown in Step 9.
  - No other applications are using IBM GSKIT.
- If either of the preceding conditions exist, enter the following commands:
- `reg delete HKLM\software\ibm\GSK7`
  - `reg delete HKLM\software\ibm\GSK8`
12. Remove any Tivoli Storage FlashCopy Manager user configuration files by using the following command. Repeat the command for any user accounts that are configured with Tivoli Storage FlashCopy Manager:
- Change to the following directory:  
`cd %userprofile%\appdata\local\microsoft_corporation`  
Add quotation marks around the directory name if the name contains any spaces. For example: `cd /d "%userprofile%\appdata\local\microsoft_corporation"`
  - Enter this command:  
`dir _fmux*`
  - Remove each folder that begins with `_fmux`. Make sure to enclose the folder name in quotation marks ("). For example:  
`rd /s "_FmUx,_Version=4.1.0.0,_C_Path_rusomschqavk3w2upyovnjy1331z5qn3"`

## Results

Tivoli Storage FlashCopy Manager is uninstalled.

---

## Chapter 4. Configuring

The following list identifies the ways to configure Tivoli Storage FlashCopy Manager software by using a configuration wizard.

### About this task

#### Standalone Configuration

When you select the Standalone Configuration option, you configure Tivoli Storage FlashCopy Manager to manage snapshots locally, without using a Tivoli Storage Manager server. For stand-alone support, backups are stored locally on the server that is running the backup. The VSS backup is created by using Microsoft Volume Shadow Copy Service. The VSS backup produces an online snapshot (point-in-time consistent copy) of Exchange, SQL, or custom application and file system data.

#### TSM Configuration

When you select the TSM Configuration configuration option, you configure Tivoli Storage FlashCopy Manager to work with Tivoli Storage Manager. Backups can be stored either locally or on the Tivoli Storage Manager server. The Tivoli Storage FlashCopy Manager software protects and manages Exchange, SQL, or custom application and file system data by using a Tivoli Storage Manager server. With Tivoli Storage Manager, you can also offload your backups to another computer and to move the data to the Tivoli Storage Manager server.

#### Mailbox Restore Only

When you select the Mailbox Restore Only configuration option, you configure Tivoli Storage FlashCopy Manager to restore mailboxes from Exchange database .EDB files. Extra data protection features are not available. This option is ideal when you only want to restore mailboxes from .EDB files and do not want the additional Tivoli Storage FlashCopy Manager software functions. The functions that are offered with this configuration option are included in the other configuration options.

---

## Configuring for the Standalone Configuration option

The configuration wizard guides you through configuring Tivoli Storage FlashCopy Manager to provide stand-alone snapshot support.

### Procedure

To configure Tivoli Storage FlashCopy Manager with the Standalone Configuration Wizard, complete the following steps:

1. Start the Management Console. Click **Start > All Programs > Tivoli Storage FlashCopy Manager > FlashCopy Manager Management Console**.

If the Management Console is not configured according to the licenses that are identified, a welcome page is displayed. You can select the type of configuration to complete.

2. From the start page, click **Configuration**. Alternatively, from the tree view, navigate to the **Configuration** node. Then, double-click **Wizards**.
3. In the results pane, double-click to select **Standalone Configuration**.

4. Follow the instructions that are provided on the wizard pages to configure stand-alone snapshot support.
  - a. Select the applications that you want to protect. You can select the **SQL Server**, **Exchange Server**, or **File System** workload.
  - b. To view information about the computer, operating system, processor, and physical memory, click **Show System Information**.
  - c. Review the information in the Requirements Check page. If there are any error or warning messages, resolve the issues. Click **Next** to continue.
  - d. Select the **Default** configuration setting.
 

If you need more than one instance of the Client Acceptor and Remote Agent services, or if you use the backup-archive client to back up to the Tivoli Storage Manager server, but Tivoli Storage FlashCopy Manager is in a stand-alone configuration, click **Custom**. You can use the **Custom** setting to choose a node name for the Client Acceptor and Remote Agent services, an options file, service names, and the HTTP port. Tivoli Storage FlashCopy Manager does not interfere with the existing client operations. If the backup-archive client is not installed and configured to protect the file system, the **Default** setting is easier to use.

When you select **Custom**, more fields are displayed to change the client service configuration. Review the information in the fields and, if necessary, change settings.

    - **VSS Requestor node name:** Enter the node name that communicates with the VSS Service to access the Exchange, SQL, or custom application and file system data. The VSS Requestor node name is also the node name that the Remote Client Agent service uses to communicate with Tivoli Storage FlashCopy Manager.
    - **VSS Requestor options file name:** Enter the name of the client options file for the VSS Requestor node.
    - **Client Acceptor service name:** Specify the name of the service that is used by Tivoli Storage Manager backup-archive client to communicate with Tivoli Storage FlashCopy Manager. By default, this service is named the **TSM Client Acceptor**.
    - **Remote Client Agent service name:** Specify the name of the service that communicates with Windows VSS to run the VSS operations. By default, this service is named the **TSM Remote Client Agent**.
    - **HTTP Port:** Specify the HTTP port to use for the Client Acceptor service. You can also delete an existing service by selecting a service in the **Currently installed client services** list and clicking **Remove**. Removal of a service happens instantly. The removal occurs when you click **Remove**.
  - e. Click **Show Details** to view a list of individual configuration results.
5. Click **Finish** to complete the wizard.
6. Optional: After you complete the configuration process with the wizard to test VSS snapshots on the system, click **Run VSS diagnostics when this wizard exits**.
7. To verify that Tivoli Storage FlashCopy Manager is correctly configured, select a workload in the **Protect and Recover Data** node in the tree view. From the **Automate** view, you can issue commands. Use the selection tool to choose to enter either CLI commands or PowerShell cmdlets. For example, the following CLI commands can be used:
  - For file systems and custom applications:
 

```
fccli query component
fccli query config
```

- For SQL Server:
  - tdpsqlc query tdp
  - tdpsqlc query fcm
  - tdpsqlc query sql
- For Exchange Server:
  - tdpexcc query tdp
  - tdpexcc query fcm
  - tdpexcc query exchange

You can also view the configuration settings by clicking **Properties** for each configured workload.

## Results

After you complete the configuration wizard, you can use Tivoli Storage FlashCopy Manager to back up and restore data.

## Configuring a remote system with a Standalone Configuration

You can use a configuration wizard to configure a remote system to work in a stand-alone environment.

### Before you begin

On the local system, verify the following prerequisites are met:

- Windows 2008 or later, or Windows 7, Windows 8 or later (64 bit).
- PowerShell version 3.0.
- Tivoli Storage FlashCopy Manager version 4.1 or later.

On the remote system, verify the following prerequisites are met:

- Windows Server 2008.
- Windows PowerShell version 3.0.
- Tivoli Storage FlashCopy Manager version 4.1 or later.

For the most current requirements, review the Hardware and Software Requirements technote. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

### Procedure

To configure a remote system with a Standalone Configuration, complete the following steps:

1. On the local system, from the Management Console, add the remote system using Manage Computers.
2. In the navigation tree, verify that the remote system is displayed.
3. Click **Manage > Configuration > Wizards**.
4. Select **Standalone Configuration**.
5. On the Data Protection Selection page, verify the following information is entered correctly:
  - The remote computer name in the window title.
  - The correct system information.
6. Select the application to be configured and click **Next**.

7. On the Requirements Check page, click **Show Details**. Verify the progress and status of the configuration.
8. On the Custom Configuration page, select **Default**.
9. On the Configuration page, click **Show Details**. Verify the progress and status of the configuration.
10. Click **Finish** to complete the wizard.

## What to do next

To verify the configuration is set up correctly, complete the following steps:

1. In the navigation tree, for the remote system, expand **Protect and Recover** and click on the application that is configured.
2. Query the components and verify that a successful backup can be completed.

---

## Configuring for the TSM Configuration option

Configure Tivoli Storage FlashCopy Manager to protect and manage application data by using a Tivoli Storage Manager server.

### About this task

The following configuration instructions apply to the following environments:

- Data Protection for SQL Server, if the required license is located
- Data Protection for Exchange, if the required license is located
- File system and custom applications

### Procedure

To configure Tivoli Storage FlashCopy Manager with the Tivoli Storage Manager configuration wizard, complete the following steps:

1. Start the Management Console. Click **Start > All Programs > Tivoli FlashCopy Manager > FlashCopy Manager Management Console**.  
If the Management Console is not configured according to the licenses that are identified, a welcome page is displayed. You can select the type of configuration to complete.
2. From the start page, click **Configuration**. Alternatively, from the tree view, navigate to the **Configuration** node. Then, double-click **Wizards**.
3. In the results pane, double-click **TSM Configuration** to open the Tivoli Storage Manager Configuration Wizard.
4. Follow the instructions on the pages of the wizard and click **Next** to move to the next page.
  - a. In the Data Protection Selection page, select the applications that you want to protect. Click **Next**.
  - b. Review the results of the requirements check and ensure that you address any errors or warnings.  
Click **Show Details** to view a list of individual requirement results. If you are configuring an application for which you do not have the necessary license, the license requirement check fails. You must either go back to the Data Protection Selection page and clear the selected application to proceed with the configuration, or obtain the necessary license.

- c. In the TSM Node Names page, specify the Tivoli Storage Manager node names that exist on the same system to use for the applications that you want to protect.
- In the **VSS Requestor** field, enter the node name that communicates with the VSS service to access the Exchange, SQL, or custom application and file system data.
  - In the **Data Protection for SQL** field, enter the node name where the Data Protection application is installed. This is the node name that is used to store the Data Protection for SQL Server backups.
  - If you are configuring Tivoli Storage FlashCopy Manager for SQL Server 2012, enter a node name in the **AlwaysOn Node** field. This is the node name that is used to back up the availability databases in an AlwaysOn Availability Group. By default, the Windows Failover Cluster name is used.
  - In the **Data Protection for Exchange** field, enter the node name where the Data Protection application is installed. This is the node name that is used to store the Data Protection for Exchange backups. If you configure the **DAG Node** on this wizard page, Exchange Server DAG database backups are not stored under the Data Protection for Exchange node. They are stored under the DAG node.
  - In the **DAG Node** field, enter the node name that you want to use to back up databases in an Exchange Server DAG. With this setting, backups from all DAG members that are configured to use the DAG node are backed up to a common file space on the Tivoli Storage Manager server. The database copies are managed as a single entity, regardless of which DAG member they were backed up from. This setting can prevent Tivoli Storage FlashCopy Manager from making too many backups of the same database.
- Ensure that you configure all of your DAG members that have copies of the same database to all use the same DAG node. On the Tivoli Storage Manager server, ensure that you register the DAG node name. All of the DAG member nodes (the Data Protection nodes) must be granted *proxynode* authority to run backups on behalf of the DAG node. All of the DSM Agent nodes (the backup-archive client nodes) must also be granted *proxynode* authority. If you do not want to manually update these properties, you can use the configuration wizard to set the properties on the Tivoli Storage Manager server.
- In the **Files System and Custom Configuration** field, enter the node name that you want to use to back up custom application and file system data.
- Create a node name that can help you distinguish the type of backup that is run. For example, if your host name is *MALTA*, you can name the VSS requestor node name *MALTA*, and you can create a Data Protection node name that is called *MALTA\_EXC*. For an SQL configuration, the AlwaysOn node name does not have to be related to the VSS Requestor or the Data Protection for SQL Server node name. For example, you can name it *TSM\_ALWAYSON*. For an Exchange configuration, the DAG node name does not have to be related to the VSS Requestor or the node name. For example, you can name it *TSMDAG*.
- d. Enter information for the Tivoli Storage Manager server that you are connecting to and click **Next** to continue.
- In the **Tivoli Storage Manager Server Address** field, enter the TCP/IP domain name or a numeric IP address for the Tivoli Storage Manager



server that contains the backups. Obtain this information from your Tivoli Storage Manager server administrator.

- In the **Tivoli Storage Manager Server Port** field, enter the port number for the Tivoli Storage Manager server that contains the backups. Obtain this information from your Tivoli Storage Manager administrator.
- Specify whether to have the wizard to configure the Tivoli Storage Manager server for you by generating a configuration macro file.

If you click **No**, the macro file is available at the final page of the wizard so that it can be provided to the Tivoli Storage Manager administrator as an example of one way to configure the Tivoli Storage Manager server to support application data protection.

If you click **Yes**, the wizard starts the macro during the Configuration step in the wizard. Review the macro file and update it if needed.

After you click **Yes**, enter the following information in the appropriate field:

- The name of the Tivoli Storage Manager administrator account.
  - The password for the Tivoli Storage Manager administrator.
  - Click **Test Communications** if you want to test your connection with the Tivoli Storage Manager server. This button is not available until the VSS requestor is installed.
  - Click **Review/Edit** to review or update the Tivoli Storage Manager macro file. Alternatively, you can review the macro file and directly run the commands on the Tivoli Storage Manager server.
- e. Select the **Default** configuration setting. When you select the **Default** configuration setting, in addition to configuring the applications that you selected, the VSS Requestor is configured. The client and agent services are also registered and configured, and a schedule to support historical managed capacity is defined.
- f. Review the results of the configuration process. Click **Show Details** to view a list of individual configuration results.
5. Click **Finish** in the Completion page to complete the wizard.
6. Optional: For a VSS configuration, verify that the **Run VSS diagnostics when this wizard exits** option is selected. When this option is selected, after you complete the wizard, a diagnostic process tests the VSS snapshots on your system.

**Attention:** If the configuration is for space-efficient target volumes for SVC or Storwize V7000, testing VSS snapshots deletes previous backups that are created for the volumes that are selected in the test wizard.

7. Verify that Tivoli Storage FlashCopy Manager is correctly configured. Select a workload in the **Protect and Recover Data** node in the tree view and issue one of the following commands in the **Automate** view.
- For file systems and custom applications:  
fccli query component  
fccli query config
  - For SQL Server:  
tdpsqlc query tdp  
tdpsqlc query tsm  
tdpsqlc query sql
  - For Exchange Server:  
tdpexcc query tdp  
tdpexcc query tsm  
tdpexcc query exchange



You can also view the configuration settings by clicking **Properties** for each configured workload.

## Results

You are now ready to use Tivoli Storage FlashCopy Manager to protect and manage data that is backed up to a Tivoli Storage Manager server.

## Configuring a remote system with a TSM Configuration

You can use a configuration wizard to configure a remote system to communicate with a Tivoli Storage Manager server.

### Before you begin

On the local system, verify the following prerequisites are met:

- Windows 2008 or later, or Windows 7, Windows 8 or later (64 bit).
- PowerShell version 3.0.
- Tivoli Storage FlashCopy Manager version 4.1 or later.
- Tivoli Storage Manager command-line administrative interface (dsmadm.exe). You can meet this requirement by configuring any workload after installing Tivoli Storage FlashCopy Manager. This step must be completed because the local system configures the nodes on the TSM server.

On the remote system, verify the following prerequisites are met:

- Windows 2008 or later.
- Windows PowerShell version 3.0.
- Tivoli Storage FlashCopy Manager version 4.1 or later.

For the most current requirements, review the Hardware and Software Requirements technote. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

### Procedure

To configure a remote system with a TSM Configuration, complete the following steps:

1. On the local system, from the Management Console, add the remote system using Manage Computers.
2. In the navigation tree, verify that the remote system is displayed.
3. Click **Manage > Configuration > Wizards**.
4. Select **TSM Configuration**.
5. On the Data Protection Selection page, verify the following information is entered correctly:
  - The remote computer name in the window title.
  - The correct system information.
6. Select the application to be configured and click **Next**.
7. For Exchange or SQL, the license check might fail. If the test fails, provide the file path and name for the location on the remote server.

8. On the TSM Node Names page, verify the following information is entered correctly:
  - VSS Requestor
  - The Data Protection or file system name, depending on the application that is being configured

For system with the a Database Availability Group or an AlwaysOn Availability Group, the corresponding DAG node or AlwaysOn node should be detected.
9. On the TSM Server Settings page, type the server name and port number.
10. For the **Would you like this wizard to configure your TSM server?** question, select **Yes**.
11. Click **Review / Edit**. If the domain is not entered correctly, update the information. Click **OK**.
12. On the Custom Configuration page, select **Default**.
13. On the Configuration page, click **Show Details**. Verify the progress and status of the configuration.
14. Click **Finish** to complete the wizard.

## What to do next

To verify the configuration is set up correctly, complete the following steps:

1. In the navigation tree, for the remote system, expand **Protect and Recover** and click on the application that is configured.
2. Open the Properties and click **Server Information**. Verify that the correct information is displayed.
3. Query the components and verify that a successful backup can be completed.

---

## Configuring for the Mailbox Restore Only option

The configuration wizard guides you through the configuration process for the Mailbox Restore Only option.

### Procedure

To configure Tivoli Storage FlashCopy Manager with the configuration wizard, complete the following steps:

1. Start the Management Console. Click **Start > All Programs > Tivoli Storage FlashCopy Manager > FlashCopy Manager Management Console**.  
If the Management Console is not configured according to the licenses that are identified, a welcome page is displayed. You can select the type of configuration to complete.
2. From the start page, click **Configuration**. Alternatively, from the tree view, navigate to the **Configuration** node. Then, double-click **Wizards**.
3. Double-click to select Mailbox Restore Only.
4. Follow the instructions that are provided on the wizard pages to configure Mailbox Restore Only.
5. Click **Finish** to complete the wizard.

---

## Configure clustered environments

Depending on the applications that are installed, you can configure Tivoli Storage FlashCopy Manager to operate in clustered environments with SQL Server, or file system workloads.

### Tivoli Storage FlashCopy Manager for SQL: Tivoli Storage Manager configuration

When you set up a clustered environment for Tivoli Storage FlashCopy Manager for SQL, use the following scenario as a guide:

1. On the primary system, start the Tivoli Storage FlashCopy Manager Management Console Tivoli Storage Manager Configuration wizard. Use the wizard to select application that you want to protect. For example, the SQL server.
2. On the Requirements Check page, in the main panel, for **Cluster check**, click **Warnings**.
3. In the Issue Resolution dialog, specify the path to the VSSALTSTAGINGDIR directory. You can also specify a directory on clustered storage that fails over to the node that is doing the backup.
4. Click **OK** and complete the configuration wizard. In a cluster environment, Tivoli Storage FlashCopy Manager automatically enables the **Import VSS snapshots only when needed** configuration option.
5. After you complete the configuration wizard, verify that this path is used for the Microsoft shared cluster disk. To verify the path, check the information that is stored in the dsm.opt files. For example:

```
Tivoli Storage Manager backup-archive dsm.opt file
NODename variable
PASSWORDAccess generate
TCPServeraddress variable.domain.com
TCPPort variable
CLUSTERnode no
CLUSTERDISKOnly no
VSSALTSTAGINGDIR J:\vssaltstagingdir

Data Protection for SQL dsm.opt file
NODename variable
PASSWORDAccess generate
TCPServeraddress variable.domain.com
TCPPort variable
HTTPport variable
CLUSTERnode yes
```

If the VSSALTSTAGINGDIR path is not correct, edit the file to specify the correct path.

6. Repeat these steps on the other systems in the cluster.

### Tivoli Storage FlashCopy Manager file system: Tivoli Storage Manager configuration

When you set up a clustered environment for file systems, use the following scenario as a guide:

1. On the primary system, start the Tivoli Storage FlashCopy Manager Management Console Tivoli Storage Manager configuration wizard. Use the wizard to configure the file system.
2. On the Requirements Check page, in the main panel, for **Cluster check**, click **Warnings**.

3. In the Issue Resolution dialog, specify the path to the VSSALTSTAGINGDIR directory.
4. Click **OK** and complete the configuration wizard. In a cluster environment, Tivoli Storage FlashCopy Manager automatically enables the **Import VSS snapshots only when needed** configuration option.
5. After you complete the configuration wizard, verify that this path is used for the Microsoft shared cluster disk. To verify the path, check the information that is stored in the options files. For example:

```
Tivoli Storage Manager backup-archive client options file
NODename variable
PASSWORDAccess generate
TCPServeraddress variable.domain.com
TCPPort variable
CLUSTERnode no
CLUSTERDISKSONly no
VSSALTSTAGINGDIR H:\vssaltstgingdir_fcm

Tivoli Storage FlashCopy Manager file system options file
NODename variable>
PASSWORDAccess generate
TCPServeraddress variable.domain.com
TCPPort variable
HTTPport variable
CLUSTERnode yes
VSSALTSTAGINGDIR H:\vssaltstgingdir_fcm
```

If the VSSALTSTAGINGDIR path is not correct, edit the file to specify the correct path.

6. Repeat these steps on the other systems in the cluster.

## Tivoli Storage FlashCopy Manager: Standalone configuration

To configure Tivoli Storage FlashCopy Manager stand-alone in a clustered environment, complete the following steps:

1. On the primary system, install Tivoli Storage FlashCopy Manager. When you install Tivoli Storage FlashCopy Manager on the other cluster nodes, Tivoli Storage FlashCopy Manager must be installed in the same directory on all cluster nodes. The default install directory is c:\Program Files\tivoli\FlashCopyManager.
2. From the MMC GUI, run the configuration wizard and configure Tivoli Storage FlashCopy Manager to protect the desired application. In a cluster environment, Tivoli Storage FlashCopy Manager automatically enables the **Import VSS snapshots only when needed** configuration option.
3. After the configuration wizard finishes successfully, close the MMC GUI.
4. From the command prompt, navigate to the baclient directory. The default location is c:\Program Files\tivoli\tsm\baclient.
5. Depending on the configuration wizard mode, either default or custom, edit either the dsm.opt or custom.opt file. Make sure the settings in the file match the following options:

```
NODename localdsmagent
PASSWORDAccess generate
TCPServeraddress flashcopymanager
CLUSTERnode no
CLUSTERDISKSONly no
TCPADDRESS IP Address of your Cluster Node
VSSALTSTAGINGDIR Drive and Path of shared VSS Staging Directory
```

The **VSSALTSTAGINGDIR** parameter must be set to point to a cluster disk and directory that is accessible from all cluster nodes. For example: h:\vssalt

6. Edit the application-specific dsm.opt file to work in cluster mode. The dsm.opt file location depends on the application that is being protected. For example:

**File systems and custom applications**

c:\Program Files\tivoli\FlashCopyManager

**Microsoft SQL Server**

c:\Program Files\tivoli\tsm\TDPSQL

**Microsoft Exchange Server**

c:\Program Files\tivoli\tsm\TDPEXchange

Make sure the settings in the file match the following options:

```
NODename Virtual Cluster Node Name
PASSWORDAccess generate
TCPServeraddress flashcopymanager
CLUSTERnode yes
VSSALTSTAGINGDIR Drive and Path of shared VSS Staging Directory
```

Make sure the **VSSALTSTAGINGDIR** parameter is set to the same drive and path as the **VSSALTSTAGINGDIR** parameter in the previous step.

7. Configure the Client Acceptor Daemon according to the *IBM Tivoli Storage Manager Backup-Archive Clients Installation and User's Guide*. The information is documented in the *Configuring the backup-archive client in a Microsoft Clustered Environment* topic.
8. Repeat these steps on the other systems in the cluster.

## Troubleshooting

If problems occur during the configuration process, use the following list to identify common problems that can be easily resolved:

- To correctly configure the cluster, verify that the contents of Data Protection options file that are stored on the systems in the cluster, are identical. For the Tivoli Storage Manager backup-archive client dsm.opt file, each system uses its node name as the local agent node for Tivoli Storage FlashCopy Manager. The same Data Protection or file system node name needs to be used on all of the systems in the cluster.
- In the Data Protection and Tivoli Storage FlashCopy Manager dsm.opt files, verify that option for the **CLUSTERNODE** parameter is set to yes.
- Verify that the VSSALTSTAGINGDIR path to a shared disk is set so the path can failover and be accessed by both systems in the cluster.

When you work in a cluster environment, from the command-line interface, the Volume GUID is not displayed for volumes that are clustered disks. The cluster disk is displayed.

---

## Configuring Tivoli Storage FlashCopy Manager for file system and custom application on a Microsoft Cluster Server environment

The following steps are required to configure a Tivoli Storage FlashCopy Manager for file system and custom application support workload for a Microsoft Cluster Server environment. Before initiating the configuration, read the entire procedure.

### About this task

The configuration steps must be performed in the same precise manner on all of the nodes in the cluster. The steps also show you how to configure multiple cluster resource groups containing physical disk resources.

Keep the number of cluster groups to a minimum. If possible, have only one cluster resource group contain all physical disk resources. Also, use a dedicated volume (VSS staging directory volume) for each cluster resource group. The VSS staging directory volume must have a minimum of 1 GB of storage space for FlashCopy Manager metadata. This volume must be part of the cluster resource group and must be able to failover with the cluster resource group. This VSS staging directory volume should not be one of the volumes that gets backed up with Tivoli Storage FlashCopy Manager.

Complete the following steps for each node on the cluster:

### Procedure

1. Install Tivoli Storage FlashCopy Manager.
2. Launch the Tivoli Storage FlashCopy Manager MMC GUI.

You are automatically prompted to run the configuration wizard. If the configuration wizard prompt is not displayed automatically, expand the following tree nodes: **IBM Tivoli Storage Manager > Dashboard > Manage > Configuration**. Then, select **Wizards**. Depending on your environment, launch either the Standalone Configuration or TSM Configuration wizard. If you have a Tivoli Storage Manager server, select TSM Configuration, otherwise, if you do not have access to a Tivoli Storage Manager server, select Standalone Configuration.
3. Select the **File System** checkbox. To start the wizard, click **Next**.
  - For the Standalone Configuration, complete the following steps:
    - a. On the requirements check panel, for the Cluster check rule, you might see a **Warnings** link. Click **Warnings** and the MMC displays the Issue Resolution Windows for **vssaltstagingdir** path. In this Path dialog box, enter the path of your VSS staging directory volume as described above. If you are configuring multiple resource groups, start with the dedicated volume belonging to the cluster resource group you want to configure first.
    - b. Complete the wizard pages.
    - c. Click **Finish** to complete the initial configuration.
    - d. After the configuration wizard completes, the following are the contents of the different options files. Values might differ slightly:
      - In the backup-archive client options file:

```

NODename OTHELLO
PASSWORDAccess generate
TCPServeraddress flashcopymanager
CLUSTERnode no
CLUSTERDISKSOnly no

```

- In the Tivoli Storage FlashCopy Manager file system options file:

```

NODename OTHELLO_FS
PASSWORDAccess generate
TCPServeraddress flashcopymanager
HTTPport 1581
CLUSTERnode yes

```

- e. Exit the MMC GUI. If you had a **Warnings** link for the cluster check in the requirements check panel, go to step 5. Otherwise, go to step 4.
- For the TSM Configuration, complete the following steps:
    - a. On the requirements check panel, for the Cluster check rule, you might see a **Warnings** link. Click **Warnings** and the MMC displays the Issue Resolution Windows for **vssaltstagingdir** path. In this Path dialog box, enter the path of your VSS staging directory volume as described above. If you are configuring multiple resource groups, start with the dedicated volume belonging to the cluster resource group you want to configure first.
    - b. Complete the required information.
    - c. Click **Finish** to complete the initial configuration.
    - d. After the configuration wizard is complete, the following contents are displayed in the different options files. Values might differ slightly. In the following OPT files, make sure the DSM agent node and Tivoli Storage FlashCopy Manager node have already been registered and granted proxy.
      - In the backup-archive client options file:
 

```

NODename OTHELLO
PASSWORDAccess generate
TCPServeraddress orion.storage.usca.ibm.com
TCPPort 1500
CLUSTERnode no
CLUSTERDISKSOnly no
VSSALTSTAGINGDIR J:\vssaltstagingdir

```
      - In the Tivoli Storage FlashCopy Manager file system options file:
 

```

NODename CLUSTER_FS
PASSWORDAccess generate
TCPServeraddress orion.storage.usca.ibm.com
TCPPort 1500
HTTPport 1581
CLUSTERnode yes
VSSALTSTAGINGDIR J:\vssaltstagingdir

```
    - e. Exit the MMC GUI.
    - f. Open a Windows command prompt and change the directory to the backup-archive client directory. Default location: c:\Program Files\Tivoli\tsm\baclient
    - g. To connect to the Tivoli Storage Manager server, issue the **dsmc** command . You might need to provide your user ID and password for the backup-archive client DSMAGENT node to save the password on the registry. Exit the **dsmc**.
    - h. Using the same Windows command prompt, enter the following command to connect to the Tivoli Storage Manager server using the Tivoli Storage FlashCopy Manager node:



```
dsmc -optfile="c:\Program Files\Tivoli\FlashCopyManager\dsm.opt"
```

You might need to provide your user ID and password for the Tivoli Storage FlashCopy Manager node to save the password on the registry. Exit the **dsmc** and exit the Windows command prompt.

4. For the Standalone Configuration only, complete the following steps:
  - a. Open the Windows Services MMC. Stop both the CAD and Agent Services named, by default, *TSM Client Acceptor* and *TSM Remote Client Agent*, respectively.
  - b. Open a Windows command prompt and change directories to the Tivoli Storage FlashCopy Manager installation directory. The default location: `C:\Program Files\Tivoli\FlashCopyManager`
  - c. Open the `dsm.opt` file using Notepad and change the `nodename` option to a different name that would best describe your cluster. For example:  
`NODENAME cluster_fs`
  - d. Specify the VSS staging directory volume for Tivoli Storage FlashCopy Manager VSS metadata. Add the **vssaltstagingdir** option at the end of the file. The path should be the path of your VSS staging directory volume as described above. If you are configuring multiple resource groups, start with the dedicated volume belonging to the cluster resource group that you want to configure first. For example, if the J: drive is the dedicated VSS staging directory volume belonging to the cluster resource that you want to configure, specify the option like the following example:  
`VSSALTSTAGINGDIR J:\vssaltstagingdir`
  - e. Save and close the Tivoli Storage FlashCopy Manager options file.
  - f. Change the directory to the backup-archive client installation directory. Default location: `C:\Program Files\Tivoli\tsm\baclient`
  - g. Open the `dsm.opt` file using Notepad and add the exact same value for the **vssaltstagingdir** option as in the Tivoli Storage FlashCopy Manager `dsm.opt` file. For example:  
`VSSALTSTAGINGDIR J:\vssaltstagingdir`
  - h. Save and close the backup-archive client options file.
  - i. Exit the Windows command prompt.
5. If this node is the first cluster node that you are configuring, open the Microsoft Failover Cluster Manager. Go to the cluster resource group that you are configuring. Right click on the resource group and select **Add a resource > Generic Service**. From the New Resource Wizard dialog that is displayed, select the CAD service, named, by default, *TSM Client Acceptor*, and continue the wizard until finished. Bring the *TSM Client Acceptor* service resource online from the Failover Cluster Manager. If you are repeating this procedure for another cluster node, the *TSM Client Acceptor* service resource has already been configured. In this scenario, go to the resource group and bring up the service resource online.
6. Open a Windows command prompt and change directories to the Tivoli Storage FlashCopy Manager installation directory. Default location: `C:\Program Files\Tivoli\FlashCopyManager`  
Issue the following command:  
`fccli query component`  
  
A list of all available volumes for backup is displayed.
7. You have just configured your first group resource. If you only have one resource group, you are finished. Complete the same procedure on the other

nodes in your cluster. Before you begin the procedure on other nodes in the cluster, go to the Windows Services MMC, and stop, if running, the *TSM Remote Client Agent* service created in this procedure. Then, using the Microsoft Failover Cluster Manager, make the *TSM Client Acceptor* service offline from the resource group just configured. Finally move the group resource you have configured to the other node in the cluster and begin the procedure again from step 1. A final note: All nodes in the cluster should have identical Tivoli Storage FlashCopy Manager options file. For the backup-archive client dsm.opt file, each node in the cluster can use its own nodename, but everything else in the options file should be identical. The steps that follow are only required if you have additional cluster resource groups that you want to configure with its own configuration files.

8. From the same Windows command prompt, make a copy of the Tivoli Storage FlashCopy Manager options file (dsm.opt) and also the configuration file (fcmcfg.xml). You can issue the following commands: copy dsm.opt dsm\_XXX.opt and copy fcmcfg.xml fcmcfg\_XXX.xml where XXX is the *n*th time that you are running this step. Start with 2 and increment by one each time this step is completed. Alternatively, you can use a more descriptive name for your options and configuration files, for example, fcmappxyz.opt/fcmappxyz.cfg, ensuring the names are unique per cluster group resource configuration and ensuring the files always have the extensions \*.opt and \*.cfg, respectively.
9. Using Notepad, open the newly created Tivoli Storage FlashCopy Manager options file from step 8 and make the following changes:
  - a. Change the nodename option to something different. For example, NODename CLUSTER\_XXX\_FS where XXX is the *n*th time this step is completed. Start with 2, and increment by one each time this step is completed.
  - b. Change the HTTPPORT option to a different **available** port. For example: HTTPport 1582
  - c. Change the VSSALTSTAGINGDIR option to the VSS staging directory volume belonging to the cluster resource group that you want to configure. For example, if the K: drive belongs to the cluster group that you want to configure, your option looks like this: VSSALTSTAGINGDIR K:\vssaltstagingdir
  - d. Save and close the options file.
10. Using Notepad, open the newly created Tivoli Storage FlashCopy Manager configuration file from step 8 and make the following changes:
  - a. Look for the following HTML tag: **LOCALDSMAgentnode** The following example is provided:
 

```
<LOCALDSMAgentnode>0THELLO</LOCALDSMAgentnode>
```

Change the value for the tag to something different. For example, change it to the following text:

```
<LOCALDSMAgentnode>0THELLO_XXX</LOCALDSMAgentnode>
```

where XXX is the *n*th time that this step is completed. Start with 2, and increment by one each time this step is completed.
  - b. Save and close the configuration file.
11. Using the same Windows command prompt, change directories to the backup-archive client installation directory. Default location: C:\Program Files\Tivoli\tsm\baclient
 

Make a copy of the dsm.opt file. You can issue the following command: copy dsm.opt dsm\_XXX.opt where XXX is the *n*th time that you are completing this

step. Start with 2, and increment by one each time this step is completed. Alternatively, you can use a more meaningful name depending on the resource group that you are configuring.

12. Using Notepad, open the newly created backup-archive client options file from step 11 and make the following changes:
  - a. Change the nodename option to the same value you used for **LOCALDSMAgentnode** in step 10. For example: NODename OTHELLO\_XXX
  - b. Add the HTTPPORT option. The value should be identical to the value used in step 9. For example: HTTPport 1582
  - c. Change the VSSALTSTAGINGDIR option. The value should be identical to the value used in step 9. For example: VSSALTSTAGINGDIR K:\vssaltstagingdir
  - d. Save and close the configuration file.

13. If you are configuring Tivoli Storage FlashCopy Manager Standalone Configuration, skip to step 14. Otherwise, using the administrative command line **dsmadm** from the Windows command line, log on to your Tivoli Storage Manager server and register the new nodes defined in the new options files. For example, run the following set of commands:

```
reg node cluster_XXX_fs cluster_XXX_fs Domain=...
reg node othello_XXX othello_XXX Domain=...
grant proxy target=cluster_XXX_fs agent=othello_XXX
```

Exit the administrative command line.

To connect to the Tivoli Storage Manager server, issue the following command:

```
dsmc -optfile="c:\Program Files\Tivoli\tsm\baclient\dsm_XXX.opt"
```

You might need to provide your user ID and password for the backup-archive client DSMAGENT node to save the password on the registry. Exit the **dsmc**.

To connect to the Tivoli Storage Manager server using the Tivoli Storage FlashCopy Manager node, issue the following command:

```
dsmc -optfile="c:\Program Files\Tivoli\FlashCopyManager\dsm_XXX.opt"
```

You might need to provide your user ID and password for the Tivoli Storage FlashCopy Manager node to save the password on the registry. Exit the **dsmc**.

14. Issue the following **dsmcutil** commands to register the new CAD and AGENT services for this new configuration, where XXX is the *n*th time that this step is completed, starting with 2, and increment by one.

```
dsmcutil install cad /name:"TSM Client Acceptor XXX" /node:othello_XXX
/password:othello_XXX
/optfile:"c:\program files\tivoli\tsm\baclient\dsm_XXX.opt"
/httpport:value_from_step_9
dsmcutil install remoteagent /name:"TSM Remote Client Agent XXX"
/node:othello_XXX /password:othello_XXX
/optfile:"c:\program files\tivoli\tsm\baclient\dsm_XXX.opt"
/partnername:"TSM Client Acceptor XXX"
```

15. If this is the first cluster node that you are configuring, open the Microsoft Failover Cluster Manager. Go to the cluster resource group that you are configuring. Right click on the resource group and select **Add a resource > Generic Service**. From the New Resource Wizard dialog window that is displayed, select the CAD service, named *TSM Client Acceptor XXX*, and continue the wizard until it is finished. Bring the *TSM Client Acceptor XXX* service resource online from the Microsoft Failover Cluster Manager. If you are repeating this procedure for another cluster node, the *TSM Client Acceptor*

XXX service resource has already been configured. Go to the resource group and bring up the service resource online.

16. Change directories to the Tivoli Storage FlashCopy Manager installation directory. Default location: C:\Program Files\Tivoli\FlashCopyManager

Enter the following command:

```
fcmclic component /fcmoptfile=dsm_XXX.opt /configfile=fcmcfg_XXX.xml
```

A list of all available volumes for backup is displayed.

17. You have configured another group resource. If you have more resource groups to configure, repeat steps 8 through 17. Otherwise, you are ready to complete the same procedure on the other nodes in your cluster. Before you begin the procedure again on other nodes in the cluster. You must first stop, if running, all of the *TSM Remote Client Agent* services created in this procedure. Go to the Windows Services MMC and stop all of these services. Then, using the Microsoft Failover Cluster Manager, make all of the *TSM Client Acceptor* services offline from all the different resource groups configured. Finally, move each one of the group resources you have configured to the other node in the cluster and begin the procedure again from step 1. A final note: All nodes in the cluster should have identical Tivoli Storage FlashCopy Manager options files. All *dsm\_XXX.opt* and *fcmcfg\_XXX.cfg* files must be identical in all nodes in the cluster. For the backup-archive client *dsm\_XXX.opt* file, each node in the cluster can use its own node name, but everything else in the options file should be identical.

---

## Configuring where scheduled backups are run on SQL availability replicas

You can configure to select an availability replica on which to run a backup.

### About this task

When an availability database is replicated across multiple availability replicas in an availability group, a mechanism is required to select a single replica on which to run a backup operation instead of backing up all replicas. This mechanism can also offload the backup from a primary replica to a secondary replica for load balancing. When databases failover, backups must continue to run from other replicas for high availability.

Microsoft SQL Server 2012 provides a set of configuration options that enable these functions. You can use the Tivoli Storage FlashCopy Manager GUI to set these options.

### Procedure

To specify whether scheduled backups are run on the primary or secondary replica at the availability group level:

1. Start the Management Console.
2. In the Management section of the window, click **Protect Data** next to the SQL Server workload.
3. Click **Properties** in the Actions pane.
4. Click the **AlwaysOn Preferences** property page.
5. In the **Availability group** field, select the **AlwaysOn Availability Group** for which you want to set up backup preferences.

6. In the **Preferred replica** field, select which replica is the preferred replica on which to run scheduled backups.
  - Select **Prefer Secondary replica** if you want scheduled backups to occur on a secondary replica, if it is available. Otherwise, use the primary replica for the scheduled backup.
  - Select **Secondary only** if you want scheduled backups to occur only on a secondary replica.
  - Select **Primary** if you want scheduled backups to occur only on the primary replica.
  - Select **Any replica** if you want scheduled backups to occur on any availability replica.
7. For each availability replica listed in the Availability replicas list box, specify whether it is a candidate for running scheduled backups by specifying the backup priority for that replica. A value of 1 has the lowest priority, and a value of 100 has the highest priority. A value of 0 indicates that the replica is excluded from schedule backup operations.
8. Click **OK** to save your configuration and exit the Data Protection Properties page. The settings are saved to the `tdpsql.cfg` file and can be replicated to the other replicas in the availability group.

## What to do next

After you configure where scheduled backups are run, the administrator can specify the **tdpsql backup** command along with the **/ALWAYSONPriority** parameter in a backup schedule. For example:

```
tdpsqlc backup TestDb1 full /ALWAYSONPriority
```

When this scheduled backup command is run, Tivoli Storage FlashCopy Manager queries the SQL Server to determine the highest-priority availability replica that is active or online, ordered by preference. If the replica meets the specified criteria, the replica is backed up. Otherwise, the backup operation ends and a message is added to the log to indicate why the replica was not backed up.

An administrator can create a common backup schedule to run on all availability replicas. When the backup schedule starts, each **tdpsqlc** command queries each replica to determine whether it is to run the backup. Only one of the scheduled backups runs the backup.

---

## Configuring Tivoli Storage FlashCopy Manager for SQL on Windows Server Core

The following sections describe how to manually configure Tivoli Storage FlashCopy Manager on Windows Server Core.

### Before you begin

When Tivoli Storage FlashCopy Manager is installed on the remote system and PowerShell remoting is configured on the remote system, on either a local or centralized computer, add the remote server core system to the Microsoft Management Console (MMC). On the local system that is running the MMC, you can point to the server core system and complete the TSM Configuration wizard. Using the wizard, you can provision and configure the software as if the wizard is running on the remote system.

If you are not using the remote configuration option, before you can use Tivoli Storage FlashCopy Manager to protect your SQL Server 2012 data on Windows Server Core, ensure that you install Tivoli Storage FlashCopy Manager and the Tivoli Storage Manager backup-archive client on the system that runs the Microsoft SQL Server.

## Procedure

Complete the following tasks:

1. Create a node on the Tivoli Storage Manager server for the backup-archive client and Tivoli Storage FlashCopy Manager. If you are protecting availability databases in an AlwaysOn Availability Group, you must also create the AlwaysOn node on the Tivoli Storage Manager server.
2. If you intend to run offloaded VSS backups, set up a remote node to run the offloaded backup operation on a remote computer.
3. Configure the backup-archive client options file (`dsm.opt`).
4. Configure the Tivoli Storage FlashCopy Manager option files (`dsm.opt` and `tsmfcm.cfg`).
5. If you use Tivoli Storage Manager policy sets, you must also specify a management class to use for your Tivoli Storage FlashCopy Manager backups.

## Registering a node on the Tivoli Storage Manager server

After you install the Tivoli Storage Manager client and Tivoli Storage FlashCopy Manager, you must set up a node name and password and register your node with the Tivoli Storage Manager server.

### About this task

When you register your node, you create a file space on the Tivoli Storage Manager server where the backups of your data are stored. You must set up a client node and a Tivoli Storage FlashCopy Manager node. If you are protecting availability databases in an AlwaysOn Availability Group, you must also register the AlwaysOn node.

Follow these procedures if you installed the Tivoli Storage Manager administrative command-line client. If you did not install the administrative client, the nodes must be registered on the Tivoli Storage Manager server.

### Procedure

1. Start an administrative client session by issuing the following command in a Command Prompt window:

```
C:\Program Files\Tivoli\TSM\baclient\dsmadm
```

2. To register a client node, issue the following command:

```
reg node client_nodename password backdel=yes
```

Where *client\_nodename* is the node name for the client and *password* is the password that you want to use for the client. The **backdel=yes** parameter indicates that you can delete backup objects in your file space on the server.

For example:

```
reg node doomvm3 doomvm3passwd backdel=yes
```

3. To register a node, issue the following command:

```
reg node sql_nodename password backdel=yes
```



Where *sql\_nodename* is the node name for the Data Protection node and *password* is the password that you want to use for the SQL node. The **backdel=yes** parameter indicates that you can delete backup objects in your file space on the server.

For example:

```
reg node doomvm3_sql doomvm3sqlpasswd backdel=yes
```

**Tip:** To easily identify the node as a node for , add “\_sql” to the end of the node name.

4. To register the AlwaysOn node, issue the following command:

```
reg node alwayson_nodename password backdel=yes
```

Where *alwayson\_nodename* is the name for the AlwaysOn node and *password* is the password that you want to use for the AlwaysOn node. The **backdel=yes** parameter indicates that you can delete backup objects in your file space on the server. For example:

```
reg node myalwaysonnode alwaysonpasswd backdel=yes
```

## What to do next

To use Tivoli Storage Manager server policy sets, the Tivoli Storage Manager must define the policy domains, policy sets, management classes, copy groups, and storage pools. These definitions are necessary to meet your Tivoli Storage FlashCopy Manager backup and restore requirements. For VSS operations, Tivoli Storage Manager server authentication must be on.

## Setting up a proxy node for offloaded VSS backups in the Windows Server Core environment

If you want to offload VSS backups to the Tivoli Storage FlashCopy Manager, you must define a remote node to run the offloaded backups. This step is part of the configuration tasks for operating Tivoli Storage FlashCopy Manager on Windows Server Core.

### About this task

Tivoli Storage FlashCopy Manager can offload VSS backups by using a remote computer to create the backup instead of using the local computer. To run an offload backup by using a remote node, you must first set the remote node as an agent of the local Tivoli Storage FlashCopy Manager node.

If you are protecting availability databases in an AlwaysOn Availability Group, you must set the remote node as an agent of the AlwaysOn node.

Before you begin, ensure that the Tivoli Storage Manager client is installed and configured on the remote computer.

### Procedure

To define the proxy node relationship, the Tivoli Storage Manager administrator can issue the **grant proxynode** command from the Tivoli Storage Manager server administrative console.

- For standard Tivoli Storage FlashCopy Manager nodes, issue the following command:

```
grant proxynode target=local_sql_node agent=remote_node
```



Where *local\_sql\_node* is the node name of the local Tivoli Storage FlashCopy Manager node, and *remote\_node* is the remote Tivoli Storage Manager client node that runs the remote backups. For example:

```
grant proxynode target=doomvm3_sql agent=babar
```

- For AlwaysOn nodes, issue the following command:

```
grant proxynode target=alwayson_node agent=remote_node
```

Where *alwayson\_node* is the name of the AlwaysOn node, and *remote\_node* is the remote Tivoli Storage Manager client node that runs the remote backups. For example:

```
grant proxynode target=myalwaysonnode agent=babar
```

- To display the client nodes with authority to act as proxy to other clients, run the following command from the administrative console of the server:

```
query proxynode
```

## Configuring the client in the Windows Server Core environment

You must configure the Tivoli Storage Manager client node that you created. This step is part of the initial configuration tasks before you can use Tivoli Storage FlashCopy Manager in the Windows Server Core environment.

### About this task

You must configure the client options file (*dsm.opt*), set the environment variables, and install and setup the Tivoli Storage Manager client acceptor service and remote client agent service.

### Procedure

To configure the client, complete the following steps:

1. Configure the client options file:

- a. Change to the backup-archive client installation directory. For example, issue the following command in a Command Prompt window:

```
cd C:\Program Files\Tivoli\TSM\baclient
```

- b. Open the *dsm.opt* file with a text editor and enter the following statements:

```
PASSWORDACCESS GENERATE
COMMethod TCPip
TCPPort 1500
nodename client_nodename
TCPSERVERADDRESS tsm_server
```

The following list contains brief explanations of the client options in the statements:

#### **PASSWORDACCESS GENERATE**

Instructs the client to save the password whenever the */tsmpassword* option is used so you do not have to enter the password with every command.

#### **TCPPort 1500**

Specifies that the client accesses the Tivoli Storage Manager server at TCP/IP port 1500. 1500 is the default port number.

**nodename** *client\_nodename*

Specifies the newly created node for the backup-archive client.

### TCPSERVERADDRESS *tsm\_server*

Specifies the name of the Tivoli Storage Manager server. You can enter the server IP address or the fully qualified domain name.

For example:

```
NODename DOOMVM3
PASSWORDAccess generate
TCPServeraddress gijoe
TCPPort 1500
```

For more information about Tivoli Storage Manager client options, see Processing options.

2. Install and start the Tivoli Storage Manager client acceptor service and remote client agent service.

- a. Install the client acceptor service by entering the following command in a Command Prompt window:

```
C:\Program Files\Tivoli\TSM\baclient\dsmcutil install cad
/name:"servicename" /node:nodename /password:password
/autostart:yes
```

Where *nodename* is the client node name, *password* is the client password, and *servicename* is the name that you want to use for the client acceptor service. The default name is "TSM Client Acceptor". For example:

```
C:\Program Files\Tivoli\TSM\baclient\dsmcutil install cad /name:"TSM CAD"
/node:DOOMVM3 /password:doomvm3passwd /autostart:yes
```

- b. Install the remote client agent service by entering the following command in a Command Prompt window:

```
C:\Program Files\Tivoli\TSM\baclient\dsmcutil install remoteagent
/name:"servicename" /node:nodename /password:password
/partnername:"partner service name"
```

The node name for the Tivoli Storage Manager Client Acceptor and the Remote Client Agent must be set to the backup-archive client node. The default service name is "TSM Remote Client Agent". The value for the **/partnername** option must match the name of the client acceptor service that you created. The default name is "TSM Client Acceptor". For example:

```
C:\Program Files\Tivoli\TSM\baclient\dsmcutil install remoteagent
/name:"TSM AGENT" /node:DOOMVM3 /password:doomvm3passwd
/partnername:"TSM CAD"
```

- c. Start the client acceptor service by entering the following command:

```
net start "servicename"
```

Where *servicename* is the name of the client acceptor service that you created. For example:

```
net start "TSM CAD"
```

Do not start the remote client agent service manually. The remote client agent service is automatically started by the client acceptor service when it is needed.

# Configuring Tivoli Storage FlashCopy Manager for SQL for Windows Server Core

You must configure Tivoli Storage FlashCopy Manager before you can protect your Microsoft SQL Server 2012 data in the Windows Server Core environment.

## About this task

You must configure the client options file (`dsm.opt`) and configuration file (`tdpsql.cfg`).

## Procedure

1. Edit the client options file (`dsm.opt`).
  - a. In the Tivoli Storage FlashCopy Manager installation directory, open the client options file (`dsm.opt`) with a text editor.
  - b. Add the following statements to the client options file:

```
NODename sql_nodename
PASSWORDAccess Generate
COMMMethod TCPip
TCPServeraddress tsm_server
TCPPort 1500
TCPWindowsize 63
TCPBuffSize 32
```

Where **nodename** is the Tivoli Storage FlashCopy Manager node name, and **TCPServeraddress** is the name of the Tivoli Storage Manager server. You can enter the server IP address or the fully qualified domain name.

For example:

```
NODename D00MVM3_SQL
PASSWORDAccess generate
TCPServeraddress gjoe
TCPPort 1500
```

2. Edit the `tdpsql.cfg` file.
  - a. In the Tivoli Storage FlashCopy Manager installation directory, open the configuration file (`tdpsql.cfg`) with a text editor.
  - b. Add the following statements in the `tdpsql.cfg` file:

```
SQLSERVER sql_server
FROMSQLserver sql_server
SQLAUTHentication INTEGRATED
MOUNTWaitfordata Yes
BACKUPMethod [Legacy|VSS]
DIFFESTimate 20
BUFFers 3
BUFFERSize 1024
STRIPes 1
SQLBUFFers 0
SQLBUFFERSize 1024
LOGPrune 60
LANGuage ENU
BACKUPDestination [LOCAL|TSM|BOTH]
LOCALDSMAgentnode local_node
REMOTEDSMAgentnode remote_node
ALWAYSONnode alwayson_node
USEALWAYSONnode [TRUE|FALSE]
LOGFile tdpsql.log
```

The following list contains brief descriptions of the key options in the `tdpsql.cfg` file:

**SQLSERVER**

Specifies the name of the Microsoft SQL Server that is running on the local computer.

**BACKUPMethod**

Determines whether to run a Legacy or VSS backup.

**BACKUPDestination**

Determines whether to run a local backup, Tivoli Storage Manager backup, or both. For Legacy backup, only Tivoli Storage Manager is used.

**LOCALDSMAgentnode**

Specifies the local node name of the client that is running on the local computer. This option is required for VSS offloaded backups.

**REMOTEDSMAgentnode**

Specifies the remote client node that runs the VSS offloaded backups on a remote computer.

**ALWAYSONNode**

Specifies the Tivoli Storage Manager node name use to back up availability databases in an AlwaysOn Availability Group.

**USEALWAYSONnode**

Specify *TRUE* to set the AlwaysOn node as the default node for all backup operations of standard and availability databases. You can use this option to change database backups from a standard Tivoli Storage FlashCopy Manager node to an AlwaysOn node.

Specify *FALSE* to back up standard databases to the Tivoli Storage FlashCopy Manager node. Availability databases are always backed up with the AlwaysOn node.

3. If you are running the stand-alone configuration on Tivoli Storage FlashCopy Manager, do the following steps:
  - a. In the Tivoli Storage FlashCopy Manager installation directory, open the client options file (*dsm.opt*) with a text editor.
  - b. Edit the *dsm.opt* file and change the *TCPServeraddress tsm\_server* statement to *TCPServeraddress flashcopymanager*.
  - c. If installed, remove the Tivoli Storage Manager client acceptor service. Run the following command from a Command Prompt window:
 

```
C:\Program Files\Tivoli\TSM\baclient\dsmcutil remove /name:"TSM CAD"
```

 In this case, TSM CAD is the name of the client acceptor service that you want to remove.
  - d. Reinstall the remote client agent service by entering the following command:
 

```
C:\Program Files\Tivoli\TSM\baclient\dsmcutil install remoteagent /name:"TSM AGENT" /node:DOOMVM3_SQL /password:doomvm3sqlpasswd /partnername:"TSM CAD"
```

 In this case, TSM AGENT is the name of the remote agent and TSM CAD is the name of the client acceptor service.
  - e. Start the client acceptor service by entering the following command:
 

```
net start "TSM CAD"
```

 In this case, TSM CAD is the name of the client acceptor service are starting. Do not start the remote client agent service manually. The remote client agent service is automatically started by the client acceptor service when it is needed.

- Optional: Use the **VSSPOLICY** option to Specify a management class for VSS backups.

Unless specified otherwise, Tivoli Storage FlashCopy Manager uses the default management class of the policy domain that its node name is in. To specify that Tivoli Storage FlashCopy Manager uses a different management class, add the **VSSPOLICY** option to the `tdpsqlc.cfg` file. The format of the option is as follows:

```
VSSPOLICY SQL_server_name "db_name" backup_type backup_dest mgmt_class
```

For example:

```
VSSPOLICY doomvm3 * FULL LOCAL MGMT2
```

This statement specifies that Tivoli Storage FlashCopy Manager uses the management class MGMT2 for local backups of any database in the SQL server named doomvm3.

---

## SAN Volume Controller and Storwize V7000 configurations

The following sections provide examples of configurations. These examples can be used when planning to set up backup and recovery solutions.

**Production application data are on standard volumes. Keep 14 snapshot backup versions. Use minimum storage space for snapshot backup versions. A full physical copy is not required. Perform two VSS backups per day.**

### SVC and Storwize V7000 settings

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.

### VSS Provider settings

Set background copy rate equal to 0.

### Tivoli Storage FlashCopy Manager settings

Set the policy to retain 14 local backup versions. Schedule snapshot backups as required by using backup destination equal to local.

After 14 VSS backups are completed, the 15th VSS backup causes the oldest backup to be deleted and reuses that target set.

**Production application data are on standard volumes. Keep one snapshot backup version. Use minimum storage space for snapshot backup versions. A full physical copy is not required. Perform one VSS backup per day and also send the backup to Tivoli Storage Manager.**

### SVC and Storwize V7000 settings

Create two 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.

### VSS Provider settings

Set background copy rate equal to 0.

### Tivoli Storage FlashCopy Manager settings

Set the policy to retain two local backup versions. Schedule snapshot backups as required by using backup destination equal to both.

Set the 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 might not be available if a VSS backup fails after the prior backup was deleted.

**Production application data are on standard volumes. Keep one snapshot backup version. A full physical copy is required. Minimize space usage of background copies. Perform one VSS backup per day and send the backup to Tivoli Storage Manager.**

**SVC and Storwize V7000 settings**

Create one standard target volume for each source volume to be protected. Add standard target volumes to the VSS free pool.

**VSS Provider settings**

Use the default background copy rate (50). Configure to use incremental FlashCopy.

**Tivoli Storage FlashCopy Manager settings**

Set the policy to retain one local backup version. Schedule snapshot backups as required by using backup destination equal to both.

When you use incremental FlashCopy, the VSS provider does not delete the single snapshot target set even though FlashCopy Manager software deletes the prior VSS snapshot before it creates a new one.

**Production application data are on standard volumes. Keep two snapshot backup versions. Full physical copies are required for local backup versions. Perform VSS backups every 12 hours with one backup daily sent to Tivoli Storage Manager.**

**SVC and Storwize V7000 settings**

Create three standard target volumes for each source volume to be protected. Add standard target volumes to the VSS free pool.

**VSS Provider settings**

Use default background copy rate (50).

**Tivoli Storage FlashCopy Manager settings**

Set the policy to retain three local backup versions. Schedule VSS backups as follows: backup destination equal to local at 11:00, backup destination equal to both at 23:00.

Set the policy for local snapshot backups to retain  $N+1$  backup versions so that  $N$  snapshot backups are available for restore.

**Production application data are on standard volumes. Keep four snapshot backup versions. Use minimum storage space for snapshot backup versions. A full physical copy is not required. Perform VSS backups every six hours with one backup daily sent to Tivoli Storage Manager.**

**SVC and Storwize V7000 settings**

Create five SE target volumes for each source volume to be protected. Enable autoexpand for the SE target volumes. Add SE target volumes to the VSS free pool.

**VSS Provider settings**

Set background copy rate equal to 0.

**Tivoli Storage FlashCopy Manager settings**

Set the policy for local snapshot backups to retain five local backup versions. Schedule VSS backups as follows: backup destination equal to local at 06:00, 12:00, and 18:00, backup destination equal to both at 00:00.

- Set policy to retain  $N+1$  backup versions so that  $N$  snapshot backups are available for restore

**Production application data are on SE volumes. Keep two snapshot backup versions. A full physical copy is required for local backup versions. Perform VSS backups every six hours with one backup daily sent to Tivoli Storage Manager.**

#### **SVC and Storwize V7000 settings**

Create three SE target volumes for each source volume to be protected. Allocate the same percentage of real storage as for source volumes. Add SE target volumes to the VSS free pool.

#### **VSS Provider settings**

Use default background copy rate 50.

#### **Tivoli Storage FlashCopy Manager settings**

Set the policy to retain three local backup versions. Schedule VSS backups as follows: backup destination equal to local at 06:00, 12:00, and 18:00, backup destination equal to both at 00:00.

Set the policy for local snapshot backups to retain  $N+1$  backup versions so that  $N$  snapshot backups are available for restore. This setting allows thin provisioning for both source and target volumes and allows them to grow together.

---

## **Setting user preferences**

Use the property pages in the Data Protection Properties window to customize your IBM Tivoli Storage FlashCopy Manager configuration preferences.

### **Before you begin**

The property pages customize preferences such as logging of activity, how languages and information are displayed, and tune performance. The information about the General property page is required to back up data, but the properties are set when you complete the configuration wizard.

When configuring preferences, consider the backup strategy, resource needs, policy settings, and hardware environment of your system.

### **Procedure**

To configure user preferences, complete the following steps:

1. In the tree view of the Management Console, select the Exchange, SQL, or file system instance for which you want to edit preferences.
2. Click **Properties** in the Actions pane.
3. Select the property page that you want to view or edit. The property pages that are available vary depending on whether it is configured for stand-alone support or Tivoli Storage Manager support.
4. Edit the property page and click **OK** to save your changes and close the window.

### **What to do next**

**Tip:** You can also view or edit properties for the dashboard and the Management Console. To open the properties window, click **Dashboard** in the tree view, and



click **Properties** in the Actions pane.

## Data Protection properties

Use property pages to customize your configuration preferences.

The available property pages for a workload vary depending on whether it is configured for the stand-alone environment or the Tivoli Storage Manager environment.

You can view or edit property pages by selecting a workload from the **Protect and Recover Data** node in the tree view of the Management Console, and clicking **Properties** in the Actions pane.

### Server Information

This property page displays information about the server that you contact for backup services.

Different information is displayed depending on whether the product is configured for a stand-alone snapshot environment or for a Tivoli Storage Manager environment.

**Note:** References to the stand-alone snapshot environment are specific to Tivoli Storage FlashCopy Manager.

#### Node name

Specifies the name that is used to identify the client node for stand-alone backup operations or backup operations to Tivoli Storage Manager server.

#### TSM API version

Specifies the version of the Tivoli Storage Manager application programming interface (API).

#### Server name

For backups to Tivoli Storage Manager, specifies the name of the Tivoli Storage Manager server that you are connected to.

For a stand-alone configuration, *Virtual Server* is displayed.

#### Server Network Host name

Specifies the network host name for the Tivoli Storage Manager server.

For a stand-alone configuration, **FLASHCOPYMANAGER** is displayed.

#### Server type

For backups to Tivoli Storage Manager, specifies the type of operating system of the Tivoli Storage Manager server.

For a stand-alone configuration, *Virtual Platform* is displayed.

#### Server version

Specifies the version of the Tivoli Storage Manager server.

#### Compression mode

Specifies whether compression is used during backup operations to the Tivoli Storage Manager server. The possible values are **Yes**, **No**, and **Client Determined**.

#### Domain name

Specifies the policy domain that the node belongs to. A policy domain contains one or more policy sets.

**Active Policy Set**

Specifies the policy set that is active for the policy domain. A policy set contains one or more management class definitions.

**Default Management Class**

The default policy or management class that contains attributes. These attributes determine how long backup versions are stored, where backup versions are stored, and how many backup versions are kept.

**Server Password**

Use this property page to change the password for the Data Protection node that you use to access the Tivoli Storage Manager server. This property page applies only to Tivoli Storage Manager configurations.

**Old password**

Type the Tivoli Storage Manager password that you want to change.

**New password**

Type a new password. Follow the Tivoli Storage Manager server password policy rules.

**Confirm new password**

Type the new password again. Click **OK** to save your changes.

**Policy Management**

Use this property page to add or update a backup policy to control how different backup versions are retained on local shadow volumes on stand-alone snapshot configurations.

Backup retention on local shadow volumes is determined by version and time-based policies. Ensure that sufficient local storage space is available on local shadow volumes for your VSS backup. The amount of storage space that is required depends on the VSS Provider that you use.

The following fields are displayed in the property page:

**Policy** Specify the unique name of a backup policy for the stand-alone configuration.

**Number of Snapshots to keep**

Specify the number of backup versions to retain on local shadow volumes. Enter a value from 1 to 9999. Type NL to retain as many backup versions as permitted by available storage space. The default value is 2.

This parameter does not apply to incremental backup versions of Exchange Server data. Incremental backups do not participate in expirations because of version limit because there is never more than one version of an incremental backup object. There is only one version of an incremental backup object because incremental backups are always uniquely named.

**Days to keep a Snapshot**

Specify the number of days to retain backup versions on local shadow volumes. Enter a value from 0 to 9999. Type NL to retain as many backup versions as permitted by available storage space. When the value is set to 0, snapshots are kept for the current day. The default value is 30.

## VSS Policy Binding

Use this property page to bind storage snapshots to back up policies or management classes. VSS policies determine how backups are managed and retained.

VSS policy statements are processed from the bottom to the top and processing stops at the first match. To ensure that more specific statements are processed, specify the more general specification before the more specific ones.

The policy statements do not take effect on existing or new backups until the next backup is issued.

## Managed Capacity

Use this property page to track the capacity of managed storage.

The information that is provided can assist you with storage capacity planning during activities such as license renewal.

## Diagnostics

Use this property page to select the type of tracing to run on various components of Tivoli Storage FlashCopy Manager.

When you encounter a problem, open the Diagnostics property page. Select the diagnostic mode that you want to use by clicking **Normal**, **Complete**, or **Custom**. Then, click **Begin** to start the trace. Close the property page. Re-create the problem, open the Diagnostics property page, and click **End** to stop the tracing and collect the data.

If you are using this property page from the Dashboard property sheet, you can run trace only for Management Console (MMC) GUI.

## Diagnostic modes

The following diagnostic mode is available in the Diagnostics property page from the Dashboard property sheet:

**MMC** - use this mode to set tracing for the MMC GUI only. Only MMC tracing can be done here.

The following diagnostic modes are available in the Diagnostics property page in the workload property sheets. The type of tracing that is enabled for each mode is listed in the table. Specific trace flags, and guidance on when to use each mode is also listed.

Table 1. Diagnostics modes and their usage

| Mode     | Components traced along with trace flags used                | When to use                                                                          |
|----------|--------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Normal   | MMC, DP (service), API (service,api_detail)                  | If using legacy operations, you can use this mode as it results in small output size |
| Complete | MMC, DP (service), API (service,api_detail), Agent (service) | Use for VSS operations, results in large output size                                 |
| Custom   | Any combination                                              | Use if specific flags are needed                                                     |

### Normal

Click **Normal** to collect trace and log files for legacy operations. Not applicable for Data Protection for Microsoft Exchange Server.

### Complete

Click **Complete** to collect trace and log files for VSS operations.

### Custom

Click **Custom**, then click the check mark icon to select the trace and log files that you want to collect. Use this mode only if specific trace flags are required.

#### Enable snapin tracing

Select this box to enable tracing of the Management Console. Click **Review** to view the trace file.

#### Set Default Trace Flags

Click **Set Default Trace Flags** to set the most commonly requested trace flags.

#### Enable Data Protection tracing

Select this box to enable tracing of Data Protection for Microsoft Exchange Server, Data Protection for Microsoft SQL Server, and file system and custom application operations. Click **Review** to view the trace file. Add or update trace flags in the field.

#### Enable DSM Agent tracing

Select this box to enable tracing for the Tivoli Storage Manager client node. You must restart the client acceptor service before you start the trace. Click **Review** to view the trace file. Add or update trace flags in the field.

#### Enable API tracing

Select this box to enable tracing for the Tivoli Storage Manager API. Click **Review** to view the trace file. Add or update trace flags in the field.

**Email** Select diagnostic files and click **Email** to send a diagnostic email to an IBM service representative with the selected files attached. You must configure your email information before you can send the data to an IBM service representative. To configure your email information, go to the Dashboard and click **Properties**. Then, click **Email** to open the email property page.

### Screenshot

This function is enabled after you click **Begin**. Click **Screenshot** to open the Diagnostic Screenshot Tool. This tool is a modeless dialog that remains open until you close it or click **End** or **Cancel**.

Click **Add New Screenshot** to add a screen capture to the FlashCopyManager\ProblemDetermination folder. The screen capture can be selected with other diagnostic data.

## Tracing details for each component

All trace files are stored in the flashcopymanager folder, which is C:\Program Files\Tivoli\flashcopymanager by default. When you click **End**, these files are automatically copied, compressed, and stored in the C:\Program Files\Tivoli\flashcopymanager\problemdetermination folder along with other information.

**MMC** Options are stored in the MMC user settings file. The following files are created as a result of the diagnostic functions:

TraceFm.trc  
TraceUx.trc

#### **Data Protection**

Tracing options are stored in the MMC user settings file and passed to the Data Protection component as part of the command. The following file is generated:

TraceFileFs.trc  
TraceFileSql.trc  
TraceFileExc.trc

**Agent** Tracing options are stored in the VSS requestor dsm.opt file. The following file is generated:

TraceFileAgent.trc

**API** Tracing options are stored in the respective Data Protection dsm.opt file. The following file is generated:

TraceFileFsAPI.trc

### **Collecting remote diagnostic data**

Collecting diagnostic data for a remote system using Tivoli Storage FlashCopy Manager is different than collecting data for a local system. You can update the Diagnostics property page to collect the correct log and trace files for remote data collection.

On the local system, verify the following prerequisites are met:

- Windows 7, Windows 8, Windows 2008, Windows 2008 R2, Windows 2012 or later
- PowerShell version 3.0
- Tivoli Storage FlashCopy Manager version 4.1 or later

On the remote system, verify the following prerequisites are met:

- Windows 2008, Windows 2008 R2, Windows 2012 or later
- Windows PowerShell version 3.0
- Tivoli Storage FlashCopy Manager version 4.1 or later
- The desired workload is configured.

For the most current requirements, review the Hardware and Software Requirements technote. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

To collect remote diagnostic data, complete the following steps:

1. Click **Properties** in the Actions pane.
2. Select the Diagnostics property page.
3. For the mode, select any mode. For a smaller trace file, select **Normal**. For a larger trace file, select **Complete**. For full control over the trace flags that are set, select **Custom**.
4. Click **Begin**.
5. Click **OK** to close the window.

6. Repeat the issue that you are seeing on the remote server. For example, backup or restore data on the remote Exchange Server.
7. Open the Diagnostics property page.
8. Click **Screen shot**.
9. In the Diagnostic Screen Shot Tool window, click **Add New Screen Shot**. An image is displayed. When using the Diagnostic Screen Shot Tool on the remote system, the screen shot files are located on the local system.
10. Close the Diagnostic Screen Shot Tool window.
11. Click **End**.

A list of files is displayed. The diagnostic log files are located on the remote system. Depending on the files found on the system, the log, configuration, and trace files are pulled from the system. The following list is provided to help you identify the files you might see displayed:

- Management Console (MMC): TraceFm.trc and TraceUx.trc
- Data Protection: TraceFileFs.trc, TraceFileSql.trc, TraceFileExc.trc
- Agent: TraceFileAgent.trc
- API: TraceFileFsAPI.trc
- Other: Hardware provider logs, System information

The files and traces are stored in the following folder on the remote system: C:\Program Files\Tivoli\FlashCopyManager\ProblemDetermination. Use the **Copy** function to copy the files locally.

## SQL Login

Use this property page to set preferences for logging on to the Microsoft SQL Server. This property page is available only for the **SQL Server** workload.

### Use Windows Authentication

Select this option to use a trusted connection and allow Microsoft Windows to authenticate the logon.

### Use SQL Server Authentication

Select this option to use SQL user ID security. With this type of security, you must enter the logon ID and the password to log on to the Microsoft SQL Server.

### User name

Specifies the SQL user ID.

### Password

Specifies the password to log on to the Microsoft SQL Server.

## General (SQL)

Use this property page to specify general preferences for the **SQL Server** workload. This property page applies if the product is configured to back up data to stand-alone storage or Tivoli Storage Manager.

### SQL Server

Specify the unique name that identifies the SQL Server instance.

### From Server

Specify the SQL server backups that you want to use for the restore. By default, this field displays the same name for the **SQL Server**.

### Wait for tape mounts for backup or restore

Select this box when you want Data Protection for Microsoft SQL Server to

wait for tape media to be mounted for backup and restore operations. This setting is applicable when the Tivoli Storage Manager server is configured to store the backup data on tape media. With backup data on removable media, during backup and restore operations, a wait period occurs during storage volume mounts. If a wait occurs, this setting specifies whether Data Protection for Microsoft SQL Server waits for the media mount or stop the current operation. By default, this option is not selected.

#### **Use VSS backups as the default backup method**

Select this box to set VSS backups as the default backup method. Ensure that the **Local DSMAGENT Node name** field is specified in the VSS Backup property page. Backups can be restored only by using VSS.

#### **Compress backup by using SQL Server compression**

Select this box to enable SQL Server compression during legacy backup operations. This check box is available only if you are running Microsoft SQL Server 2008 or later versions.

#### **Estimate % change for differential backup**

Specify the value for the estimated change to database pages for differential backups. This estimate is used by Data Protection for Microsoft SQL Server to determine whether enough storage space is available for the backup. The default value is 20. This value becomes the default value for all differential backups.

This field applies only to Data Protection for Microsoft SQL Server legacy backups.

### **General (Exchange)**

Use this property page to specify general preferences for the **Exchange Server** workload. This property page applies only if your workload is configured to back up data to Tivoli Storage Manager.

#### **Temporary log restore path**

Specify the default temporary path to use when you restore logs and patch files. For best performance, specify a path that is on a different physical device than the current active logger. If you do not enter a path, the default is the value of the TEMP environment variable. When you run a full restore, copy restore, or database copy restore, all log files that are in the specified path are erased.

#### **Back up DAG databases to common node**

Specify the node name that you want to use to back up databases from a Database Availability Group (DAG) on Exchange Server 2010. With this setting, all active and passive copies of the databases are backed up to the same file space on the Tivoli Storage Manager server. The database copies are managed as a single entity, regardless of which Database Availability Group member they were backed up from.

When you use this setting, Tivoli Storage Manager applies the same policy across all DAG members, regardless of which DAG member ran the backup.

#### **Temporary database restore path**

Specify the directory where the database files that are being restored are temporarily located. Ensure that the directory provides enough space to store the entire mailbox database file. If you do not specify a directory, the database files are restored into a directory that is specified by the TEMP environment variable. This option is only available for mailbox restore operations.



### **Alias of temporary mailbox**

Specifies the alias of a mailbox to use as a temporary storage location during mailbox restore operations. The temporary mailbox is used during restore operations of mailboxes that were deleted, re-created, or moved since the time of the backup. By default, the mailbox restore operation uses the administrator user's mailbox as a temporary storage location.

### **Exchange client access server**

Specify the name of the Client Access Server that you want to use. This field is available only for Microsoft Exchange Server 2010.

By default, Tivoli Storage FlashCopy Manager uses the local server as the Client Access Server if the local server has the Client Access server role installed. The Client Access Server that is defined by the logon user mailbox database is used if the local server does not have the Client Access server role installed.

You can find the name of the current Client Access Server, which is defined by the current logon user mailbox database, by running this Exchange Management Shell command:

```
Get-MailboxDatabase -Identity <logon user mailbox database> |
select RpcClientAccessServer
```

To use a different Client Access Server, you can define the Client Access Server to be used here.

### **Restore mail messages as unread**

Select this check box to specify that restored mail messages are marked as unread.

### **Backup mailbox history**

Select this check box if you are using mailbox restore operations and you want the mailbox history to be backed up.

**Tip:** If you do not intend to run mailbox restore operations, clear this check box. This action can improve backup performance.

### **Pre/Post Snapshot**

Use this property page to specify presnapshot and postsnapshot commands. This property page applies only to custom applications in the **File System** workload.

#### **Pre-Snapshot Command**

Specify the name of the command script that is used to quiesce custom applications that use the file system before the snapshot is created. You must specify the fully qualified path name for the command script.

#### **Post-Snapshot Command**

Specify the name of the command script that is used to restart custom applications that use the file system after the snapshot is created. You must specify the fully qualified path name for the command script.

**Requirement:** Batch scripts must include an exit statement with the value "exit <error\_code>" if a functional error occurs while it is running the script.

## Logging

Use this property page to specify activity log preferences.

### Log File Name

Specifies the name of the file in which activities are logged.

### Enable pruning

Specifies that older entries from the log are to automatically be deleted. By default, log pruning is activated and performed daily.

### Number of days to keep old entries

Specifies the number of days to keep old entries in the log before they are pruned. By default, 60 days of log entries are saved in the pruning process.

### Prune now

Click this option to delete older entries from the Tivoli Storage FlashCopy Manager activity log when a command runs.

## Regional

Use this property page to set preferences that affect how languages and information are displayed and logged.

### Regional and Language options

Select this option to set preferences for the Management Console (MMC). The MMC uses the same regional settings as the Windows system.

### Language

Select the language to use for log files and the command-line interface.

### Date Format

Select a date format to use for log files and the command-line interface. The available choices represent several ways to place the month (*mm*), day (*dd*), year (*yyyy*), and period of day (*a.m.* or *p.m.*). The default date format is *mm/dd/yyyy*.

### Time Format

Select a time format to use for log files and the command-line interface. The available choices represent several ways to place the hour (*hh*), minutes (*mm*), and seconds (*ss*). The default time format is *hh:mm:ss*.

### Number Format

Select a number format to use for log files and the command-line interface. The available choices represent several ways to place the decimal, comma, and spaces. The default number format is *xxx,xxx.dd*.

### Match MMC Language

Select this option to change the MMC regional settings to match the system's regional and language options. By selecting this option, the number, date, and time formats are matched to the default formats of the selected language.

## VSS Options

Use this property page to configure preferences that are used during VSS operations.

### Default Backup Destination

Select the default storage location for your backups. You can select from these storage locations:

- TSM** The backup is only stored on Tivoli Storage Manager server storage. This selection applies to workloads that are configured with the Tivoli Storage Manager server.
- Local** The backup is only stored on local disk. For custom application and file system data, this selection is the default.
- Both** The backup is stored on both Tivoli Storage Manager server storage and local disk. This selection applies to workloads that are configured with the Tivoli Storage Manager server. The Tivoli Storage FlashCopy Manager license must be present with the Tivoli Storage Manager configuration. If only the Data Protection license is found, only the Tivoli Storage Manager option is enabled.

For Tivoli Storage Manager configurations, the backups are stored on a local disk, but managed on the Tivoli Storage Manager server. The Tivoli Storage Manager server maintains the metadata or information about where the local snapshot is stored.

### Local DSMAGENT Node name

Specify the node name for the DSM Agent node of the local client system that creates the VSS backups.

### Remote DSMAGENT Node name

Specify the node name of the system that moves the VSS data to Tivoli Storage Manager server storage during offloaded backups. If you do not use offloaded backups, you can leave this field blank.

### Import VSS snapshots only when needed

By default, local persistent VSS snapshots are automatically imported to the Windows system where the snapshots are created. If you select this option, the VSS snapshots are imported to the local host when needed to perform FlashCopy Manager operations.

To automatically import local persistent snapshots to the Windows system where the snapshots are created, the check box should be cleared.

If you intend to keep many backup versions (for example, more than 100 backup versions), or, if there is a limit to the number of LUNs that your server can use (for example, in virtual machine environments), select this option.

When you select this option, if the VSS hardware provider does not support transportable snapshots, or, if no hardware provider is available, the backup completes, but the VSS snapshot is imported and is not transportable.

If you are running in a VMware environment and want to use VMware vMotion, ensure the LUNs are properly zoned to the ESX hosts and select this option. By choosing to import VSS snapshots when the snapshots are needed, the import process maps the the VSS snapshot to the ESX host where the Windows virtual machine is running.

### **During Instant Restore, automatically stop and restart necessary Microsoft Exchange services**

When this option is selected, during instant restore operations, the following Microsoft Exchange services are, as necessary, automatically stopped and restarted:

- (DAG environments only) Exchange Replication Service
- (Exchange 2013 only) Exchange Search Host Controller Service

### **Custom Settings**

Select the box to display **Show Refresh Options** in the toolbar in the Recover view. This property page is available only with SQL Server and Exchange Server workloads.

In environments where thousands or millions of backup objects are stored on the Tivoli Storage Manager server, it can be helpful to disable the automatic refresh mode. You can click **Refresh Options** and use the toolbar to switch between manual and automatic refresh mode.

Automatic and manual refresh modes differ in the following ways:

- In automatic refresh mode, a view automatically refreshes the first time that you select it. If there are thousands or millions of objects on the server, the refresh can take a long time to complete.
- In manual refresh mode, the view is not automatically refreshed. A name filter is available on the **Refresh Options** toolbar that you can use to narrow down the number of objects selected. After you enter a name pattern, you can click **Refresh**. By using manual refresh mode and limiting your query by using filters, you can reduce the amount of information that is returned from the server. Reducing the amount of information that is returned from the server can improve query and restore performance.

You can also specify a wildcard character (\*) in the name pattern to assist your filtering effort.

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## Chapter 5. Protecting data

After you complete the configuration process, start the Management Console to protect your SQL Server, Exchange Server, or custom application and file system data.

### About this task

To start the Management Console, click **Start > All Programs > Tivoli FlashCopy Manager > FlashCopy Manager Management Console**. If you try to use the Management Console before you complete the configuration process, the software does not function correctly.

The Management Console that is displayed is the Microsoft Management Console (MMC) with Tivoli Storage FlashCopy Manager software displayed as a plug-in. The console uses a navigation tree to organize the computer data that you have registered. Each computer icon that is followed by the word *Dashboard* represents a physical computer.

When you register a computer, information about this particular system is collected and stored. Password information is encrypted and stored separately. The computers that are registered are tracked with a globally unique identifier (GUID). The GUID is assigned to each system and is used when backing up and restoring data.

You can create groups of computers. These groups consolidate information when you view the dashboard, prepare reports, and run group commands. By default, the computers in a group are selected when you complete tasks for the group, but you can select additional computers in the tree to include in an operation.

---

## Determining managed storage capacity

You can track the capacity of managed storage assets. This information can be helpful with storage planning during activities such as license renewal.

### About this task

Typically there is a difference between the capacity that is used by server data and the capacity of the volume that contains that data. For example, a set of databases might require a capacity of 1 GB and are 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.

### Procedure

1. Select an Exchange, SQL, or File System instance.
2. On the **Protect**, **Recover**, or **Automate** tab, click **Properties** in the **Action** pane.
3. Select **Managed Capacity** from the list of available property pages. The managed capacity is calculated and displayed.
4. To view a list of the volumes (that contain backups) and their respective managed capacity, by clicking **Show Details**.
5. Close this window.

---

## Create snapshots

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

### Creating a snapshot of SQL Server data

In the Tivoli Storage FlashCopy Manager tree view, a SQL Server node is displayed for each SQL Server instance on the computer.

To create a snapshot of an SQL Server instance:

1. Select an **SQL Server** instance in the tree view.
2. Create a snapshot by using one of the following methods:
  - To create snapshots by using the GUI, click the **Protect** tab, select one or more databases from the results pane, and select the VSS backup method. In addition, select the backup destination and backup type.
  - To create backups by using commands, click the **Automate** tab, and enter the commands in the integrated command prompt interface.  
Click **Tips** for information that regard the integrated command prompt.

### Creating a snapshot of Exchange Server data

In the Tivoli Storage FlashCopy Manager tree pane, an Exchange Server node is displayed for each Exchange Server instance on the computer.

To create a snapshot of an Exchange Server instance:

1. Select a **Exchange Server** instance in the tree view.
2. Create a snapshot by using one of the following methods:
  - To create snapshots by using the GUI, click the **Protect** tab, select one or more databases from the results pane, and select the applicable backup action.
  - To create backups by using commands, click the **Automate** tab, and enter the commands in the integrated command prompt interface.  
Click **Tips** for information that regard the integrated command prompt.

### Creating a snapshot of custom application and file system data

In the tree view, a File System node is displayed that represents the custom application and file system data for the computer.

To create a snapshot of a file system or custom application:

1. Select a **File System** in the tree view.
2. Create a snapshot by using one of the following methods:
  - To create snapshots by using the GUI, click the **Protect** tab, select one or more volumes, and click **Full Backup** in the Actions pane.

**Optional:** For custom applications, specify the presnapshot and postsnapshot batch scripts. Consistent backups require the application to be quiesced or stopped before the snapshot is created.

The **PreSnapshotCmd** and the **PostSnapshotCmd** options are available in the backup options pane. Click **Show Backup Options** to display these options. This step is not necessary if there is no custom application that is using the file system.

- To create snapshots by using commands, click the **Automate** tab. Enter the commands in the integrated command prompt interface.

Click **Tips** for information that regard the integrated command prompt.

---

## Mounting VSS snapshots to remote servers

You can mount VSS snapshots to servers that other users can access.

### Before you begin

The mount command with remote options of a backup requires a hardware provider that supports transportable snapshots. In addition, the **Import VSS snapshots only when needed** configuration option and remote Windows PowerShell must be enabled. To enable Windows PowerShell Remoting, refer to the Microsoft documentation for this service.

When you select the **Import VSS snapshots only when needed** option, if the VSS hardware provider does not support transportable snapshots, or, if no hardware provider is available, the backup completes, but the VSS snapshot is imported and is not transportable. Do not attempt to create backups that contain a mixture of hardware providers that do and do not support transportable snapshots. If you attempt this type of backup scenario, the backup operations fail.

### About this task

With the command-line interface, the following tasks can be completed. These tasks assume there are at least three servers in the environment: *Server A*, *Server B*, and *Server C*. The backup that is created on *Server A* is remote-mounted to *Server B*.

- On *Server A*, complete a local backup query to show the backup is mounted on *Server B*.
- From *Server C*, complete a remote backup query of *Server A*. The query shows the backup is mounted on *Server B*.

For more information about the command-line interface commands that can be used to complete these tasks, see the following sections:

#### TDPEXCC

- “Mount backup syntax” on page 159
- “Unmount backup syntax” on page 205

#### TDPSQLC

- “Mount Backup syntax” on page 222
- “Unmount Backup syntax” on page 258

#### FCMCLI

- “Mount backup syntax” on page 274
- “Unmount backup syntax” on page 300
- “Query backup syntax” on page 284



## What to do next

When you use the command-line interface to mount VSS snapshots to remote servers, there are a few factors to remember:

- No Fast Restore of the full backup on the server where the backup is created.
- There is read-only access to all local and remote mounts.
- After a backup is locally or remotely mounted, the backup cannot be remotely mounted to a different location.

When a backup is remote-mounted and the backup is deleted, the state of the mount point varies. The state of the mount point depends on the VSS hardware provider and storage device used. When a backup is mounted remotely, the backup can be deleted. When a local persistent VSS snapshot is created, a source and target volume relationship is created. The local persistent VSS snapshot is created on your storage device. In this scenario, when a mount command with remote options operation occurs, the target volume is imported and mounted to the server that sends the request for the remote operation.

During the deletion of a backup, the snapshots and the relationship between the source and target volumes on the storage device are also deleted. However, the target volume that is imported and mounted might continue to exist. In addition, the target volume might not be available to the server where the mount command with remote options occurred. The operations that occur to the target volume depend on the VSS hardware provider and the storage device implementation.

There are two common backup deletion scenarios to consider when you use the mount command with remote options:

- The manual deletion of a remotely mounted backup: The Tivoli Storage FlashCopy Manager software can delete any backup by using the command-line interface or Microsoft Management Console.
- The expiration process: When either the maximum number of backup versions or the maximum number of days to retain a backup (as specified by the Tivoli Storage FlashCopy Manager policy) is exceeded, the associate backup is expired and deleted.

When you enter a **mount** or **query** command with the `/remotecomputer` option, if a problem occurs, enable command-line interface tracing to debug the problem. For tracing, append `/tracefile=filename.trc /traceflag=service` to the command.

After trace is enabled, the command-line interface generates trace files for the local and remote systems. On the local system, you can view the file that you specified. In addition, on the local and remote systems, a trace file is also created. This file has the same name as the file stored on the local system and the file name concludes with the following suffix appended to the file type extension: `_remote`

For example, on the local system, after you enable command-line interface tracing, the following files are created:

- `filename.trc`
- `filename.trc_remote`

On the remote system, after you enable command-line interface tracing, the following file is created: `filename.trc_remote`

In addition to the command-line interface trace file, enable tracing on the agent. Again, enable tracing on both the local and remote systems.

---

## Protecting Exchange Server data with Tivoli Storage FlashCopy Manager

Tivoli Storage FlashCopy Manager provides online backups and restores of Microsoft Exchange Server.

### About this task

For Exchange 2013 users, you can back up and restore public folder mailboxes located on mailbox databases in standalone and DAG configurations. Item-level restore for public folders is not supported.

## Backup and restore prerequisites

Before you run backup and restore tasks, review the following prerequisites.

### Exchange Server 2010 and 2013

Tivoli Storage FlashCopy Manager software must operate in an account with membership in the Organization Management group. You must also have local Administrator privilege.

For mailbox restore and mailbox restore browser operations, membership in the Organization Management group is also required. The Exchange server must have the Client Access server role installed, or Tivoli Storage FlashCopy Manager must be configured to use a different client access server in the domain.

When you run backups, the Exchange database file size can increase because of increased database commitments that are triggered by backup operations.

### Mailbox restore operations

There are several options to consider when restoring mailboxes and mailbox data. For example, you can choose where to restore the mail, and how to restore the mail. You can restore mailbox data from the graphical or command-line interfaces of Tivoli Storage FlashCopy Manager. From these interfaces there are options for restoring interactively with the Mailbox Restore Browser or directly from Exchange database files. When restoring mailboxes and mailbox data, make sure your environment is set up to meet the following requirements:

- The administrator account that is being used to run the mailbox restore must have an active Exchange mailbox in the domain.
- Temporary space is required to accommodate the mailbox database during restore operations. Specify the temporary space on the General property page for the Exchange Server workload. On the General property page, set the following options:
  - **Temporary Log Restore Path**
  - **Temporary Database Restore Path**

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

- Ensure that correct version of Microsoft Exchange Server MAPI Client and Collaboration Data Objects is installed on the Exchange server that you use to run the mailbox restore operations. The correct version is identified in the Hardware and Software Requirements technote that is associated with the level of your software. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website

at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

- When restoring mailboxes directly from Exchange database files, verify that there is read and write access to the EDB file and verify that the Exchange transaction log files are available.

Microsoft Outlook cannot be installed on the server that is being used to run the mailbox restore.

When you submit a restore or mount request, all of the volumes that are contained in the original snapshot set are imported. If the number of volumes that are imported exceeds the maximum number of allowable mapped volumes for the environment, the restore or mount operation can fail.

## Backing up Exchange Server data

Complete these steps to back up Exchange Server data.

### Before you begin

Before you begin, review “Backup and restore prerequisites” on page 99.

If you are backing up Exchange Server databases in a Database Availability Group (DAG) environment, and you want to back up your databases to a common node, ensure that you set up a DAG node name (DAGNODE). (Backing up DAG databases to a common node is helpful when you want to manage backups with a single policy, regardless of which DAG server completed the backup.) You can set up the DAG node name in the **DAG Node** field in the TSM Node Names page of the Tivoli Storage Manager configuration wizard, or in the **Back up DAG databases to common node** field in the General properties page for your Exchange workload.

### Procedure

To back up Exchange Server data, complete the following steps:

1. Start the Management Console and click **Exchange Server** in the tree view.
2. On the **Protect** tab, select one or more databases to back up. Alternatively, click the **Protect Data** shortcut in the start page of the Management Console.

Filter the list of available databases in the results pane by entering a keyword in the **Search** field.

If you are running in an Exchange Server 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 **Protect** tab.

3. Verify the backup options. If the backup options are not displayed, click **Show Backup Options**.

- Set the **Offload** option to **True** to use offloaded backups. An offloaded backup uses another system (specified with the **RemoteDSMAGENTNode** parameter) to move Exchange data to Tivoli Storage Manager server storage and runs the Exchange Integrity Check. An offloaded backup can reduce the load on network, I/O, and processor resources during backup processing.

If you are going to use offloaded backups, make sure a **RemoteDSMAGENTNode** is specified. This option applies only to the Tivoli Storage Manager configuration.

- Click **Skip Exchange Integrity Check** if you do not want to run the Exchange Integrity check to verify that the databases and log files to be backed up do not contain integrity issues. According to Microsoft advised practices, you can skip the integrity check if the database you are backing up has two or more healthy copies within a DAG environment.

**Attention:** If you do not verify that the backups are valid by using the Exchange integrity check, and there is an integrity error when you restore the database, you must run repairs on the database, which can result in data loss. If you skip the integrity check and the database is not recoverable because of integrity errors, contact Microsoft support for help in recovering your data.

- If you are scheduling the backup of databases in an Exchange Server DAG, use **Minimum Backup Interval** to set the minimum amount of time, in minutes, before a backup of another copy of the same DAG database can begin. The default value is 0, which means that you can back up the database again immediately after a backup operation of that database is complete. The time of the last backup for the database is determined from the Exchange Server and not the Tivoli Storage Manager server.

This option specifies that only one database copy can be backed up within a timeframe. This option prevents all of the members in a DAG from backing up the database, which would be redundant and invalidate the Tivoli Storage Manager storage management policy.

This setting is intended to be used with tasks that are scheduled to be run with the **Run Scheduled** button, or in a script to be run with the Tivoli Storage Manager Scheduler.

- If you are scheduling the backup of databases in an Exchange Server DAG, set **PreferDAGPassive** to **True** to skip the backup for an active database copy unless no healthy passive copy is available. If no healthy passive copy is available, the backup is made from the healthy active database copy. There is no default value for **PreferDAGPassive** because **PreferDAGPassive** is a switch option.

This setting is intended to be used with tasks that are scheduled to be run with the **Run Scheduled** button, or in a script to be run with the Tivoli Storage Manager Scheduler.

4. (Optional) Choose a mode for the current task:

- **Run Interactively:** Click this item to run the current task interactively. This selection is the default.
- **Run Scheduled:** Click this item to convert the current action into a scheduled task. When you select this item, the schedule wizard starts, complete with the appropriate command that is required to complete the task.

5. Create the backup by selecting the backup action from the **Action** pane. You can run a full, copy, incremental, or differential backup with the VSS backup method.

**Related tasks:**

“Restoring a Database Availability Group database copy backup” on page 107

## Managing Exchange Database Availability Group members by using a single policy

You can prevent Tivoli Storage FlashCopy Manager from backing up each database copy separately by backing up the database copies under a single Database Availability Group (DAG) node.

### About this task

For Microsoft Exchange Server databases in a DAG environment, several online copies of a database are maintained for high availability. To reduce the number of database backups that are created, set up to back up database copies from different DAG members under a single DAG node.

All database copies can be managed as a single entity. This management is regardless of where they were backed up from, and whether they were active or passive at the time of the backup. You can then set up a minimum interval between database backups. The minimum interval ensures that the database copies are not backed up at the same time or backed up too frequently.

## Mounting Exchange Server backups

From the Recover tab, you can mount a backup.

### About this task

To mount backups, complete the following steps:

#### Procedure

1. Start the Management Console.
2. Click **Recover Data** in the welcome page of the Management Console.
3. In the Recover tab, go to the Action pane. Click **Mount Backup**.
4. Either type the path to the empty NTFS or ReFS folder where you want to mount the backup or browse to find the path. Click **OK**.

### Results

In the Recover tab, the backup that you mount is displayed. You can use the **Explore** and **Unmount Backup** options in the Action pane to complete more tasks with the backup that you mounted.

## Deleting Exchange Server backups

You can delete an Exchange Server backup.

### Before you begin

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

For backups of Exchange Server Database Availability Group (DAG) databases to Tivoli Storage Manager, backups of a database from a DAG member to LOCAL can be deleted only from the system that created the backup.

## Procedure

To delete Exchange Server backups, follow these steps:

1. Start the Management Console.
2. Click **Recover Data**.
3. On the **Recover** tab for the Exchange instance, select one or more backups of databases to delete.
4. Click **Delete Backup** in the Action pane to delete the backups of the selected databases.

When a delete backup operation is in progress, two tasks are shown in the task window. The content in the view is updated when both tasks are finished.

## Restoring an Exchange Server database

If you back up data, you can restore the data when data loss or data corruption occurs.

### Before you begin

To run backup or restore tasks, Tivoli Storage FlashCopy Manager must be operating in an account with membership in the Organization Management group.

### About this task

For database backups in the Exchange Server Database Availability Group (DAG) environment, because all database copies are backed up by using a single DAG node, you can restore a database regardless of which DAG member the database was backed up from. Local backups must be restored on the node where the backup was performed.

Ensure that you are set up to use the DAG node name (DAGNODE). You can set up the DAG node name in the **DAG Node** field in the TSM Node Names page of the Tivoli Storage Manager configuration wizard, or in the **Back up DAG databases to common node** field in the General properties page for your Exchange workload.

In a stand-alone environment, you cannot back up a database from one DAG member and restore it to a different DAG member. Backups of the same database are managed with the same policy, regardless of whether the database is active or passive at the time of the backup.

When you restore a database, data that exists in the database is overwritten, and is no longer available after restore processing is complete. Instant Restore processing overwrites all files on the destination file system. When you complete the following steps to restore Exchange Server data, one of the terms that is used is *restore into*. When you use the *restore into* options, you restore data to an alternate target destination. The data is not restored to the original source destination. For the restore to successfully complete, the alternate target destination must be of equal size as the original source volume.

## Procedure

To restore Exchange Server data, complete the following steps:

1. From the Management Console, click **Recover Data** in the welcome page.



2. In the **Recover** tab for the Exchange instance, select **View: Database Restore**. Use the results pane to browse the databases available for restore. The following features are available:

- Filter: Use the filter options to narrow the list of databases in the result pane.
  - a. Click **Show Filter Options** and **Add Row**.
  - b. Click the down arrow in the **Column Name** field and select an item to filter. You can filter by database **Name**, **Restore Into**, **From DB Copy**, **Backup Date**, **Backup Location**, **Size (in GB)**, **Instant Restore Supported**, **Management Class**, and **Server**.

For database backups in the Exchange Server DAG environment, the **Server** column displays the name of the DAG and the server that made the backup in this format:

```
DAGNAME\SERVERNAME
```

Where DAGNAME is the name of the DAG, and SERVERNAME is the name of the server (DAG member) that created the backup. For example:

```
TSM DAG4\AVOCADO
```

To filter by **Backup Date**, click the default date and time to edit the table cell. To change the date, click the drop-down icon that is displayed at the end of the cell. The calendar date selection tool is displayed. After you select a date, to display the date in the field, press **Enter**. To edit the time, enter the time using the 12-hour clock time convention.

When you click **Select All**, all rows that reflect the filter specifications are selected.

- c. Select an operator in the **Operator** field.
  - d. Specify a value to filter on in the **Value** field.
  - e. In you want to filter on more items, click **Add Row**.
  - f. Click **Apply Filter** to filter your databases.
- Backups: Select the database to restore. You can click **Active Backups** to show only active backups, or click **All Backups** to show both active and inactive backups.
  - Search: Use the **Search** field to filter the databases.
  - Refresh: Click **Refresh** to update the view with your changes.

If you applied a filter, the objects on the server that match the filter or search criteria are listed in the **Recover** tab. The status area indicates the number of items that match the criteria *n* of *x* displayed, where *n* equals the number of objects that match the filter criteria, and *x* is the number of objects that are retrieved from the server. For example, 5 of 20 displayed. If you specify refresh options to further narrow your results, and click **Refresh** again, the objects on the server that match the filtered and refresh options are displayed. Each time that you click **Refresh**, another query is run against the Tivoli Storage Manager server.

3. In the **Recover** tab for the Exchange instance, select one or more backups to restore. If the **AutoSelect** option is set to **True** in the Restore Options view, more backups necessary to restore the most recent backup are selected for you. If you do not want more selections that are made for you, set **AutoSelect** to **False**.
4. Verify the restore options. If the restore options are not displayed, click **Show Restore Options**.
5. (Optional) Choose a mode for the current task:



- **Run Interactively:** Click this item to run the current task interactively. This selection is the default.
  - **Run Scheduled:** Click this item to convert the current action into a scheduled task. When you select this item, the schedule wizard begins, complete with the command that is required to complete the task.
6. Start the restore operation:
- To restore the backup, right-click that backup name and select **Restore**. To begin the restore operation, you can also click **Restore** in the Action pane.
  - To restore the backup into another location, right-click and select **Restore Into** to specify a target location for the restore operation. A dialog window pops up for you to specify the database to restore into.  
Select the name of a database into which a VSS backup is restored. To restore into a recovery database (RDB) or alternate database, an RDB or alternate database must exist before you attempt the restore operation. Any type of **Restore Into** processing automatically disables VSS instant restore.
- VSS instant restore is only available for full or copy type backups that are on the disk devices that support this type of restore. During the VSS instant restore operation, the drive or volume where the database is located must not be accessed by any other process or application.

## Restoring an Exchange Server mailbox

Use Tivoli Storage FlashCopy Manager to restore mailboxes and mailbox data.

### About this task

If you restore personal storage folders (.pst files), there are two options: **Restore Mail to Unicode PST file** and **Restore Mail to non-Unicode PST file**. The non-Unicode .pst file is also known as a Microsoft Outlook 97-2002 data file. There is a size limitation when restoring non-Unicode .pst files: The file size must be less than 2 GB. There is no size limitation when restoring Unicode .pst files.

When you select what type of .pst file to restore, use the following table to make the best decision for your environment:

*Table 2. Restoring Unicode and non-Unicode PST files*

|                                         | Unicode .pst file        | Non-Unicode .pst file |
|-----------------------------------------|--------------------------|-----------------------|
| Filters supported                       | All Content, Folder Name | All                   |
| Compatible with Mailbox Restore Browser | No                       | Yes                   |
| Size                                    | No limit                 | less than 2 GB        |

### Procedure

Follow these instructions to restore an Exchange Server mailbox or mailbox items.

1. Start the Management Console and select **Exchange Server** in the tree view.
2. In the **Recover** tab for the Exchange instance, and change the selected view to **Mailbox Restore**.

3. Select one or more mailboxes to restore. A list of mailboxes that are backed up is displayed. If you are restoring a mailbox that was deleted or re-created since the time of the backup, enter a mailbox with sufficient space to temporarily store the messages during the restore. This mailbox is set by using the Alias of temporary mailbox option from the Properties page, under the General tab.
4. Optional: By default, 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** option to select an earlier date and time. When you specify a backup date, Tivoli Storage FlashCopy Manager looks for a backup with that exact date. If a backup with that exact date is not found, Tivoli Storage FlashCopy Manager looks for and selects the first backup **after** that date. For example, if you have a backup at 9:51 and a backup at 10:09, and you specify 10:00, Tivoli Storage FlashCopy Manager selects the backup at 10:09. This backup is selected so the software does not miss any messages. If the backup at 9:51 was selected, the software would miss messages from 9:51 to 10:00.

By default, the entire mailbox is restored. Use the **Item-Level Mailbox Filters** to identify individual messages to restore.

- a. Click **Show Filter Options** and **Add Row**.
- b. Click the down arrow in the **Column Name** field and select an item to filter. You can filter by **Backup Date**, **Folder Name**, **Subject Text**, **Sender Name**, **Message Body Text**, **All Content**, **Attachment Name**, and **Received Date**. When restoring to a Unicode .pst file, except for the **Folder Name** and **All Content** filters, the filters are ignored.  
When you click **All Content**, the mailbox items are filtered by attachment name, sender, subject, and message body.  
To filter by **Backup Date**, click the default date and time to edit the table cell. To change the date, click the drop-down icon that is displayed at the end of the cell. The calendar date selection tool is displayed. After you select a date, to display the date in the field, press **Enter**. To edit the time, enter the time using the 12-hour clock time convention.
- c. Select an operator in the **Operator** field.
- d. Specify a value to filter on in the **Value** field.
- e. In you want to filter on more items, click **Add Row**.

5. Verify restore options. If the restore options are not currently displayed, click **Show Restore Options**.

#### **Mailbox**

If the alias of the mailbox to restore is not displayed in the list of mailboxes, specify the alias. This option overrides any selected mailboxes.

#### **Mark restored messages as unread**

Use this option to automatically mark the mailbox messages as unread after restore operation completes. The default value is **True**.

#### **Mailbox Original Location**

Use this option only if the mailbox is deleted or recreated since the time of the selected backup, and mailbox history is disabled. Specify the Exchange Server and the database where the mailbox is at the time of the backup. Use the following format: server-name,db-name

6. Click one of the **Restore** actions in the **Action** pane to begin the restore operation.

### **Restore Mail to Original Location**

Select this action to restore the mail back to where the mail items existed at the time of backup.

### **Restore Mail to Alternate Location**

Select this action to restore the mail items to a different mailbox. A dialog is displayed for you to specify the mailbox

### **Restore Mail to non-Unicode PST file**

Select this action to restore the mail items to a non-Unicode personal folders (.pst) file. When you restore to a .pst file with one selected mailbox, you are prompted for a file name. When you restore to a .pst file with more than one selected mailbox, you are prompted for a directory location. Each mailbox is restored to a separate .pst file that bears the name of the mailbox at the specified directory.

If the .pst file exists, the file is used. If it does not exist, the file is created.

### **Restore Mail to Unicode PST file**

Select this action to restore the mail items to a Unicode personal folders (.pst) file. When you restore to a .pst file with one selected mailbox, you are prompted for a file name. When you restore to a .pst file with more than one selected mailbox, you are prompted for a directory location.

You can enter a standard path name (for example, c:\PST\mailbox.pst) or a UNC path (for example, \\server\c\$\PST\mailbox.pst). When you enter a standard path, the path is converted to a UNC path. If the UNC is a non-default UNC path, enter the UNC path directly.

Each mailbox is restored to a separate .pst file that bears the name of the mailbox at the specified directory. If the .pst file exists, the file is used. If it does not exist, the file is created.

The amount of time that it takes 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 Database Availability Group database copy backup**

Perform these steps to restore a replicated database copy backup in a Database Availability Group (DAG). This procedure assumes that you already backed up your database.

### **About this task**

Use the Management Console or the Management Shell to input commands as detailed in the parentheses.

### **Procedure**

To restore a DAG database copy backup, complete the following steps:

1. Make the database active on the server that you want to host the restore (**Move-ActiveMailboxDatabase**).
2. Suspend replication of all passive copies of the database (**Suspend-MailboxCopy**).
3. Unmount the active mailbox database (**Dismount-Database**).

4. (VSS instant restore only) When either the **During Instant Restore, automatically stop and restart necessary Microsoft Exchange services** option is not selected, or the **STOPSERVICESONIR** parameter is set to no, stop the service that corresponds to your environment:
  - (DAG environments only) Exchange Replication Service
  - (Exchange 2013 only) Exchange Search Host Controller Service
5. Restore the database and logs by using the Tivoli Storage FlashCopy Manager command line or Management Console. The database must not be mounted automatically after the restore. If you use the Management Console, ensure that the **MountDatabasesAfterRestore** option is set to *False* in the Restore panel. If you use the command line, the **/mountdatabases** restore option must be set to *NO*.  
 If either the **During Instant Restore, automatically stop and restart necessary Microsoft Exchange services** option is selected, or the **STOPSERVICESONIR** parameter is set to yes, the **MountDatabasesAfterRestore** option can be set to *True*.
6. If the service is stopped, start the replication service before you mount the active mailbox database. Otherwise, the database mount fails (**Mount-Database**).
7. Verify the health of the database before you update or reseed to replicated database copies.
8. Update or reseed all replicas (**Update-MailboxDatabaseCopy**). This step avoids potential transaction log synchronization problems that might arise if replication were resumed directly.
9. Move the active database to the server that you want (**Move-ActiveMailboxDatabase**).

## Restoring mailbox messages interactively with the Mailbox Restore Browser

You can interactively restore a mailbox or items from a mailbox on Exchange Server by using the Mailbox Restore Browser.

### Before you begin

Before you begin, review “Backup and restore prerequisites” on page 99.

### About this task

In addition, review the mailbox restore characteristics before you attempt a restore operation:

- When the Management Console is started, it detects whether there exists a recovery database that was previously created by Tivoli Storage FlashCopy Manager. If one exists, then the Management Console automatically connects to the existing recovery database and displays its contents. Otherwise, you are prompted for the mailbox or database to restore into the recovery database.
- The Management Console also detects a recovery database that was created outside of Tivoli Storage FlashCopy Manager and automatically connects to it. When you complete your mailbox restore tasks, you must manually remove the recovery database. You cannot use the **Close Mailbox to Restore** action item.
- When a mailbox is selected, it is first restored to the recovery database. It is from this location that the mailbox becomes available for browsing. When the restore operation to this location completes, the restored mailbox and folders are shown in the results pane.

- If you plan to restore mail or folders by using a Simple Mail Transfer Protocol (SMTP) Server, make sure to configure the SMTP Server before you attempt a restore operation. Set the configuration in the Management Console by right-clicking **Dashboard** in the tree view and selecting **Properties**. Then, go to the E-mail property page. Enter the SMTP server and port in this property page.
- If you select a mailbox to restore, you can click **Restore Mailbox to Original Mailbox**. If you select a folder, you can click **Restore Folder to Original Mailbox**, or **Restore Folder to SMTP Server**. If messages are selected, you can click **Restore Messages to the Original Mailbox**, **Restore Messages to SMTP Server** or **Save Mail Message Content**.
- Tivoli Storage FlashCopy Manager restores the mailbox backup to its original mailbox location. However, you can also restore a mailbox to either of the following locations:
  - To restore a mailbox item to a different mailbox, use the **Open Exchange Mailbox** task in the Action pane. Enter the alias of the mailbox to identify it as the restore destination. This mailbox restore destination is shown in the lower results pane. Drag the source mailbox from the upper results pane to the destination mailbox in the lower results pane.
  - To restore a mailbox to an Outlook personal folders (.pst) file, use the **Open PST File** task in the Action pane. A Windows File dialog opens so that you can select an existing .pst file or create a .pst file. This specified destination .pst file is shown in the lower results pane. Drag the source mailbox from the upper results pane to the destination .pst file in the lower results pane.

The mailbox restore browser only supports non-Unicode .pst files.

In either case, a merge operation is done during the restore. If the object exists, Tivoli Storage FlashCopy Manager does not create a duplicate. Tivoli Storage FlashCopy Manager restores only items that do not exist in the restore destination.

When a mailbox is restored to its original mailbox location, the items are merged. When a mailbox is restored to a different mailbox or to a .pst file, the items are restored to a folder that bears the original mailbox name.

- The **Close Exchange Mailbox** and **Close PST File** tasks in the Action pane are only shown when a destination mailbox or .pst file is opened.

**Restriction:** Only mailboxes within the same database can be restored in a single mailbox restore action.

## Procedure

To restore mailbox messages with the mailbox restore browser, complete the following steps:

1. Start the Management Console.
2. Under the **Protect and Recover Data** node in the tree, select **Exchange Server**.
3. In the Recover panel, click **View > Mailbox Restore Browser**. The Select Source Mailbox to Restore dialog opens.
4. Specify the mailbox to restore in the Select Source dialog:
  - a. To browse mailboxes, select **Browse Mailboxes**. You can also switch to the databases view by selecting **Browse Databases** in the drop-down list. Enter the name of the mailbox in the field in the **Mailbox Name** field, or scroll down through the list and select a mailbox. The list is populated by using mailbox history that is taken at the time of the backup. If mailbox

history is disabled, you can type a mailbox name. Otherwise, use the **Search** field to filter the mailboxes. You can also sort the mailboxes by columns. Click **OK**.

You can also specify a date and time in the **Backup Date/Time** field when you want to restore a backup that was created at a specific point in time. To filter by date and time, click the default date and time to edit the table cell. To change the date, click the drop-down icon that is displayed at the end of the cell. The calendar date selection tool is displayed. After you select a date, to display the date in the field, press **Enter**. To edit the time, enter the time using the 12-hour clock time convention.

- b. To browse all mailboxes in a particular backup, specify **Browse Databases**. A list of available backups is displayed. Scroll down the list and select a database. Use the **Search** field to filter the databases. You can also sort the databases by columns. Click **OK**.
- c. To restore a mailbox that was deleted or recreated after the time of the backup, go to the **Properties > General** tab. Enter the temporary mailbox alias. If this alias is not entered, the mailbox restore operation uses the current administrator user mailbox as a temporary storage location.

After the specified mailbox is restored to the recovery database, the restored mailbox and folders are shown in the results pane.

5. Use the results pane to browse the folders and messages that are contained within your mailbox. The following features are available:
  - **Preview:** When a mailbox item is selected, its content is shown in the preview panel. When an item contains an attachment, click the attachment icon to preview its contents (click **Open**) or save it (click **Save**).
  - **Filter:** Use the filter options to narrow the list of folders and messages in the result pane.
    - a. Click **Show Filter Options** and **Add Row**.
    - b. Click the down arrow in the **Column Name** field and select an item to filter. You can filter by Folder Name, Subject Text, Sender Name, Message Body Text, All Content, Attachment Name, Size (in KB), Created Date, Modified Date, Sent Date, and Received Date.

When you select **All Content**, the mailbox items are filtered by attachment name, sender, subject, and message body.
    - c. Select an operator in the **Operator** field.
    - d. Specify a value to filter on in the **Value** field.
    - e. In you want to filter on more items, click **Add Row**.
    - f. Click **Apply Filter** to filter your messages and folders.

Select the mailbox, folder, or message to restore before proceeding.

6. Click the restore task in the Action pane. Depending on the item that you selected, the following restore actions are available:
  - **Restore Folder to Original Mailbox**
  - **Restore Messages to Original Mailbox**
  - **Restore Folder to SMTP Server**
  - **Restore Mail to SMTP Server**

If the SMTP Server was not configured, you must configure it before you run the restore action. Right-click the dashboard and select **Properties**, then click **E-mail** to complete the configuration.



- **Save Mail Message Content:** A Windows Save File dialog is displayed. Specify the location and message name and click **Save**. The Save Mail Message Content action becomes available when a message is selected in the preview pane.

When you restore an email with an attachment larger than 3 MB, a Microsoft fix is required. The fix resolves the following issue: *QFD: System.Net.Mail - SmtplibClient class throws exceptions if file attachment is over 3MB*. The fix is available online at <https://connect.microsoft.com/VisualStudio/Downloads/DownloadDetails.aspx?DownloadID=30226>.

The Restore Progress dialog opens and shows operation details.

The **Close Mailbox to Restore** button is displayed after a recovery database is created. When you click this button, Tivoli Storage FlashCopy Manager removes the recovery database that was created and cleans up the restored files. If you do not select **Close Mailbox to Restore**, the recovery database is not removed even if you exit the Management Console.

## Restoring mailboxes on remote systems

For a typical mailbox restore task, on the local and remote systems, the FlashCopy Manager for Microsoft Exchange Server package must be installed. The correct version of Microsoft Exchange Server MAPI Client and Collaboration Data Objects must also be installed.

### Before you begin

For the most current requirements, review the Hardware and Software Requirements technote. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

After you complete the installation of software on the local and remote systems, verify that the remote system is available and that you can connect to it. You can also verify that the database with the mailbox you want to restore has been backed up successfully. You can use the Management Console (MMC) to navigate to the remote system where you want to restore mailboxes.

### About this task

The process of restoring mailboxes on a remote system with Mailbox Restore Browser is a little different so specific instructions are provided in this topic. For all other mailbox restore tasks completed on remote systems, you can use the instructions provided in subsequent sections.

To restore mailboxes on a remote system with Mailbox Restore Browser, the local and remote systems must be in the same domain. The following procedure assumes that you have installed the latest version of Tivoli Storage FlashCopy Manager, configured the Microsoft Exchange workload, and have a Windows PowerShell remote connection. At least one mailbox needs to be stored in a database on the remote system.

### Procedure

1. From the MMC, in the navigation tree, expand the tree to the remote system.
2. From the Protect and Recover Data tree node, select the Exchange Server.



3. In the main window, from the Recover tab, click **View > Mailbox Restore Browser**.
4. Select the mailbox that you want to restore. Click **OK**. The mailbox is displayed in the Source Mailbox tree view.
5. Click **Restore Mail to Original Mailbox**.

## Results

The mail is restored to the original mailbox. The task is complete.

## Restoring mailboxes directly from Exchange database files

When the backup database (EDB) file and log files are available on the disk of a supported Microsoft Exchange server, you can restore an individual mailbox directly from the EDB file.

### About this task

To complete this task, there are two prerequisites:

- Verify read/write access to the EDB file.
- Verify that the Exchange transaction log files are available.

If you use Tivoli Storage FlashCopy Manager to back up the Exchange server, the database files can be restored to a local disk with the following command:

```
tdpexcc RESTOREFILES
```

If you are using Tivoli Storage Manager for Virtual Environments software, review the following statements before you restore the mailbox:

- To back up an Exchange server, the database files can be stored on virtual volumes that are mounted from Tivoli Storage FlashCopy Manager for VMware snapshots.
- Mount the virtual volumes with read/write access. Read or write access can be gained by clearing the **Mount virtual volume as read only** check box.
- If the log files are on a different volume than the EDB file, mount the volume with the log files on an unused drive letter. With this action, you can apply the transaction logs to the EDB file.

To complete the restore from the graphical user interface, complete the following steps:

### Procedure

1. From the Exchange server, start Tivoli Storage FlashCopy Manager.
2. After you log on to Tivoli Storage FlashCopy Manager, in the navigation area, select the Exchange Server node and Recover tab. The Mailbox Restore Browser view opens.
3. From the Actions pane, click **Open EDB File on Disk**.
4. In the dialog, enter or browse to the location of the backup database (EDB) file. This field is required.
5. In the dialog, enter or browse to the location of the log file directory. Specifying a path to the log file directory is not required. Although, the amount of time necessary to complete the restore is reduced when you provide the log file directory path.
6. Click **OK**. The EDB file is opened and the mailboxes are displayed.

7. Select the mailbox that you want to restore and the type of restore that you want to complete. For example, you can restore a mailbox to a PST file.
8. When the restore is complete, click **Close Mailbox to Restore**. During the closure process, a message is displayed. The message displays a question that asks whether you want to delete the recovery database folder.

---

## Protecting SQL Server data with IBM Tivoli Storage FlashCopy Manager for Windows

Information is provided regarding how to use IBM Tivoli Storage FlashCopy Manager for Windows to protect SQL Server data.

### Backing up SQL Server databases by using VSS

You can back up SQL server data by using Microsoft Volume Shadow Copy Service (VSS).

#### Before you begin

You can also back up availability databases in an AlwaysOn Availability Group on SQL Server 2012.

Tivoli Storage FlashCopy Manager uses a single AlwaysOn node to back up availability databases in an AlwaysOn Availability Group regardless of which availability replica is used for the backup operation. Ensure that you configured Tivoli Storage FlashCopy Manager to use an AlwaysOn node. You also must specify the AlwaysOn node in the **AlwaysOn Node** field in the TSM Node Names page of the Tivoli Storage Manager Configuration Wizard. If you change the **AlwaysOn node name** field in the AlwaysOn Node properties page for your SQL workload, you must run the Tivoli Storage Manager Configuration Wizard to complete the reconfiguration of the name. If you do not want to use the Tivoli Storage Manager Configuration Wizard to register the node on the Tivoli Storage Manager server, you can use the Tivoli Storage Manager **register node** command.

#### Procedure

To back up standard SQL databases or availability databases by using the VSS method:

1. Start the Management Console (MMC) GUI.
2. When configured for use with a Tivoli Storage Manager server, if you plan to use offloaded backups, make sure a **Remote DSMAGENT Node name** is specified. An offloaded backup uses another system (specified with the **Remote DSMAGENT Node name** parameter) to move SQL data to Tivoli Storage Manager server storage. Offloaded backups can reduce the load on network, I/O, and processor resources during backup processing.  

To verify or specify a remote **Remote DSMAGENT Node name**, select the **SQL Server** instance in the tree view, and click **Properties** in the Actions pane. Then, select the VSS Backup property page. If the **Remote DSMAGENT Node name** is blank, enter a node name.
3. On the **Protect** tab of the SQL instance, specify the type of SQL data to back up:
  - Click **View: Databases** for a list of discovered SQL databases that are available for backup.
  - For SQL Server 2012: The **Standard Databases / Availability Databases** button toggles between the standard database view and the availability

database view. The label on the button reflects the type of databases that are displayed in the view. To display a list of availability databases, click **Standard Databases**. Information about the availability databases in an availability group is displayed, including the replica role, synchronization state, and space and log usage.

Use the **Protect** tab to browse and select the databases to back up. Fine-tune the list of available databases in the results pane by entering a keyword in the **Search** field.

4. Verify the backup options. If the backup options are not currently displayed, click **Show Backup Options**.
  - If you want to use offloaded backups, select **True** in the **Offload** field. This field applies only to VSS backups.
5. In the Actions pane, click **Backup Method** and select **VSS**.
6. In the Actions pane, click the **Backup Destination** and select where to store the backup:
  - Local** Click this item to store the database backups to local shadow volumes only.
  - TSM** Click this item to store the database backups on Tivoli Storage Manager server storage only. Does not apply to the stand-alone configuration.
  - Both** Click this item to store the database backups to both Tivoli Storage Manager server storage and local shadow volumes. Both does not apply to the stand-alone configuration, or the TSM configuration when no Tivoli Storage FlashCopy Manager license is found.
7. Optional: Choose a mode for the current task:
  - **Run Interactively:** Click this item to run the current task interactively. This selection is the default.
  - **Run Scheduled:** Click this item to convert the current action into a scheduled task. When you select this item, the schedule wizard starts up, complete with the command that is required to complete the task.
8. Create the backup by clicking **Full Backup** in the Actions pane. You can also right-click a database, and select the backup action that you want from the menu.

If you want to create a copy-only full backup, click **Copy-Only Full Backup** in the Actions pane. A copy-only full backup is independent of the sequence of SQL Server backups. A copy-only full backup is not used as a base for a differential backup. The copy-only full backup does not disturb the sequence for a differential backup. The differential backup would not be associated to the copy-full backup, but would be associated to the prior full backup that was run. This type of backup can be used for special purpose backups that do not affect backup and restore procedures. It can be used for longer term retention than conventional backups.

## Deleting SQL Server backups

Perform these steps to delete an SQL Server backup that was created with the VSS backup method.

### Before you begin

**Attention:** Do not use this procedure for typical delete tasks as backups are deleted automatically, based on user-defined policy management settings. This procedure is necessary for those deletions that are outside the scope of standard policy management deletions. Perform this task with caution and only as a last resort.

### Procedure

To delete an SQL Server backup:

1. Start the Management Console.
2. Click **Recover Data** in the welcome page.
3. In the **Recover** tab for the SQL instance, select one or more VSS database backups to delete. The corresponding node type, for example, DP or AlwaysOn, must also be selected.
4. Click **Delete backup** in the **Action** pane to delete the selected database backups.

**Attention:** Upon completion of a delete backup operation, the view content refreshes and all object selections are cleared.

## Restoring SQL Server data

You can restore SQL server data.

### Before you begin

You can also restore availability databases that you backed up with the AlwaysOn node in a SQL Server 2012 environment. Backups of availability databases can be restored to any availability replica in an availability group.

**Attention:** When you restore a database, existing data is overwritten by the restored data and is no longer available after the restore is complete.

For AlwaysOn availability databases, ensure that Tivoli Storage FlashCopy Manager is set up to use an AlwaysOn node name. You can set up the AlwaysOn node name in the **AlwaysOn Node** field in the TSM Node Names page of the Tivoli Storage Manager Configuration wizard. By default, the AlwaysOn node name is set to the cluster node name for the SQL Server 2012 Availability Group.

When restoring availability databases, refer to the following guidelines:

#### VSS restore

Because of a SQL Server limitation, you cannot restore a VSS backup to an alternative SQL server instance. Therefore, VSS backups must be restored to the same SQL server instance where the snapshot was taken.

### Procedure

To restore an SQL server database:

1. Start the Management Console.

2. Select the **SQL Server** instance in the tree.
3. On the **Recover** tab for the SQL instance, specify the type of SQL data to restore:
  - Select **View: Databases** for a list of SQL database backups that are available for restore.
  - Select **View: Files** for a list of SQL database backup files that are available for restore.
4. For availability databases, click **DP Node Backups** to show all AlwaysOn node backups. The name of the button changes to **AlwaysOn Node Backups**. The **DP Node Backups / AlwaysOn Node Backups** button toggles between the standard database view and the availability database view. The label reflects the type of databases that are displayed in the view.
5. Use the **Recover** tab to browse and select the databases or files to restore. The following features are available:
  - Search: Fine-tune the list of available databases or files in the results pane by entering a keyword in the **Search** field.
  - Filter: Use the filter options to narrow the list of items in the result pane.
    - a. Click **Show Filter Options** and **Add Row**.
    - b. Click the down arrow in the **Column Name** field and select an item to filter.  
When you click **Select All**, all rows that reflect the filter specifications are selected.
    - c. Select an operator in the **Operator** field.
    - d. Specify a value to filter on in the **Value** field.
    - e. If you want to filter on extra items, click **Add Row**.
    - f. Click **Apply Filter** to filter the items on the list.
  - Backups: You can click **Active Backups** to show only active backups, or click **All Backups** to show both active and inactive backups.
  - Refresh: Click **Refresh** to update the view with your changes.  
If you applied a filter, the objects on the server that match the filter or search criteria are listed in the **Recover** tab. The status area indicates the number of items that match the criteria n of x displayed, where n equals the number of objects that match the filter criteria, and x is the number of objects that are retrieved from the server. For example, "5 of 20 displayed." If you specify refresh options to further narrow your results, and click **Refresh** again, the objects on the server that match the filtered and refresh options are displayed. Each time that you click **Refresh**, another query is run against the Tivoli Storage Manager server.
6. Verify restore options. If the restore options are not currently displayed, click **Show Restore Options**.
7. Optional: Choose a mode for the current task:
  - **Run Interactively**: Click this item to run the current task interactively. This selection is the default.
  - **Run Scheduled**: Click this item to convert the current action into a scheduled task. When you select this item, the schedule wizard begins, complete with the command that is required to complete the task.
8. Click **Restore** or **Restore to Alternate location** in the Actions pane to initiate the restore operation.

## Restore considerations

Unless otherwise specified, a restore refers to the following VSS restore types: VSS Fast Restore and VSS Instant Restore.

When you submit a restore or mount request, all of the volumes that are contained in the original snapshot set are imported. If the number of volumes that are imported exceeds the maximum number of allowable mapped volumes for the environment, the restore or mount operation can fail.

Before you start a restore, review the following list:

- VSS restore of the master database (msdb) must be done offline. Therefore, the associated SQL Server instance must be stopped before you run the restore. Attempting to restore a master database that is online fails. Such an attempt can also disable subsequent VSS Backup and VSS restore operations until the SQL Server VSS Writer service is restarted.
- A VSS Instant Restore overwrites the entire contents of the source volumes. However, you can avoid overwriting the source volumes by setting the **Instant Restore** option to **False**. This option bypasses volume-level copy and uses file-level copy instead. For best results, ensure that the source volume contains only the SQL database.
- When you run a VSS Instant Restore, there is no check to verify that any other data (including other SQL databases that are specified for restore) is present on the volume. Before you run a VSS restore operation that uses the VSS Instant Restore function, verify that there is no other data on the volumes that are being restored. If you want to avoid overwriting the source volumes, or if you are restoring a single database from a VSS Backup that is on local VSS shadow volumes that contain more than one database, make sure to set the **Instant Restore** option to **False**.
- VSS Instant Restore requires that the local disk is not being accessed by other applications, for example, Windows Explorer.

## Protecting SQL Server data in the Windows Server Core environment

Because of the Windows Server Core environment requirements, you can operate Tivoli Storage FlashCopy Manager from only the command-line interface.

### About this task

You can use the **backup** and **restore** commands to protect your Microsoft SQL Server 2012 and later databases, the **set** command to change the configuration of Tivoli Storage FlashCopy Manager, and the **help** command to display concise help information about a command.

### Backing up SQL Server databases on Windows Server Core

The following code samples provide guidance about using the **backup** command in the Windows Server Core environment to back up SQL Server databases to the Tivoli Storage Manager server, or to take local VSS snapshots.

### About this task

To back up all or part of a SQL database on Windows Server Core, issue the following command from a Command Prompt window:

```
tdpsqlc backup database_name backup_type [other_options]
```

To run a full legacy backup of SQL databases DB\_01 and DB\_02, enter the following command:

```
tdpsqlc backup DB_01,DB_02 full /backupmethod=legacy
```

To run a full legacy backup of all databases on the SQL Server, enter the following command:

```
tdpsqlc backup * full /backupmethod=legacy
```

To back up the filegroup DB\_01\_group1 that belongs to the DB\_01 database, enter the following command:

```
tdpsqlc backup DB_01 Group=DB_01_group1
```

## Restoring SQL databases on Windows Server Core

The following code samples provide guidance about using the **restore** command in the Windows Server Core environment to recover all or part of one or more SQL databases.

### About this task

To restore all or part of a SQL database on Windows Server Core, issue the following command from a Command Prompt window:

```
tdpsqlc restore database_name backup_type [other_options]
```

To run a full database restore of databases DB\_01 and DB\_02, and replace the existing databases with the database objects that are recovered from the Tivoli Storage Manager server, enter the following command:

```
tdpsqlc restore DB_01,DB_02 Full /REPLACE
```

To restore the filegroup DB\_01\_group1 that belongs to the DB\_01 database, enter the following command:

```
tdpsqlc restore DB_01 group=DB_01_group1
```

To restore all the logical files that are in the DB\_01 database, enter the following command:

```
tdpsqlc R DB_01 file=*
```

## Changing Tivoli Storage FlashCopy Manager configuration values on Windows Server Core

Use the set command to change the values for the Data Protection for SQL configurable parameters and options from the Windows Server Core command prompt.

### About this task

The values that you change are saved in the Tivoli Storage FlashCopy Manager configuration file. The default configuration file is `tdpsql.cfg`.

To change the values for configurable parameters and options, issue the following command from a Command Prompt window:

```
TDPSQLC Set Parameter=Value [/CONFIGfile=filename]
```

Where *Parameter* is the Tivoli Storage FlashCopy Manager parameter or option for which you want to change values, and *Value* is the new value that you want to



specify. **/CONFIGfile** is the optional parameter for the configuration file name. If you do not specify the **/CONFIGfile** parameter, the default configuration file (`tdpsql.cfg`) is used.

For detailed information about the **set** command, see the "Set command" topic.

### Example

Examples:

**Task** Change the number of data buffers to 2 and save the changed value in the `tdpsql.cfg` file.

Command: `tdpsqlc set buffers=2 /config=tdpsql.cfg`

**Task** Change the name of the Tivoli Storage FlashCopy Manager activity log file to `tdpsql.log`.

Command: `tdpsqlc set logfile=tdpsql.log`

### Getting help for Tivoli Storage FlashCopy Manager commands on Windows Server Core

Use the **help** command to display the syntax of a Tivoli Storage FlashCopy Manager command from the Windows Server Core command prompt.

#### About this task

To display the command syntax of Tivoli Storage FlashCopy Manager commands, issue the following command from a Command Prompt window:

```
TDPSQLC Help|? [*|?|command]
```

You can use either **Help** or **?** to start the command-line help.

For detailed information about the **help** command, see the "Help command" topic.

### Example

Examples:

**Task** Display the command syntax for a full restore operation.

Command: `tdpsqlc help restore full`

**Task** Display the command syntax for the **backup** command.

Command: `tdpsqlc ? backup`

---

## Protecting custom application and file system data with Tivoli Storage FlashCopy Manager for Windows

To create VSS snapshot backups of NTFS or ReFS file systems and applications, use Tivoli Storage FlashCopy Manager. When you back up applications and file systems, Tivoli Storage FlashCopy Manager must access the data. If there are permissions that must be granted for Tivoli Storage FlashCopy Manager to access the data, see the documentation that is provided with the application and file system.

## Backing up custom application and file system data

You can back up custom application and file system data by using Microsoft Volume Shadow Copy Service (VSS).

### Before you begin

Before you begin, Tivoli Storage FlashCopy Manager must be configured to manage VSS snapshots for the custom application or file system. To configure Tivoli Storage FlashCopy Manager for this task, use the Standalone Configuration Wizard. In the wizard, select **File System**. Alternatively, if you are using Tivoli Storage Manager server, configure to a Tivoli Storage Manager server by using the Tivoli Storage Manager configuration.

### Procedure

To back up custom application and file system data, complete the following steps:

1. Start the Management Console.
2. In the tree view, click **Protect and Recover Data > File System**.
3. In the **Protect** tab, select the volume names and mount points to back up.

**Tip:** Review the list of available volume names and mount points in the results pane by entering a keyword in the **Search** field.

4. Click **Show Backup Options**, and complete one of the following procedures:

- Specify the complete path for a presnapshotcmd file or postsnapshotcmd file to use. When custom application and file system data is being protected, these scripts are used to quiesce or stop the application. The application must be either quiesced or stopped to ensure backup consistency.

A presnapshotcmd file is a Windows command file that is run before a snapshot backup is created. For example, the presnapshotcmd script can quiesce an application before the snapshot is created. A postsnapshotcmd file is a Windows command file that is run after a snapshot backup is created. For example, a postsnapshotcmd script can resume an application after the snapshot is created.

These options are not required. If you use them, specify a fully qualified path designation.

- To use offloaded backups, set the **Offload** option. An offloaded backup uses another system to move custom application and file system data to Tivoli Storage Manager server storage. An offloaded backup can reduce the load on the network, I/O, and CPU resources during backup processing.

If you intend to use offloaded backups, when you set preferences for the Data Protection properties, make sure the **Remote DSMAGENT Node name** field is complete. If you use the command-line interface to update the configuration for offloaded backups, set the **REMOTEDSMAGENTNODE** parameter. This parameter applies only to VSS backups.

5. (Optional) Choose a mode for the current task:
  - **Run Interactively:** Click this item to run the current task interactively. This selection is the default.
  - **Run Scheduled:** Click this item to convert the current action into a scheduled task. When you select this item, the schedule wizard starts. Enter the appropriate command that is required to complete the task.
6. In the Actions pane, click **Backup Method** and select **VSS**.

7. In the Actions pane, click **Backup Destination** and select where to store the backup. There are three options:
  - **Local**
  - **TSM**
  - **Both**
8. In the Actions pane, click **Full Backup**. You can view the backup progress from the Task List and Task Details panels.

## Deleting custom application and file system backups

You can remove a custom application or file system VSS backup object by using the Management Console.

### Before you begin

Because VSS Backups are automatically deleted based on user-defined policy management settings, do not use this procedure for typical deletion tasks. The following steps are used for deletions that are outside the scope of standard policy management deletions. Before you delete custom application and file system backups, verify that you do not want the information. The information cannot be recovered after the deletion.

### Procedure

To delete custom application and file system VSS backups, complete the following steps:

1. Start the Management Console.
2. From the Management window, click **Protect and Recover Data > File System**.
3. In the **Recover** tab, select the volume name or mount point to delete. You are not deleting the volume or mount point, you are deleting the backup version of the volume or mount point. To view both active and inactive backups, click **All Backups**. To view only active backups, click **Active Backups**.
4. Right-click to select the volume or mount point; then, either click **Delete Backup** in the menu, or click **Delete Backup** in the Actions pane. A confirmation message is displayed.
  - To delete the volume, click **Yes**.
  - To stop the deletion process, click **No**.

**Attention:** When you click **Delete backup**, two tasks are displayed in the Task List. One task identifies the delete operation. Another task identifies the refresh. The Task List does not refresh until after both tasks are completed. When the delete backup operation is completed, the view content refreshes and all object selections are cleared.

### What to do next

For special considerations about multiple backups on space-efficient target volumes with SAN Volume Controller and Storwize V7000, see "More guidelines for SAN Volume Controller and Storwize V7000 environments" on page 18.

## Restore considerations

When the term *restore* is used, the term refers to both VSS Fast Restore and VSS Instant Restore. If VSS snapshot backups are completed with the backup destination parameter set to TSM, restore also refers to an image-level restore from the Tivoli Storage Manager server.

### VSS Instant Restore

A VSS Instant Restore overwrites the entire contents of the source volumes.

### VSS Fast Restore

A VSS Fast Restore copies all files from the snapshot to the original volume. This restore operation overwrites all data without prompting. If you do not want to overwrite all the data on the original volume, mount the snapshot. Copy only the files that you want to restore.

### Tivoli Storage Manager server

When you use Tivoli Storage FlashCopy Manager software that is configured to a Tivoli Storage Manager server, and you create VSS snapshot backups of application and file system data, you can send the data to the Tivoli Storage Manager server storage pools. The data is set as a FULL image backup. The backup that is stored on the Tivoli Storage Manager server is used to restore volumes and mount points.

When you restore a VSS Backup from a Tivoli Storage Manager server, if the **INSTANTRESTORE** is set to FALSE or **FASTRESTORE** parameter is set to NO, the setting is ignored. (From the command-line interface, the **INSTANTRESTORE** parameter is set to NO, not FALSE.) The restore operation completes with an image-level restore.

When you submit a restore or mount request, all of the volumes that are contained in the original snapshot set are imported. If the number of volumes that are imported exceeds the maximum number of allowable mapped volumes for the environment, the restore or mount operation can fail.

## Restoring custom application and file system data

With this release of Tivoli Storage FlashCopy Manager, there is more information that is displayed for the active and inactive backups. These new columns of data, Restore Into, Backup Location, Server Name, Compression, Encryption, and Client-Side Deduplication, provide statistics that can help you decide what custom application and file system data must be restored.

### Before you begin

If you are not familiar with the term *restore into*, when you select this option, you restore data to an alternate target destination. The data is not restored to the original source destination. For the restore to successfully complete, the alternate target destination must be of equal size as the original source volume. During the restore into operation, the target volume label is changed to the label of the original volume.

### About this task

To restore custom application and file system data, complete the following steps:

## Procedure

1. Start the Management Console.
2. In the Management window, click **Protect and Recover Data > File System**.
3. In the **Recover** tab, use the results pane to browse the volumes or mount points available for restore. The following features are available:
  - **Search:** Enter a keyword in the **Search** field to review the list of available volumes or mount points in the results pane.
  - **Filter:** To narrow the list of volumes or mount points in the result pane, use the filter options,
    - a. Click **Show Filter Options** and **Add Row**.
    - b. Click the down arrow in the **Column Name** field and select an item to filter. You can filter by **Volume Name**, **Restore Into**, **Mounted As**, **Backup Location**, **Backup Date**, **Backup Size (GB)**, **Instant Restore Supported**, **Server Name**, **Compression**, **Encryption**, and **Client-Side Deduplication**.

To filter by **Backup Date**, click the default date and time to edit the table cell. To change the date, click the drop-down icon that is displayed at the end of the cell. The calendar date selection tool is displayed. After you select a date, to display the date in the field, press **Enter**. To edit the time, enter the time using the 12-hour clock time convention.
    - c. Select an operator in the **Operator** field.
    - d. Specify a value to filter on in the **Value** field.
    - e. In you want to filter on more items, click **Add Row**.
    - f. To filter the list of volumes or mount points, click **Apply Filter**.
  - **Backups:** To show both active and inactive backups, click **All Backups**. To show only active backups, click **Active Backups**.
  - **Refresh:** To update the view with your changes, click **Refresh**.

If you applied a filter, the objects on the server that match the filter or search criteria are listed in the Recover tab. The status area indicates the number of items that match the criteria n of x displayed, where n equals the number of objects that match the filter criteria, and x is the number of objects that are retrieved from the server. For example, 5 of 20 displayed. If you specify refresh options to further narrow your results, and click **Refresh** again, the objects on the server that match the filtered and refresh options are displayed. Each time that you click **Refresh**, another query is run against the Tivoli Storage Manager server.

4. Click **Show Restore Options** and set a value for the following options:

### **FromServer**

If the backup is not displayed in the results pane, enter the name of the server where the original backup was completed. The default value is the current server.

### **InstantRestore**

To use VSS Instant Restore, enter True. This option applies only to snapshots that are on a disk system that supports Instant Restore. Enter False to use VSS Fast Restore (file-level copy).

5. Optional: Choose a mode for the current task:
  - **Run Interactively:** Click this item to run the current task interactively. This selection is the default.
  - **Run Scheduled:** Click this item to convert the current action into a scheduled task. When you select this item, the schedule wizard starts.

6. In the Action pane, click the appropriate recovery action. Depending on the volume or mount point that is selected, the following actions are available in the Actions pane:

**Restore Into**

When the backup is stored on only the Tivoli Storage Manager server, Tivoli Storage FlashCopy Manager provides the **Restore Into** option. When the backup is stored on only the local disk, the **Restore Into** option is not available.

After you select **Restore Into**, in the window that is displayed, specify a target location for the restore operation. The target location must be a drive letter or mount point. The size of the target location must be equal to the size of the original volume.

**Restore**

Restores the selected volumes or mount points to their original location.

**Restore to Point-in-Time**

Specify a point in time when you want to restore the latest version of your volumes or mount points. When selected, you are prompted to specify a point in time to restore a specific backup version:

**PITDate**

Enter the date to establish a point in time to restore a specific version of your custom application or file system backup. Objects that were backed up on or before the date and time you specify, and that were not deleted before the date and time you specify, are processed. Backup versions that you created after this date and time are ignored.

**PITTime**

Use this option with the **PITDate** option to establish a point in time to restore a specific version of your custom application or file system backup. Objects that were backed up on or before the date and time you specify, and objects that were not deleted before the date and time you specify, are processed. Backup versions that you created after this date and time are ignored. This option is ignored if you do not specify **PITDate** option.

**Mount Backup**

Mount the selected volume or mount point backup to a drive, or NTFS or ReFS folder. You can also specify a point in time when you want to mount the latest version of your volumes or mount points.

Tivoli Storage FlashCopy Manager supports mounting backups when the backup is stored on the local disk. If the backup is stored on the Tivoli Storage Manager server, the backup cannot be mounted.

**Explore**

View the subdirectories and files contained within a mounted backup. This action is available only when mounted backups exist.

**Unmount Backup**

Unmount the selected volumes. This action is available only when mounted backups exist.

**Delete Backup**

See Delete Backup.

View the restore progress in the Task List or Task Details panel. If the operation fails, you can view the error message by either clicking **Task Details** and then **Error Details**, or hovering the cursor on the selected operation.

## Mounting custom application and file system backups

From the Recover tab, you can mount a backup.

### About this task

To mount backups, complete the following steps:

#### Procedure

1. Start the Management Console.
2. Click **Recover Data** in the welcome page of the Management Console.
3. In the Recover tab, go to the Action pane. Click **Mount Backup**.
4. Either type the path to the empty NTFS or ReFS folder where you want to mount the backup or browse to find the path. Click **OK**.

### Results

In the Recover tab, the backup that you mount is displayed. You can use the **Explore** and **Unmount Backup** options in the Action pane to complete more tasks with the backup that you mount.

---

## Viewing, printing, and saving reports

Access reports about recent activity, historical managed capacity, and which licenses and software are installed.

### About this task

Perform the following steps to view, save, or print reports.

#### Procedure

1. Select **Reporting** in the tree view, under **Manage**.
2. Select a report from the list.
3. Print or save the current report by clicking the appropriate icon at the top of the report.

## Group management, reports, and status reporting

When you create a group, in the Management Console (MMC), for the Group tree nodes, the Protect, Recover, and Automate tabs are replaced with the Group Dashboard, Group Reports, and Group Commands tabs.

### About this task

The information you need to navigate and use these tabs to complete data protection activities are on the GUI. For the group tabs, clicking **Refresh** is required to display data. Because you refresh the data when you need it, performance improves.

When you want to generate group reports and facilitate group status reporting, you can use the MMC. The systems need to run Windows 2008 or later, PowerShell



3.0, and Tivoli Storage FlashCopy Manager 4.1. The following instructions assume that you have configured workloads and are successfully backing up data.

To generate group reports, complete the following steps:

### **Procedure**

1. In the MMC navigation pane, select the group with the added systems.
2. In the main window, select the Group Reports tab. The list of reports is displayed.
3. In the Actions pane, verify the group name is correct.
4. In the Reports section, refresh the reports.

---

## Chapter 6. Automating

The term *automation*, as it applies to Tivoli Storage FlashCopy Manager, means that you can run commands from the command line, create scripts, schedule tasks, and use the graphical user interface to start tasks that are based on scripts and schedules that you create.

The software supports running tasks from both the command-line interface or Microsoft Windows PowerShell command prompt (Version 3.0 and later). In the Management Console (MMC), for the **Dashboard** tree nodes, you can also use the **Automate** tab. For the **Group** tree nodes, you can use the **Group Commands** tab.

When managing groups of computers, PowerShell cmdlets can be issued to multiple computers. For more information about how the cmdlets can be used, see the cmdlet help.

---

### Automating tasks for Exchange Server

You can use the Automate view to work with commands. You can save a command and run the command at a scheduled time.

#### About this task

You can use the Automate view to create, save, store, and schedule commands. Open the Automate view by selecting a workload that you want to work with and clicking **Automate**. An integrated command line is available in the task window. You can use the interface to enter PowerShell cmdlets or command-line interface commands. The output is displayed in the main window.

#### Procedure

1. Change **PowerShell** to **Command Line**.
2. Type a command in the details pane and click the **Execute** icon to run the command. You can also run a saved task by clicking the **Open** icon, selecting the command file, and clicking the **Execute** icon.

The commands can be entered with or without specifying `tdpexcc`. For example, for each selected workload instance, you can enter a single command or multiple commands, such as:

```
q fcm
```

3. Click the **Save** icon and follow the prompts to save a command for future use.
4. To schedule a command, click the **Schedule this command** icon to open the scheduling wizard. Follow the prompts in the wizard to create a schedule for the command.
5. The output of the command is displayed in the results pane. The output can be saved or sent to an email address.

#### What to do next

There are more ways that you can automate commands from the Management Console. To automate commands from the Management Console, use the Protect, Recover, Schedule, and Task List views.

1. Start the Management Console and select a workload in the tree view.

2. Click the tab for the task you want to do (**Protect** or **Recover**).
3. Automate the command by using one of the following methods:

#### **Result pane**

Select the databases for your task in the result pane, then select **Run Scheduled** in the toolbar drop-down menu. Click the appropriate task in the **Action** pane. When the schedule wizard starts, enter the information for each prompt to create a scheduled task.

#### **Task List pane**

When a task is submitted, it displays in the task list pane. Select the appropriate task, then click **Schedule command script** in the task list toolbar. When the schedule wizard starts, enter the information for each prompt to create a scheduled task.

You can also right-click a task in the Task List pane and click **Copy**. Then, click the **Automate** tab and paste the command in there.

---

## **Automating tasks for SQL Server**

You can use the Automate view to work with commands. You can save a command and run the command at a scheduled time.

### **About this task**

You can use the Automate view to create, save, store, and schedule commands. Open the Automate view by selecting a workload that you want to work with and clicking **Automate**. An integrated command line is available in the task window. You can use the interface to enter PowerShell cmdlets or command-line interface commands. The output is displayed in the main window.

### **Procedure**

1. Change **PowerShell** to **Command Line**.
2. Type a command in the details pane and click the **Execute** icon to run the command. You can also run a saved task by clicking the **Open** icon, selecting the command file, and clicking the **Execute** icon.  
The commands can be entered with or without specifying `tdpsqlc`. For example, for each selected workload instance, you can enter a single command or multiple commands, such as:  

```
q fcm
```
3. Click the **Save** icon and follow the prompts to save a command for future use.
4. To schedule a command, click the **Schedule this command** icon to open the scheduling wizard. Follow the prompts in the wizard to create a schedule for the command.
5. The output of the command is displayed in the results pane. The output can be saved or sent to an email address.

### **What to do next**

There are more ways that you can automate commands from the Management Console. To automate commands from the Management Console, use the Protect, Recover, Schedule, and Task List views.

1. Start the Management Console and select a workload in the tree view.
2. Click the tab for the task you want to do (**Protect** or **Recover**).

3. Automate the command by using one of the following methods:

#### **Result pane**

Select the databases for your task in the result pane, then select **Run Scheduled** in the toolbar drop-down menu. Click the appropriate task in the **Action** pane. When the schedule wizard starts, enter the information for each prompt to create a scheduled task.

#### **Task List pane**

When a task is submitted, it displays in the task list pane. Select the appropriate task, then click **Schedule command script** in the task list toolbar. When the schedule wizard starts, enter the information for each prompt to create a scheduled task.

You can also right-click a task in the Task List pane and click **Copy**. Then, click the **Automate** tab and paste the command in there.

---

## **Automating tasks for custom applications and file systems**

You can use the Automate view to work with commands. You can save a command and run the command at a scheduled time.

### **About this task**

You can use the Automate view to create, save, store, and schedule commands. Open the Automate view by selecting a workload that you want to work with and clicking **Automate**. An integrated command line is available in the task window. You can use the interface to enter PowerShell cmdlets or command-line interface commands. The output is displayed in the main window.

### **Procedure**

1. Change **PowerShell** to **Command Line**.
2. Type a command in the details pane and click the **Execute** icon to run the command. You can also run a saved task by clicking the **Open** icon, selecting the command file, and clicking the **Execute** icon.

The commands can be entered with or without specifying `fcmdi`. For example, for each selected workload instance, you can enter a single command or multiple commands, such as:

```
q component
q backup
```

3. Click the **Save** icon and follow the prompts to save a command for future use.
4. To schedule a command, click the **Schedule this command** icon to open the scheduling wizard. Follow the prompts in the wizard to create a schedule for the command.
5. The output of the command is displayed in the results pane. The output can be saved or sent to an email address.

### **What to do next**

There are more ways that you can automate commands from the Management Console. To automate commands from the Management Console, use the Protect, Recover, Schedule, and Task List views.

1. Start the Management Console and select a workload in the tree view.
2. Click the tab for the task you want to do (**Protect** or **Recover**).
3. Automate the command by using one of the following methods:

### Result pane

Select the items for your task in the result pane, then select **Run Scheduled** in the toolbar drop-down menu. Click the appropriate task in the **Action** pane. When the schedule wizard starts, enter the information for each prompt to create a scheduled task.

### Task List pane

When a task is submitted, it displays in the task list pane. Select the appropriate task, then click **Schedule command script** in the task list toolbar. When the schedule wizard starts, enter the information for each prompt to create a scheduled task.

You can also right-click a task in the Task List pane and click **Copy**. Then, click the **Automate** tab and paste the command in there.

---

## 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. You can also schedule tasks by using the Tivoli Storage Manager Scheduler, and by using the PowerShell cmdlets that are available for use when you interact with the Management Console.

### About this task

With Tivoli Storage FlashCopy Manager scheduling operations, you can schedule tasks to run periodically. However, you cannot schedule tasks to run only one time. When a schedule is defined, you can run it manually at any time by selecting the schedule and then clicking **Run** in the Action pane. For more granular control of your schedules, access the Windows scheduled tasks control panel.

By default, Tivoli Storage FlashCopy Manager schedules are activated by using Windows System Account permissions. If a schedule requires different Windows permissions, click **Run as** and enter the appropriate account and password. The following character is not supported: %

All defined schedules are displayed. You can also create, edit, enable, disable, delete, or run new schedules. Use the Scheduling wizard to guide you through the steps that are needed to define a local scheduled data protection task. The Scheduling wizard is available from the Action pane.

The scheduling wizards supports PowerShell and command line scripts. The default is PowerShell. There are templates for PowerShell and command line scripts. When you use the PowerShell scheduling tasks, you can take work that would have, in previous releases, required multiple schedules, and complete the work with a single scheduled task. For example, for a schedule to complete a full backup on Sunday and incremental backups on other days, a single schedule can be used. The PowerShell script determines what to do based on the day of the week, or additional criteria that you enter.

In the scheduling wizard, when PowerShell is selected, there are four templates that are available: file system, SQL, Exchange, and MMC. The MMC template can be used to generate and email a report.

The other templates include statements to ensure that the correct working directory is used, and that error information is handled properly. The templates also include sample statements to run queries and backups.

The scheduling-tasks area is divided into the following segments:

- The first segment where defined schedules are displayed. You can also select options to create, edit, enable, disable, delete, or run new schedules.
- The second segment where a list of all scheduled activity is displayed. Select an item in this list to display the output of the scheduled operation.
- The third segment where the results of the selected activity are displayed.

Three types of schedules can be created:

### Hourly

This type of schedule starts at a set time and runs indefinitely or for a set duration. It can be repeated at a specified time. Despite the duration or repeat settings, this type of schedule runs within one 24 hour period only.

**Daily** This type of schedule starts at a set time and repeats each day as specified.

### Weekly

This type of schedule starts at a set time and repeats every week as specified.

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 by 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 that you want, and then from the Action pane select **Properties**.

## Results

For more information about the cmdlets for scheduling, from a Windows PowerShell prompt, change directories to C:\Program Files\Tivoli\FlashCopyManager. Enter the following command:

```
gcm -mod FmModuleMMC *schedule*
```

Information about available cmdlets is displayed. For example, you might see information like the following sample:

```
CommandType Name ModuleName

Cmdlet Clear-FcmMmcScheduledActivityHistory FmModuleMMC
Cmdlet Disable-FcmMmcSchedule FmModuleMMC
Cmdlet Enable-FcmMmcSchedule FmModuleMMC
Cmdlet Get-FcmMmcSchedule FmModuleMMC
Cmdlet Get-FcmMmcScheduledActivity FmModuleMMC
Cmdlet New-FcmMmcSchedule FmModuleMMC
Cmdlet Remove-FcmMmcSchedule FmModuleMMC
Cmdlet Set-FcmMmcSchedule FmModuleMMC
Cmdlet Start-FcmMmcSchedule FmModuleMMC
```

---

## Windows PowerShell and Tivoli Storage FlashCopy Manager

Tivoli Storage FlashCopy Manager includes a set of Windows PowerShell cmdlets to help manage FlashCopy Manager components in your environment. Because cmdlets can be chained together to form commands and because there is a large body of existing cmdlets from other vendors the FlashCopy Manager cmdlets help support a seamless management environment. Remote management and automation capabilities are greatly improved when using the FlashCopy Manager cmdlets.

### Getting started

The cmdlets can be used in supported Windows environments.

#### About this task

Before you use the cmdlets that are provided with Tivoli Storage FlashCopy Manager, complete the following steps:

#### Procedure

1. Log on to the system as an administrator.
2. From a Windows PowerShell command prompt, enter the following command:  
`set-executionpolicy remotesigned`
3. Import the Windows PowerShell modules from the FlashCopyManager folder:
  - FmModuleExc.dll
  - FmModuleFs.dll
  - FmModuleMMC.dll
  - FmModuleSQL.dll

To import modules, with the administrator credentials, from a Windows PowerShell command prompt, complete the following steps:

- a. Navigate to the FlashCopyManager folder.
- b. Enter the following commands:

```
import-module .\FmModuleExc.dll
import-module .\FmModuleFs.dll
import-module .\FmModuleMMC.dll
import-module .\FmModuleSQL.dll
```
- c. (Optional) To use the cmdlets in these modules any time you start Windows PowerShell, add the following lines to your profile:

```
$path = (get-itemproperty -path "HKLM:\SOFTWARE\IBM\FlashCopyManager\
currentversion\mmc" -ea SilentlyContinue).path
if ($null -ne $path)
{
 dir "$path\fmmodule*.dll" | select -expand fullname | import-module
 -force -Global
}
```

#### What to do next

For information about creating, running, monitoring, and troubleshooting scripts with cmdlets, see Windows PowerShell 3.0 documentation. Information about Windows PowerShell cmdlets consistent naming patterns, parameters, arguments, and syntax is also provided in the Windows PowerShell documentation. The following website is a starting point for this type of documentation: <http://technet.microsoft.com/en-us/library/hh857337.aspx>.



## Cmdlets for protecting Microsoft Exchange server data

The following table identifies the cmdlets that are available for use to protect Microsoft Exchange server data.

Table 3. Cmdlets to protect Microsoft Exchange Server data. The following table identifies the cmdlets that you can use to protect Microsoft Exchange server data.

| Cmdlet name                            | Related command-line interface command | Short description                                                                            |
|----------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------|
| <b>Add-DpExcPolicy</b>                 | <b>tdpexcc create policy</b>           | Create a policy for FlashCopy Manager for Microsoft Exchange Server.                         |
| <b>Backup-DpExcComponent</b>           | <b>tdpexcc backup</b>                  | Back up a Microsoft Exchange database.                                                       |
| <b>Copy-DpExcPolicy</b>                | <b>tdpexcc copy policy</b>             | Copy an existing policy.                                                                     |
| <b>Dismount-DpExcBackup</b>            | <b>tdpexcc unmount backup</b>          | Dismounts a backup.                                                                          |
| <b>Get-DpExcBackup</b>                 | <b>tdpexcc query tsm *</b>             | Query backups.                                                                               |
| <b>Get-DpExcComponent</b>              | <b>tdpexcc query exchange</b>          | Query the Exchange Server for all databases that are available for backup.                   |
| <b>Get-DpExcConfig</b>                 | <b>tdpexcc query tdp</b>               | Displays configuration information.                                                          |
| <b>Get-DpExcConnection</b>             | <b>tdpexcc query tsm</b>               | Query a list of the current values set in the configuration file for Tivoli Storage Manager. |
| <b>Get-DpExcInformation</b>            | <b>tdpexcc query exchange</b>          | Query general local Exchange Server information.                                             |
| <b>Get-DpExcMailboxLocationHistory</b> |                                        | Query the mailbox location history.                                                          |
| <b>Get-DpExcManagedCapacity</b>        | <b>tdpexcc query managedcapacity</b>   | Query managed capacity for Microsoft Exchange Server.                                        |
| <b>Get-DpExcPolicy</b>                 | <b>tdpexcc query policy</b>            | Displays policy information.                                                                 |
| <b>Mount-DpExcBackup</b>               | <b>tdpexcc mount backup</b>            | Mounts a backup to provide access to the files that the backup contains.                     |
| <b>Remove-DpExcBackup</b>              | <b>tdpexcc delete backup</b>           | Removes the backup.                                                                          |
| <b>Remove-DpExcPolicy</b>              | <b>tdpexcc delete policy</b>           | Deletes the policy.                                                                          |
| <b>Reset-DpExcTsmPassword</b>          | <b>tdpexcc changetsmpassword</b>       | Change the Tivoli Storage Manager password used by Data Protection for Exchange.             |
| <b>Restore-DpExcBackup</b>             | <b>tdpexcc restore</b>                 | Restore a backup.                                                                            |
| <b>Restore-DpExcMailbox</b>            | <b>tdpexcc restore mailbox</b>         | Restore a mailbox.                                                                           |
| <b>Set-DpExcConfig</b>                 | <b>tdpexcc set paramname</b>           | Set the application configuration parameters in a configuration file.                        |
| <b>Set-DpExcPolicy</b>                 | <b>tdpexcc update policy</b>           | Update a policy.                                                                             |

To view the details about a specific cmdlet, run the **Get-Help** cmdlet with the cmdlet name. For example:

```
Get-Help Backup-DpExcComponent
```

To continue the example, to see examples for the cmdlet, enter:

```
get-help Backup-DpExcComponent -examples
```

For more information, enter:

```
get-help Backup-DpExcComponent -detailed
```

For technical information, enter:

```
get-help Backup-DpExcComponent -full
```

To go to the information center, enter:

```
get-help Backup-DpExcComponent -online
```

For information about a specific parameter, enter:

```
help Backup-DpExcComponent -Parameter backupdestination
```

To display the help in a separate window, include the **-showwindow** parameter with the **help** command.

## Cmdlets for protecting Microsoft SQL Server data

The following table identifies the cmdlets that are available for use to protect Microsoft SQL Server data.

*Table 4. Cmdlets to protect Microsoft SQL Server data.* The following table identifies the cmdlets that you can use to protect Microsoft SQL Server data.

| Cmdlet name                     | Related command-line interface command                        | Short description                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Add-DpSqlPolicy</b>          | <b>tdpsqlc create policy</b>                                  | Create a new policy for Microsoft SQL Server data.                                                                                                |
| <b>Backup-DpSqlComponent</b>    | <b>tdpsqlc backup</b>                                         | Backup SQL components.                                                                                                                            |
| <b>Copy-DpSqlPolicy</b>         | <b>tdpsqlc copy policy</b>                                    | Copy an existing policy to a new policy.                                                                                                          |
| <b>Dismount-DpSqlBackup</b>     | <b>tdpsqlc unmount backup</b>                                 | Dismount a backup.                                                                                                                                |
| <b>Get-DpSqlBackup</b>          | <b>tdpsqlc query tsm *</b>                                    | Query the backups that are stored on the server.                                                                                                  |
| <b>Get-DpSqlComponent</b>       | <b>tdpsqlc query sql *</b>                                    | Query the databases that are available on the SQL server.                                                                                         |
| <b>Get-DpSqlConfig</b>          | <b>tdpsqlc query tdp</b>                                      | Display configuration information.                                                                                                                |
| <b>Get-DpSqlConnection</b>      | <b>tdpsqlc query tsm</b>                                      | Displays the Tivoli Storage Manager API and server information.                                                                                   |
| <b>Get-DpSqlFileGroups</b>      | not applicable                                                | Displays all file and group information about specified SQL Server databases.                                                                     |
| <b>Get-DpSqlInformation</b>     | <b>tdpsqlc query sql</b>                                      | Display specified SQL Server information.                                                                                                         |
| <b>Get-DpSqlManagedCapacity</b> | <b>tdpsqlc query managedcapacity</b>                          | Assist with storage planning by determining the amount of managed capacity that is in use.                                                        |
| <b>Get-DpSqlPolicy</b>          | <b>tdpsqlc query policy</b>                                   | Query policy.                                                                                                                                     |
| <b>Mount-DpSqlBackup</b>        | <b>tdpsqlc mount backup</b>                                   | Mounts a backup that provides access to the files that are contained by the backup.                                                               |
| <b>Remove-DpSqlBackup</b>       | <b>tdpsqlc delete backup</b> and<br><b>tdpsqlc inactivate</b> | Use to delete a VSS backup of a SQL Server database, or inactivate one or more active legacy backup objects on the Tivoli Storage Manager server. |
| <b>Remove-DpSqlPolicy</b>       | <b>tdpsqlc delete policy</b>                                  | Deletes a local policy.                                                                                                                           |
| <b>Reset-DpSqlTsmPassword</b>   | <b>tdpsqlc changetsmpassword</b>                              | Changes the Tivoli Storage Manager password used by Data Protection for SQL Server.                                                               |
| <b>Restore-DpSqlBackup</b>      | <b>tdpsqlc restore</b>                                        | Restore backups of Microsoft SQL Server data.                                                                                                     |
| <b>Set-DpSqlConfig</b>          | <b>tdpsqlc set paramname</b>                                  | Set the Tivoli Storage FlashCopy Manager for SQL configuration parameters in the configuration file.                                              |
| <b>Set-DpSqlPolicy</b>          | <b>tdpsqlc update policy</b>                                  | Changes an existing policy.                                                                                                                       |

To view the details about a specific cmdlet, run the **Get-Help** cmdlet with the cmdlet name. For example:

```
Get-Help Get-DpSqlBackup
```

To continue the example, to see examples for the cmdlet, enter:

```
get-help Get-DpSqlBackup -examples
```

For more information, enter:

```
get-help Get-DpSqlBackup -detailed
```

For technical information, enter:

```
get-help Get-DpSqlBackup -full
```

To go to the information center, enter:

```
get-help Get-DpSqlBackup -online
```

For information about a specific parameter, enter:

```
help Get-DpSqlBackup -Parameter backupdestination
```

To display the help in a separate window, include the **-showwindow** parameter with the **help** command.

## Cmdlets for protecting custom application and file system data

The following table identifies the cmdlets that are available for use to protect custom application and file system data.

*Table 5. Cmdlets to protect custom application and file system data.* The following table identifies the cmdlets that you can use to protect custom application and file system data.

| Cmdlet name                     | Related command-line interface command (if available) | Short description                                                                          |
|---------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Add-FcmFsPolicy</b>          | <b>fccli create policy</b>                            | Add a new VSS policy binding statement.                                                    |
| <b>Add-FcmFsVssPolicy</b>       | <b>fccli insert vsspolicy</b>                         | Inserts a new VSS policy binding statement.                                                |
| <b>Backup-FcmFsComponent</b>    | <b>fccli backup</b>                                   | Creates a VSS snapshot backup of volumes and mount points.                                 |
| <b>Copy-FcmFsPolicy</b>         | <b>fccli copy policy</b>                              | Copy a policy.                                                                             |
| <b>Dismount-FcmFsBackup</b>     | <b>fccli unmount backup</b>                           | Unmounts a mounted backup.                                                                 |
| <b>Get-FcmFsBackup</b>          | <b>fccli query backup</b>                             | Displays information about the backup.                                                     |
| <b>Get-FcmFsComponent</b>       | <b>fccli query component</b>                          | Query the VSS components that are available on the system.                                 |
| <b>Get-FcmFsConfig</b>          | <b>fccli query config</b>                             | Displays configuration information.                                                        |
| <b>Get-FcmFsConnection</b>      | <b>fccli query config</b>                             | Query for Tivoli Storage Manager server connection information.                            |
| <b>Get-FcmFsManagedCapacity</b> | <b>fccli query managedcapacity</b>                    | Assist with storage planning by determining the amount of managed capacity that is in use. |

Table 5. Cmdlets to protect custom application and file system data (continued). The following table identifies the cmdlets that you can use to protect custom application and file system data.

| Cmdlet name                   | Related command-line interface command (if available) | Short description                                                                                  |
|-------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Get-FcmFsPolicy</b>        | <b>fccli query policy</b>                             | Displays policy information.                                                                       |
| <b>Get-FcmFsVSSPolicy</b>     | <b>fccli query vsspolicy</b>                          | Returns the VSS policy binding statements that are stored in the configuration file.               |
| <b>Mount-FcmFsBackup</b>      | <b>fccli mount backup</b>                             | Mounts a backup providing access to the files that the backup contains.                            |
| <b>Remove-FcmFsBackup</b>     | <b>fccli delete backup</b>                            | Deletes a backup from FlashCopy Manager storage.                                                   |
| <b>Remove-FcmFsPolicy</b>     | <b>fccli delete policy</b>                            | Removes a policy.                                                                                  |
| <b>Remove-FcmFsVssPolicy</b>  | <b>fccli delete vsspolicy</b>                         | Deletes a VSS policy binding statement.                                                            |
| <b>Reset-FcmFsTsmPassword</b> | <b>fccli changetsmpassword</b>                        | Used to change the Tivoli Storage Manager password used by the FlashCopy Manager for File Systems. |
| <b>Restore-FcmFsBackup</b>    | <b>fccli restore</b>                                  | Restore a backup.                                                                                  |
| <b>Set-FcmFsConfig</b>        | <b>fccli update config</b>                            | Update configuration for file systems and custom applications.                                     |
| <b>Set-FcmFsPolicy</b>        | <b>fccli update policy</b>                            | Update an existing policy.                                                                         |
| <b>Set-FcmFsVssPolicy</b>     | <b>fccli update vsspolicy</b>                         | Updates an existing VSS policy binding statement.                                                  |

To view the details about a specific cmdlet, run the **Get-Help** cmdlet with the cmdlet name. For example:

```
Get-Help Backup-FcmFsComponent
```

To continue the example, to see examples for the cmdlet, enter:

```
get-help Backup-FcmFsComponent -examples
```

For more information, enter:

```
get-help Backup-FcmFsComponent -detailed
```

For technical information, enter:

```
get-help Backup-FcmFsComponent -full
```

To go to the information center, enter:

```
get-help Backup-FcmFsComponent -online
```

For information about a specific parameter, enter:

```
help Backup-FcmFsComponent -Parameter backupdestination
```

To display the help in a separate window, include the **-showwindow** parameter with the **help** command.

## Cmdlets for the Management Console

The following list identifies the cmdlets that are available for use when interacting with the Management Console.

- **Clear-FcmMmcManagedCapacityHistory**
- **Clear-FcmMmcScheduledActivityHistory**
- **Disable-FcmMmcSchedule**
- **Enable-FcmMmcSchedule**
- **Get-FcmMmcActivity**
- **Get-FcmMmcComputerInformation**
- **Get-FcmMmcManagedCapacityHistory**
- **Get-FcmMmcReport**
- **Get-FcmMmcSchedule**
- **Get-FcmMmcScheduledActivity**
- **New-FcmMmcSchedule**
- **Remove-FcmMmcSchedule**
- **Set-FcmMmcSchedule**
- **Start-FcmMmcSchedule**

To view the details about a specific cmdlet, run the **Get-Help** cmdlet with the cmdlet name. For example:

```
Get-Help New-FcmMmcSchedule
```

To continue the example, to see examples for the cmdlet, enter:

```
get-help New-FcmMmcSchedule -examples
```

For more information, enter:

```
get-help New-FcmMmcSchedule -detailed
```

For technical information, enter:

```
get-help New-FcmMmcSchedule -full
```

To go to the information center, enter:

```
get-help New-FcmMmcSchedule -online
```

For information about a specific parameter, enter:

```
help New-FcmMmcSchedule -Parameter backupdestination
```

To display the help in a separate window, include the **-showwindow** parameter with the **help** command.



---

## Chapter 7. Troubleshooting

To assist with troubleshooting and problem determination, diagnostic files and system information are displayed in a centralized location. Details are provided about topics that generate questions.

When troubleshooting a mailbox restore error, you can use the **TDPMAPI TESTMAPI** command. The command helps diagnose MAPI connection issues when connecting to the mailbox. The following parameters can be used:

### **/MAILBOXALIAS**

This parameter is the alias name for the mailbox that was specified when the mailbox was originally created. The parameter refers to the email alias for the user and is the portion of the email address on the left side of the @ symbol. You should run this command against both the mailbox to be restored and the mailbox of the administrator you are currently logged in as.

### **/EXCSERVER**

(Exchange 2010 environments) This parameter is the name of the Exchange Server that has the Client Access Server (CAS) role. The default is the local server. The **get-ExchangeServer | fl** Exchange PowerShell command can be used to determine which Exchange Server has the CAS role defined for the mailbox database. It is mandatory to specify this parameter when there is a CAS Load Balancer within the environment.

(Exchange 2013 environments) Depending on the information that you need, use one of the following formats:

#### **Retrieve the ExchangeGUID for the user that is logged on**

Enter the following command:

```
whoami | Get-Mailbox | fl ExchangeGUID
```

#### **Retrieve diagnostic information**

Enter the following command:

```
tdpmapi.exe /excserver={ExchangeGUID@domain}
```

### **/TRACEFILE**

This parameter is the filename used to hold the output from the tracing. By default, tracing is turned off. The filename can be qualified with a drive and full path location, and must have write permissions for the user running the command.

For example:

```
TDPMAPI TESTMAPI /MAILBOXALIAS=alias /EXCSERVER=cas /TRACEFILE=filename
```

## **Exchange 2013**

The following list identifies troubleshooting information when protecting data for an Exchange 2013 server:

- For the target mailbox, grant full access permission. When using the Administrator mailbox, Exchange 2013 usually, by default, blocks full access permission for this administrator.
- Log on as an Exchange administrator with a mailbox on an Exchange 2013 database.



- Make sure both the administrator mailbox and the target mailbox are accessible in either Microsoft Outlook or Outlook Web Access.
- Use an Exchange 2013 CAS. Specifically, set the **CLIENTACCESSServer** parameter to an Exchange 2013 CAS.
- If you are using a load balancer, for troubleshooting, set the **CLIENTACCESSServer** parameter to an actual server instead of the load balancer.
- To open the administrator mailbox and the target mailbox, try using the Mailbox Restore Browser with Open Exchange Mailbox.
- Check the MAPI registry key. The key is located at HKEY\_CURRENT\_USER\Software\Microsoft\Windows NT\Current Version\Windows Messaging Subsystem. The name of the key is RpcHttpProxyMap\_TSM. Depending on your environment, you might have to change the HTTP to HTTPS, or change the authentication method, or change the domain name to \*. The MAPI download contains the Microsoft documentation for setting this registry key.  
If the default registry key is something like the following example:  
contoso.com=http://mail.contoso.com,ntlm,ntlm,false

You might make one or more of the following updates:

```
contoso.com=https://mail.contoso.com,ntlm,ntlm,false
*=http://mail.contoso.com,ntlm,ntlm,false
contoso.com=http://mail.contoso.com,negotiate,negotiate,false
```

For all of the information about registry keys, see the Microsoft documentation.

In addition, when completing a backup and restore tasks for an Exchange 2013 server, if a Client Access Server (CAS) is used and later removed as the CAS, or, if the CAS is enabled for SSL authentication, an Enter Password window might be displayed. This window prompts you to enter the domain, user name, and password. To verify and workaround this problem is occurring, complete the following steps:

1. From a command prompt, enter **regedit.exe**.
2. Use the Microsoft documentation to backup the registry.
3. Locate the following registry key: RpcHttpProxyMap\_TSM. This key is located at HKCU\Software\Microsoft\WindowsNT\CurrentVersion\Windows Messaging Subsystem
4. To go from HTTPS to HTTP, change the subdomain.domain.com=https://server.subdomain.domain.com,ntlm,ntlm,false value to subdomain.domain.com=http://server.subdomain.domain.com,ntlm,ntlm,false.

---

## Diagnosing VSS issues

The VSS Diagnostics wizard runs persistent and non-persistent snapshot testing. Do not run these tests if you are already using SAN Volume Controller or Storwize V7000 space-efficient snapshots on your computer. Doing so can result in the removal of previously existing snapshots.

### Procedure

To test persistent and non-persistent VSS snapshots, complete the following steps:

1. Start the Management Console.
2. Click **Diagnostics** in the start 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 or mount points to test and click **Next**. Click **Show VSS Information** to view details about the VSS providers, writers, and snapshots available on your system. Click **Next** to begin testing the selected items.
4. The results of the persistent and non-persistent snapshot testing displays as **Passed** or **Failed**. If a test fails, click the **Failed** link for more information. During testing, the output of the Windows Event Log is also displayed. Review the events and click **Copy Info** if you want to save the results. Click **Next** to continue. The results of the snapshot testing are displayed. If a problem is identified, use the information that is displayed to isolate the issue. When the testing is successful and complete, click **Finish** to exit the wizard.

## What to do next

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

---

## Collecting detailed diagnostic information

Collect detailed diagnostic information by using the Diagnostic property sheet.

### About this task

A Diagnostics property page is added to the Dashboard property sheet and to each workload instance's property sheet in the Management Console (MMC) GUI.

The Diagnostics property page that is available in the Dashboard property sheet is limited only to setting tracing for the MMC console and taking screen capture.

SQL, Exchange, and File System workload instance nodes are displayed in the tree view only after configuration. Therefore, you can trace the MMC GUI before you complete the configuration.

A Diagnostics property page is also available in the property sheet of each workload instance. These diagnostics property pages can control the tracing settings for all related components. These related components include the workload, the Tivoli Storage Manager API, the Client Agent service, and the MMC GUI.

The following diagnostic modes are available:

#### Normal

Use for SQL legacy backup operations. Using this mode results in a small sized trace file.

#### Complete (default)

Using this mode results in a large sized trace file.

#### Custom

Use when full control over trace flags must be set

Tooltips describe the function of each toolbar button. When trace options are set for the agent service, the service must be restarted for the tracing to take effect.

## Procedure

The following steps illustrate the process flow for how to collect diagnostic information:

1. A problem occurs in the Management Console (MMC) GUI.
2. Open the Diagnostics property page.
3. Optional: Select a value from the **Mode** field. The default is **Complete**.
4. Click **Begin** to set all appropriate tracing options. You can optionally set the following items:
  - You can click **Screen shot** to open the Diagnostics screen shot tool window. When you want to create a screen capture of any open windows, click **Add New Screenshot**. The name of the screen capture is added to the list of items on the Diagnostics property page. Close the Diagnostics screen shot when you finish taking screen captures.
  - For SQL workload instances, enter a database name in the **SQL Database** field, and click **Add Database Information**. Repeat this step as needed. This step is useful if one database can be backed up and another cannot. By providing the details for both databases, it helps identify differences in database properties.
5. Close the property sheet.
6. Reproduce the problem.
7. Open the **Diagnostics** property page.
8. Click **End** to clear all tracing and gather data. Or, click **Cancel** to clear tracing without gathering data.
9. Review, copy, email, and delete the problem determination data.

## Results

When a diagnostic property page collects data, it makes copies of all of the trace files, compress them, and stores them in the FlashCopyManager\ProblemDetermination folder along with other information. The FlashCopyManager\ProblemDetermination folder is located in the installation directory.

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## Online support

There are multiple resources for support.

### About this task

The following list identifies the various ways that you can find information online:

- Tivoli Storage FlashCopy Manager wiki on the developerWorks® site at [http://www.ibm.com/developerworks/mydeveloperworks/wikis/home/wiki/Tivoli\\_Storage\\_FlashCopy\\_Manager](http://www.ibm.com/developerworks/mydeveloperworks/wikis/home/wiki/Tivoli_Storage_FlashCopy_Manager).
- Service Management Connect site at <https://www.ibm.com/developerworks/servicemanagement/sm/index.html>.
- Tivoli Storage FlashCopy Manager product support at [http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli\\_Storage\\_FlashCopy\\_Manager](http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_FlashCopy_Manager). Enter the search term to narrow the search criteria for your support needs. The terms can be an authorized program analysis report (APAR) number, release level, or operating system.

---

## Viewing system information

View or edit scripts that provide information about system components. Some examples are Tivoli Storage FlashCopy Manager related Windows Services, Windows Event Log entries, and Volume Shadow Copy Service (VSS) information.

### About this task

The System Information view is extensible. You can take advantage of this flexibility to add and share customize scripts.

### Procedure

To work with scripts, follow these steps:

1. Open the System Information view by following these steps:
  - a. Click **Diagnostics** in the start page.
  - b. Double-click **System Information** in the results pane. A list of scripts is displayed in the results pane of the System Information view. The types of scripts that are displayed are PowerShell scripts, Windows Management Instrumentation scripts, and Tivoli Storage Manager scripts.
2. Add, update, or delete your scripts.
  - To add your own scripts, click **New** in the Actions pane. You can also copy your scripts directly to the scripts folder in the Tivoli Storage FlashCopy Manager installation directory.

Tivoli Storage FlashCopy Manager uses the file type extension to determine how to run the script. Verify that your scripts follow these extension requirements:

    - PowerShell scripts: *filename.ps1*
    - Windows Management Instrumentation (WMI) scripts: *filename.wmi*
    - Tivoli Storage Manager scripts: *filename.tsm*
  - To view or edit an existing script:
    - a. From the list of script files in the results pane, select the name of a script that you want to view or edit.

The name of the script is displayed in the Actions pane. Click the name of the script in the Actions pane to reveal or hide a list of actions to run.
    - b. Click **Command Editor** in the Actions pane to open the script file for viewing or editing.
    - c. View or edit the script. Click **OK** to save your changes, or click **Cancel** to exit the System Information Command Editor without saving any changes.
  - To delete a script:
    - a. From the list of script files in the results pane, select the name of a script that you want to delete.

The name of the script is displayed in the Actions pane. Click the name of the script in the Actions pane to reveal or hide a list of actions to run.
    - b. Click **Delete** in the Actions pane.

---

## Viewing trace and log files

View files that are used during troubleshooting tasks.

### Before you begin

You can collect trace and log files in the Diagnostics property page for a workload.

### About this task

When you encounter a problem in the Management Console, you can create trace files by using the Diagnostics property page. Click **Properties** > **Diagnostics**, and click **Begin**. Then, close the property page and reproduce the problem. Finally, open the Diagnostics property page and click **Stop**. The log files are displayed in the Trace and Log Files view, and you can click a file to view it.

Clicking the **Diagnostics** button is the preferred method for gathering information to send to your service representative. This method gathers all the information that is needed. Even if a problem occurs only on the command-line interface, command, you can always gather information by using the Automate tab.

Tivoli Storage FlashCopy Manager uses several components. Each component is in its own directory along with its respective troubleshooting files. The Trace and Log Files view brings these files into a central location for easy viewing. Examples including default log and trace files are provided:

- Examples of Tivoli Storage FlashCopy Manager default log and trace files:
  - Installation directory: C:\Program Files\Tivoli\FlashCopyManager
  - dsierror.log
  - Log file for custom applications and file systems workloads: fcm.log
  - TraceFm.trc
  - TraceUx.trc
  - TraceManagedCapacityHistory.trc
  - TraceSchedLaunch.trc
  - VssProvisioning.log
  - TraceFileFS.trc
  - TraceFileExc.trc
  - TraceFileSql.trc

If the fcm.log is defined in a path other than the default C:\Program Files\Tivoli\FlashCopyManager\ fcm.log, the reports does not include the following information for scheduled backup and restore operations:

- Task completion
- Type of data protection activity
- Amount of data protection activity

The charts and reports display only information that is present in the default log file fcm.log.

- Examples of trace logs and scripts to quiesce custom applications:
  - Default directory: %ALLUSERSPROFILE%\Application Data\Tivoli\FlashCopyManager\*custom-application*  
where *custom-application* can be a variety of applications. For example, an IBM Domino® mail server, or MySQL or Oracle server.

- Examples of VSS requestor default log and trace files:
  - Installation directory: C:\Program Files\Tivoli\TSM\baclient
  - dsmerror.log
- Examples of IBM VSS provider for SAN Volume Controller, Storwize V7000, and DS8000 log files:
  - IBMVDS.log
  - IBMVss.log

Click the trace or log file you want to view. The contents of the file are displayed in the results pane. Use the toolbar icons to create, save, edit, or email a file.





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## Chapter 8. Reference information

Commands, parameters, and command-line syntax information is provided.

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### 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`. If you installed the **TDPEXchange** package, or you configured the Microsoft Exchange through the Management Console, the program is (by default) in the Tivoli Storage FlashCopy Manager for Exchange installation directory (`C:\Program Files\Tivoli\tsm\TDPEXchange\`).

#### Starting the Tivoli Storage FlashCopy Manager for Exchange command-line interface

Perform the following steps to start the Tivoli Storage FlashCopy Manager for Exchange command-line interface:

1. Start the Management Console (MMC) GUI.
2. In the tree view, select the computer node where you want to run the commands.
3. Expand the **Protect and Recover Data** node.
4. In the tree view, select an Exchange Server node.
5. Click the **Automate** tab. An integrated command line is available in the task window. You can use the interface to enter PowerShell cmdlets or command-line interface commands. The output is displayed in the main window.
6. Change **PowerShell** to **Command Line**.

#### Command-line interface help

Issue the `tdpexcc`, `tdpexcc ?`, or `tdpexcc help` commands to display help for the command-line interface.

#### Command-line parameter characteristics

Before you reference the command-line interface information that is provided, review the command-line interface parameter characteristics that are identified.

There are two types of parameters: positional and optional. Each parameter is separated from the other parameters by using a space character. If a parameter's value includes a space character, the value must be enclosed in double quotation marks. Optional parameters can be used in any order after the required parameters. Optional parameters, unlike positional parameters, begin with either a leading slash (/) or dash (-). A positional parameter can be used only one time for each command invocation.

Some parameters can be used with abbreviated keywords. The minimum abbreviations for keywords are indicated in uppercase 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.

## Backup command

Use the **backup** command to run Exchange Server backups of databases 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 run a Tivoli Storage FlashCopy Manager for Exchange backup.

Microsoft Exchange Server considers the wildcard character (\*) to be an invalid character when used in database names. Databases that contain the wildcard character (\*) in their name are not backed up. When a full VSS snapshot backup is done, 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. 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 run Exchange Server backups, the Exchange database file size might increase because of increased database commitments that are triggered by backup operations. This condition is a Microsoft Exchange server standard behavior.

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

**Full** Back up the entire database and transaction logs. If a successful backup is obtained, the Exchange Server deletes the committed log files. In Exchange Server Database Availability Group environments, the log files might not be immediately deleted after a successful full backup.

### Incremental

Back up the transaction logs. If a successful backup is obtained, the Exchange Server deletes the committed log files. In Exchange Server Database Availability Group environments, the log files might not be immediately deleted after a successful incremental backup.

### Differential

Back up the transaction logs. The transaction logs are not deleted.

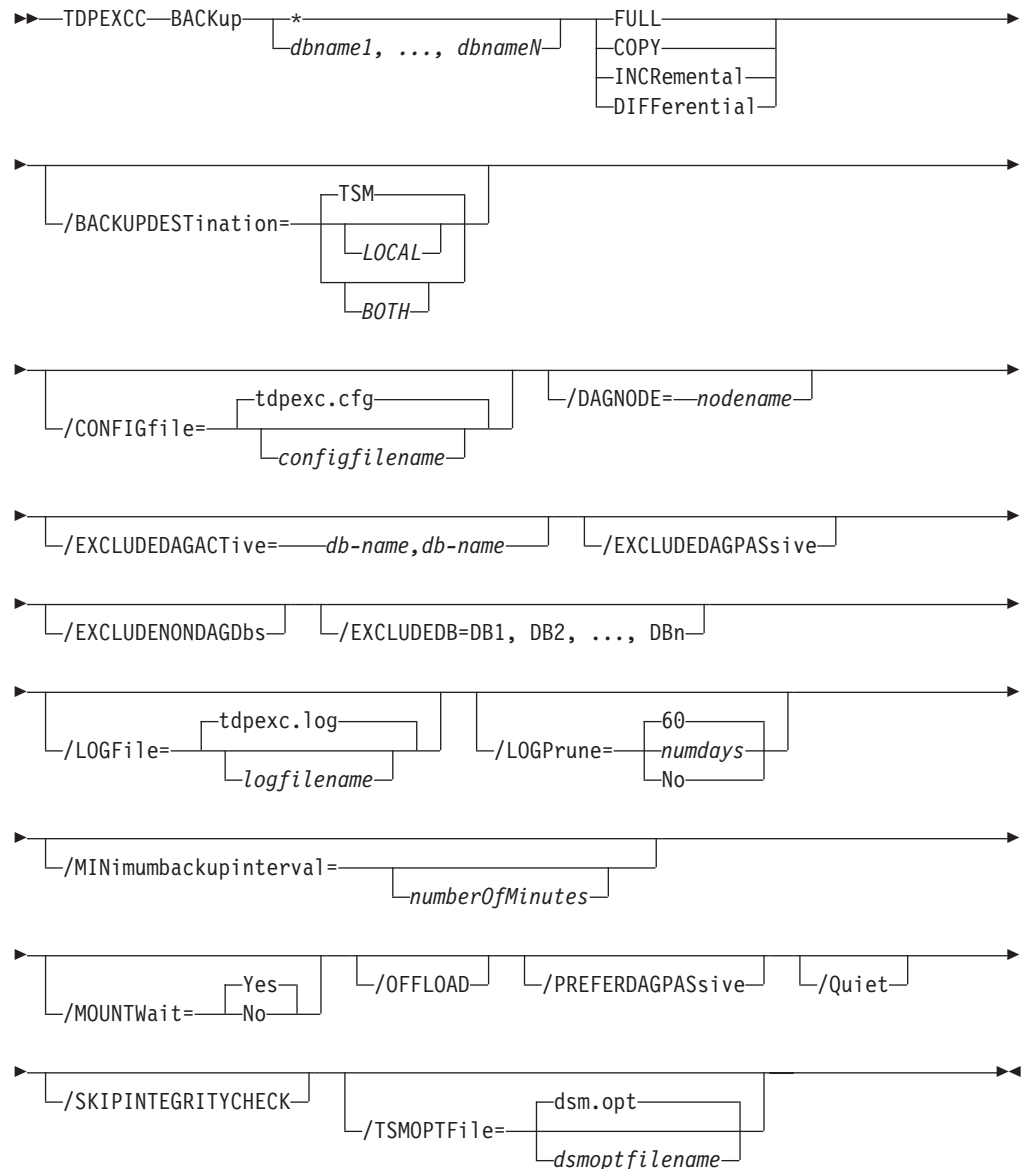
**Copy** Back up the entire database and transaction logs. The transaction logs are not deleted.

All databases must be mounted at the time of the backup operation. If any database is not mounted, the database is not backed up. In addition, the transaction logs are not truncated.

## Backup syntax

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

### TDPEXCC command



### 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:

\* | *dbname1, ..., dbnameN*

\*       Back up all databases.

*dbname*

Back up the specified database. Multiple entries are separated by commas. If separated by commas, ensure that there is no space

between the comma and the name. If any database name contains commas or blanks, enclose the name in double quotation marks.

The following positional parameters specify the type of backup to run:

**FULL | COPY | INCRemental | DIFFerential**

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

**COPY** Back up the entire 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 log files, but do not truncate the log files.

## Backup optional parameters

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

**/BACKUPDESTination=LOCAL | TSM | BOTH**

When backing up data to a local system, set **BACKUPDESTination** to LOCAL. When backing up data to a Tivoli Storage Manager server, set **BACKUPDESTination** to TSM. To back up data to a local system and a Tivoli Storage Manager server, set the parameter to BOTH.

**/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"
```

**/DAGNODE=***nodename*

Specify the node name that you want to use to back up the databases in an Exchange Server Database Availability Group. With this setting, backups from all Database Availability Group members that are configured to use the DAG node are backed up to a common file space on the Tivoli Storage Manager server. The database copies are managed as a single entity, regardless of which Database Availability Group member they were backed up from. This setting can prevent Data Protection for Exchange from making too many backups of the same database.

**/EXCLUDEDAGActive**

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

#### **/EXCLUDEDAGPASSive**

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

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

Use the **/EXCLUDEDB** parameter to exclude the specified Exchange Server databases from the backup operation. If the database names are separated by commas, ensure 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.

#### **/EXCLUDENONDAGDBs**

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

#### **/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 you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for Exchange to run operations, use the **/LOGFile** parameter to specify a different log file for each instance used. This function 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 for Exchange activity log and specifies how many days of entries are saved. By default, log pruning is enabled and done once each day Tivoli Storage FlashCopy Manager for Exchange is implemented; however, this option disables log pruning or explicitly request a prune of the log for one command run even if the log file is already 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 - 9999. A value of 0 deletes all entries in the Tivoli Storage FlashCopy Manager for Exchange activity log file except for the current command entries.

- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the Tivoli Storage FlashCopy Manager for Exchange 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 for Exchange log file. If you are running a command that might prune the log file and the value of the **timeformat** or **dateformat** parameter is changed, do 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 **/LOGPrune** parameter or logfile setting.

**/MINimumbackupinterval=numberOfMinutes**

If you are scheduling the backup of databases in an Exchange Server Database Availability Group, specify the minimum amount of time, in minutes, before a backup of another copy of the same Database Availability Group database can begin. The range is 1 - 9999. If you use the parameter, but do not specify a value, you can back up the database again immediately after a backup operation of that database completes.

Setting this parameter specifies that only one database copy can be backed up within a timeframe. This option prevents all of the members in a Database Availability Group from backing up the database, which would be redundant and invalidate the Tivoli Storage Manager storage management policy.

**/MOUNTwait=Yes | No**

Use the **/mountwait** parameter to specify whether waits for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify these options:

- Yes** waits until all initial volumes of any required removable media are made available to the Tivoli Storage Manager server before it completes the command. This option is the default.
- No** ends the command (if removable media are required). An error message is displayed.

**/OFFLOAD**

Specify this option if, after the VSS snapshot is complete, you want to offload the transfer of the data to the Tivoli Storage Manager server to the system specified by the **REMOTEDSMAGENTNODE** parameter. This option is only valid when the **BACKUPDESTINATION** parameter is set to either TSM or BOTH. The default is to not offload data.

**/PREFERDAGPASSive**

If you are scheduling the backup of databases in an Exchange Server Database Availability Group, set this parameter to back up a passive database in an Exchange Server Database Availability Group unless no healthy passive copy is available. If no healthy passive copy is available, the backup is made from the active database copy.

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

### **/SKIPINTEGRITYCHECK**

Specify this parameter to bypass the Exchange integrity check typically done during a backup. If the database you are backing up has two or more healthy copies, you can skip the integrity check.

When you use 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 that is managed by Tivoli Storage FlashCopy Manager storage.

### **/TSMOPTFile=tsmoptfilename**

The **/TSMOPTFile** parameter specifies the Tivoli Storage FlashCopy Manager options file to use. Considerations:

- The *tsmoptfilename* 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 *tsmoptfilename* variable contains spaces, enclose the variable in double quotation marks. For example:  
`/TSMOPTFile="c:\Program Files\dsm.opt"`
- If you do not specify **/TSMOPTFile**, the default value is `dsm.opt`.
- If you specify **/TSMOPTFile**, but not *tsmoptfilename*, the default is also `dsm.opt`.

### **Backup example**

The following list provides example of how to use the **backup** command.

To complete a full backup of a database, for example, *DB\_G*, the following command can be entered:

```
tdpexcc backup DB_G full
```

To complete a copy backup of a database, for example, *DB\_G*, the following command can be entered:

```
tdpexcc backup DB_G copy
```

To complete a differential backup of a database, for example, *DB\_G*, the following command can be entered:

```
tdpexcc backup DB_G diff
```

To complete an incremental backup of a database, for example, *DB\_G*, the following command can be entered:

```
tdpexcc backup DB_G incr
```

### **Delete backup command**

Use the **delete backup** command to delete a VSS backup of an Exchange Server database.

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

- When you run full VSS snapshot backup, the backup remains active until the backup version is either deleted with the delete backup command, or expired by Tivoli Storage FlashCopy Manager according to the defined policy. The expiration does not delete an incremental backup. Two different active backups can exist at the same time:

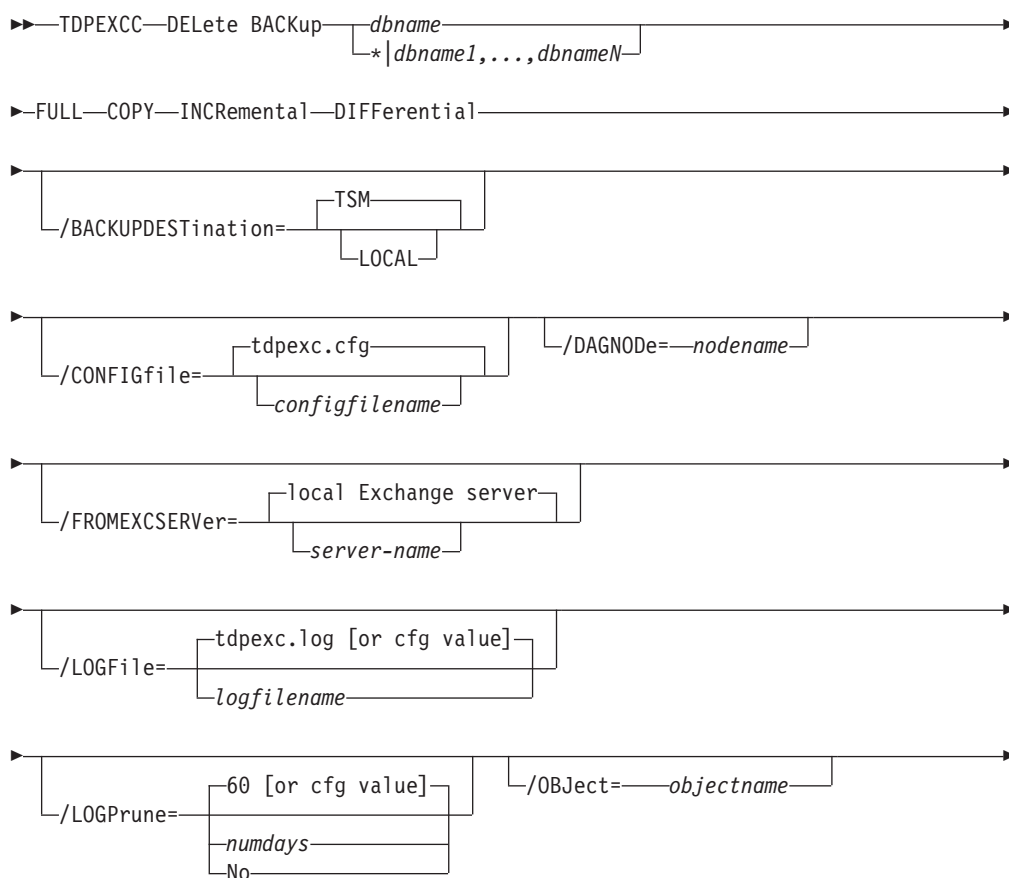


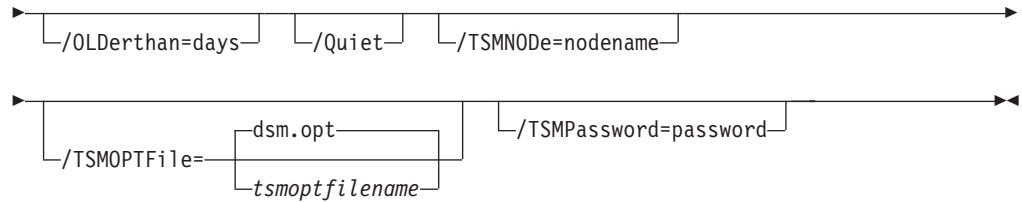
- Full backup, along with any associated incremental backups and differential backups.
- Copy backup, along with any associated incremental backups and differential backups.
- When you delete an active full or copy backup, the state of the previous active full or copy backup changes from inactive to active. However, the current active incremental or differential backup is not deleted and erroneously seems to be associated with the newly active full or copy backup. Also, the incremental or differential backup (associated with the previous inactive full or copy backup that is 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, Storwize V7000, or Space Efficient volumes, 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.

## Delete backup syntax

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

### TDPEXCC command





## 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:

\* | *dbname1,...,dbnameN* *backuptype*

- \* 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** 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, ensure that there is no space between the comma and the component name. If any component name contains commas or blanks, enclose the name in double quotation marks.

### Attention:

- 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 run:

**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.

### **/BACKUPDESTination=LOCAL|TSM**

Use this parameter to specify the destination of the backups to be deleted. The default is TSM.

### **/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"
```

### **/DAGNODE=nodename**

Specify the node name that you want to use to back up the databases in an Exchange Server Database Availability Group. With this setting, backups from all Database Availability Group members that are configured to use the DAG node are backed up to a common file space on the Tivoli Storage Manager server. The database copies are managed as a single entity, regardless of which Database Availability Group member they were backed up from. This setting can prevent Data Protection for Exchange from making too many backups of the same database.

### **/FROMEXCServer=server-name**

Use the **/fromexcserver** parameter to specify the name of the Exchange Server where the original backup was processed.

The default is the local Exchange Server.

If a DAG node is specified by using the **dagnode** parameter, Tivoli Storage FlashCopy Manager for Exchange uses this node name instead of the Tivoli Storage FlashCopy Manager for Exchange node to back up databases in an Exchange Server Database Availability Group. Therefore, the **delete** command automatically deletes the backups that were created by the other DAG members, without having to specify the **/fromexcserver** parameter.

### **/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 you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for Exchange to process operations, use the **/logfile** parameter to specify a different log file for each instance used. This function 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 is pruned for one command run. By default, log pruning is enabled and done one time 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for Exchange command that might prune the log file, do 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 backup** command. If it is not specified, the **delete backup** command fails.

#### **/OLDERthan=days**

Use the **/olderthan** parameter to specify how old backup files can be to be deleted. The *days* variable can range from 0 - 9999. There is no default value for the **/olderthan** parameter.

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

#### **/TSMNODE=tsmnode name**

Use the *tsmnode name* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (`dsm.opt`). This parameter overrides the value in the

Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

#### **/TSMOPTFile=***tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the Tivoli Storage FlashCopy Manager installation directory is used.

If the *tsmoptfilename* variable includes spaces, enclose it in double quotation marks. For example:

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is `dsm.opt` if you do not specify the **/tsmoptfile** parameter or if you specify **/tsmoptfile** but not *tsmoptfilename*.

#### **TSMPassword**

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS** GENERATE in the Tivoli Storage FlashCopy Manager options file (`dsm.opt`), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS** GENERATE is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS** PROMPT is in effect, and you do not specify a password value on the command line, you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

## **Help command**

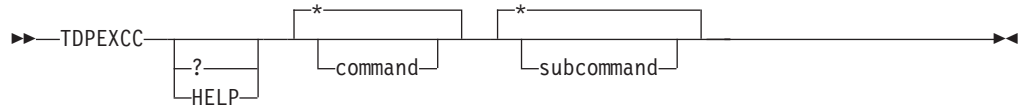
Use the **tdpexcc help** command to display help for Tivoli Storage FlashCopy Manager for Exchange commands.

This command lists one or more commands and their parameters. When you use a language other than English, you might be required to set the width of your screen display. To view the entire help description in one screen, set the screen display width to a value greater than 80 characters. 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.

### TDPEXCC command



## 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 are 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 are displayed.

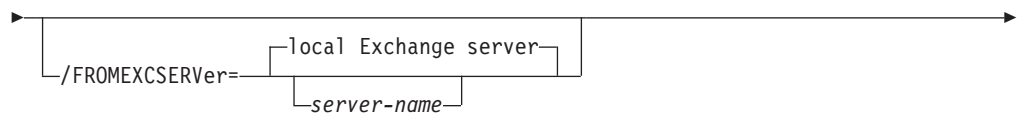
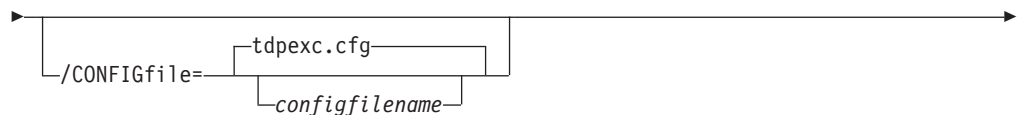
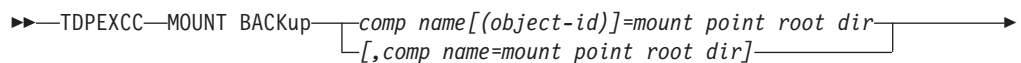
## Mount backup command

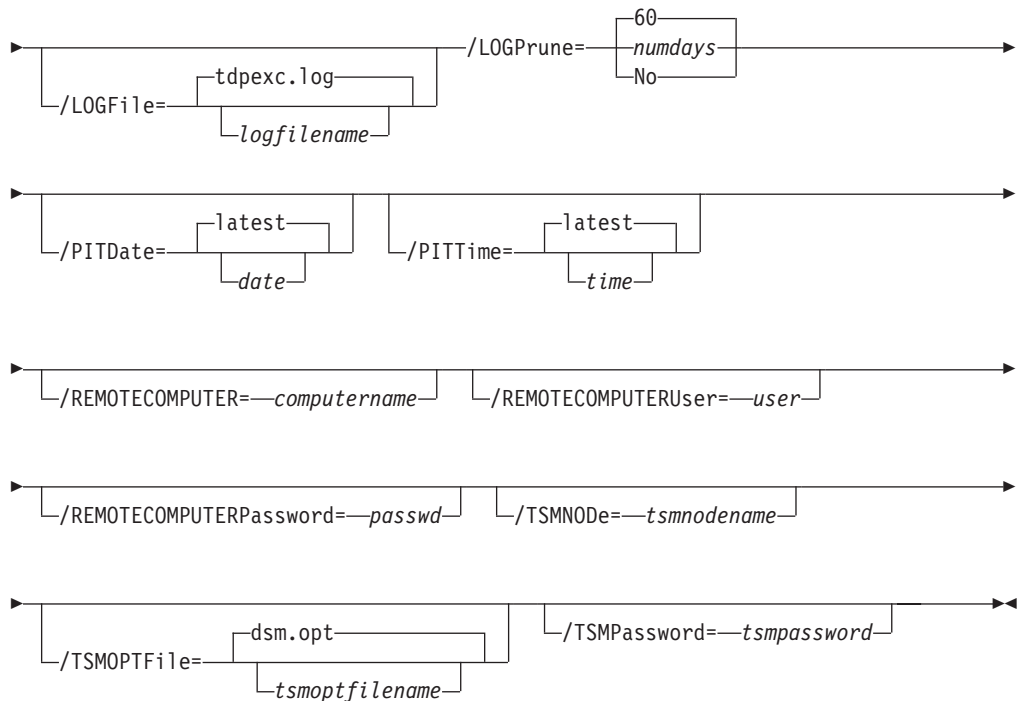
To mount backups that are managed by Tivoli Storage FlashCopy Manager for Exchange, use the **mount backup** command.

### Mount backup syntax

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

### TDPEXCC command





## Mount backup positional parameter

The positional parameters immediately follow the **mount backup** command and precede the optional parameters.

The following positional parameters specify the objects to mount:

*component name*[(*object-id*)]=*mount point root dir*[,*component name*=*mount point root dir*]

*component name*[(*object-id*)]

Specify the backup of a local Exchange database.

*mount point root dir*

Specify the absolute path to the directory where the snapshots are going to be displayed as mount point directories. The directory must be empty. If not empty, an error is reported.

The list must contain all non-qualified objects or all qualified objects. The list cannot contain a combination of non-qualified objects and qualified objects. Specify the list by using the following syntax:

*mount backup object-1*[(*object-1-id*)]=*mount-point-1*[,*object-2*[(*object-2-id*)]  
=*mount-point-2*...]

For example:

```
tdpexc mount backup excdb:(20120815064316)=f:\emptyfolder
```



## Mount backup optional parameters

Optional parameters follow the **mount 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 **mount 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\tdpexc.cfg"
```

### **/FROMEXCServer**=*server-name*

Use the **/fromexcserver** parameter to specify the name of the Exchange Server where the original backup was processed.

The default is the local Exchange Server.

If a DAG node is specified by using the **dagnode** parameter, Tivoli Storage FlashCopy Manager for Exchange uses this node name instead of the Tivoli Storage FlashCopy Manager for Exchange node to back up databases in an Exchange Server Database Availability Group. Therefore, the **delete** command automatically deletes the backups that were created by the other DAG members, without having to specify the **/fromexcserver** parameter.

### **/LOGFile**=*logfile*

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

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory.

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

```
/LOGFile="c:\Program Files\tdpexc.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.

### **/LOGPrune**=*numdays* | **No**

Use the **/LOGPrune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning is enabled and done one time 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 graphical user interface or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for Exchange command that might prune the log file, do 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.

**/REMOTECOMPUTER=***computername*

Enter the computer name or IP address of the remote system where the backup was created.

**/REMOTECOMPUTERUser=***user*

Enter the user name that is used to log on to the server specified with the **REMOTECOMPUTER** parameter. If a domain is required to log on with the domain account, enter *Domain\User*. To log on to the local account, the domain is not required. There is no default value.

**/REMOTECOMPUTERPassword=***passwd*

Enter the password for the user name that is specified with the **/REMOTECOMPUTERUser** parameter. There is no default value.

**/TSMNODE=***tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMOPTFile=***tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\dsm.opt"
```

The default is *dsm.opt*.

**/TSMPassword=***tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (*dsm.opt*), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the

password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

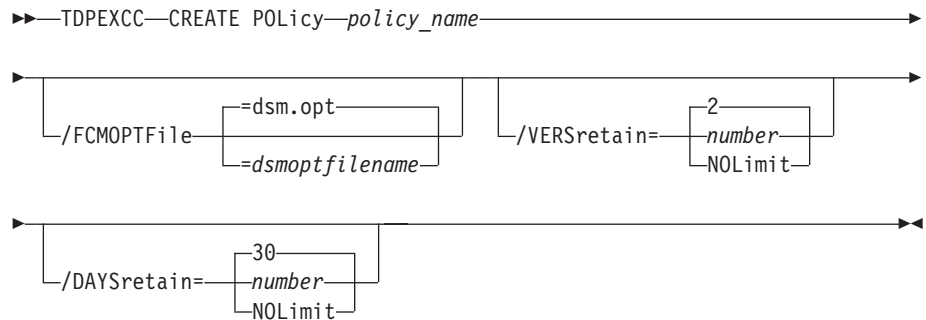
The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

## Policy commands for Tivoli Storage FlashCopy Manager for Exchange

### Create Policy

This command is used to create a policy.

#### TDPEXCC command: CREATE POLIcy



Parameters:

- **policy\_name** (required): Specifies the name of the policy that is being created. To create a policy, the policy name must be unique.
- **FCMOPTFile**: Specifies the Tivoli Storage FlashCopy Manager options file to use.
- **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.

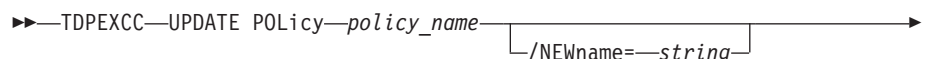
This parameter does not apply to incremental backup versions of Exchange Server data. Incremental backups do not participate in expirations because of version limits. There is never more than one version of an incremental backup object. There is only one version of an incremental backup object because incremental backups are always uniquely named.

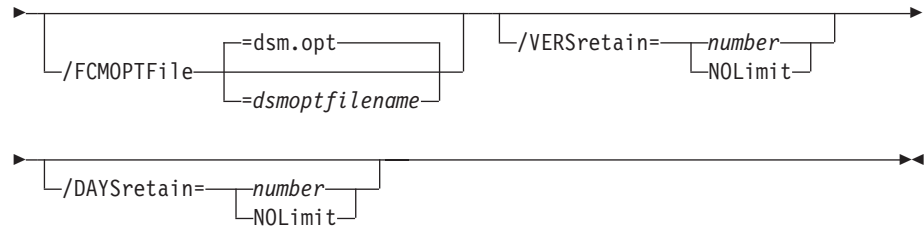
- **DAYSretain**: Specifies the number of days to retain a snapshot (0 - 9999). You can also specify NOLimit to represent an unlimited number of days to retain snapshot versions.

### Update Policy

This command is used to update or modify an existing policy.

#### TDPEXCC command: UPDATE 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.
- **FCMOPTFile:** Specifies the Tivoli Storage FlashCopy Manager options file to use.
- **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.

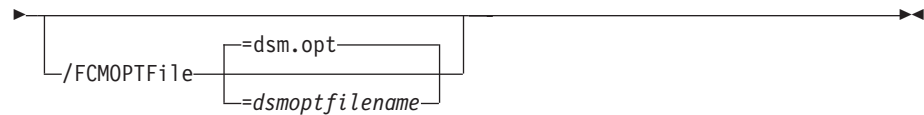
This parameter does not apply to incremental backup versions of Exchange Server data. Incremental backups do not participate in expirations because of version limits. There is never more than one version of an incremental backup object. There is only one version of an incremental backup object because incremental backups are always uniquely named.

- **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.

**TDPEXCC command: COPY POLIcy**



Parameters:

- **existing\_policy\_name** (required): Specifies the name of the policy that is being copied.
- **FCMOPTFile:** Specifies the Tivoli Storage FlashCopy Manager options file to use.
- **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.

## TDPEXCC command: Query POLicy

▶▶—TDPEXCC—Query POLicy—\*—▶▶

Parameters: \* (required) Specifies all policies are to be queried. The result of the query is displayed as follows:

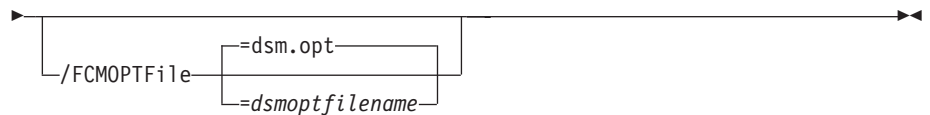
| Connecting to Exchange Server, please wait... |                             |                         |
|-----------------------------------------------|-----------------------------|-------------------------|
| Policy                                        | Number of snapshots to keep | Days to keep a snapshot |
| -----                                         | -----                       | -----                   |
| FCMPOL                                        | 3                           | 60                      |
| STANDARD                                      | 2                           | 30                      |

## Delete Policy

This command is used to delete a policy.

### TDPEXCC command: DELEte POLicy

▶▶—TDPEXCC—DELEte POLicy—*policy\_name*—▶▶



Parameters:

- **policy\_name** (required): Specifies the name of the policy that is being deleted.
- **FCMOPTFile**: Specifies the Tivoli Storage FlashCopy Manager options file to use.

## Exchange policy examples

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

In this example, the `tdpexcc create policy fcmexch01` command creates the `FCMEXCHPOL1` policy. The following output is displayed:

```
C:\PROGRA~1\Tivoli\tsm\TDPEXchange>tdpexcc create policy fcmexch01

IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 0.0
(C) Copyright IBM Corporation 1998, 2013. All rights reserved.

CREATE policy was successful.

The operation completed successfully. (rc = 0)
```

In this example, the `tdpexcc delete policy fcmexch01` command deletes the `FCMEXCHPOL1` policy. The following output is displayed:

```
C:\PROGRA~1\Tivoli\tsm\TDPEExchange>tdpexcc delete policy fcmexch01
```

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 0.0
(C) Copyright IBM Corporation 1998, 2013. All rights reserved.
```

```
DELETE policy was successful.
```

```
The operation completed successfully. (rc = 0)
```

## Query Exchange command

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

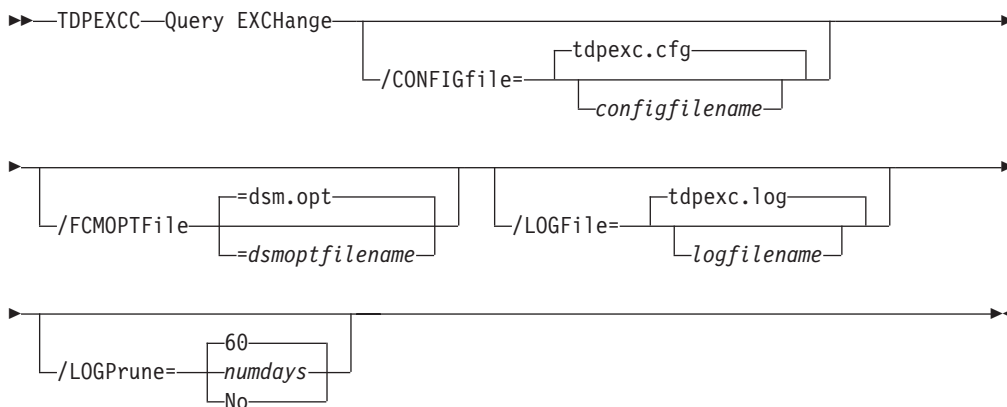
The **query exchange** command returns the following information:

- Exchange Server name and version
- Domain name
- Names of all databases
- Status (online, offline) of all databases
- Circular logging status (enabled, disabled) of all databases
- 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.

### TDPEXCC command



## 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"
```

### **/FCMPTFile**=*dsmoptfilename*

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

- 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 **/FCMPTFile**, the default value is `dsm.opt`.
- If you specify **/FCMPTFile** but not *dsmoptfilename*, the default is also `dsm.opt`.

### **/LOGFile**=*logfile*

Use the **/LOGFile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager for Exchange. The *logfile* variable identifies the name of the activity log file. If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory. If the *logfile* variable includes spaces, enclose the entire **/LOGFile** parameter 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 you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for Exchange to run operations, use the **/LOGFile** parameter to specify a different log file for each instance used. This function 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 is to be pruned for one command run. By default, log pruning



is enabled and done one time 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** parameter, the variable *numdays* is a number in the range 0 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter changes before you issue a Tivoli Storage FlashCopy Manager for Exchange command that might prune the log file, do 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 you use the **query exchange** command.

The **tdpexcc query exchange** command queries the Exchange server. An example of the output in an Exchange Server Database Availability Group environment is displayed:

Querying Exchange Server to gather component information, please wait...

Microsoft Exchange Server Information

-----  
Server Name: AVATAR  
Domain Name: avatar.local  
Exchange Server Version: 14.1.270.1 (Exchange Server 2010)

Databases and Status

-----  
avatarDB3\_D\_local\_bas  
Circular Logging - Disabled  
DAG Status - None  
Recovery - False  
avatarDB3\_D\_local\_bas Offline  
  
avatarDB4\_D\_local\_bas  
Circular Logging - Disabled  
DAG Status - None  
Recovery - False  
avatarDB4\_D\_local\_bas Online  
  
avatarDB5\_G\_storwize\_bas  
Circular Logging - Disabled  
DAG Status - None  
Recovery - False  
avatarDB5\_G\_storwize\_bas Online  
  
avatar\_F\_H  
Circular Logging - Disabled  
DAG Status - None  
Recovery - False  
avatar\_F\_H Online  
  
Mailbox Database 0003208508  
Circular Logging - Disabled  
DAG Status - None  
Recovery - False  
Mailbox Database 0003208508 Online

Volume Shadow Copy Service (VSS) Information

-----  
Writer Name : Microsoft Exchange Writer  
Local DSMAgent Node : AVATAR  
Remote DSMAgent Node :  
Writer Status : Online  
Selectable Components : 4

## Query FCM command

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

This command displays the following information:

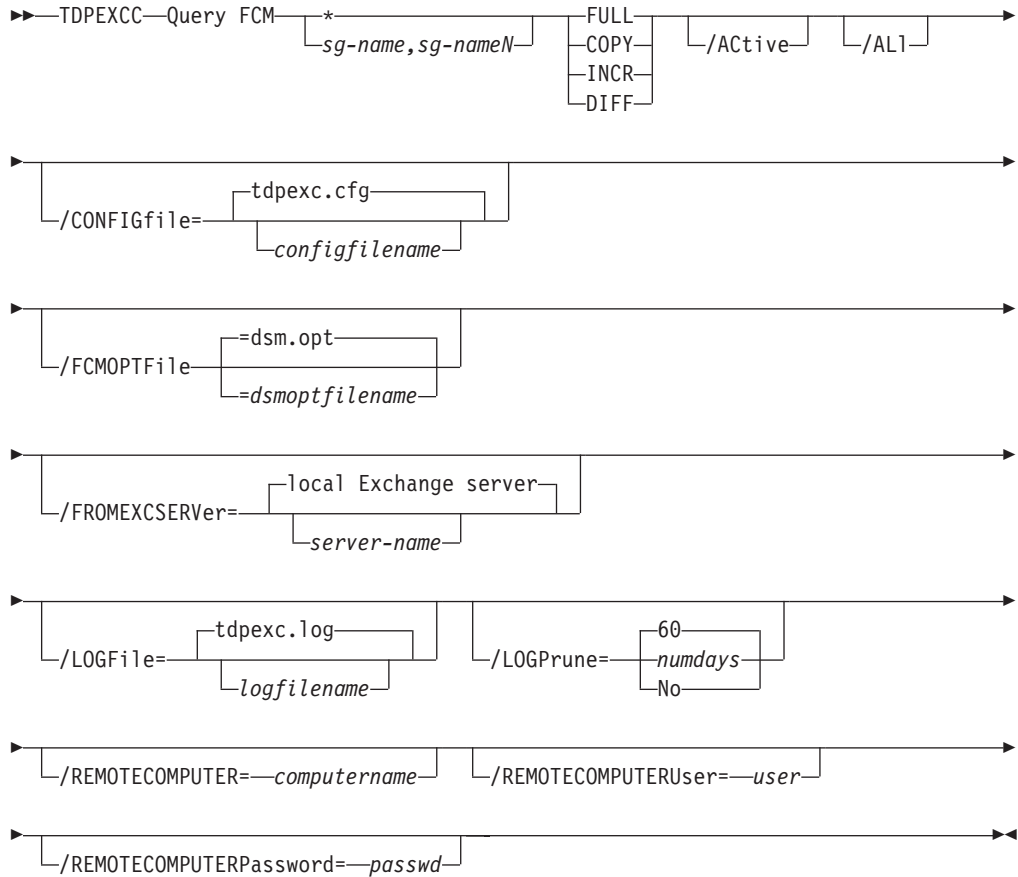
- Compression mode
- Active policy set
- Default management class

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

## Query FCM syntax

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

### TDPEXCC command



### 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:

\* | *componentname*

*componentname1, ..., componentnameN*

Query all backup objects for the specified component. Multiple entries are separated by commas.

Where *componentname* can be a database name.

The following positional parameters specify the type of backup to query. If this parameter is not specified, all backup types are 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 parameter 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=filename**

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.

The *filename* variable can include a fully qualified path. If the *filename* 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 *filename* variable is not specified, the default value is `tdpexc.cfg`.

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

```
/CONFIGfile="c:\Program Files\file.cfg"
```

#### **/Detail**

Use the **/Detail** parameter to display detailed output from the query command.

- The *filename* 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 *filename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/FCMPTFile**, the default value is `dsm.opt`.
- If you specify **/FCMPTFile**, but not *filename*, the default is also `dsm.opt`.

#### **/FCMPTFile=dsmptfilename**

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

- The *filename* 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 *filename* variable spaces, enclose it in double quotation marks.
- If you do not specify **/FCMPTFile**, the default value is `dsm.opt`.
- If you specify **/FCMPTFile**, but not *filename*, 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 processed.

The default is the local Exchange Server.

If a DAG node is specified by using the **dagnode** parameter, Tivoli Storage FlashCopy Manager for Exchange uses this node name instead of the Tivoli Storage FlashCopy Manager for Exchange node to back up databases in an Exchange Server Database Availability Group. Therefore, the **delete** command automatically deletes the backups that were created by the other DAG members, without having to specify the **/fromexcserver** parameter.

#### **/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 you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for Exchange to run operations, use the **/LOGFile** parameter to specify a different log file for each instance used. This function 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 is to be pruned for one command run. By default, log pruning is enabled and done one time 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for Exchange command that might prune the log file, do 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.

#### **/REMOTECOMPUTER=computername**

Enter the IP address or host name for the remote system where you want to query the data that is backed up.

**/REMOTECOMPUTERUser=*user***

Enter the user name that is used to log on to the server specified with the **REMOTECOMPUTER** parameter. If a domain is required to log on with the domain account, enter *Domain\User*. To log on to the local account, the domain is not required. There is no default value.

**/REMOTECOMPUTERPassword=*passwd***

Enter the password for the user name that is specified with the **REMOTECOMPUTERUser** parameter. There is no default value.

## Query FCM example

The following command shows detailed information about current backups: **query fcm \* /detail**

```
IBM FlashCopy Manager for Mail:
FlashCopy Manager for Microsoft Exchange Server
Version 7, Release 1, Level 0.0
(C) Copyright IBM Corporation 1998, 2013. All rights reserved.

Querying FlashCopy Manager server for a list of database backups, please wait...

Connecting to FCM Server as node 'TIVVM483_EXC'...
Connecting to Local DSM Agent 'TIVVM483'...
Using backup node 'DAG2'...

DAG : DAG2

Backup Object Information

Exchange Server Name TIVVM483
Database Availability Group DAG2
Backup Database Name RATTEST_DAGDB
Backup Method VSS
Backup Location Loc
Backup Object Type full
Mount Points Root Directory
Backup Object State Active
Backup Creation Date / Time 08/22/2012 22:23:00
Backup Supports Instant Restore No
Backup Object Size / Name 172.07MB / 20120822222300
Backup Object Size / Name 36.01MB / Logs
Backup Object Size / Name 136.06MB / File

The operation completed successfully. (rc = 0)
```

## 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 that are represented in local inventory that is managed by Tivoli Storage FlashCopy Manager. This command is valid for all Windows operating systems that are supported by Tivoli Storage FlashCopy Manager.

### TDPEXCC command

►►—TDPEXCC—Query MANAGEDCAPacity—◄◄  
                                          └/Detailed┘

## Parameters

### /Detailed

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

In this example, the **tdpexcc query managedcapacity** 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 managedcapacity /detailed** command displays a detailed listing of total amount of managed capacity and the snapped volumes in use. The following output is displayed:

```
IBM FlashCopy Manager for Mail:
FlashCopy Manager for Microsoft Exchange Server
Version 7, Release 1, Level 0.0
(C) Copyright IBM Corporation 1998, 2013. All rights reserved.

Total Managed Capacity : 31.99 GB (34,353,438,720 bytes)

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

Volume : F:
Managed Capacity : 16.00 GB (17,176,719,360 bytes)
Total Managed Capacity : 1,019.72 MB (1,069,253,632 bytes)
```

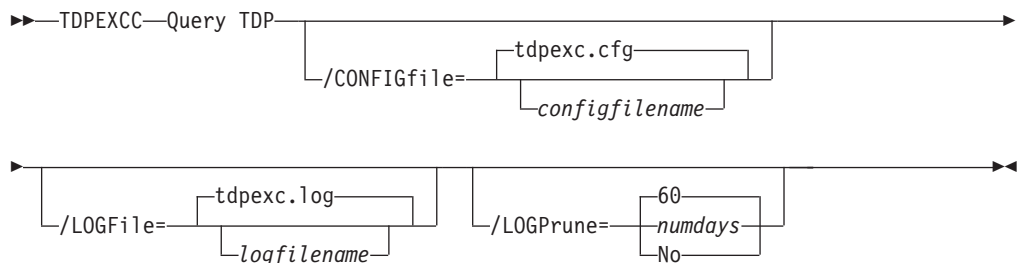
## Query TDP command

Use the **query tdp** command to query a list of the current values that are 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.

### TDPEXCC command





## 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"
```

### **/LOGFile**=*logfile*

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

The *logfile* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory.

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

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

If 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 you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for Exchange to run operations, use the **/LOGFile** parameter to specify a different log file for each instance used. This function 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 is to be pruned for one command run. By default, log pruning is enabled and done one time 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 graphical user interface 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or

**dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for Exchange command that might prune the log file, do 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 you use the **query TDP** command.

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

```
IBM FlashCopy Manager for Mail:
FlashCopy Manager for Microsoft Exchange Server
Version 7, Release 1, Level 0.0
(C) Copyright IBM Corporation 1998, 2013. All rights reserved.

FlashCopy Manager for Exchange Preferences

BACKUPDESTination..... LOCAL
DATEformat 1
IMPORTVSSSNAPSHOTSONLYWhenneeded ... No
LANGuage ENU
LOCALDSMAgentnode..... CENTORI
LOGFile tdpexc.log
LOGPrune 60
MOUNTWait Yes
NUMBERformat 1
REMOVEDSMAgentnode.....
TEMPDBRestorepath.....
TEMPLOGRestorepath.....
TIMEformat 1
```

## Restore command

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

To complete a Tivoli Storage FlashCopy Manager for Exchange restore, you must have local registry rights for all versions of the Exchange Server.

When you use the **restore** command, remember the following points:

- When you restore 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 that is managed by Tivoli Storage FlashCopy Manager storage. You can issue a **tdpexcc query fcm \* /all** command to obtain a list of all the active and inactive backup objects.  
If the **tdpexcc restore dbname 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 databases.

- Specify `/mountdatabases=yes` if you are restoring the last backup and you want the database or databases to be automatically mounted after the recovery completes. Only transaction logs that are contained in the backup is applied to the mailbox database when you run a recovery database restore. You must specify `/recover=applyrestoredlogs` when you restore a mailbox database to a recovery database. Otherwise, the restore operation might fail.

The graphical user interface provides an easy-to-use, flexible interface to help you run a restore operation. The interface presents information in a way that allows multiple selection and, in some cases, automatic operation.

Microsoft Exchange Server considers the wildcard character (\*) to be an invalid character when used in database names. Databases that contain the wildcard character (\*) in their name are not 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 restore considerations**

Use the following considerations when you run VSS fast restores and VSS instant restores.

Unless otherwise specified, *VSS restores* refer to VSS fast restore and VSS instant restore. The following characteristics are true of VSS restore processes:

- Full, copy, differential, and incremental backup types can be restored.
- You can restore one or more databases from a VSS snapshot backup on storage that is managed by Tivoli Storage FlashCopy Manager.
- Parallel VSS fast restore or VSS instant restore operations are not supported on Microsoft Windows Server 2008 and later.
- VSS instant restore requires that the restored volume is available. Other applications, for example, Windows Explorer, cannot access the volume.
- VSS restores ignore the recovery database, and are placed directly into the production database unless the `/intodb` parameter is specified.
- A VSS instant restore overwrites the entire contents of the source volumes. However, you can avoid overwriting the source volumes by specifying `/INSTANTRESTORE=NO`. This parameter bypasses volume-level copy and uses file-level copy instead to restore the files from a VSS backup that are on local shadow volumes.
- If `/MOUNTDatabases=yes` is specified during a VSS restore, the database that is being restored are mounted after restore.
- If a hardware provider is used, the disks that contain Exchange data are configured as basic disks.
- When a VSS instant restore from local shadow volumes is done, the bytes transferred display 0. When a VSS fast restore is performed, the bytes transferred display the actual size.
- Any backup to **LOCAL** can be restored only to the same system.

## Restore syntax

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

### TDPEXCC command



### Restore positional parameters

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

The following positional parameters specify the object to restore:

- \* | *database\_name1, ..., database\_nameN*
- \* Restore all components sequentially.

The following positional parameters specify the type of restore to run:

#### FULL | COPY | INCRemental | DIFFerential

- FULL** Restore a full backup.
- COPY** Restore a copy backup.
- INCRemental**  
Restore an incremental backup.
- DIFFerential**  
Restore a differential 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.

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"
```

### **/DAGNODE**=*nodename*

Specify the node name that you want to use to back up the databases in an Exchange Server Database Availability Group. With this setting, backups from all Database Availability Group members that are configured to use the DAG node are backed up to a common file space on the Tivoli Storage Manager server. The database copies are managed as a single entity, regardless of which Database Availability Group member they were backed up from. This setting can prevent Data Protection for Exchange from making too many backups of the same database.

### **/FCMPTFile**=*dsmoptfilename*

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

- 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 **/FCMPTFile**, the default value is `dsm.opt`.
- If you specify **/FCMPTFile** 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 processed.

The default is the local Exchange Server.

If a DAG node is specified by using the **dagnode** parameter, Tivoli Storage FlashCopy Manager for Exchange uses this node name instead of the Tivoli Storage FlashCopy Manager for Exchange node to back up databases in an Exchange Server Database Availability Group. Therefore, the **delete** command automatically deletes the backups that were created by the other DAG members, without having to specify the **/fromexcserver** parameter.

### **/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 is on local shadow volumes. The default value is **Yes**. An IBM Systems Storage SAN Volume

Controller, DS8000, the XIV system, or IBM Storwize V7000 storage subsystem is required to perform VSS Instant Restores.

You can specify:

- Yes** Use volume level snapshot restore for a VSS backup that are on local shadow volumes if the backup exists on volumes that support it. This option is the default.
- No** Use file level copy to restore the files from a VSS backup that is on local shadow volumes. Bypassing volume-level copy means that Exchange database files, log files, and the checkpoint file are the only data overwritten on the source volumes.

When a VSS instant restore completes on DS8000 and Storwize V7000, make sure that any previous background copies (that involve the volumes that are being restored) are completed before you initiate the VSS instant restore. The **/instantrestore** parameter is ignored and VSS instant restore capabilities are automatically disabled when it runs any type of VSS restore into operation. VSS instant restore of differential and incremental backups is not supported.

#### **/INTODB**=*db-name*

Use the **/INTODB** parameter to specify the name of the database into which the VSS backup is 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 is restored, the input on the command line is as follows:

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

However, when you restore a database that is 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
```

- There is no default value.
- To restore into a Recovery Database (RDB) or alternate database, an RDB or alternate database must exist before you attempt the restore operation.

#### **/LOGFile**=*logfile*

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

The *logfile* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory.

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

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

If you do not specify the **/LOGFile** parameter, log records are written to the default log file, *tdpexc.log*.

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

When you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for Exchange to run operations, use the **/LOGFile** parameter to specify a different log file for each instance used. This function 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 is to be pruned for one command run. By default, log pruning is enabled and done one time 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 graphical user interface 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed before you issue a Tivoli Storage FlashCopy Manager for Exchange command that might prune the log file, do 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 option is the default.

**/MOUNTWait=Yes | No**

Use the **/mountwait** parameter to specify whether waits for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify these options:

- Yes** waits until all initial volumes of any required removable media are made available to the Tivoli Storage Manager server before it completes the command. This option is the default.
- No** ends the command (if removable media are required). An error message is displayed.

**/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 dbname 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 function does not affect the level of information that is written to the activity log.

#### **/RECOVER=APPLYRESToredlogs | APPLYALLlogs**

Use this parameter to specify whether you want to run recovery after you restore an object. If the database is not mountable, 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 you use 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 display in the current active-transaction log are replayed. This option is the default.

##### **APPLYRESToredlogs**

Specify `/recover=applyrestoredlogs` to replay only the restored-transaction log entries. The current active-transaction log entries are not replayed. When you choose this option for a restore, your next backup must be a full or copy backup.

When you restore multiple backup objects, the **/RECOVER** option must 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 logs and patch files are restored. For best performance, this is to 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.

When you do a full or copy restore operation, all log files in the path that is specified by the **/TEMPLOGRESTorepath** parameter are erased. In addition, the value of **/TEMPLOGRESTorepath** must not be the same value as the current location for the database. If the value is the same, the database can become corrupted.

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

## Restorefiles command

Use the **restorefiles** command to restore flat files from a backup into a specified directory.

The following information provides details about this using the **restorefiles** command:

- The **restorefiles** command is only available on the command-line interface.
- This command does not require an Exchange Server to be installed on, or accessible from the system where **restorefiles** is run.
- Files can be restored to an alternative system or to an alternative directory on the same system as the Exchange Server.
- The **restorefiles** operation fails if a previously restored file exists, except for VSS backup files.
- The command continues until it succeeds, or until the destination volume does not contain enough space for the operation.
- When you restore files from an inactive backup or an active incremental backup, use the **/object** parameter to specify the name of the backup object. The object name uniquely identifies the backup instance in Tivoli Storage Manager server storage. A list of backup object names is obtained by issuing the **query tsm \* /all** command.

A VSS **restorefiles** operation overwrites files that exist and have the same name. If a log file from an incremental backup has the same name as the log file from the full backup operation, you can run two consecutive **restorefiles** operations to the same directory:

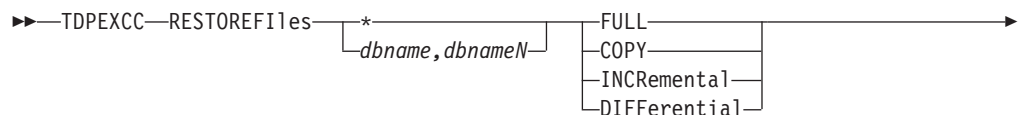
1. Run the following command to restore a full backup:  
`tdpexcc restorefiles DB1 FULL /into=d:\temprestore`
2. Run the following command to restore the log files during the incremental restore:  
`tdpexcc restorefiles DB1 INCR /into=d:\temprestore`

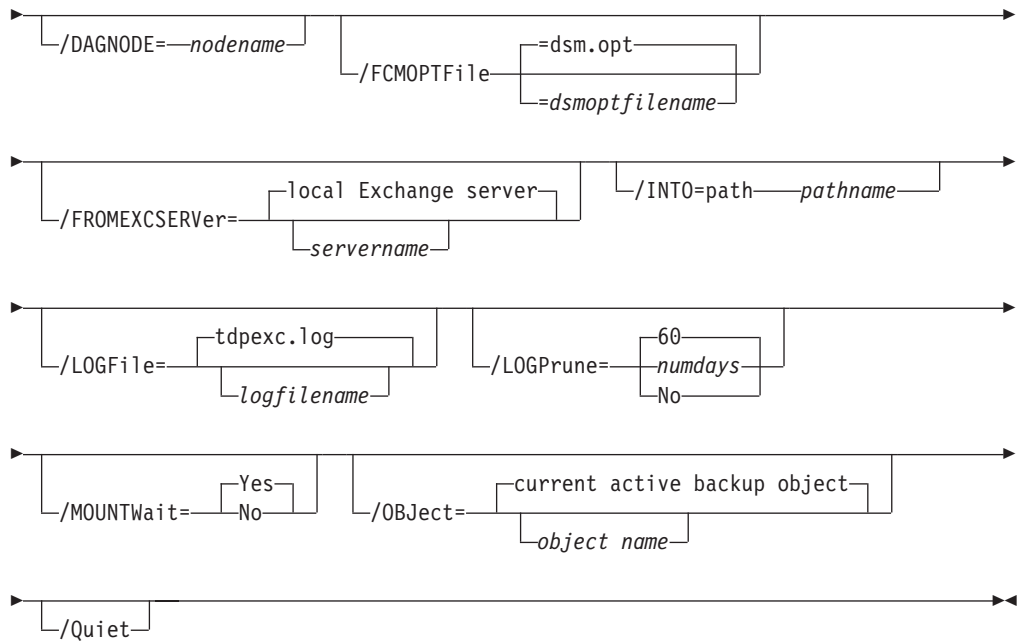
Before you issue the **restorefiles** command, make sure that you have sufficient disk space to hold all of the flat files. For example, if your database and logs are 50 GB in size, you need 50 GB available in the destination directory that is specified by the **/into** parameter. For VSS backups, do not issue a **restorefiles** command to the existing location of the production or active database. Those files are overwritten.

### Restorefiles syntax

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

#### TDPEXCC command





## Restorefiles positional parameters

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

The following positional parameters specify the object to restore:

\* *dbname*

\* Sequentially restore all flat files for the database.

*dbname*

Restore the specified database files. Multiple entries are separated by commas.

The following positional parameters specify the type of backup from which the files are restored:

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

**FULL** Restore the files from a full backup.

**COPY** Restore the files from a copied backup.

**INCRemental**

Restore the files from an incremental backup.

**DIFFerential**

Restore the files from a differential backup.

## Restorefiles optional parameters

The optional parameters for the **restorefiles** command and positional parameters are listed.

### **/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.

The *configfilename* variable can include a full 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"
```

### **/DAGNODE**=*nodename*

Specify the node name that you want to use to back up the databases in an Exchange Server Database Availability Group. With this setting, backups from all Database Availability Group members that are configured to use the DAG node are backed up to a common file space on the Tivoli Storage Manager server. The database copies are managed as a single entity, regardless of which Database Availability Group member they were backed up from. This setting can prevent Data Protection for Exchange from making too many backups of the same database.

### **/FROMEXCServer**=*server-name*

Use the **/fromexcserver** parameter to specify the name of the Exchange Server where the original backup was processed.

The default is the local Exchange Server.

If a DAG node is specified by using the **dagnode** parameter, Tivoli Storage FlashCopy Manager for Exchange uses this node name instead of the Tivoli Storage FlashCopy Manager for Exchange node to back up databases in an Exchange Server Database Availability Group. Therefore, the **delete** command automatically deletes the backups that were created by the other DAG members, without having to specify the **/fromexcserver** parameter.

### **/INTO**=*path*

Use the **/INTO** parameter to specify the root directory where files are to be restored. The **restorefiles** operation creates a subdirectory under the root directory that contains the name of the database. Restored files are placed in that subdirectory. If the **/INTO** parameter is not specified, the files are restored into the directory where the **restorefiles** command is issued.

### **/LOGFile**=*logfile*

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

The *logfile* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory.

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

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

If 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 you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for Exchange to run operations, use the **/LOGFile** parameter to specify a different log file for each instance used. This function 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 to prune the log when the command runs. By default, log pruning is enabled and done one time 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 graphical user interface 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for Exchange command that might prune the log file, do one of the following actions to prevent the log file from being pruned:

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

#### **/MOUNTwait=Yes | No**

Use the **/mountwait** parameter to specify whether waits for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify these options:

**Yes**      waits until all initial volumes of any required removable media are made available to the Tivoli Storage Manager server before it completes the command. This option is the default.

**No**        ends the command (if removable media are required). An error message is displayed.

#### **/OBJECT=object**

Use the **/OBJECT** parameter to specify the name of the backup object files that 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 tsm \* /all** command to view the names of the backup objects.

**/Quiet** This parameter prevents status information from being displayed. The level of information that is written to the activity log is not affected.

**/FCMPTFile=***dsm.opt filename*

Use the *tsmoptfilename* variable to identify the Tivoli Storage FlashCopy Manager for Exchange options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager for Exchange is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire *dsm.opt filename* parameter entry in double quotation marks. For example:

```
/fcmoptfile="c:\Program Files\file.opt"
```

The default is *dsm.opt*.

## 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:

- 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 graphical user interface to restore mailbox-level data or mailbox-item-level data. The graphical user interface also provides the Mailbox Restore Browser, an interactive action panel that lists all available mailbox actions. 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 and the database where the mailbox was at the time of backup.
  - Use the command-line interface for **/tempmailboxalias** optional parameter to specify the temporary mailbox to use when you run mailbox restore operations on mailboxes that were deleted, re-created, or moved since the time of the backup you are restoring from.
  - To open the Tivoli Storage FlashCopy Manager for Exchange Properties form, select **Properties** from the Actions pane. Select the General page, where you can specify the temporary log restore path, the temporary database restore path and the alias of the temporary mailbox.
- 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 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 that are 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 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.

## Prerequisites for Tivoli Storage FlashCopy Manager for Exchange mailbox restore tasks

Before you complete mailbox restore tasks, review the following prerequisites:

- Before you start, ensure that you have sufficient privileges to restore mailboxes.
- 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.

The temporary restore locations must have enough space to restore the entire restored databases and log files.

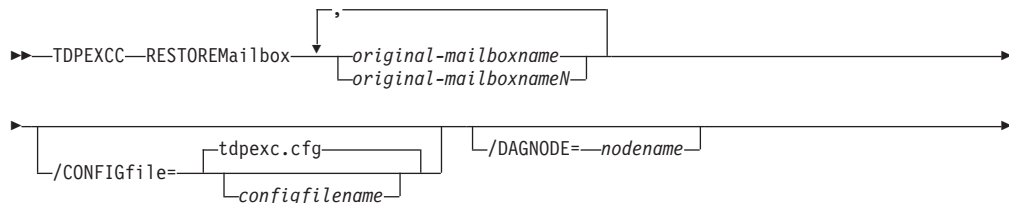
- Ensure that correct version of Microsoft Exchange Server MAPI Client and Collaboration Data Objects is installed on the Exchange server that you use to run the mailbox restore operations. The correct version is identified in the Hardware and Software Requirements technote that is associated with the level of your software. This technote is available in the *Tivoli Storage FlashCopy Manager - All Requirement Documents* website at <http://www.ibm.com/support/docview.wss?uid=swg21427692>. When you are at the website, follow the link to the requirements technote for your specific release or update level.

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.

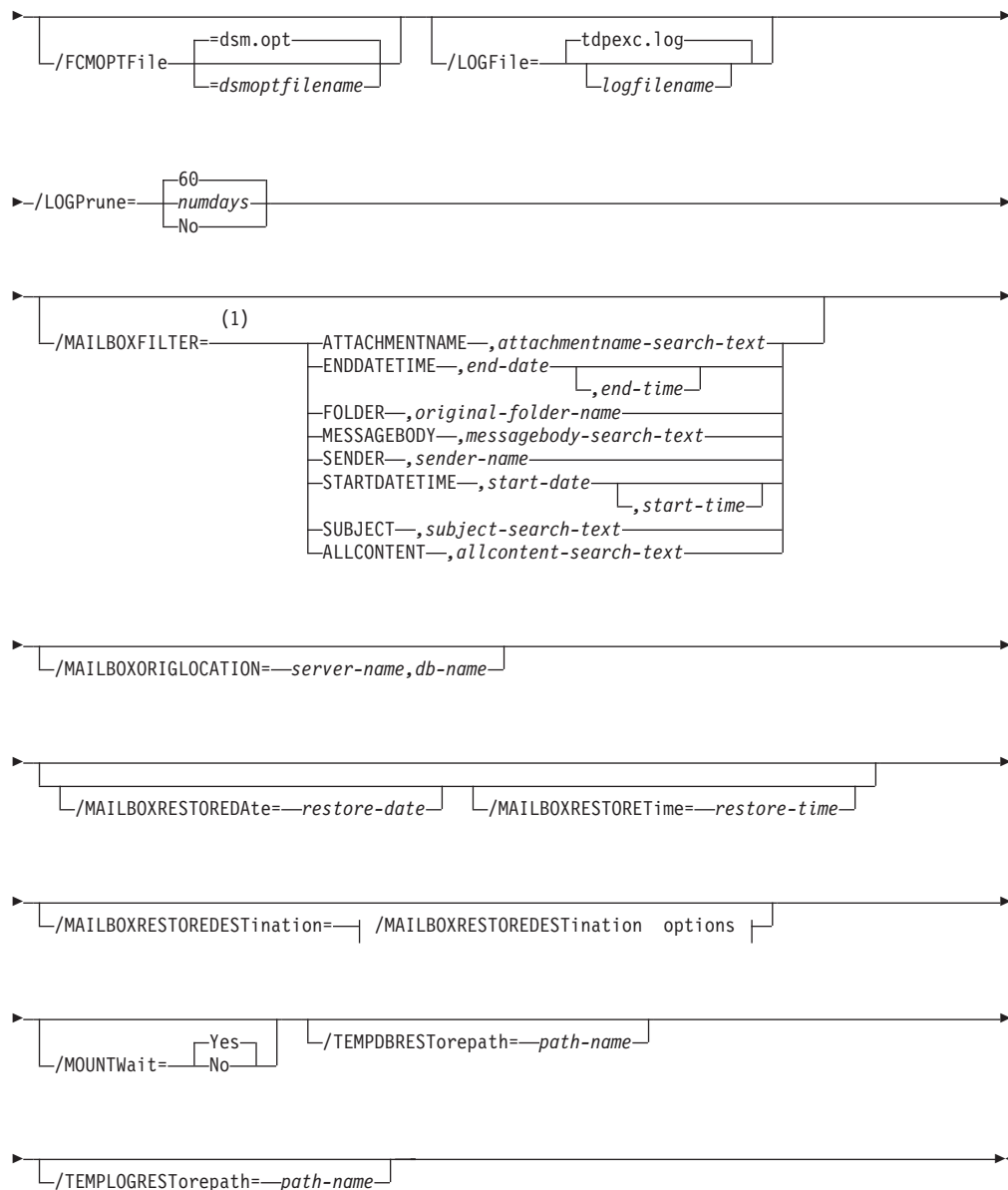
## Restoremailbox syntax

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

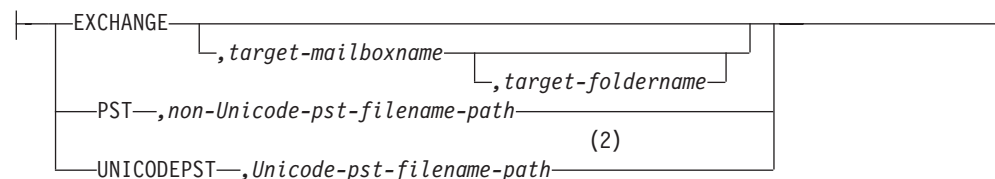
### TDPEXCC command







**/MAILBOXRESTOREDESTination options:**



**Notes:**

- 1 You can specify the **/MAILBOXFILTER** parameter multiple times; however, you must specify each **/MAILBOXFILTER** subparameter only once.
- 2 If you restore personal storage folders (.pst files), there are two options: **Restore Mail to Unicode PST file** and **Restore Mail to non-Unicode PST**

file. Unicode .pst files can store messages in multiple languages, and are not limited to 2 GB of data. For non-Unicode .pst files, the file size must be less than 2 GB.

## 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 are supplied following 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.

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"
```

### **/DAGNODE=***nodename*

Specify the node name that you want to use to back up the databases in an Exchange Server Database Availability Group. With this setting, backups from all Database Availability Group members that are configured to use the DAG node are backed up to a common file space on the Tivoli Storage Manager server. The database copies are managed as a single entity, regardless of which Database Availability Group member they were backed up from. This setting can prevent Data Protection for Exchange from making too many backups of the same database.

### **/FCMOPTFile=***dsmoptfilename*

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

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

### **/LOGFile=logfile**

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

The *logfile* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory.

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

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

If you do not specify the **/LOGFile** parameter, log records are written to the default log file, *tdpexc.log*.

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

When you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for Exchange to run operations, use the **/LOGFile** parameter to specify a different log file for each instance that is used. This function 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 is to be pruned for one command run. By default, log pruning is enabled and done one time 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 graphical user interface 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 - 9999, the log is pruned even if log pruning is already completed for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for Exchange command that might prune the log file, do 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. When restoring to a Unicode .pst file, except for the **FOLDER** and **ALLCONTENT** filters, the filters are ignored.

You can specify multiple filters; however, you must specify each filter only one time. For each filter that you specify, a separate **/MAILBOXFILTER** parameter must be used. For example:

```
tdpexcc.exe restoremailbox dchang /MAILBOXFILTER=STARTDATETIME,07/01/2013
/MAILBOXFILTER=ENDDATETIME,07/31/2013
```

Mailbox data that matches a combination of all filters that are specified is restored. If no filters are specified, by default all data in the mailbox is restored.

Specify one of the following filters when you use 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.

The **ATTACHMENTNAME** filter does not match the attachment names of encrypted mailbox messages. If a mailbox message is encrypted, it is skipped by the **ATTACHMENTNAME** filter.

**ENDDATETIME**,*end-date[,end-time]*

Use `/MAILBOXFILTER=enddatetime, end-date[, end-time]` to restore only the mailbox messages that are 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 that are sent or received on that date is restored.

**FOLDER**,*folder-name*

Use `/MAILBOXFILTER=folder, original-folder-name` to restore only the mailbox messages that are 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.

The **MESSAGEBODY** filter does not match the message body of encrypted mailbox messages. If a mailbox message is encrypted, it is skipped by the **MESSAGEBODY** filter.

**SENDER**,*sender-name*

Use `/MAILBOXFILTER=sender,,sender-name` to restore only the mailbox messages that are 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 are 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 that are sent or received on that date is 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 that is 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 attachment name, message sender, the subject line, or the message body.

Enclose the *allcontent-search-text* variable in double quotation marks.

The ALLCONTENT filter does not match the message body of encrypted mailbox messages. If a mailbox message is encrypted, the ALLCONTENT filter matches only text that is contained within the message sender or the subject line.

**/MAILBOXORIGLOCATION**=*server-name*,*db-name*

Use the `/MAILBOXORIGLOCATION` parameter to specify the Exchange Server and the database where the mailbox is 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 is at the time of backup.

*db-name*

The name of the database where the mailbox is at the time of backup.

The **/MAILBOXORIGLOCATION** parameter is only necessary if the mailbox to be restored from is moved or deleted since the time of the backup, and no mailbox location history is available.

A **restoremailbox** operation from a backup that is selected with Tivoli Storage FlashCopy Manager for Exchange before version 6.1 fails if the **/MAILBOXORIGLOCATION** parameter is not specified for mailboxes that meet one or both of the following conditions:

- The mailbox to be restored is moved. (The mailbox is not in the same server and the same database where the mailbox is at the time of backup).
- The mailbox to be restored is deleted and the restore destination is to an alternate mailbox or to a .pst file.

For example:

```
TDPEXCC RESTOREMAILBOX annjones /MAILBOXORIGLOCATION=serv1,mbdb1
/MAILBOXRESTOREDate=12/31/2013
/MAILBOXRESTOREDESTINATION=PST,c:\team99\rcvr.pst

TDPEXCC RESTOREMAILBOX annjones
/MAILBOXORIGLOCATION=serv1,mbdb1
/MAILBOXRESTOREDate=12/31/2013
/MAILBOXRESTOREDESTINATION=PST,c:\team99\rcvr.pst
```

**/MAILBOXRESTOREDate=restore-date**

Use the **/MAILBOXRESTOREDate** parameter with or without the **/mailboxrestorettime** parameter to establish a date and time to restore mailbox data from. A mailbox is restored from the earliest backup that is selected after the date and time that is established by the **/MAILBOXRESTOREDate** and the **/mailboxrestorettime** 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 are established. By default the mailbox is 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 that is selected 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.

- If you specify both *restore-date* or *restore-time*, this action 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 action 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 setting 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 that is selected after the date and time that is 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 are 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 that is selected 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.

- If you specify both *restore-date* and *restore-time*, this function 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 function establishes the *restore-date* at the specified date.
- If you specify *restore-time* without *restore-date*, the *restore-date* variable defaults to the current date. This function establishes the restoration date and time as the current date at the specified *restore-time*.

### **/MAILBOXRESTOREDESTination=EXCHANGE | PST | UNICODEPST**

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 you restore 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 exists in the mailbox destination, that item is not restored.

You must specify one of the following values when you use 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 you restore 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* is 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 did not specify the **/mailboxfilter** parameter, the target folder that you specified contains, within the subfolder that is designated by the original mailbox alias, all the folders that are in the mailbox that you are restoring from. If you specify 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:

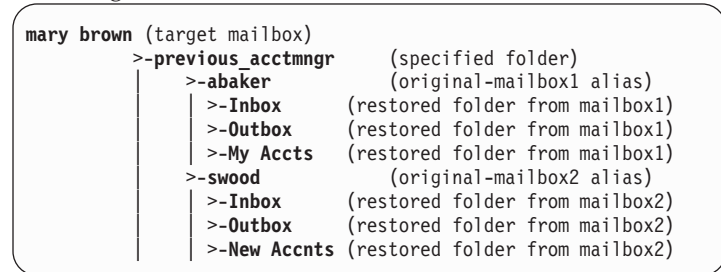
```
/MAILBOXRESTOREDESTination=EXCHANGE,Kerry,"temp folder"
```

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

For example, this **restoremailbox** operation restores mailboxes *andrew baker* and *sally wood* to the folder *previous\_acctmng*r in the target mailbox *mary brown*:

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

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



### PST,*non-Unicode-pst-filename-path*

Use `/mailboxrestoredestination=PST,non-Unicode-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 *non-Unicode-pst-filename-path* variable to specify the destination where the **restoremailbox** operation writes the .pst file. The *non-Unicode-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 *non-Unicode-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
```

**Important:** The .pst directory must exist before you use the **restoremailbox** command. The .pst file is 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 is restored to the one .pst file specified. Inside the .pst file, the top-level folder name is the mailbox-alias-name, with the rest of the mailbox folders below it.

- You can specify *non-Unicode-pst-filename-path* as a directory path to have Tivoli Storage FlashCopy Manager for Exchange create a .pst file by using the mailbox-alias-name of the mailbox that is 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\
```

The .pst directory must exist before you use the **restoremailbox** command. If the .pst file does not exist, the file is created.

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
```

The .pst directory must exist before you use the **restoremailbox** command. The mailbox data that is restored by using `/mailboxrestoredestination=PST,non-Unicode-pst-filename-path` must be less than 2 GB.

If the *non-Unicode-pst-filename-path* variable includes spaces, enclose the entire *non-Unicode-pst-filename-path* variable entry in double quotation marks. For example:

```
TDPEXCC RESTOREMAILBOX "george clark"
/mailboxrestoredestination=PST,"c:\mb\dept54\access group\"
```

#### **UNICODEPST**,*Unicode-pst-filename-path*

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

You can include the *Unicode-pst-filename-path* variable to specify the destination where the **restoremailbox** operation writes the .pst file. The *Unicode-pst-filename-path* can be either a fully qualified UNC 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. If you specify a non-UNC path (such as c:\dir\mailbox.pst), Tivoli Storage FlashCopy Manager for Exchange tries to convert it to a UNC path for you, but it may not work for custom UNC paths or shares.

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

```
TDPEXCC RESTOREMAILBOX gclark
/mailboxrestoredestination=UNICODEPST,c:\mb\dept54\vp0.pst
```

**Important:** The .pst directory must exist before you use the **restoremailbox** command. The .pst file is 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 is restored to the one .pst file specified. Inside the .pst file, the top-level folder name is the mailbox-alias-name, with the rest of the mailbox folders below it.

- You can specify *Unicode-pst-filename-path* as a directory path to have Tivoli Storage FlashCopy Manager for Exchange create a .pst file by using the mailbox-alias-name of the mailbox that is 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\
```

The .pst directory must exist before you use the **restoremailbox** command. If the .pst file does not exist, the file is created.

If you restore multiple mailboxes with the same **restoremailbox** command, and you specify a directory path, each mailbox is restored into a separate .pst file. For example, if mailboxes John (john1), John Oblong (oblong), and Barney Olaf (barneyo) are restored and the specified directory path is c:\finance, all mailboxes are restored into the c:\finance directory as shown:

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

If the *Unicode-pst-filename-path* variable includes spaces, enclose the entire *Unicode-pst-filename-path* variable entry in double quotation marks. For example:

```
TDPEXCC RESTOREMAILBOX "george clark"
/mailboxrestoredestination=UNICODEPST,"c:\mb\dept54\access group\"
```

#### **/MOUNTwait=Yes | No**

Use the **/mountwait** parameter to specify whether waits for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify these options:

- Yes** waits until all initial volumes of any required removable media are made available to the Tivoli Storage Manager server before it completes the command. This option is the default.
- No** ends the command (if removable media are required). An error message is displayed.

#### **/TEMPDBRESTorepath=path-name**

Use the **/TEMPDBRESTorepath** parameter to specify the default temporary path to use when you restore 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"
```

- 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 database.

For better performance, the current active-transaction logger is to be on a different physical device from the paths that are specified by the values of the **/TEMPDBRESTorepath** parameter and the **/TEMPDBRESTorepath** parameter. The paths that are specified by the values of the **/TEMPDBRESTorepath** parameter and the **/TEMPDBRESTorepath** parameter can be on the same or separate physical devices from each other.

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 you restore 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.

- Do not specify a value of ***/TEMPLOGRESTorepath*** that is the same value as the current location for the database that is used for recovery. If the value is the same, the database might become corrupted.
- Choose a temporary log-restore location that has enough space to hold all the log and patch files.

For better performance, the current active-transaction logger is to be on a different physical device from the paths that are specified by the values of the ***/TEMPLOGRESTorepath*** parameter and the ***/TEMPLOGRESTorepath*** parameter. The paths that are specified by the values of the ***/TEMPLOGRESTorepath*** parameter and the ***/TEMPLOGRESTorepath*** parameter can be on the same or separate physical devices from each other.

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

***/TEMPMAILBOXA1ias=*tempmailbox-alias**

Use the ***/TEMPMAILBOXA1ias*** parameter to specify the mailbox-alias of a temporary mailbox to use. A temporary mailbox is used when you run mailbox restore operations on mailboxes that were deleted or recreated since the time of the backup you are restoring from. A temporary mailbox is used by the 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 ***/TEMPMAILBOXA1ias*** parameter, the default value is the value that is specified by the ***/TEMPMAILBOXA1ias*** option in the Tivoli Storage FlashCopy Manager configuration file. The default Tivoli Storage FlashCopy Manager for Exchange configuration file is `tdpexc.cfg`. If the ***/TEMPMAILBOXA1ias*** 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 you use this parameter:

*tempmailbox-alias*

Specify the mailbox-alias of the temporary mailbox to use for recovery of mailboxes that were deleted or recreated 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.

## Set command

Use the **set** command to set the Tivoli Storage FlashCopy Manager for Exchange configuration parameters in a configuration file.

The values that you set are saved in a Tivoli Storage FlashCopy Manager for Exchange configuration file. The default file is *tdpexc.cfg*. Configuration values can also be set in the Data Protection Properties window in the Management Console.

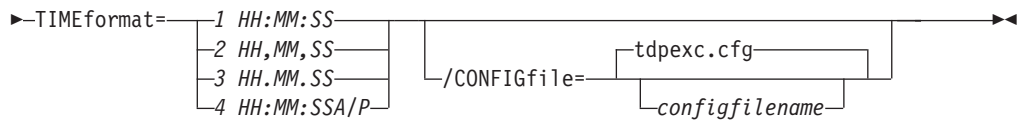
For command invocations other than this command, the value of a configuration parameter that is specified in a command overrides the value of the configuration parameter that is specified in the Tivoli Storage FlashCopy Manager for Exchange configuration file. If, when you use this command, you do not override a value for the configuration file parameter, the values in the default configuration file are used.

### Set syntax

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

#### TDPEXCC command





## 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:

### BACKUPDESTination=TSM | LOCAL | BOTH

Use the **BACKUPDESTination** positional parameter to specify the storage location for your backup. You can specify:

- TSM** The backup is stored on Tivoli Storage Manager server storage only. This option is the default.
- LOCAL** The backup is stored on local shadow volumes only.
- BOTH** The backup is stored on both Tivoli Storage Manager server storage and local shadow volumes.

### CLIENTAccessserver=servername

The *servername* variable refers to the name of the server you use to access the client.

### 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 (Default) 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 Data Protection for Exchange log file (*tdpexc.log* by default). You can avoid losing existing log file data by doing one of the following choices:

- After you change the value of the **DATEformat** parameter, make a copy of the existing log file before you run Data Protection for Exchange.
- Specify a new log file with the **LOGFile** parameter.

### LANGuage=language

Specify the three-character code of the language you want to use to display messages:



|            |                            |
|------------|----------------------------|
| <b>CHS</b> | Simplified Chinese         |
| <b>CHT</b> | Traditional Chinese        |
| <b>DEU</b> | Standard German            |
| <b>ENU</b> | (Default) American English |
| <b>ESP</b> | Standard Spanish           |
| <b>FRA</b> | Standard French            |
| <b>ITA</b> | Standard Italian           |
| <b>JPN</b> | Japanese                   |
| <b>KOR</b> | Korean                     |
| <b>PTB</b> | Brazilian Portuguese       |

**LOCALDSMAgentnode=*nodename***

Specify the node name of the local system that runs the VSS backups. This positional parameter must be specified for VSS operations to run.

**LOGFile=*logfile***

Use the **LOGFile** positional parameter to specify the name of the activity log file that is generated by Data Protection for Exchange. The Data Protection for Exchange activity log records significant events, such as completed commands and error messages.

The *logfile* variable identifies the name of the activity log file. If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is assigned to the Data Protection for Exchange installation directory.

**LOGPrune=*numdays* | No**

Use the **LOGPrune** positional parameter to disable log pruning or to set log pruning parameters. By default, log pruning is enabled and done one time per day. The *numdays* variable represents the number of days to save log entries. You can specify a value of No or 0 - 9999. By default, 60 days of log entries are saved in the pruning process.

**MOUNTWait=*Yes* | No**

Use the **MOUNTWait** positional parameter to specify whether Data Protection for Exchange waits for removable media to mount (such as tapes or DVDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

Specify *Yes* for Data Protection for Exchange to wait until all initial volumes of any required removable media are made available to the Tivoli Storage Manager server before you complete the command.

Specify *No* for Data Protection for Exchange to end the command (if removable media are required). An error message is displayed.

**NUMBERformat=*fntnum***

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

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

- 1 (Default) *n,nnn.dd*
- 2 *n,nnn,dd*
- 3 *n nnn,dd*
- 4 *n nnn.dd*
- 5 *n.nnn,dd*
- 6 *n'nnn,dd*

**STOREMAILBOXInfo=Yes | No**

The **STOREMAILBOXInfo** parameter is used to track mailbox history for moved and deleted mailboxes. By default, this parameter is set to Yes. If you do not plan to use mailbox restore, you can set this option to No. When the option is set to No, Data Protection for Exchange does not back up the mailbox history.

In large or geographically dispersed domains, more time is required to complete the backup mailbox history task. In this scenario, you can reduce the amount of time that is required to complete the backup mailbox history task by setting the option for **STOREMAILBOXInfo** to No. When you set the option for **STOREMAILBOXInfo** to No, mailboxes that are not moved or are not deleted can be restored normally. Moved and deleted mailbox restores can use the **MAILBOXORIGLOCATION** parameter (of the **restoremailbox** command) to specify the mailbox location at the time of the backup.

**TEMPDBRESTorepath=pathname**

For mailbox restore operations, use the **TEMPDBRESTorepath** positional parameter to specify the default temporary path to use when you restore 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"
```

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

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

**TIMEformat=formatnumber**

Use the **TIMEformat** positional parameter to specify the format in which you want system time that is 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 (Default) *HH:MM:SS*

- 2 *HH,MM,SS*
- 3 *HH.MM.SS*
- 4 *HH:MM:SSA/P*

### Set optional parameters

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

**/CONFIGfile=***configfilename*

Use the **/CONFIGfile** parameter to specify the name of the Data Protection for Exchange configuration file in which these values are set.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange installation directory is used. If the **/CONFIGfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is *tdpexc.cfg*.

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

**/CONFIGfile="c:\Program Files\file.cfg"**

### Set example

The **tdpexc set localdsmagentnode=mean** command sets the node *mean* as the node name of the local system that processes the backups.

Specify the node name of the local system that processes the VSS backups. When the command completes, the following message is displayed:

FMX5054I The preference has been set successfully.

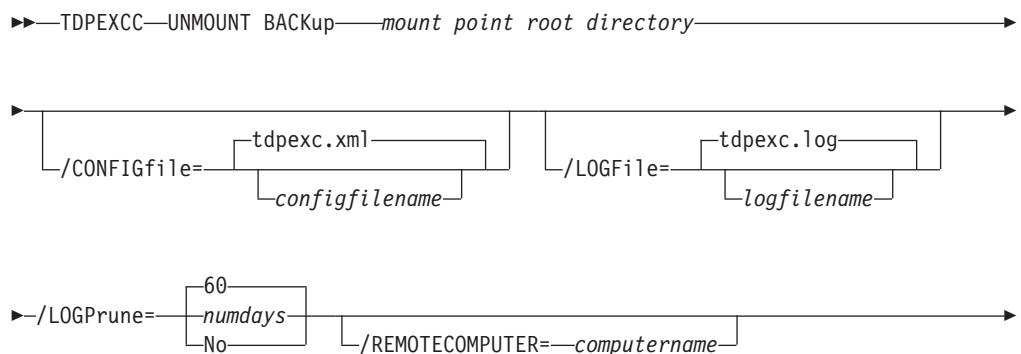
## Unmount backup command

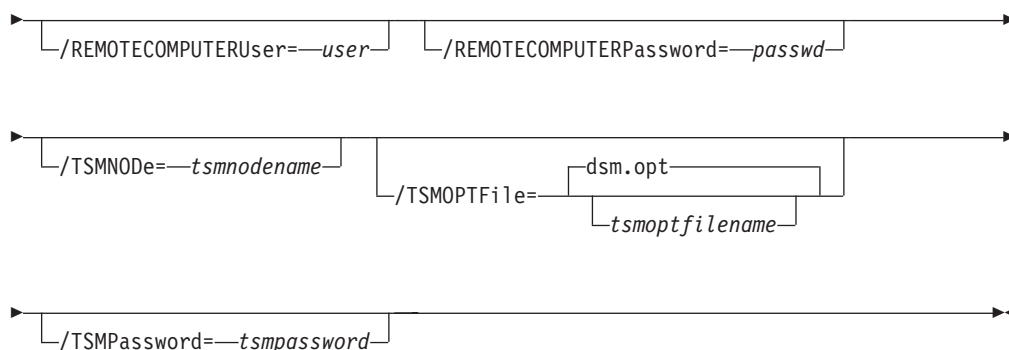
Use the **unmount backup** command to unmount backups that were previously mounted, and are managed by Tivoli Storage FlashCopy Manager for Exchange.

### Unmount backup syntax

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

#### TDPEXCC command





## Unmount backup positional parameter

The positional parameter immediately follows the **unmount backup** command and precedes the optional parameters.

### *mount points root directory*

Absolute path to the directory where the snapshots are displayed as mount point directories.

## Unmount backup optional parameters

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

### **/CONFIGfile=***configfilename*

Use the **/CONFIGfile** parameter to specify the name (*configfilename*) of the configuration file that contains the values to use for an **unmount backup** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the 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\tdpexc.cfg"
```

### **/LOGFile=***logfile*

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

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for Exchange installation directory.

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

```
/LOGFile="c:\Program Files\tdpexc.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.

**/LOGPrune=numdays | No**

Use the **/LOGPrune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning is enabled and done one time 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 graphical user interface or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for Exchange command that might prune the log file, do 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.

**/REMOTECOMPUTER=computername**

Enter the computer name or IP address of the remote system where the backup was created.

**/REMOTECOMPUTERUser=user**

Enter the user name that is used to log on to the server specified with the **REMOTECOMPUTER** parameter. If a domain is required to log on with the domain account, enter *Domain\User*. To log on to the local account, the domain is not required. There is no default value.

**/REMOTECOMPUTERPassword=password**

Enter the password for the user name that is specified with the **REMOTECOMPUTERUser** parameter. There is no default value.

**/TSMNODE=tsmnodename**

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMOPTFile=tsmoptfilename**

Use the *tsmoptfilename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is *dsm.opt*.

**/TSMPassword=tsmpassword**

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager

password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (`dsm.opt`), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS PROMPT** is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

### Unmount backup example

This output example provides a sample of the text, messages, and process status that displays when you use the **unmount backup** command.

For a local backup, enter the following command:

```
tdpexcc unmount backup C:\mount-points-root-dir
```

For a remote backup, enter the following command:

```
tdpexcc unmount backup C:\mount-points-root-dir /remotecomputer=computer-name
/remotecomputeruser=userID /remotecomputerpassword=user password
```

---

## Command-line reference: Tivoli Storage FlashCopy Manager for SQL

The name of the Tivoli Storage FlashCopy Manager for SQL 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`).

### Starting the Tivoli Storage FlashCopy Manager command-line interface

Perform the following steps to start the Tivoli Storage FlashCopy Manager command-line interface:

1. Start the Management Console (MMC) GUI.
2. In the tree view, select the computer node where you want to run the commands.
3. Expand the **Protect and Recover Data** node.
4. Select an SQL Server node.
5. Select the **Automate** tab on the center display. An integrated command line is available in the bottom of the task window for inputting commands. You can also use this interface to enter PowerShell cmdlets. The top section of the window displays the output.

## 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 can place multiple optional parameters per command invocation in any order after positional parameters.
- You can abbreviate keywords. Minimum abbreviations are indicated in uppercase 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 might 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 quotation marks.
- You can use positional and optional parameters one time per command invocation unless otherwise specified.

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

### TDPSQLC command



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, see “Reading syntax diagrams” on page x.

## Backup command

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

You can enter the \* character to back up all databases. You can specify more than one database for multiple database and transaction log backups.

When you use the **backup** command, remember the following facts:

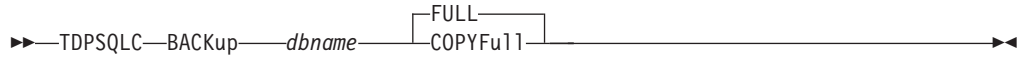
- You cannot back up or restore the `tempdb` database because this database is created by the SQL server each time the server is started.
- The user ID that is used by Tivoli Storage FlashCopy Manager to log on to the SQL server must have the SQL Server `SYSADMIN` fixed server role.
- You can use the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



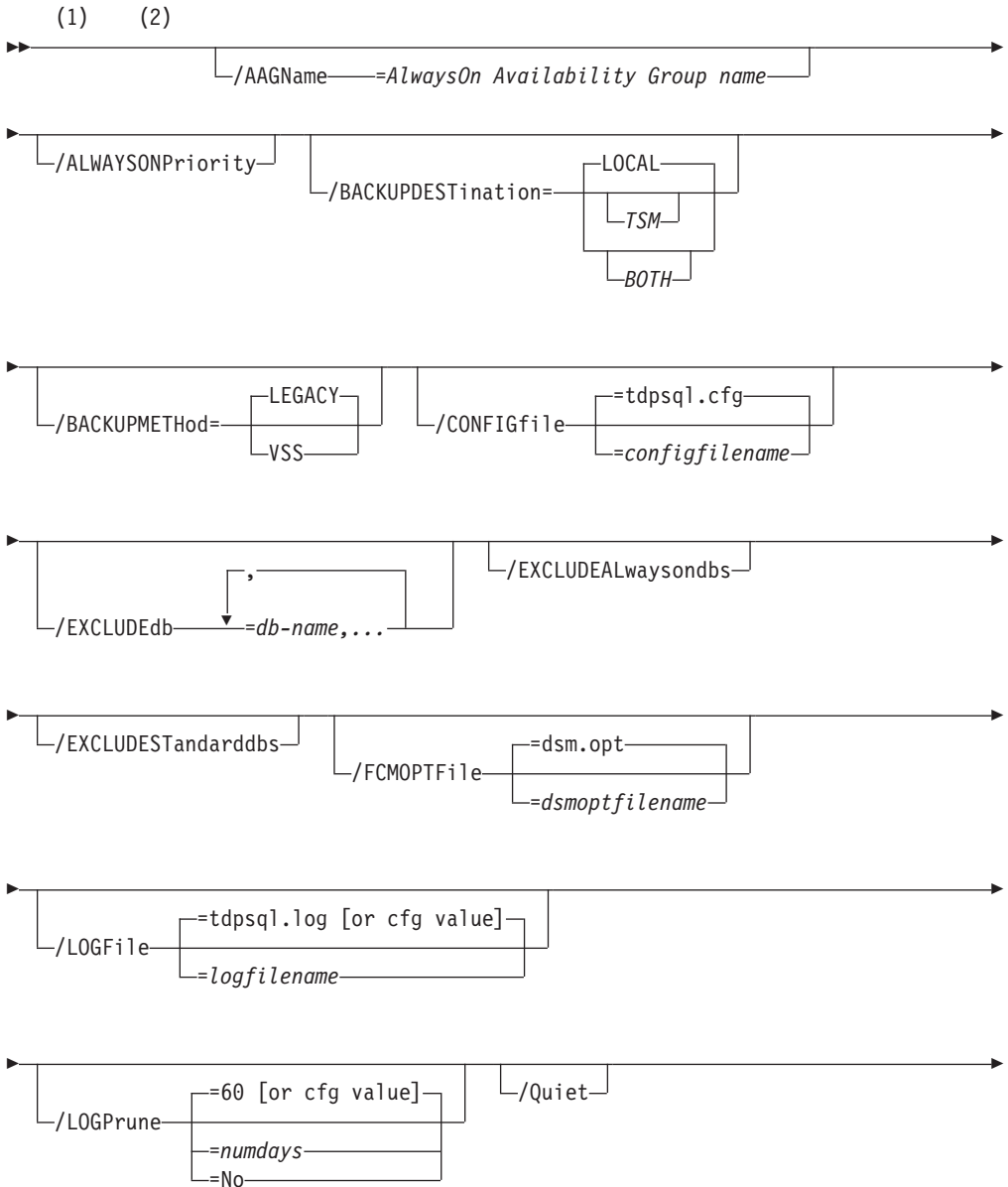
## Backup syntax

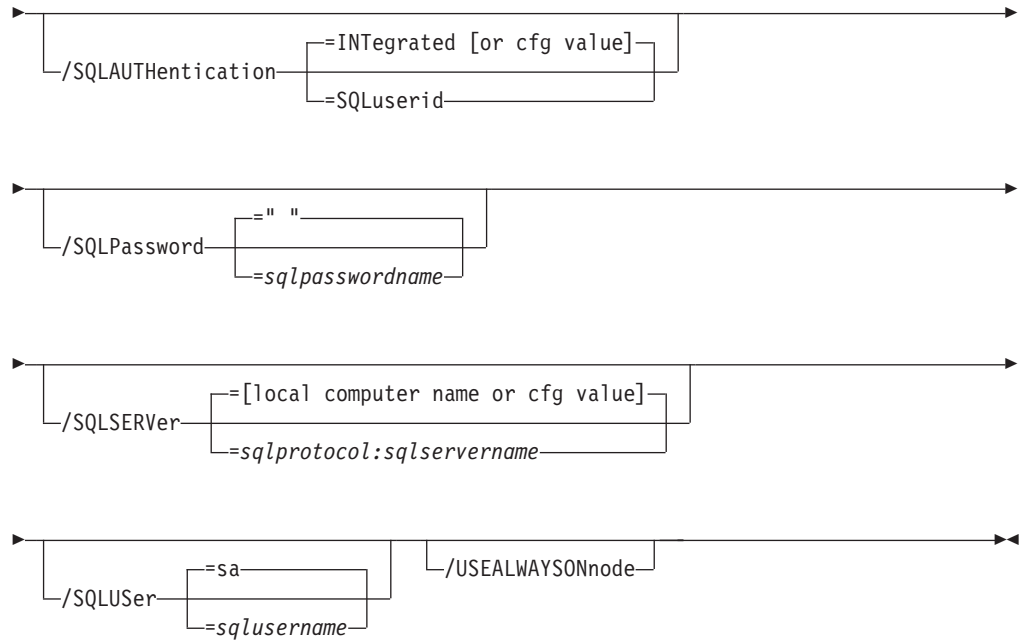
Use the **backup** command syntax diagrams as a reference to view available options and truncation requirements.

### TDPSQLC command



### Backup optional parameters





#### Notes:

- 1 For the optional parameters, the **/BACKUPMETHod=** is only valid when using the **full** or **copyfull** positional parameters. The **full** and **copyfull** backups can be performed using VSS or legacy operations. The **/BACKUPMETHod=** parameter is used to choose between the options. The **log**, **diff**, **file**, and **group** backups can be performed only when using legacy operations. The **/BACKUPMETHod=** parameter is not supported in with these types of backups because only legacy backups are viable.
- 2 The **/BACKUPDESTination** parameter is valid only when using the **full** or **copyfull** positional parameters. The **full** and **copyfull** backups can be saved to local storage, TSM server storage, or both. The **/BACKUPDESTination** parameter is used to choose among the options.

### 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 you specify the wildcard character (\*) as Microsoft warns not to back up more than a few dozen databases in a single command because of SQL Server limitations.

*dbname*

Back up the specified database. Multiple entries are separated by commas. If separated by commas, ensure that 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 run:

**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, and FILESTREAM files (SQL Server 2008 and SQL Server 2008 R2).

#### **COPYFull**

A copy-only full backup contains a copy-only version of a full backup. These backups are considered out of the regular sequence of conventional SQL server backups. The backups do not affect the transaction logs or any sequence of backups, such as differential backups or full backups. Use this option to create copy-only full backups periodically for long-term retention without affecting existing backup schedules or retention policies for disaster recovery.

### **Backup optional parameters**

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

**/AAGName=AlwaysOn Availability Group name**

When you back up a database list or all databases with the wildcard character, \*, and specify the **/AAGName** parameter, only databases from the availability group that you specify are backed up.

**/ALWAYSONPriority**

Use this parameter to specify that a local availability database is backed up only if it has the highest backup priority among the availability replicas that are working properly on SQL Server 2012. You can use this parameter at the command-line interface or as part of a scheduled backup.

**/BACKUPDESTination= LOCAL | TSM | BOTH**

Use the **/BACKUPDESTination** parameter to specify the location where the backup is stored.

You can specify:

**TSM** The backup is stored on Tivoli Storage Manager server storage only. This is the default.

**LOCAL**

The backup is stored on local shadow volumes only. This is only valid when the **/BACKUPMETHod** parameter specifies VSS.

**BOTH** The backup is stored on Tivoli Storage Manager server storage and local shadow volumes. This is only valid when the **/BACKUPMETHod** parameter specifies VSS.

The **/BACKUPDESTination** parameter is valid only when using the **full** or **copyfull** positional parameters. The **full** and **copyfull** backups can be saved to TSM server storage, local storage, or both. The **/BACKUPDESTination** parameter is used to choose among options. The **log**, **diff**, **file**, and **group** backups can be stored only to TSM server storage. In this scenario, the **/BACKUPDESTination** parameter is not supported because TSM is the only viable option.

**/BACKUPMETHod=LEGACY | VSS**

Use the **/BACKUPMETHod** parameter to specify the manner in which the backup is performed.

You can specify:

**LEGACY**

The backup is performed with the legacy API. This is the SQL

streaming backup and restore API as used in previous versions of Tivoli Storage FlashCopy Manager for SQL. This option is the default value.

**VSS** The backup is performed with VSS.

The **/BACKUPMETHOD** parameter is valid only when using the **full** or **copyfull** positional parameters. The **full** and **copyfull** backups can be performed using VSS or legacy operations. The **/BACKUPMETHOD** parameter is used to choose between the options. The **log**, **diff**, **file**, and **group** backups can only be performed using legacy operations. In this scenario, the **/BACKUPMETHOD** parameter is not supported because legacy is the only viable option.

#### **/CONFIGfile=***configfilename*

The **/CONFIGfile** parameter specifies the name of the Tivoli Storage FlashCopy Manager configuration file. The configuration file contains the values for the Tivoli Storage FlashCopy Manager configurable options. When you use this parameter, review the following information:

- *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 the space character in double quotation marks.
- If you do not specify **/CONFIGfile**, the default value is `tdpsql.cfg`.

#### **/EXCLUDEdb=***dblist*

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

#### **/EXCLUDEAlwaysondbs**

Use this parameter to exclude all AlwaysOn Availability Databases from the backup operation. If you want to exclude specific databases, use the **/EXCLUDEdb** parameter.

#### **/EXCLUDEStandarddbs**

Use this parameter to exclude all standard databases from the backup operation. If you want to exclude specific databases, use the **/EXCLUDEdb** parameter.

#### **/FCMPTFile=***dsmoptfilename*

The **/FCMPTFile** 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 **/FCMPTFile**, the default value is *dsm.opt*.
- If you specify **/FCMPTFile** but not *dsmoptfilename*, the default is also *dsm.opt*.

#### **/LOGFile=***logfile*

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

Tivoli Storage FlashCopy Manager activity log is distinct from the SQL Server error log. The *logfile* variable identifies the name to be used for the activity log generated by Tivoli Storage FlashCopy Manager.

Considerations:

- If the specified file does not exist, it is created. If it does exist, new log entries are appended to the file.
- The file name can include a fully qualified path; however, if you specify no path, the file is written to the directory where Tivoli Storage FlashCopy Manager is installed.
- You cannot turn Tivoli Storage FlashCopy Manager logging activity off. If you do not specify **/LOGFile**, log records are written to the default log file. The default log file is *tdpsql.log*.
- When you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager to run operations, use the **/LOGFile** parameter to specify a different log file for each instance used. This function 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 done once each day Tivoli Storage FlashCopy Manager is activated. However, this option disables log pruning or explicitly request a prune of the log for one command operation even if the log file is already 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 0 - 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 that is 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 might prune the log file and the value of the **timeformat** or **dateformat** parameter is changed, do 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 function does not affect the level of information that is written to the activity log.

#### **/SQLAUTHentication=INTEgrated | SQLuserid**

This parameter specifies the authorization mode that is used when you log 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 use to log on to the SQL server. This option 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 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 that is specified by the SQL server configurable option in the Tivoli Storage FlashCopy Manager configuration file. This option 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 shortcuts are a period and the word `local` within parentheses.
- You must specify the name if the SQL server is not the default instance or is a member of a failover cluster.
- The format of `sqlservername` depends on what type of instance it is and whether it is clustered or not:

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

| Format                                     | Instance? | Clustered? | Name required? |
|--------------------------------------------|-----------|------------|----------------|
| <i>virtualservername\<br/>instancename</i> | named     | yes        | yes            |

*localcomputername*

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

*instancename*

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

*virtualservername*

The name that is given to the clustered SQL Server specified during clustering service setup. This name 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.

**/USEALWAYSOnnode**

Specify this parameter to back up standard databases on SQL Server 2012 by using the AlwaysOn node. By setting this parameter, you can back up all availability databases and standard databases under a single node to help you to manage your database backups more easily. By default, SQL Server 2012 availability databases are backed up to the AlwaysOn node.

## Backup examples

The following examples are provided to show how the **backup** command can be entered with various parameters and options.

If you want to use the **backup** command from the command-line interface, the following examples are provided to help model the command syntax:

- To complete a full backup of a database, enter the following command:  
tdpsqlc backup
- To complete a full backup of all standard databases, enter the following command:  
tdpsqlc backup \* full /EXCLUDEAlwaysondb
- To complete a log backup of all availability databases, enter the following command:  
tdpsqlc backup \* log /EXCLUDEStandarddbs



- For a more complex example, consider the following scenario: There are three AlwaysOn Availability Groups. The first availability group is called *AG01* with the following databases:

- AlwaysOn Availability Database called *AlwaysOnLegacyDB1*
- AlwaysOn Availability Database called *AlwaysOnLegacyDB3*

The second availability group is called *AG03* with the following AlwaysOn Availability Database: *AlwaysOnLegacyDB2*. The third availability group is called *AG04* with the following databases:

- AlwaysOn Availability Database called *AlwaysOnLegacyDB5*
- AlwaysOn Availability Database called *AlwaysOnLegacyDB6*
- Standard database called *SQL\_DB1*
- Standard database called *SQL\_DB2*

To complete a full backup with a database list that matches both standard and availability databases, but excluding standard databases, enter the following command:

```
C:\Program Files\tivoli\tsm\TDPSql>tdpsqlc backup AlwaysOnLegacy*,SQL*
full /backupdest=TSM /backupmeth=legacy /EXCLUDEStandarddbs
```

- When you use the **/AAGName** parameter to filter the databases that are backed up, refer to the following scenario with the examples: There are two AlwaysOn Availability Groups. The first availability group is called *AG01* with the following databases:

- AlwaysOn Availability Database called *AlwaysOnLegacyDB1*
- AlwaysOn Availability Database called *AlwaysOnLegacyDB3*

The second availability group is called *AG04* with the following databases: with databases:

- AlwaysOn Availability Database called *AlwaysOnLegacyDB5*
- AlwaysOn Availability Database called *AlwaysOnLegacyDB6*

When you enter a **backup** command for all databases, but use the **/AAGName** parameter to include only databases from *AG01* in the backup, enter the following command:

```
C:\Program Files\tivoli\tsm\TDPSql>tdpsqlc backup * full /backupdest=TSM
/backupmeth=legacy /AAGName=AG01
```

When you enter a **backup** command for a database list with wildcards, but use the **/AAGName** parameter to include only databases from *AG04* in the backup, enter the following command:

```
C:\Program Files\tivoli\tsm\TDPSql>tdpsqlc backup AlwaysOn*,SQL* full
/backupdest=TSM /backupmeth=legacy /AAGName=AG04
```

When you enter a **backup** command for a database list with wildcards, but do not match all databases from the specified AlwaysOn Availability Group, enter the following command:

```
C:\Program Files\tivoli\tsm\TDPSql>tdpsqlc back *DB5 full /backupdest=TSM
/backupmeth=legacy /AAGName=AG04
```

- To complete a differential backup with a database list that matches both standard and availability databases, but excluding availability databases, enter the following command:

```
C:\Program Files\tivoli\tsm\TDPSql>tdpsqlc backup AlwaysOnLegacy*,SQL*
diff /EXCLUDEAlwaysondbs
```

## Delete backup command

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

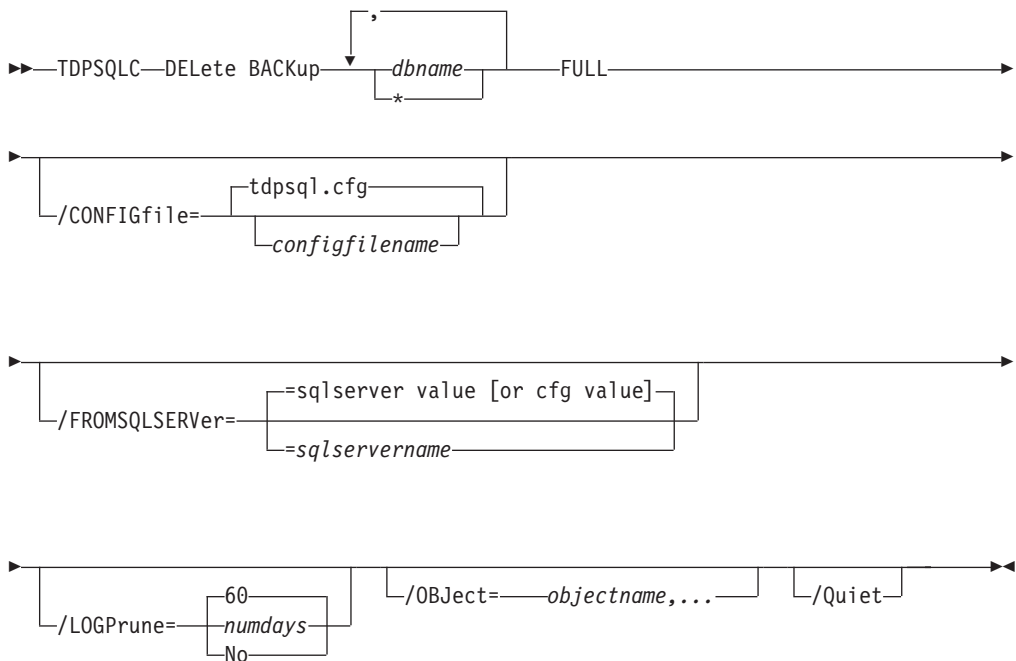
You must have local registry rights (for all versions of SQL Server) to run a Tivoli Storage FlashCopy Manager for SQL delete backup.

If you delete multiple LOCAL snapshots that are stored on SAN Volume Controller or Storwize V7000 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.

### Delete Backup syntax

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

### TDPSQLC command



### 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 that 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 run:

**FULL** Delete full type backups.

**COPY** Delete copy 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 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 202 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 done. 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 that is 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=***logfile*

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

The *logfile* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for SQL installation directory.

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

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

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

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

When you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for SQL to run operations, use the **/logfile** parameter to specify a different log file for each instance used. This function 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 is to be pruned for one command run. By default, log pruning is enabled and done one time 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for SQL command that might prune the log file, do 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 `fcv * /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 is to 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.

#### **/QUERYNode=DP | ALWAYSON**

Specify whether you want to query standard databases from SQL Server 2012 that were backed up from a standard Data Protection for SQL node or the AlwaysOn node. This parameter is ignored for availability databases because the availability databases are always backed up under the AlwaysOn node.

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

## Delete backup example

This output example provides a sample of the text, messages, and process status that displays when you use 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 : 02/10/2013 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

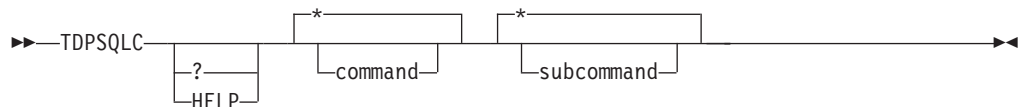
Use the **tdpsqlc help** command to display help for Tivoli Storage FlashCopy Manager for SQL commands.

This command lists one or more commands and their parameters. When you use a non-English language, you might be required to set the width of your screen display to a value greater than 80 characters. The wider setting displays 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.

### TDPSQLC command



### 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 by using a textual notation.

**Help** uses the following notation:

[*a*]     *a* is optional; *a* might 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* might occur zero or more times

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

### UPPERCASE

Minimum abbreviation (which you can also enter in lowercase)

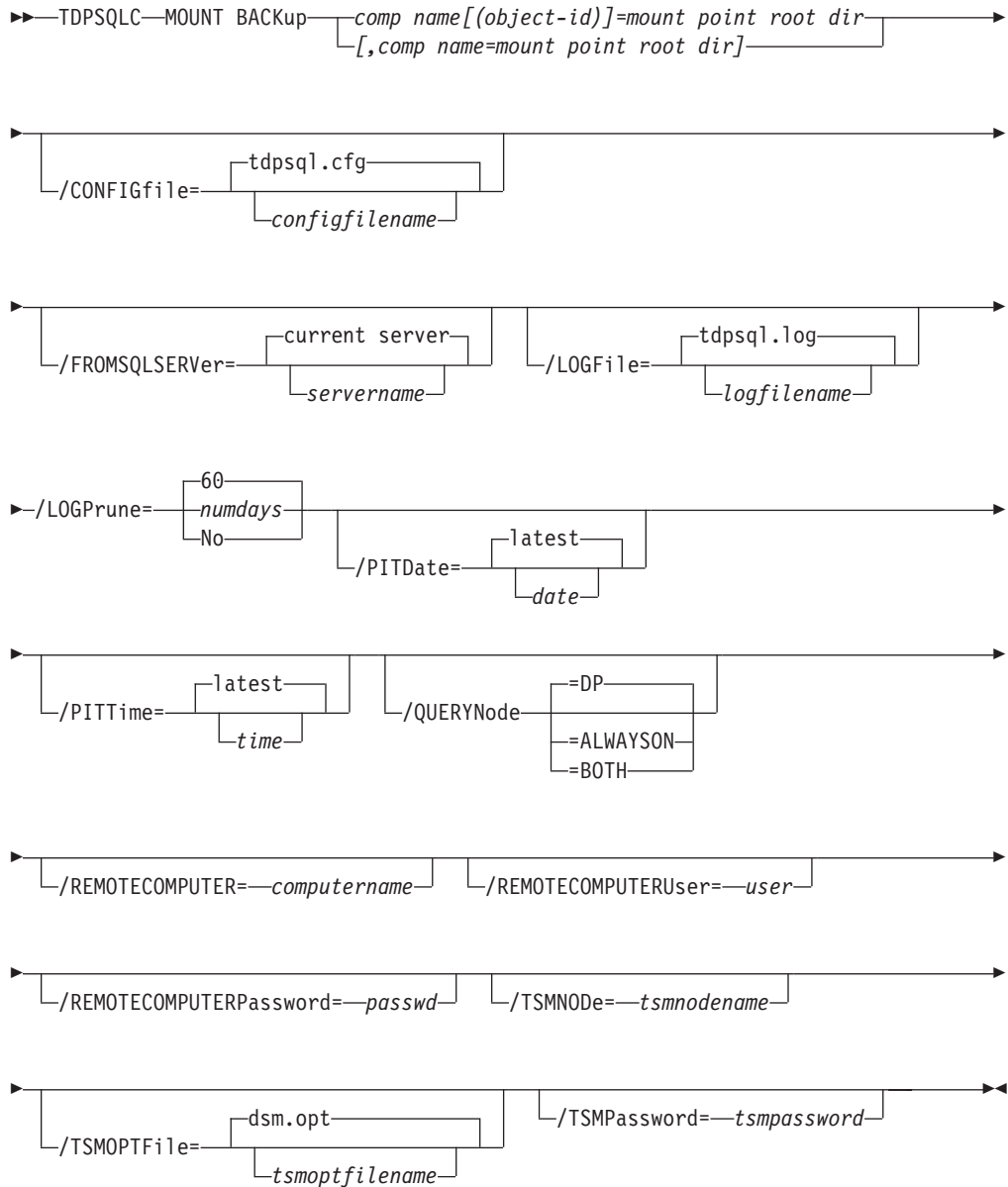
## Mount Backup command

Use the **mount backup** command to mount backups that are managed by Tivoli Storage FlashCopy Manager for SQL.

### Mount Backup syntax

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

### TDPSQLC command



## Mount backup positional parameter

The positional parameters immediately follow the **mount backup** command and precede the optional parameters.

The following positional parameters specify the objects to mount:

*component name[(object-id)]=mount point root dir[,component name=mount point root dir]*

*component name[(object-id)]*

Specify the backup of a local SQL Server database or storage group.

*mount point root dir*

Specify the absolute path to the directory where the snapshots are going to be displayed as mount point directories. The directory must be empty. If not empty, an error is reported.

The list must contain all non-qualified objects or all qualified objects. The list cannot contain a combination of non-qualified objects and qualified objects. Specify the list by using the following syntax:

*mount backup object-1[(object-1-id)]= mount-point-1[,object-2[(object-2-id)]=mount-point-2...]*

## Mount Backup optional parameters

Optional parameters follow the **mount 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 **mount 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\tdpsql.cfg"
```

**/FROMSQLSERVER**=*server-name*

Use the **/fromsqlserver** parameter to specify the name of the server where the original backup was done. The default is the local server.

**/LOGFile**=*logfilename*

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

#### **/LOGPrune=numdays | No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning is enabled and done one time 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 GUI or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for SQL command that might prune the log file, do 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.

#### **/PITDate=date**

Use the **/pitdate** parameter with the **/pittime** parameter to establish a point in time for which you want to mount the latest version of your backups. Backups that were backed up on or before the date and time you specified, and that were not deleted before the date and time you specified, are processed. Backup versions that you create after this date and time are ignored. Specify the appropriate date in the *date* variable; use the same format that you selected with the **DATEFORMAT** option in the Tivoli Storage FlashCopy Manager for SQL options file.

If neither *date* nor *time* is specified, then no date and time are established. By default the backup is mounted from the most recent available backup.

If either *date* or *time* is specified, then the backup is mounted from the earliest backup that is selected after the established mount date and time. If no backup after the established date and time is found, by default the backup is mounted from the most recent available backup.

#### **Notes:**

- If you specify both *date* and *time*, this selection establishes the mount backup period.
- If you specify *date* and you do not specify *time*, *time* defaults to a value of 23:59:59. This selection establishes the *date* at the specified date.
- If you specify *time* without *date*, then *date* defaults to the current date. This selection establishes the mount date and time as the current date at the specified *time*.

#### **/PITTime=time**

Use the **/pittime** parameter with the **/pitdate** option to establish a point in time for which you want to mount the latest version of your backups. Files or images that were backed up on or before the date and time you specify, and that were not deleted before the date and time you specify, are processed. Backup versions that you create after this date and time are

ignored. This option is ignored if you do not specify the **/pitdate** parameter. Specify the appropriate time in the *time* variable; use the same format that you selected with the TIMEFORMAT option in the Tivoli Storage FlashCopy Manager for SQL options file.

If neither *date* nor *time* is specified, then no date and time are established. By default the backup is mounted from the most recent available backup.

If either *date* or *time* is specified, then the backup is mounted from the earliest backup that is selected after the established mount date and time. If no backup after the established date and time is found, by default the backup is mounted from the most recent available backup.

**Notes:**

- If you specify both *date* and *time*, this selection establishes the mount backup period.
- If you specify *date* and you do not specify *time*, *time* defaults to a value of 23:59:59. This selection establishes the *date* at the specified date.
- If you specify *time* without *date*, then *date* defaults to the current date. This selection establishes the mount date and time as the current date at the specified *time*.

**/QUERYNode=DP | ALWAYSON | BOTH**

Specify whether you want to query standard databases from SQL Server 2012 that were backed up from a standard Data Protection for SQL Server node, the AlwaysOn node, or both nodes. To mount a backup that is using the AlwaysOn node (for AlwaysOn Availability databases), specify **/QUERYNode = ALWAYSON**.

**/REMOTECOMPUTER=computername**

Enter the IP address or host name for the remote system where you want to mount the data.

**/REMOTECOMPUTERUser=user**

Enter the user name that is used to log on to the server specified with the **REMOTECOMPUTER** parameter. If a domain is required to log on with the domain account, enter *Domain\User*. To log on to the local account, the domain is not required. There is no default value.

**/REMOTECOMPUTERPassword=password**

Enter the password for the user name that is specified with the **REMOTECOMPUTERUser** parameter. There is no default value.

**/TSMNODE=tsmnodename**

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to **PROMPT**. This parameter is not valid when **PASSWORDACCESS** is set to **GENERATE** in the options file.

**/TSMOPTFile=tsmoptfilename**

Use the *tsmoptfilename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in double quotation marks. For example:  
`/TSMOPTFile="c:\Program Files\dsm.opt"`

The default is `dsm.opt`.

**/TSMPassword=*tsmpassword***

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified `PASSWORDACCESS GENERATE` in the Tivoli Storage FlashCopy Manager options file (`dsm.opt`), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when `PASSWORDACCESS GENERATE` is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If `PASSWORDACCESS PROMPT` is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

**Mount backup examples**

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

Examples:

`TDPSQLC MOUNT BACKup SQL-DB-1=K:\MP-dir`

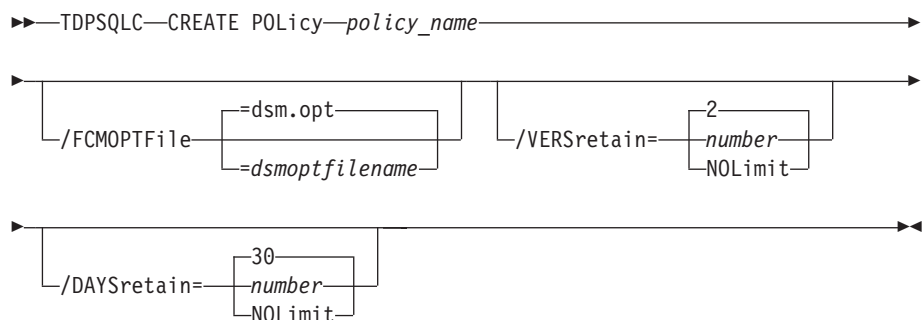
`TDPSQLC MOUNT BACKup SQL-DB-1(20120523070512)=L:\MP-dir`

**Policy commands for Tivoli Storage FlashCopy Manager for SQL**

**Create Policy**

This command is used to create a policy.

**TDPSQLC command: CREATE POLIcy**



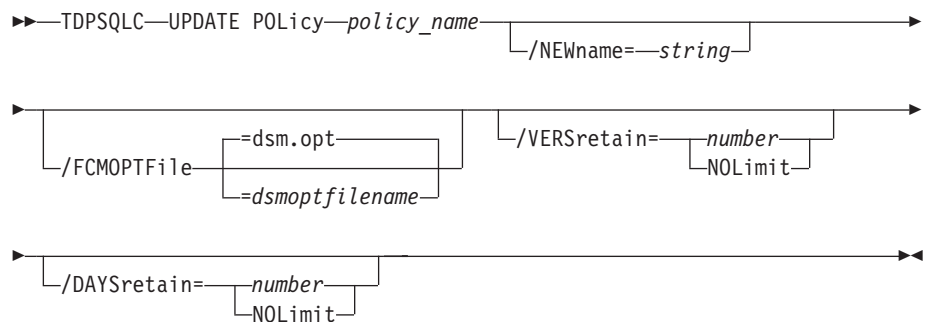
Parameters:

- *policy\_name* (required): Specifies the name of the policy that is being created. 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.

#### TDPSQLC command: UPDATE POLIcy



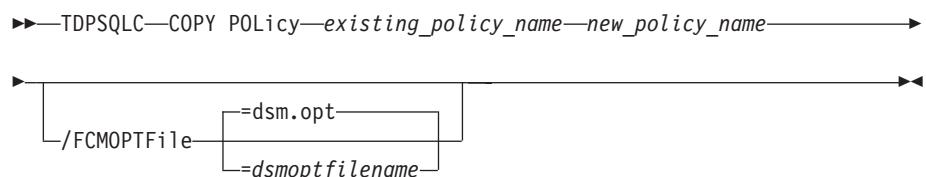
Parameters:

- **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.

#### TDPSQLC command: COPY 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.

### TDPSQLC command: Query POLIcy

```
▶▶ TDPSQLC—Query POLIcy—*—————▶▶
```

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

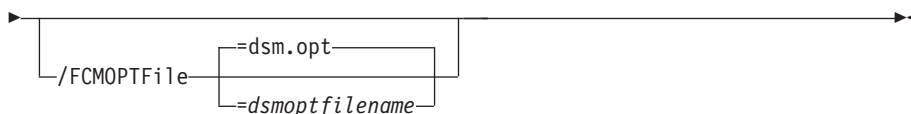
| Connecting to SQL Server, please wait... |                             |                         |
|------------------------------------------|-----------------------------|-------------------------|
| Policy                                   | Number of snapshots to keep | Days to keep a snapshot |
| -----                                    | -----                       | -----                   |
| FCMPOL                                   | 3                           | 60                      |
| STANDARD                                 | 2                           | 30                      |

## Delete Policy

This command is used to delete a policy.

### TDPSQLC command: DELEte POLIcy

```
▶▶ TDPSQLC—DELEte POLIcy—policy_name—————▶▶
```



Parameter:

- *policy\_name* (required): Specifies the name of the policy that is 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 that are 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 example

Use the **query fcm** command to return output about the server and other information:

Tivoli Storage Manager Server Connection Information

```

Nodename MALTA_EXC
Network Host Name of Server FVTSERIES10
TSM API Version Version 7, Release 1, Level 0.0

Server Name FVTSERIES10_SERVER1_622GA
Server Type Windows
Server Version Version 7, Release 1, Level 0.0
Compression Mode Client Determined
Domain Name FCM_PDEXC
Active Policy Set STANDARD
Default Management Class STANDARD

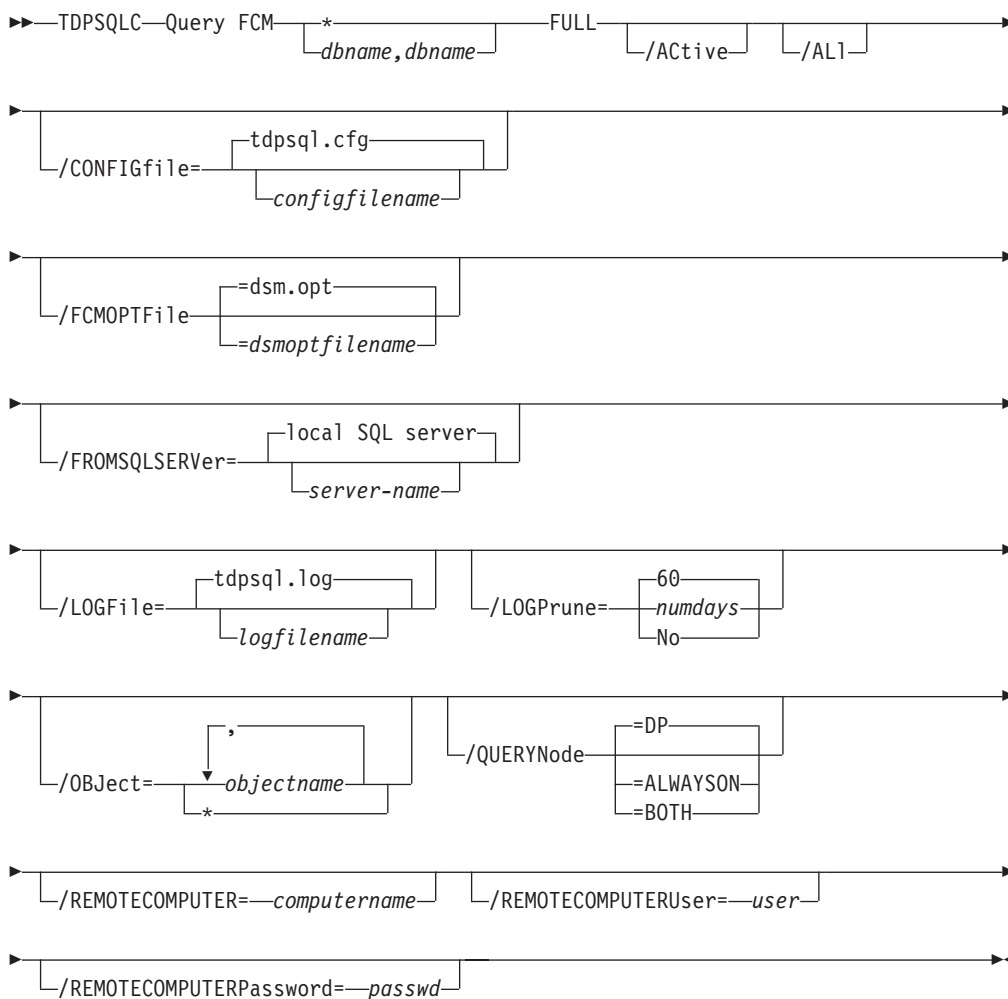
Completed

```

### Query FCM syntax

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

#### TDPSQLC command



## 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:

\* | *componentname*

*componentname1, ..., componentnameN*

Query all backup objects for the specified component. Multiple entries are separated by commas.

Where *componentname* can be a database name.

The following positional parameters specify the type of backup to query. If this parameter is not specified, all backup types are 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 parameter 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=filename**

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 253 for details on the content of the file.

Considerations:

- The *filename* variable can include a fully qualified path. If *filename* does not include a path, it uses the directory where Tivoli Storage FlashCopy Manager for SQL is installed.
- If *filename* 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 *filename*, 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 that is 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 might 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 logging activity 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 you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for SQL to run operations, use the **/logfile** parameter to specify a different log file for each instance used. This function 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 is to be pruned for one command run. By default, log pruning is enabled and done one time 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 - 9999, the log is pruned even if log pruning is already done 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 pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for SQL command that might prune the log file, do 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 deactivated. 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 deactivate. 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.

**/QUERYNode=DP | ALWAYSON | BOTH**

Specify whether you want to query standard databases from SQL Server 2012 that were backed up from a standard Data Protection for SQL Server node, the AlwaysOn node, or both nodes. This parameter is ignored for availability databases because the availability databases are always backed up under the AlwaysOn node.

**/REMOTECOMPUTER=computername**

Enter the IP address or host name for the remote system where you want to query the data that is backed up.

**/REMOTECOMPUTERUser=user**

Enter the user name that is used to log on to the server specified with the **REMOTECOMPUTER** parameter. If a domain is required to log on with the domain account, enter *Domain\User*. To log on to the local account, the domain is not required. There is no default value.

**/REMOTECOMPUTERPassword=password**

Enter the password for the user name that is specified with the **REMOTECOMPUTERUser** parameter. There is no default value.

## 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 that is related information about the volumes that are represented in local inventory that is managed by Tivoli Storage FlashCopy Manager. This command is valid for all Windows operating systems that are supported by Tivoli Storage FlashCopy Manager.

### TDPSQLC command

```
▶▶ TDPSQLC—Query MANAGEDCAPacity —————▶▶
└─/DETAILED┘
```

### Parameters

#### /DETAILED

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

### SQL Server 2008 example

Query the total managed capacity of SQL Server 2008 data that is 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:

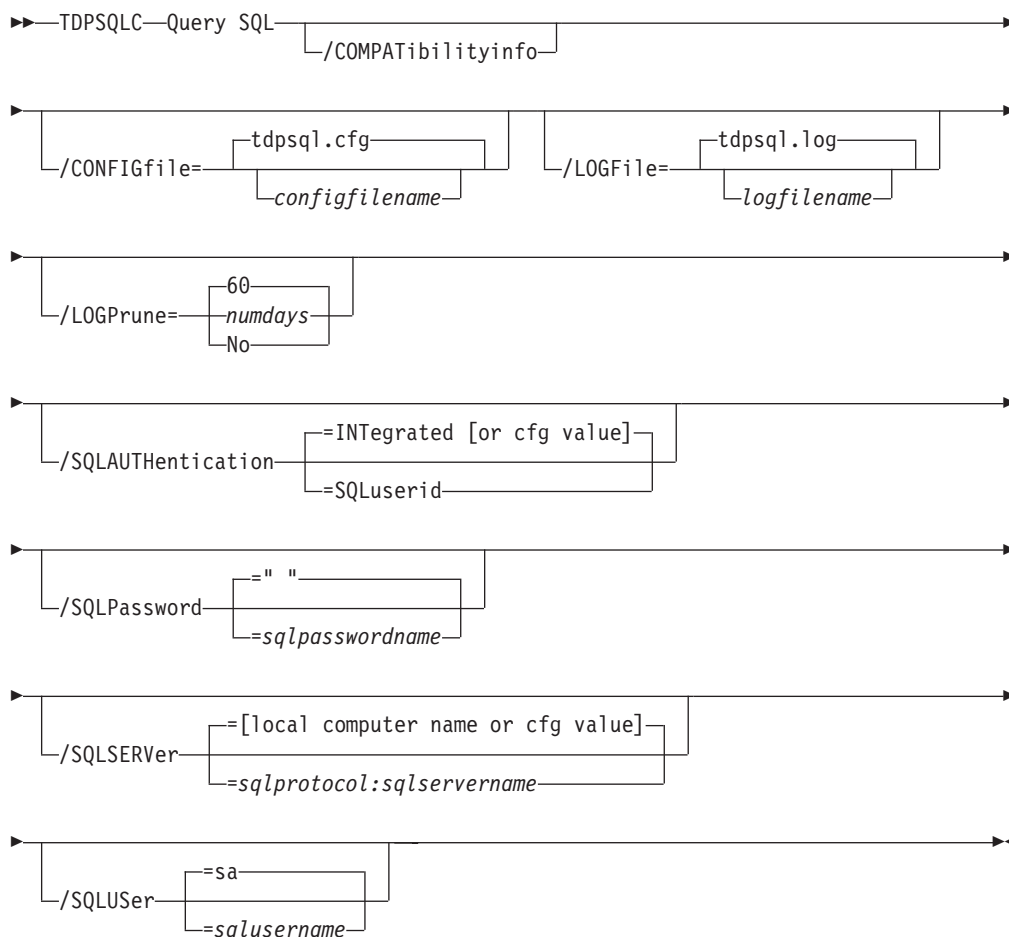
- SQL server information:
  - SQL server name and version
  - Database name
  - Database data space allocated
  - Database space that is used
  - Database log space allocated
  - Database log space used

- Database options that are set (SELECT INTO / BULK COPY, TRUNCATE LOG ON CHECKPOINT, and other options.)
- 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.

#### TDPSQLC command



## Query SQL positional parameters

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

Specify one of the following when you issue 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 that is 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 whether 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 might be different, although the interpretation of individual character values might result in different characters that are 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 254 for descriptions of available configuration parameters.

### **/LOGfile=***logfile*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager for SQL. The *logfile* variable identifies the name of the activity log file. If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for SQL installation directory. If the *logfile* variable includes spaces, enclose the entire **/logfile** parameter entry in double quotation marks. For example:

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

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

When you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for SQL to run operations, use the **/logfile** parameter to specify a different log file for each instance used. This function 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 is to be pruned for one command run. By default, log pruning is enabled and done one time 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for SQL command that might prune the log file, do 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 the *logfile* setting.

#### **/SQLAUTHentication=INTEgrated | SQLuserid**

This parameter specifies the authorization mode that is used when you log 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 use to log on to the SQL server. This option 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 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 that is specified by the SQL server configurable option in the Tivoli Storage FlashCopy Manager configuration file. This value 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.
- You must specify the name if the SQL server is not the default instance or is a member of a failover cluster.
- The format of *sqlservername* depends on what type of instance it is and whether it is clustered or not:

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

#### *localcomputername*

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

#### *instancename*

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

#### *virtualservername*

The name that is given to the clustered SQL Server specified during clustering service setup. This name 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 you use 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 VADER
SQL Server Version 10.0.1600 (SQL Server 2008)

Volume Shadow Copy Service (VSS) Information

Writer Name : SqlServerWriter
Local DSMAgent Node : VADER
Remote DSMAgent Node :
Writer Status : Online
Selectable Components : 13

```

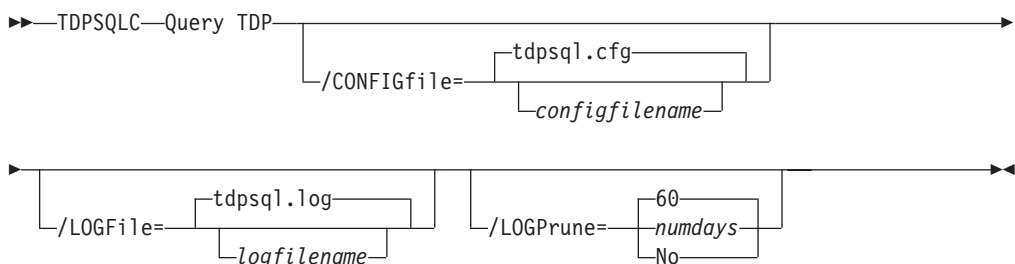
## Query TDP command

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.

### TDPSQLC command



## 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 254 for descriptions of available configuration parameters.

### **/LOGFile=***logfile*

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

The *logfile* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager for SQL installation directory.

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

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

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

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

When you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for SQL to run operations, use the **/logfile** parameter to specify a different log file for each instance used. This function 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 is to be pruned for one command run. By default, log pruning is enabled and done one time 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for SQL command that might prune the log file, do 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 you use the **query TDP** command.

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

```
IBM Tivoli Storage FlashCopy Manager configuration settings

CONFIGfile..... tdpsql.cfg
LOGFile tdpsql.log
LOGPrune 60
```

## Restore command

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

Considerations:

- Make sure to review “VSS command-line considerations” on page 241 before you attempt 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 that is 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 you run VSS restores.

- Parallel VSS Fast Restore or VSS Instant Restore operations are not supported on Microsoft Windows Server 2008 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 are on local shadow volumes. The source volume contains only the SQL database.
- When you run a VSS Instant Restore from local shadow volumes, the files and bytes transferred display "0". When a VSS Fast Restore is done, the files and bytes transferred display the actual number of files and their size.
- When you run VSS Instant Restores on DS8000, SAN Volume Controller, or Storwize V7000, background copies that involve the volumes that are being restored are completed before you initiate the VSS Instant Restore.
- Cross-SQL server restores are not supported by Microsoft.

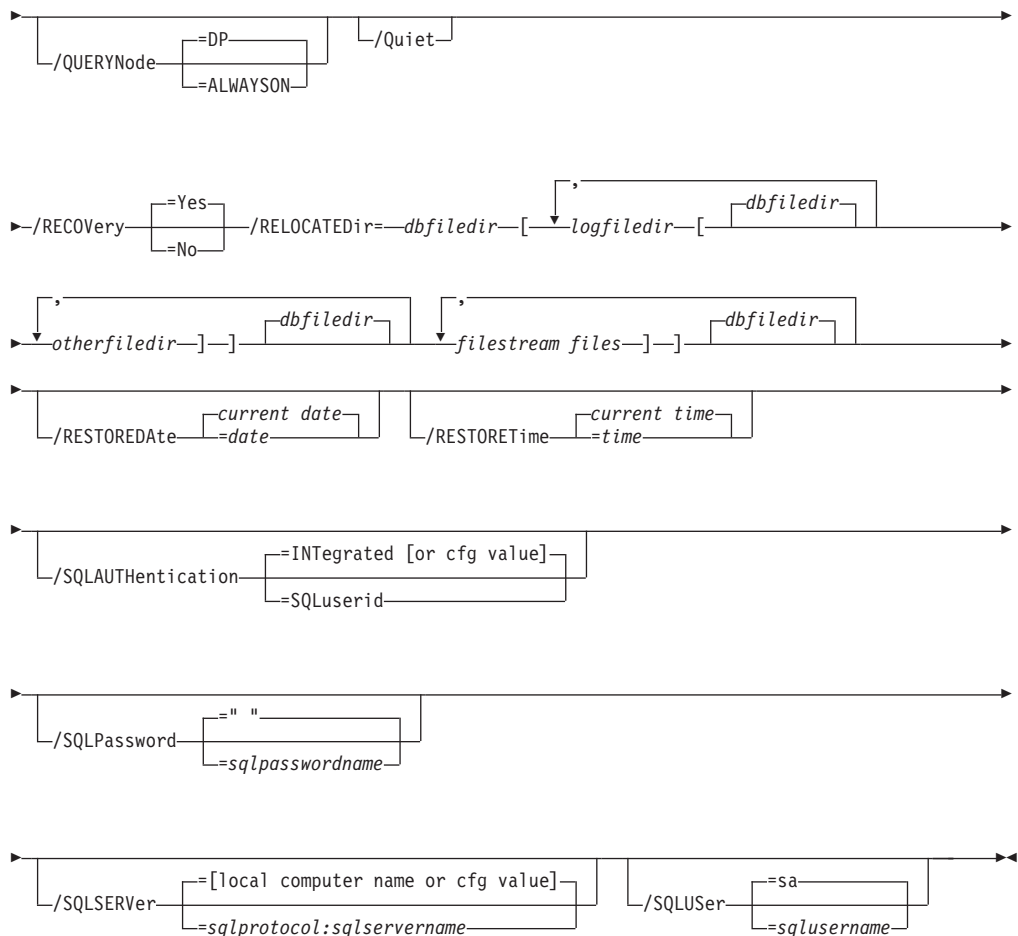
## Restore syntax

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

### Syntax

#### TDPSQLC command





## 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 that you specify.

## Restore optional parameters

Optional parameters are used with the **restore** command and positional parameters.

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

### **/CONFIGfile=filename**

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 253 for details on the contents of the file.

Considerations:

- `filename` can include a fully qualified path. If `filename` does not include a path, it uses the directory where Tivoli Storage FlashCopy Manager is installed.
- If `filename` includes spaces, place 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 **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 that is set in the Tivoli Storage FlashCopy Manager configuration file. 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 is stored on local shadow volumes. An IBM Systems Storage SAN Volume Controller, DS8000, the XIV system, or IBM Storwize V7000 storage subsystem is required to run VSS instant restores.

You can specify:

- |            |                                                                                                                                                                                                                                 |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | Use volume level snapshot restore for a VSS backup that is stored on local shadow volumes if the backup exists on volumes that support it. This option is the default.                                                          |
| <b>No</b>  | Use file-level copy to restore the files from a VSS backup that is stored on local shadow volumes. Bypassing volume-level copy means that SQL database files and log files are the only data overwritten on the source volumes. |

When you are running VSS instant restore on DS8000 and Storwize V7000, ensure that any previous background copies that involve the volumes you are restoring, complete before you initiate the VSS instant restore.

#### **/INTO=dbname**

For **restore** operations, **/INTO** specifies the SQL server database that you want a backup object that is 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 (\*) might not be used in either the command `dbname` variable or the **/INTO dbname** variable.
- There must be exactly one item in the **/INTO dbname** variable list in addition to in the command `dbname` list.

- Make sure to use the **/relocatedir** parameter when you specify **/INTO dbname**.

#### **/LOGFile=logfilename**

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

Considerations:

- If the specified file does not exist, it is created. If it does exist, new log entries are appended to the file.
- The file name can include a fully qualified path; however, if you specify no path, the file is written to the directory where Tivoli Storage FlashCopy Manager is installed.
- You cannot turn off Tivoli Storage FlashCopy Manager logging activity. If you do not specify **/LOGFile**, log records are written to the default log file. The default log file is `tdpsql.log`.
- When you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager for operations, use the **/LOGFile** parameter to specify a different log file for each instance used. This function 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 run daily. Use the **/LOGPrune=numdays|No** to disable log pruning or explicitly request a prune of the log for one command even if the log file is already 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 0 - 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 value is initially 60.
- If you specify **/LOGPrune**, its value is used instead of the value that is 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 agent name; log file. If you are running a command that prunes the log file and the value of the **timeformat** or **dateformat** parameter changes, do 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 deactivate operations, **/OBJECT** specifies that only particular backup objects for the specified SQL databases and backup object type if specified are 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 deactivate. 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.

**/QUERYNode=DP|ALWAYSON**

Specify whether you want to query standard databases from SQL Server 2012 that were backed up from a standard Data Protection for SQL Server node or the AlwaysOn node. This parameter is ignored for availability databases because the availability databases are always backed up under the AlwaysOn node. The default value is DP. To query backups of AlwaysOn Availability databases, specify **/QUERYNode = ALWAYSON**.

**/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 you want to restore more 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)**

Use when you make a sequence of restores to a SQL database and the current restore is the final in the sequence. Also, use when the restore is the only restore to a SQL database. This option informs the SQL server that the restore is complete and ready for incompleting 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.

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

Tivoli Storage FlashCopy Manager sorts the restore objects by database name, and, within database name, by backup time from earliest to latest. A **query FCM** command also displays 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. 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, if the *logfiledir* and *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, 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, if the *filestream files* variable is not specified, the SQL Server FILESTREAM data files are restored to the directory specified by *dbfiledir*. *Filestream files* 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 that is 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 be specified only when you restore 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 that is 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 be specified only when you restore 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 that is used when you log 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 use to log on to the SQL server. This option 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 that you 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. For restore operations, this SQL server is the one 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 that is specified by the SQL server configurable option in the Tivoli Storage FlashCopy Manager configuration file. This value 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.
- You must specify the name if the SQL server is not the default instance or is a member of a failover cluster.
- The format of **sqlservername** depends on what type of instance it is and whether it is clustered or not:

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

**localcomputername**

The network computer name of the computer the SQL server and Tivoli Storage FlashCopy Manager are stored. The TCP/IP host name might not always be the same.

**instancename**

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

**virtualservername**

The name that is given to the clustered SQL Server specified during clustering service setup. This name 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.

### **Restore output examples**

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

In this example, the **tdpsqlc restore db1 full** command restores a full backup of database *db1*. The following output is displayed:

```
IBM FlashCopy Manager for Databases:
FlashCopy Manager for Microsoft SQL Server
Version 7, Release 1, Level 0.0
(C) Copyright IBM Corporation 1997, 2013. All rights reserved.

Connecting to SQL Server, please wait...

Querying Virtual Server for Backups

Starting Sql database restore...

Beginning VSS restore of 'db1'...

Files Examined/Completed/Failed: [3 / 3 / 0] Total Bytes: 6029825

VSS Restore operation completed with rc = 0
Files Examined : 3
Files Completed : 3
Files Failed : 0
Total Bytes : 6029825
```

### **Restorefiles command**

Use the **restorefiles** command to restore VSS-based backups on the Tivoli Storage Manager (**/BACKUPDESTINATION=TSM**), or stored locally (**/BACKUPDESTINATION=LOCAL**).

#### **Considerations**

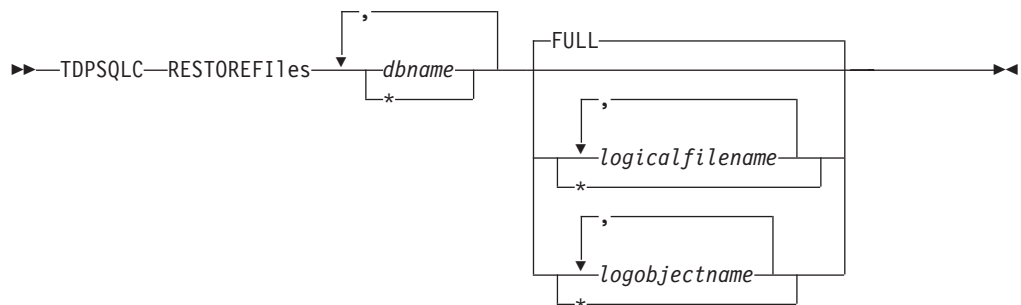
- The **restorefiles** command restores .mdf, ldf, and other flat files from a specified Tivoli Storage Manager VSS-based backup into a specified directory.
- A destination directory can be specified as a directory on a fixed file system such as C:\temp, or on a network share that is accessible to the Tivoli Storage FlashCopy Manager Remote Agent (VSS Requestor)
- The **restorefiles** command does not restore the data to the SQL server.
- This command does not require the SQL Server to be installed on the system where the **restorefiles** command is run.
- A restore continues until it is completed unless the destination volume does not have enough space to fulfill the restore operation.

- VSS-based backups that are on the Tivoli Storage FlashCopy Manager (/BACKUPDESTINATION=TSM) can be restored by using **restorefiles** on the same system that ran the VSS-based backup, or by running the command on a system that installed and configured the Tivoli Storage FlashCopy Manager client.
- The directory that is specified in the **restorefiles** command appended the VSS component name so that multiple databases can be restored to the same target directory.
- VSS-based backups that are stored on the local system by using a persistent snapshot (/BACKUPDESTINATION=LOCAL), can be restored only by running the **restorefiles** command on the same system that ran the VSS-based backup, and has access to the persistent snapshot.
- To run a full restore: `tdpsqlc restorefiles DBName1 FULL /backupmethod=vss /relocatedir=d:\temprestore`
- Use /RELOCATEDIR to specify the destination directory for the flat files. If this option is not specified, the destination directory defaults to the current working directory.
- If you are in a non-clustered environment, you can restore only a local snapshot to the system that generated the snapshot. Or for cluster environments, you can run a **restorefiles** command from any of the systems in the cluster.

### Restorefiles syntax

Use the **restorefiles** command syntax diagram as a reference for available options and truncation requirements.

#### TDPSQLC command



### Restorefiles positional parameters

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

The following positional parameters specify the object to restore:

**TDPSQLC \* | componentname1, ..., componentnameN FULL**

- \* Sequentially restore all flat files for the database.

The following positional parameter specifies the type of backup from which the files are restored:

**FULL** Restore the files from a full type backup for VSS.

## Restorefiles optional parameters

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

### **/BACKUPDESTINATION**

VSS backups that are on the Tivoli Storage Manager server are restored by using the **restorefiles** command with **/BACKUPDESTINATION=TSM**. VSS backups that are running on a local system that use a persistent snapshot are restored by using the **restorefiles** command with **/BACKUPDESTINATION=LOCAL**. TSM is the default destination for **restorefiles**.

### **/CONFIGfile=filename**

Use the **/configfile** parameter to specify the name of the Tivoli Storage FlashCopy Manager configuration file that contains the values for the Tivoli Storage FlashCopy Manager configuration options.

The *filename* variable can include a fully qualified path. If the *filename* variable does not include a path, the Tivoli Storage FlashCopy Manager installation directory is used. If the **/configfile** parameter is not specified, or if the *filename* variable is not specified, the default value is `tdpsql.cfg`.

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

```
/CONFIGfile="c:\Program Files\file.cfg"
```

### **/FROMSQLserver=sqlservername**

Use the **/FROMSQLserver** parameter to specify the name of the SQL Server where the original backup was completed. The default is the local SQL Server name. To restore availability databases, specify the AlwaysOn Availability group.

### **/LOGfile=logfilename**

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

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 installation directory.

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

```
/LOGfile="c:\Program Files\mytdpsqlserver.log"
```

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

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

When you use multiple simultaneous instances of Tivoli Storage FlashCopy Manager to run operations, use the **/logfile** parameter to specify a different log file for each instance used. This function 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



to prune the log for one command run. By default, log pruning is enabled and done one time 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 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager command that might prune the log file, do one of the following actions to prevent the log file from being pruned:

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

#### **/MOUNTwait=Yes | No**

This parameter is not valid for all backup types; does not work with DIFFFULL or LOG backup types. The **/mountwait** parameter is used to specify whether Tivoli Storage FlashCopy Manager waits for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage FlashCopy Manager is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify these options:

**Yes** Wait for tape mounts. This option is the default.

**No** Do not wait for tape mounts.

#### **/OBJECT=object name**

Use the **/object** parameter to specify the name of the backup object files that you want to restore. The object name uniquely identifies each backup object and is created by Tivoli Storage FlashCopy Manager.

Use the Tivoli Storage FlashCopy Manager **query tsm** command to view the names of the backup objects.

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

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

The **/relocatedir** parameter specifies the destination locations in which to restore the flat files. This restore includes databases, logs, and FILESTREAM files.

The *dbfiledir* variable specifies the directory location of the SQL database you want to relocate. If the *logfiledir* 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. 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. If the *otherfiledir* variable is not specified, the SQL Server full-text index files are restored to the directory specified by *dbfiledir*. The **restorefiles** operation creates a subdirectory under the root directory that contains the name of the database name. Restored files are placed in that subdirectory. If the **/relocatedir** parameter is not specified, the files are restored into the directory where the **restorefiles** command is issued. For example, if Tivoli Storage FlashCopy Manager is installed in the `c:\Program Files\Tivoli\TSM\TDPSQLC` directory and the following command is issued from `E:\Somedir`:

```
e:\Somedir> c:\"Program Files"\Tivoli\TSM\TDPSQLC\tdpsqlc restorefiles
db1 full
```

then the files are restored to the subdirectories in the `e:\Somedir` location:

```
e:\Somedir\db1\db1.mdf
e:\Somedir\db1\db1.ldf
```

#### **/TSMNODE=***tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager. You can store the node name in the Tivoli Storage Manager options file (`dsm.opt`). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to **PROMPT**. This parameter is not valid when **PASSWORDACCESS** is set to **GENERATE** in the options file.

#### **/TSMOPTFile=***tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Tivoli Storage FlashCopy Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

#### **/TSMPassword=***tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (`dsm.opt`), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS PROMPT** is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager can be up to 63 characters in length.

## Restorefiles examples

This output example provides a sample of the text, messages, and process status that displays when you use the **restorefiles** command.

This command, `tdpsqlc restorefiles Finance FULL /backupdestination=local /RELOCATEDir=e:\test /FROMSQLServer=sqlsrv12`, restores VSS files from a FULL type backup of the *Finance* database from the SQL Server named *sqlsrv12* into the `e:\test` directory. The restored files are displayed:

```
e:\test\Finance\finance.mdf
e:\test\Finance\finance_log.ldf
```

## Set command

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

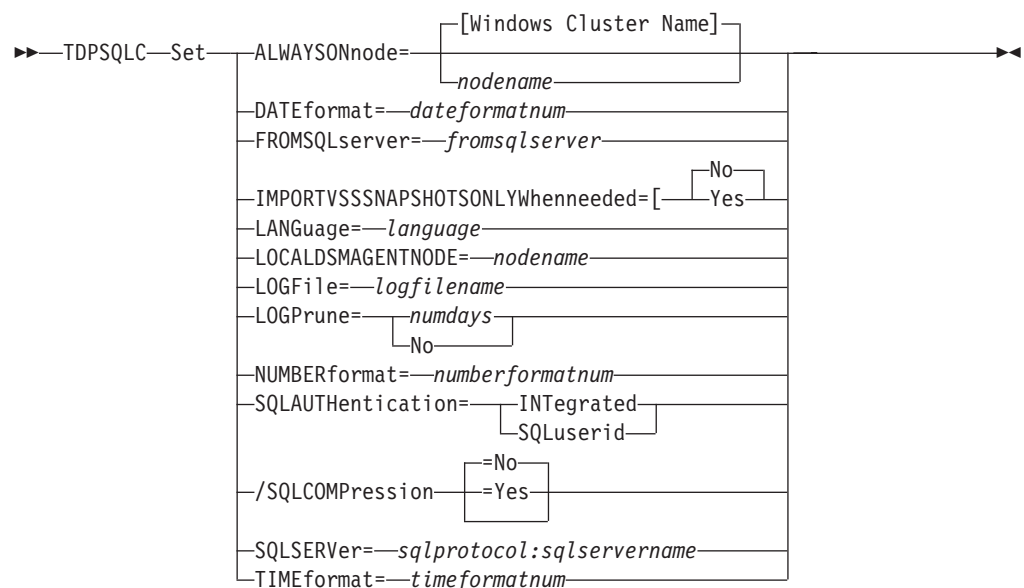
Use the **set** command to change the values for the Tivoli Storage FlashCopy Manager configurable parameters and options. The values are saved in a configuration file. The default file is `tdpsql.cfg`. Configuration values can also be set in the GUI **Edit** menu bar item.

**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.

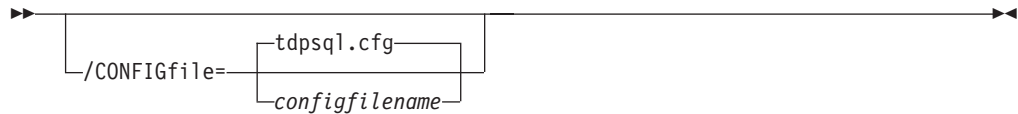
## Set syntax

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

### TDPSQLC command



## 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 you issue a **set** command.

### **ALWAYSOnNode**=*nodename*

Specify the Tivoli Storage Manager node name that is used to back up AlwaysOn availability databases in a SQL Server 2012 environment. This parameter is required when you are configuring Tivoli Storage FlashCopy Manager in a SQL Server 2012 environment. All availability databases in an availability group are backed up under this node name, regardless of which availability replica they are from. The databases that are not in an availability group are backed up under the standard Tivoli Storage FlashCopy Manager node name unless you specify the **USEALWAYSOnnode** parameter.

### **DATEformat**=*dateformatnum*

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

The *dateformatnum* variable can range 1 - 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 running one of the following tasks:

- After you change the value of the **dateformat** parameter, make a copy of the existing log file before you run 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 that is 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 setting is the default.)
- ESP** Standard Spanish
- FRA** Standard French
- ITA** Standard Italian
- JPN** Japanese
- KOR** Korean
- PTB** Brazilian Portuguese

**IMPORTVSSSNAPSHOTSONLYWhenneeded**=Yes | No

By default, the parameter is set to No. This default setting means that local persistent VSS snapshots are automatically imported to the Windows system where the snapshots are created. By importing the VSS snapshots only when needed, the snapshots are imported to a host for FlashCopy Manager operations. To not automatically import local persistent snapshots to the Windows system where the snapshots are created, set the parameter to Yes.

**LOCALDSMAgentnode**=*nodename*

Specify the node name of the local system that runs the VSS backups. This positional parameter must be specified for VSS operations to be done.

**LOGFile**=*logfile*

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 *logfile* variable identifies the name to be used for the activity log generated by Tivoli Storage FlashCopy Manager.

Considerations:

- If the specified file does not exist, it is created. If it does exist, new log entries are appended to the file.
- The file name can include a fully qualified path; however, if you specify no path, the file is written to the directory where Tivoli Storage FlashCopy Manager is installed.
- You cannot turn Tivoli Storage FlashCopy Manager logging activity 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 done one time each day Tivoli Storage FlashCopy

Manager is activated; however, this option disables log pruning. The *numdays* variable represents the number of days to save log entries.

Considerations:

- If you specify *numdays*, it can range 0 - 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 that are displayed by Tivoli Storage FlashCopy Manager. The *numberformatnum* variable can range 1 - 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 that is used when you log on to the SQL server. The *integrated* value specifies Windows authentication. The user ID that you use to log on to Windows is the same ID you use to log on to the SQL server. This option 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 use to log on to the SQL server. That user ID must have the SQL Server SYSADMIN fixed server role.

**SQLSERVER=sqlprotocol:sqlservername**

The **SQLSERVERsqlserver** parameter specifies the SQL server that Tivoli Storage FlashCopy Manager logs on to. This SQL server is the one 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 that are displayed by Tivoli Storage FlashCopy Manager. The *timeformatnum* variable can range 1 - 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 doing one of the following choices:

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

#### **USEALWAYSOnode**

Specify this parameter to back up standard databases on SQL Server 2012 by using the AlwaysOn node. By setting this parameter, you can back up all availability databases and standard databases under a single node to help you to manage your database backups more easily. By default, SQL Server 2012 availability databases are backed up to the AlwaysOn node.

### **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 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.

#### **/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 that run 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 example

These output examples provide a sample of the text, messages, and process status that displays when you use 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.
```

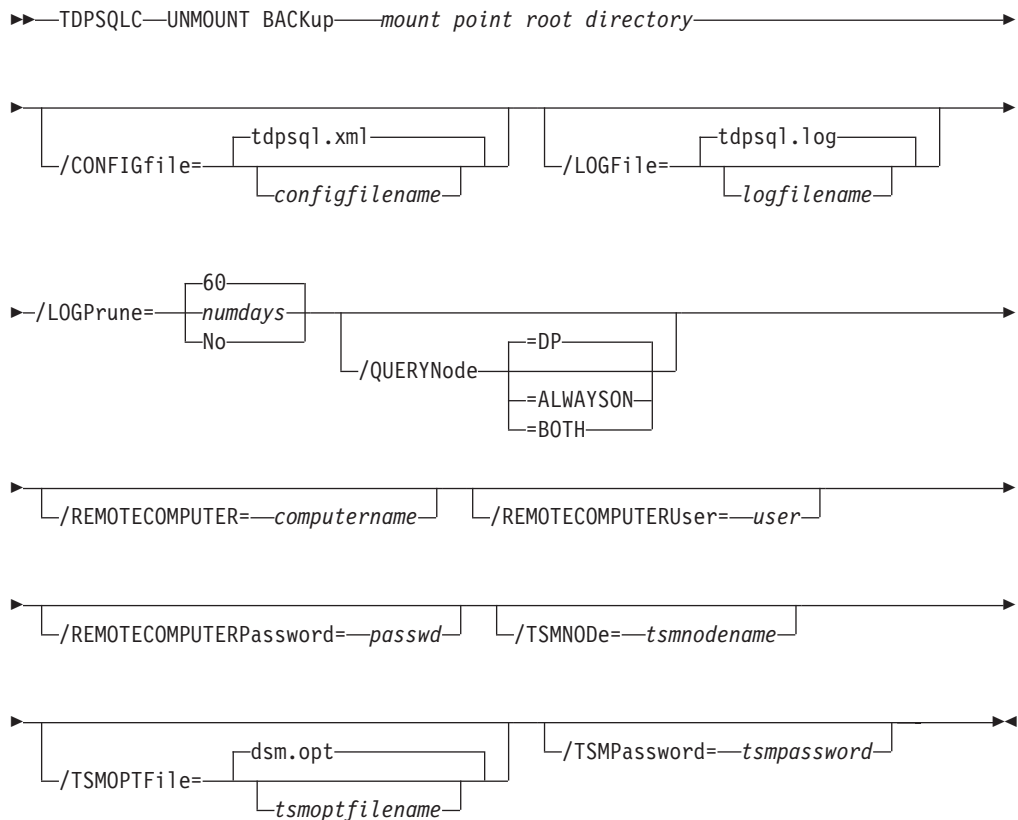
## Unmount Backup command

Use the **unmount backup** command to unmount backups that are previously mounted, and are managed by Tivoli Storage FlashCopy Manager for SQL.

### Unmount Backup syntax

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

### TDPSQLC command





## Unmount Backup positional parameter

The positional parameter immediately follows the **unmount backup** command and precedes the optional parameters.

*mount points root directory*

## Unmount Backup optional parameters

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

**/CONFIGfile**=*configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the configuration file that contains the values to use for an **unmount backup** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the 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\tdpsql.cfg"
```

**/LOGFile**=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file. 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 installation directory.

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

```
/LOGFile="c:\Program Files\tdpsql.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.

**/LOGPrune**=*numdays* | **No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning is enabled and done one time 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 GUI or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager for SQL command that might prune the log file, do 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.

**/QUERYNode=DP | ALWAYSOn | BOTH**

Specify whether you want to query standard databases from SQL Server 2012 that were backed up from a standard Data Protection for SQL Server node, the AlwaysOn node, or both nodes. This parameter is ignored for availability databases because the availability databases are always backed up under the AlwaysOn node.

**/REMOTEComputer=computername**

Enter the IP address or host name for the remote system where you want to unmount the data.

**/REMOTEComputerUser=user**

Enter the user name that is used to log on to the server specified with the **REMOTEComputer** parameter. If a domain is required to log on with the domain account, enter *Domain\User*. To log on to the local account, the domain is not required. There is no default value.

**/REMOTEComputerPassword=password**

Enter the password for the user name that is specified with the **REMOTEComputerUser** parameter. There is no default value.

**/TSMNode=tsmnode**

Use the *tsmnode* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMOptionsFile=tsmoptionsfilename**

Use the *tsmoptionsfilename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/TSMOptionsFile="c:\Program Files\dsm.opt"
```

The default is *dsm.opt*.

**/TSMPassword=tsmpassword**

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (*dsm.opt*), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If `PASSWORDACCESS PROMPT` is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

### Unmount backup example

An example of how to use the `UNMOUNT BACKUP` command is provided.

```
TDPSQLC UNMOUNT BACKUP K:\MP-dir
```

---

## Tivoli Storage FlashCopy Manager commands for custom applications and file systems

The name of the Tivoli Storage FlashCopy Manager for custom applications and file systems command-line interface is `fccli.exe`. By default, this program is in the Tivoli Storage FlashCopy Manager installation directory (`C:\Program Files\Tivoli\FlashCopyManager\`).

### Starting the Tivoli Storage FlashCopy Manager command-line interface

Perform the following steps to start the Tivoli Storage FlashCopy Manager command-line interface for custom applications and file systems:

1. Start the Management Console (MMC) GUI.
2. In the tree view, select the computer node where you want to run the commands.
3. Expand the **Protect and Recover Data** node.
4. In the tree view, select a File System node.
5. Click the **Automate** tab. An integrated command line is available in the task window. You can use the interface to enter PowerShell cmdlets or command-line interface commands. The output is displayed in the main window.
6. Change **PowerShell** to **Command Line**.

### Command-line interface help

Issue the `fccli ?` or `fccli help` command to display help for the command-line interface.

### Command-line parameter characteristics

Review these parameter characteristics before you attempt a command-line operation.

- Positional parameters do not include a leading slash (/) or dash (-)
- Optional parameters can display in any order after the required parameters
- Optional parameters begin with a forward slash (/) or a dash (-)
- Minimum abbreviations for keywords are indicated in uppercase 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 display only one time per command invocation

For help in reading syntax diagrams, see “Reading syntax diagrams” on page x.

## Backup command

Use the **backup** command to create a VSS snapshot backup of volumes and mount points to local shadow volumes.

The VSS snapshot is managed by Tivoli Storage FlashCopy Manager or Tivoli Storage Manager.

### Backup syntax

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

### FCMCLI command



## Backup positional parameter

The positional parameter immediately follows the **backup** command and precedes the optional parameters.

Specify the following positional parameter with the **backup** command:

*component name list*

Specify a list, of volume or mount points that are separated by commas to back up.

## Backup optional parameters

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

**/CONFIGfile=filename**

Use the **/CONFIGfile** parameter to specify the name (*filename*) of the Tivoli Storage FlashCopy Manager configuration file that contains the values to use for a **backup** operation.

The *filename* variable can include a fully qualified path. If the *filename* variable does not include a path, the Tivoli Storage FlashCopy Manager installation directory is used. If the **/configfile** parameter is not specified, or if the *filename* variable is not specified, the default value is `fcmcfg.xml`.

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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

**/FCMPTfile=filename**

Use the *filename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/FCMPTfile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

**/LOGFile=filename**

Use the **/LOGFile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager. The *filename* 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 *filename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager installation directory.

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

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

If the **/LOGFile** parameter is not specified, log records are written to the default log file, `fcm.log`.

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

### **/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 done one time each day Tivoli Storage FlashCopy Manager is executed. However, this option disables log pruning or explicitly requests a log prune for one command process even if the log file is already 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*, the range is 0 - 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 that is 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 might prune the log file and the value of the **timeformat** or **dateformat** parameter is changed, do 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.

### **/OFFLOAD**

Specify this option if, after the VSS snapshot is complete, you want to offload the transfer of the data to the Tivoli Storage Manager server to the system specified by the **REMOTEDSMAGENTNODE** parameter. This option is only valid when the **BACKUPDESTINATION** parameter is set to either TSM or BOTH. The default is to not offload data.

### **/PRESNapshotcmd=*cmdstring***

The **/PRESNapshotcmd** parameter runs a command or script before a snapshot operation begins. You can use this optional parameter to quiesce an application before a snapshot is created. You can then restart the application after the snapshot is started by using the **/POSTSNapshotcmd** optional parameter. The *cmdstring* variable specifies the command to run before the snapshot operation begins. You must specify the fully qualified path name for the command script.

### **/POSTSNapshotcmd=*cmdstring***

The **/POSTSNapshotcmd** parameter runs a command or script after a snapshot operation ends. You can use this optional parameter to resume the application after the snapshot is created. This parameter is used with the **/PRESNapshotcmd** parameter. The *cmdstring* variable must be a fully qualified path.

### **/TSMNODE=*nodename***

Use the *nodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMPassword=***password*

Use the *password* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified PASSWORDACCESS GENERATE in the Tivoli Storage FlashCopy Manager options file (dsm.opt), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when PASSWORDACCESS GENERATE is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

## Backup examples

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

In this example, the backup c:,d: command is run from the Automate tab integrated command line.

The following output is displayed:

```
Preparing for a BACKUP operation, please wait...
Connecting to FCM Server as node 'MALTA_FS'...
Connecting to Local DSM Agent 'MALTA'...
Starting component backup...

Beginning VSS backup of 'C:', 'D:'...

VSS Backup operation completed with rc = 0.

Elapsed Processing Time: 118.52 seconds
Completed
```

In this example, the backup c:,d: /PRESNapshotcmd="STOPDB.CMD" /POSTSNapshotcmd="STARTDB.CMD" is run from the Automate integrated command line. The following output is displayed:



```

C:\Program Files\Tivoli\FlashCopyManager>fcmcli back c:.,d:
/presn="C:\Program Files\Tivoli\FlashCopyManager\stopdb.cmd"
/postsn="C:\Program Files\Tivoli\FlashCopyManager\startdb.cmd"

FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.

Preparing for a BACKUP operation, please wait...

Connecting to FCM Server as node 'MALTA_FS'...
Connecting to Local DSM Agent 'MALTA'...
Starting component backup...

Beginning VSS backup of 'C:', 'D:'...

VSS Backup operation completed with rc = 0.

Elapsed Processing Time: 130.16 seconds

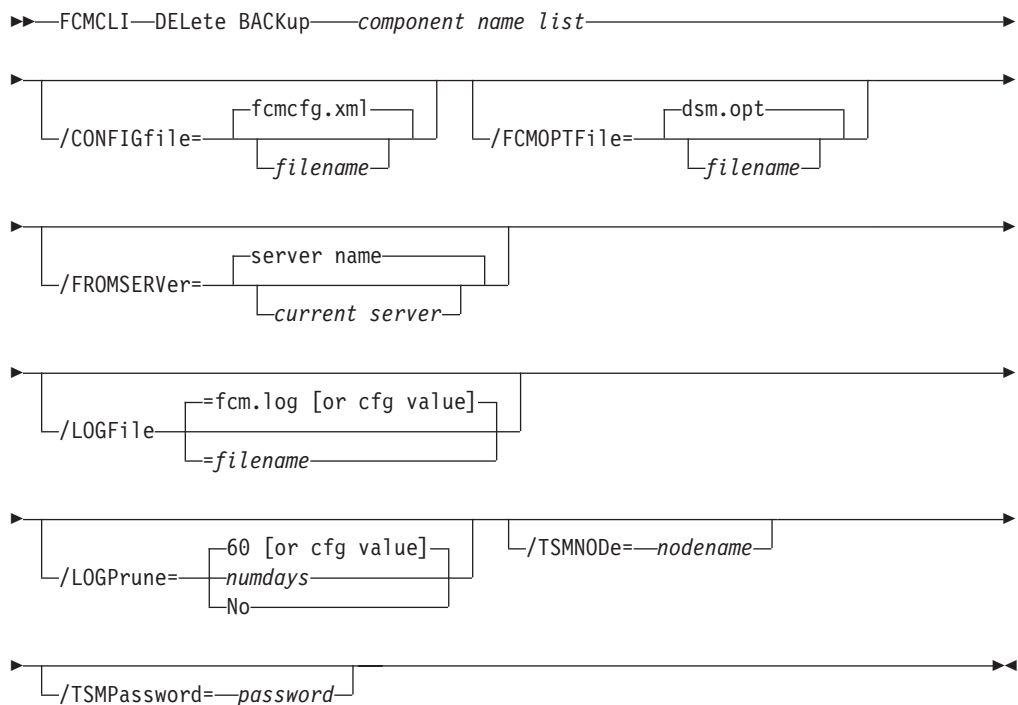
```

## Delete backup command

Use the **delete backup** command to delete Tivoli Storage FlashCopy Manager snapshot backups from local shadow volumes.

### Delete backup syntax

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



## Delete backup positional parameter

The positional parameter immediately follows the **delete backup** command and precedes the optional parameters.

Specify the following positional parameter with the **delete backup** command:

### *component name list*

Specify a list of volume or mount points to delete. The list must contain all non-qualified objects or all qualified objects. The list cannot contain a combination of non-qualified objects and qualified objects.

Specify the component name list by using the following syntax:

```
object-1[(object-1-id)][,object-2[(object-2-id)]...]
```

For example:

```
fccli delete backup g:(20110311124516),h:(20110211034512),r:(20101114164310)
```

The following example is for a non-qualified object object-1:

```
delete backup g:
```

The following example is for a qualified object object-1 (object-1-id):

```
delete backup g:(20110815064316)
```

Use the **query backup** command to find the Object Name identifier.

```
Backups for Volume/Mount Point: 'D:'
=====
Volume/Mount Point : D:
Volume GUID : 3487bc7e-4465-11dc-81cc-001a640a19f2
Server : MALTA
Volume Occupancy : 17.40GB
Backup Date/Time : 08/30/2011 04:07:04
Backup State : Active
Management Class : DEFAULT
Mounted as :
Object Name : 20110830040704
Instant Restore Supported : No

Completed
```

## Delete backup optional parameters

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

### **/CONFIGfile=***configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager 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 installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is `fcmcfg.xml`.

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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

**/FCMOPTFile=filename**

Use the *filename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/FCMOPTFile="c:\Program Files\file.opt"
```

The default is dsm.opt.

**/FROMSERVER=server-name**

Use the **/fromserver** parameter to specify the name of the server where the original backup was done. The default is the local server.

**/LOGFile=logfilename**

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

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

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

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

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

**/LOGPrune=numdays | No**

Use the **/LOGPrune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning is enabled and done one time 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 GUI or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager command that might prune the log file, do one of the following actions to prevent the log file from being pruned:

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

**/TSMNODE=nodename**

Use the *nodename* variable to refer to the Tivoli Storage Manager node

name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMPassword=***password*

Use the *password* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (dsm.opt), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS PROMPT** is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

## Delete backup example

This output example provides a sample of the text, messages, and process status that displays when you use the **delete backup** command.

In this example, the `fccli delete backup G:,H:` command deletes the backups of volumes G and H. The following output is displayed:

```
Backup(s) to be deleted:
G: and H: : VSS : full : 03/12/2013 12:04:33
VSS Delete backup operation completed with rc = 0
Files Examined : 2
Files Completed : 2
Files Failed : 0
Total Bytes : 0
```

## Help command

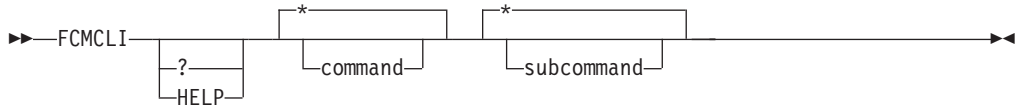
Use the **fccli help** command to display help for Tivoli Storage FlashCopy Manager commands.

This command lists one or more commands and their parameters. For a language other than English, you might be required to set the width of your screen display. Choose a value greater than 80 characters to view the entire help description in a 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.

### FCMCLI command



## Help positional parameters

Positional parameters follow the Tivoli Storage FlashCopy Manager **help** command.

The following positional parameters specify the help to be displayed:

### \* | *command*

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

### \* | *subcommand*

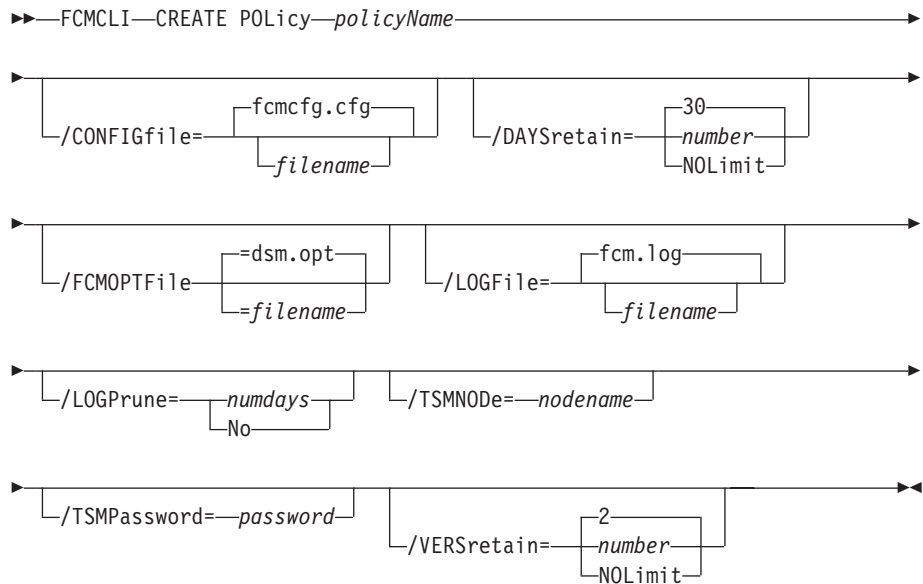
Help can be displayed for commands that have several subcommands, for example, the **query components** command. If you do not specify a subcommand or the wildcard character (\*), help for all Tivoli Storage FlashCopy Manager **query components** commands is displayed.

## Policy commands for Tivoli Storage FlashCopy Manager

### Create Policy

This command is used to create a policy.

### FCMCLI command



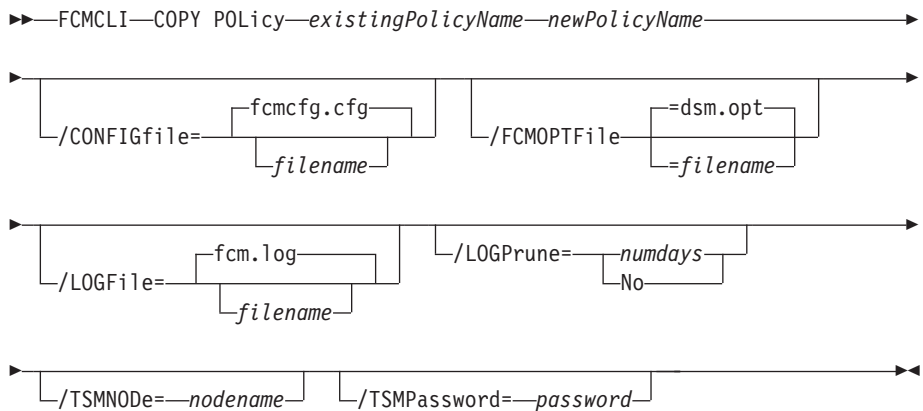
Parameters:

- *policy\_name* (required): Specifies the name of the policy that is being created. To create a policy, the policy name must be unique.
- **/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.
- **/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.

### Copy Policy

This command is used to copy an existing policy to a new policy.

#### FCMCLI command



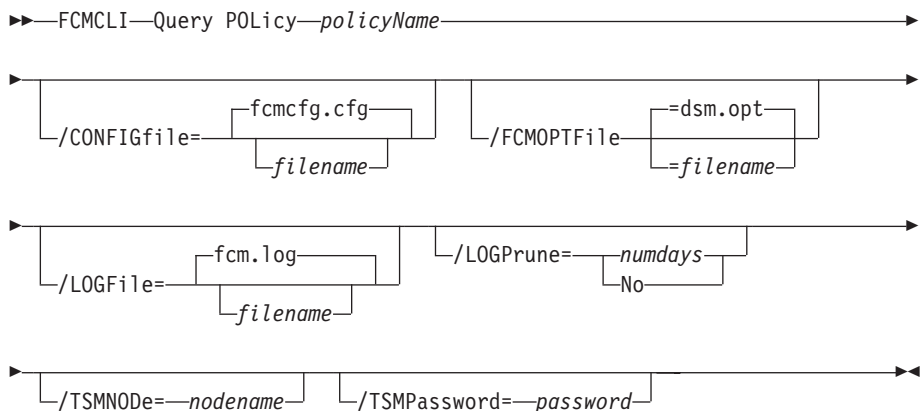
#### Parameters:

- *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.

#### FCMCLI command



#### Parameters:

- **/CONFIGfile=filename** The default is `fcmcfg.xml`.

- **/FCMPTFile=filename** The default is dsm.opt.
- **/LOGFile=filename** The default is fcm.log.
- **/LOGPrune=numdays|No** The default is either 60 or *configuration file value*.
- **/TSMNODE=nodename** The default is *value of nodename in the dsm.opt file*.
- **/TSMPassword=password** The default is None.

For example:

```
c:\Program Files\Tivoli\FlashCopyManager>fcmcli q pol T1
```

```
FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.
```

Policy Definitions

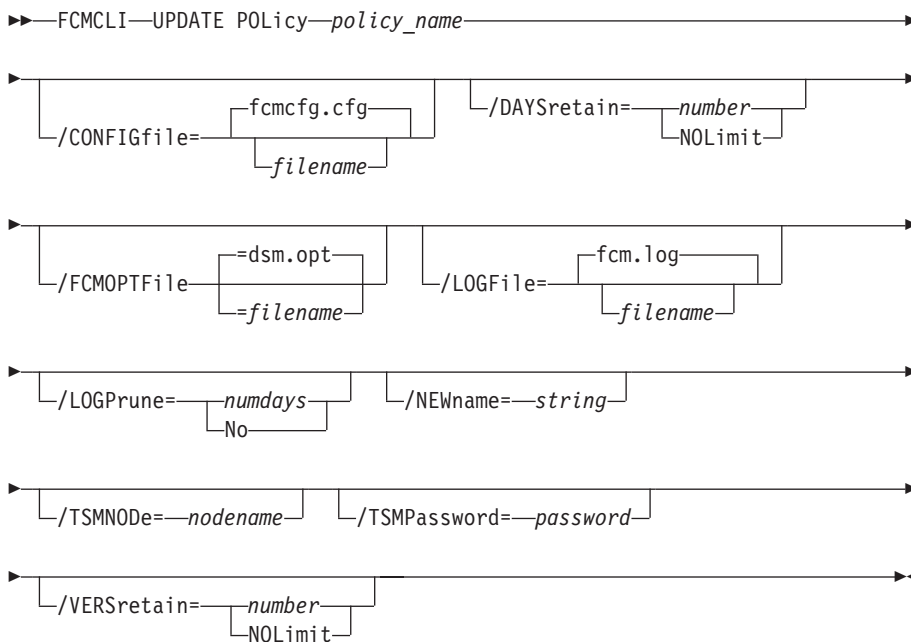
=====

```
Policy Name : T1
Number of snapshots to keep : No Limit
Number of days to retain snapshot : No Limit
```

### Update Policy

This command is used to update or modify an existing policy.

#### FCMCLI command



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.

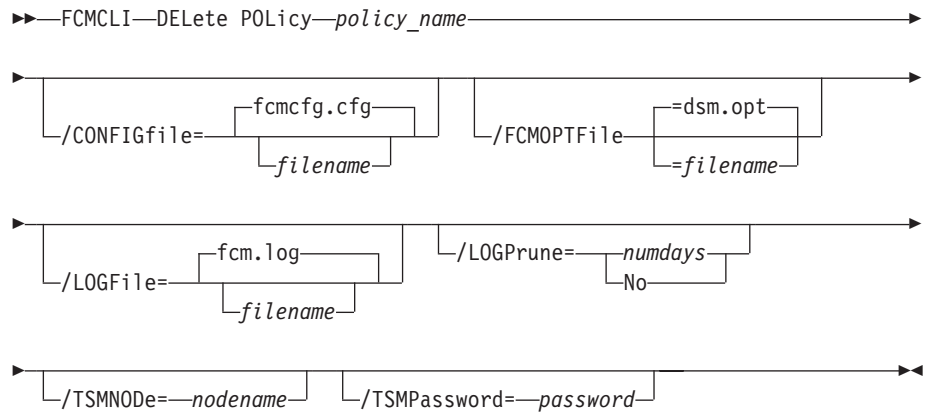


- **DAYSretain:** Specifies the number of days to retain a snapshot (0 - 9999). You can also specify **NOLimit** to represent an unlimited number of days to retain snapshot versions.

### Delete Policy

This command is used to delete a policy.

#### FCMCLI command



The required parameter is *policy\_name*. The parameter specifies the name of the policy that is being deleted.

### Tivoli Storage FlashCopy Manager policy examples

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

In this example, the `fccli create policy FCMPOL1` command creates the *FCMPOL1* policy. The following output is displayed:

```

Policy 'FCMPOL1' was created.

The operation completed successfully. (rc = 0)

Completed

```

In this example, the `fccli delete policy FCMPOL1` command deletes the *FCMPOL1* policy. The following output is displayed:

```

Policy 'FCMPOL1' was deleted.

The operation completed successfully. (rc = 0)

Completed

```

## Mount backup command

Use the **mount backup** command to mount backups that are managed by Tivoli Storage FlashCopy Manager or Tivoli Storage Manager.

### Mount backup syntax

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

### FCMCLI command



### Mount backup positional parameter

The positional parameters immediately follow the **mount backup** command and precede the optional parameters.

The following positional parameters specify the objects to mount:

*component name=mount point*[*,component name=mount point*]

*component name*

Specify the volume or drive name of the component.

*mount point*

Specify an unused drive letter or absolute path to the directory where the snapshots are going to be displayed as mount point directories. The directory must be empty. If not empty, an error is reported.

The list must contain all non-qualified objects or all qualified objects. The list cannot contain a combination of non-qualified objects and qualified objects. Specify the list by using the following syntax:

```
mount backup object-1[(object-1-id)]= mount-point-1[,object-2[(object-2-id)]
=mount-point-2...]
```

For example:

```
fcmlcli mount backup L:=X:
```

```
fcmlcli mount backup g:(2011031112451)=x:
```

The following example is for a non-qualified object object-1:

```
fcmlcli mount backup g:=x:
```

The following example is for a qualified object object-1 (object-1-id):

```
fcmlcli mount backup g:(20110815064316)=x:
```

## Mount backup optional parameters

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

### **/CONFIGfile**=*configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager configuration file that contains the values to use for a **mount 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 installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is `fcmcfg.xml`.

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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

See "Update config positional parameters" on page 305 for descriptions of available configuration parameters.

### **/FCMOPTfile**=*filename*

Use the *filename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/FCMOPTfile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

### **/FROMSERVER**=*server-name*

Use the **/fromserver** parameter to specify the name of the server where the original backup was done. The default is the local server.

### **/LOGfile**=*logfile*

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

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager installation directory.

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

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

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

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

#### **/LOGPrune=numdays | No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning is enabled and done one time 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 GUI or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager command that might prune the log file, do 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.

#### **/PITDate=date**

Use the **/pitdate** parameter with the **/pittime** parameter to establish a point in time for which you want to mount the latest version of your backups. Backups that were backed up on or before the date and time you specified, and, which were not deleted before the date and time you specified, are processed. Backup versions that you create after this date and time are ignored. Specify the appropriate date in the *date* variable; use the same format that you selected with the **DATEFORMAT** option in the Tivoli Storage FlashCopy Manager options file.

If neither *date* nor *time* is specified, then no date and time are established. By default the backup is mounted from the most recent available backup.

If either *date* or *time* is specified, then the backup is mounted from the earliest backup that is selected after the established mount date and time. If no backup after the established date and time is found, by default the backup is mounted from the most recent available backup.

#### **Notes:**

- If you specify both *date* and *time*, this selection establishes the mount backup period.
- If you specify *date* and you do not specify *time*, *time* defaults to a value of 23:59:59. This selection establishes the *date* at the specified date.

- If you specify *time* without *date*, then *date* defaults to the current date. This selection establishes the mount date and time as the current date at the specified *time*.

**/PITTime=***time*

Use the **/pittime** parameter with the **/pitdate** option to establish a point in time for which you want to mount the latest version of your backups. Files or images that were backed up on or before the date and time you specify, and that were not deleted before the date and time you specify, are processed. Backup versions that you create after this date and time are ignored. This option is ignored if you do not specify the **/pitdate** parameter. Specify the appropriate time in the *time* variable; use the same format that you selected with the TIMEFORMAT option in the Tivoli Storage FlashCopy Manager options file.

If neither *date* nor *time* is specified, then no date and time are established. By default the backup is mounted from the most recent available backup.

If either *date* or *time* is specified, then the backup is mounted from the earliest backup that is selected after the established mount date and time. If no backup after the established date and time is found, by default the backup is mounted from the most recent available backup.

**Notes:**

- If you specify both *date* and *time*, this selection establishes the mount backup period.
- If you specify *date* and you do not specify *time*, *time* defaults to a value of 23:59:59. This selection establishes the *date* at the specified date.
- If you specify *time* without *date*, then *date* defaults to the current date. This selection establishes the mount date and time as the current date at the specified *time*.

**/REMOTECOMPUTER=***computername*

Enter the IP address or host name for the remote system where you want to mount the data.

**/REMOTECOMPUTERUser=***user*

Enter the user name that is used to log on to the server specified with the **REMOTECOMPUTER** parameter. If a domain is required to log on with the domain account, enter *Domain\User*. To log on to the local account, the domain is not required. There is no default value.

**/REMOTECOMPUTERPassword=***passwd*

Enter the password for the user name that is specified with the **REMOTECOMPUTERUser** parameter. There is no default value.

**/TSMNODE=***tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if PASSWORDACCESS is set to PROMPT. This parameter is not valid when PASSWORDACCESS is set to GENERATE in the options file.

**/TSMOPTFile=***tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

If the *tsmoptfilename* variable includes spaces, enclose the entire **/tsmoptfile** parameter entry in double quotation marks. For example:  
`/TSMOPTFile="c:\Program Files\file.opt"`

The default is `dsm.opt`.

#### **/TSMPassword=tsmpassword**

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified `PASSWORDACCESS GENERATE` in the Tivoli Storage FlashCopy Manager options file (`dsm.opt`), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when `PASSWORDACCESS GENERATE` is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If `PASSWORDACCESS PROMPT` is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

## **Mount backup examples**

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

In this example, the `fcmlcli mount backup C:=X:` command mounts volume C:. The following output is displayed:

```
FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.

Preparing for a MOUNT BACKUP operation, please wait...

Connecting to TSM Server as node 'STRINGVM1_FS'...
Connecting to Local DSM Agent 'STRINGVM1'...

Backup(s) to be mounted:
C: = X: : VSS : full : 10/04/2011 13:08:50

The operation completed successfully. (rc = 0)
```

In this example, the `fcmlcli mount backup D:\mnt\mp1=M:,D:\mnt\mp2=N: /PITDATE=10/07/2011 /PITTIME=08:53:36` command mounts multiple volumes. The following output is displayed:

```
FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.
```

```
Preparing for a MOUNT BACKUP operation, please wait...
```

```
Connecting to FCM Server as node 'TROYVM1_FS'...
Connecting to Local DSM Agent 'TROYVM1'...
```

```
Backup(s) to be mounted:
```

```
d:\mnt\mp1 = M: : VSS : full : 10/07/2011 08:53:35
d:\mnt\mp2 = N: : VSS : full : 10/07/2011 08:53:36
```

## Query component command

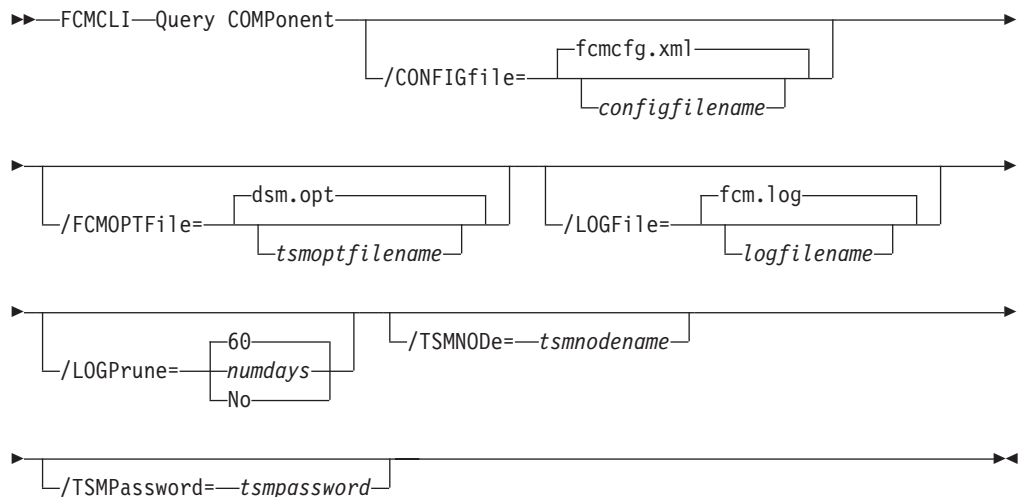
Use the **query component** command to query the VSS components available on the system.

The **query component** command returns a list of the volume and mount points available for backup.

### Query component syntax

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

#### FCMCLI command



### Query component optional parameters

Optional parameters follow the **query component** command.

**/CONFIGfile=filename**

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

The *filename* variable can include a fully qualified path. If the *filename* variable does not include a path, the Tivoli Storage FlashCopy Manager installation directory is used. If the **/configfile** parameter is not specified, or if the *filename* variable is not specified, the default value is `fcmcfg.xml`.



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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

**/FCMOPTFile=filename**

Use the *filename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/FCMOPTfile="c:\Program Files\file.opt"
```

The default is dsm.opt.

**/LOGFile=filename**

Use the **/LOGFile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager. The *filename* 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 *filename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager installation directory.

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

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

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

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

**/LOGPrune=numdays | No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning is enabled and done one time 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 GUI or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file that is being pruned unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager command that might prune the log file, do one of the following actions to prevent the log file from being pruned:

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

**/TSMNODE=nodename**

Use the *nodename* variable to refer to the Tivoli Storage Manager node

name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMPassword=***password*

Use the *password* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (dsm.opt), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS PROMPT** is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

## Query component examples

Examples of how to use the **query component** command are provided.

To query components that are associated with a configuration file, for example, *customconfig.xml*, enter the following command:

```
fccli query component /configfile=customconfig.xml
```

To query components for a list of the volume and mount points that are available for backup, enter the following command:

```
fccli query component
```

## Query config command

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

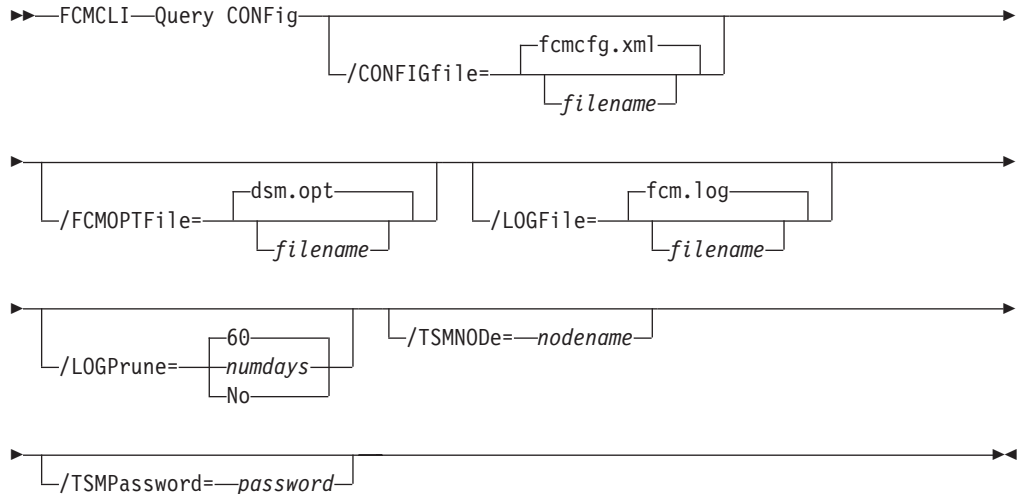
The **query config** command displays the following information:

- The value of each **configuration parameters** parameter
- Tivoli Storage FlashCopy Manager connection and configuration information
- Tivoli Storage Manager server connection and configuration information

## Query config syntax

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

### FCMCLI command



## Query config optional parameters

Optional parameters follow the **query config** command.

### **/CONFIGfile=filename**

Use the **/CONFIGfile** parameter to specify the name (*filename*) of the Tivoli Storage FlashCopy Manager configuration file that contains the values to use for a **query config** operation.

The *filename* variable can include a fully qualified path. If the *filename* variable does not include a path, the Tivoli Storage FlashCopy Manager installation directory is used. If the **/CONFIGfile** parameter is not specified, or if the *filename* variable is not specified, the default value is `fcmcfg.xml`.

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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

### **/FCMOPTfile=filename**

Use the *filename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/FCMOPTfile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

### **/LOGfile=filename**

Use the **/LOGfile** parameter to specify the name of the activity log file that is generated by Tivoli Storage FlashCopy Manager. The *filename* 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 *filename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager installation directory.

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

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

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

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

#### **/LOGPrune=numdays | No**

Use the **/LOGPrune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning is enabled and done one time 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 GUI or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager command that might prune the log file, do one of the following actions to prevent the log file from being pruned:

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

#### **/TSMNode=nodename**

Use the *nodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

#### **/TSMPassword=password**

Use the *password* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (*dsm.opt*), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the

password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If PASSWORDACCESS PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

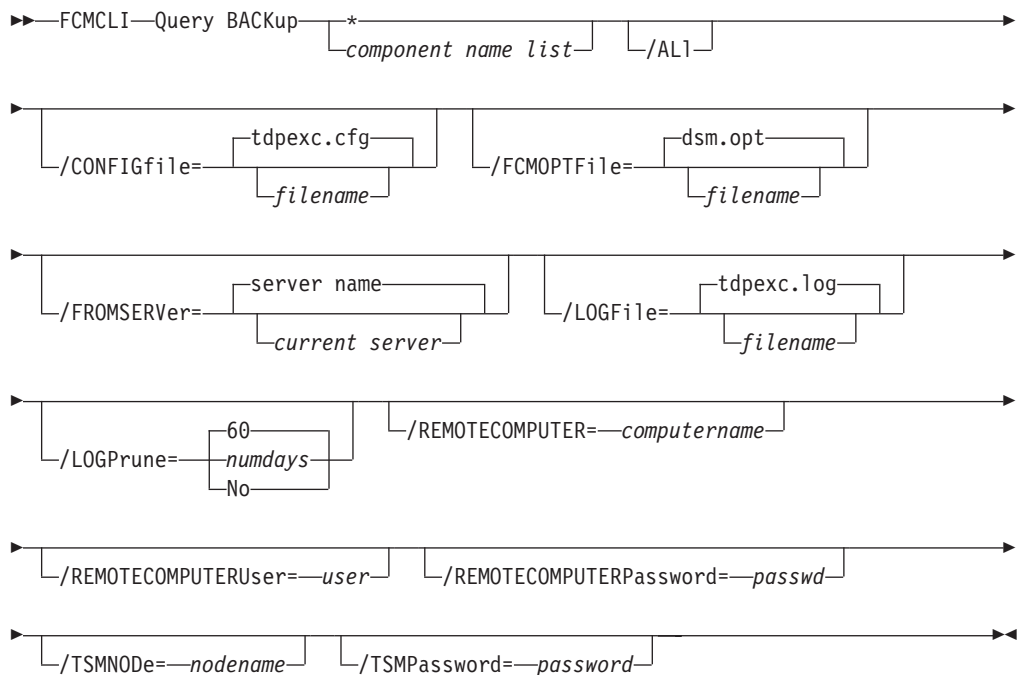
## Query backup command

Use the **query backup** command to query a list of the backups that are being managed by Tivoli Storage FlashCopy Manager and the Tivoli Storage Manager server.

### Query backup syntax

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

#### FCMCLI command



### Query backup positional parameter

The positional parameter immediately follows the **query backup** command and precedes the optional parameters.

Specify the following positional parameters with the **query backup** command:

*component name list* | \*

*component name list*

Specify a list of volume or mount points to query.

- \* All backups are queried and shown in the command output. This option is the default value.

## Query backup optional parameters

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

**/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=filename**

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

The *filename* variable can include a fully qualified path. If the *filename* variable does not include a path, the Tivoli Storage FlashCopy Manager installation directory is used. If the **/configfile** parameter is not specified, or if the *filename* variable is not specified, the default value is `fcmcfg.xml`.

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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

**/FCMPTFile=filename**

Use the *filename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/FCMPTFile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

**/FROMSERVER=server name**

Use the **/fromserver** parameter to specify the name of the server where the original backup was done. The default is the current server.

**/LOGFile=logfilename**

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

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

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

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

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

**/LOGPrune=numdays | No**

Use the **/logprune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning

is enabled and done one time 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 GUI or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager command that might prune the log file, do 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.

**/REMOTECOMPUTER=computername**

Enter the IP address or host name for the remote system where you want to query the data that is backed up.

**/REMOTECOMPUTERUser=user**

Enter the user name that is used to log on to the server specified with the **REMOTECOMPUTER** parameter. If a domain is required to log on with the domain account, enter *Domain\User*. To log on to the local account, the domain is not required. There is no default value.

**/REMOTECOMPUTERPassword=password**

Enter the password for the user name that is specified with the **REMOTECOMPUTERUser** parameter. There is no default value.

**/TSMNODE=nodename**

Use the *nodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMPassword=password**

Use the *password* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (*dsm.opt*), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS PROMPT** is in effect, and you do not specify a password value on the command line, then you are prompted for a password.



The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

### **Query backup example**

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

The **fccli query backup \* /all** command displays information about all active and inactive backups that are managed by Tivoli Storage FlashCopy Manager. An example of the output is provided.

```
FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.
```

```
Querying backups, please wait...
```

```
Connecting to FCM Server as node 'JUNE_FS'...
Connecting to Local DSM Agent 'JUNE'...
```

```
Backups for Volume/Mount Point: 'F:'
```

```
=====
Volume/Mount Point : F:
Volume GUID : aa3683af-4bdc-11de-b146-001a6499a400
Server : JUNE
Volume Occupancy : 10.13MB
Backup Date/Time : 03/31/2013 07:35:11
Backup State : Active
Management Class : DEFAULT
Mounted as :
Object Name : 20130331073511
Instant Restore Supported : No
```

```
Volume/Mount Point : F:
Volume GUID : aa3683af-4bdc-11de-b146-001a6499a400
Server : JUNE
Volume Occupancy : 10.13MB
Backup Date/Time : 03/30/2013 13:50:44
Backup State : Inactive
Management Class : DEFAULT
Mounted as :
Object Name : 20130330135044
Instant Restore Supported : No
```

```
Backups for Volume/Mount Point: 'O:'
```

```
=====
Volume/Mount Point : O:
Volume GUID : aa3683b2-4bdc-11de-b146-001a6499a400
Server : JUNE
Volume Occupancy : 10.12MB
Backup Date/Time : 03/31/2013 07:35:50
Backup State : Active
Management Class : DEFAULT
Mounted as :
Object Name : 20130331073550
Instant Restore Supported : No
```

```
Volume/Mount Point : O:
Volume GUID : aa3683b2-4bdc-11de-b146-001a6499a400
Server : JUNE
Volume Occupancy : 10.12MB
Backup Date/Time : 03/31/2013 07:24:44
Backup State : Inactive
Management Class : DEFAULT
Mounted as :
Object Name : 20130331072444
Instant Restore Supported : No
```

The **fmcli query backup** command displays information about backups that are managed by Tivoli Storage FlashCopy Manager. An example of the output is provided.

```

FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.

Querying backups, please wait...

Connecting to FCM Server as node 'JUNE_FS'...
Connecting to Local DSM Agent 'JUNE'...

Backups for Volume/Mount Point: 'F:'
=====
Volume/Mount Point : F:
Volume GUID : aa3683af-4bdc-11de-b146-001a6499a400
Server : JUNE
Volume Occupancy : 10.13MB
Backup Date/Time : 03/31/2013 07:35:11
Backup State : Active
Management Class : DEFAULT
Mounted as :
Object Name : 20130331073511
Instant Restore Supported : No

Backups for Volume/Mount Point: 'O:'
=====
Volume/Mount Point : O:
Volume GUID : aa3683b2-4bdc-11de-b146-001a6499a400
Server : JUNE
Volume Occupancy : 10.12MB
Backup Date/Time : 03/31/2013 07:35:50
Backup State : Active
Management Class : DEFAULT
Mounted as :
Object Name : 20130331073550
Instant Restore Supported : No

```

The **fcmlcli query backup** command displays information about backups that are managed by Tivoli Storage FlashCopy Manager. An example of the output is provided.

```
FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.
```

```
Querying backups, please wait...
```

```
Connecting to FCM Server as node 'JUNE_FS'...
Connecting to Local DSM Agent 'JUNE'...
```

```
Backups for Volume/Mount Point: 'F:'
```

```
=====
Volume/Mount Point : F:
Volume GUID : aa3683af-4bdc-11de-b146-001a6499a400
Server : JUNE
Volume Occupancy : 10.13MB
Backup Date/Time : 03/31/2013 07:35:11
Backup State : Active
Management Class : DEFAULT
Mounted as :
Object Name : 20130331073511
Instant Restore Supported : No
```

```
Backups for Volume/Mount Point: 'O:'
```

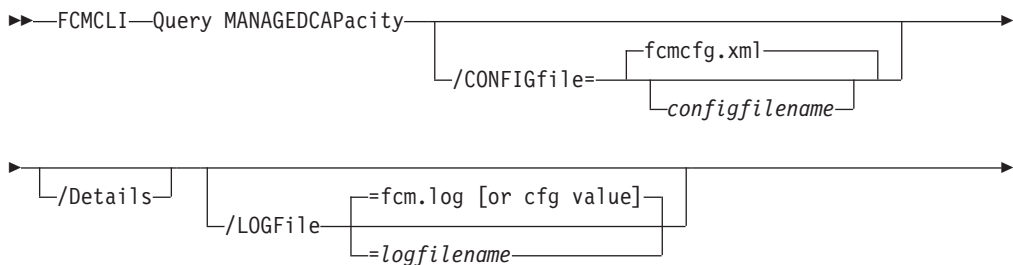
```
=====
Volume/Mount Point : O:
Volume GUID : aa3683b2-4bdc-11de-b146-001a6499a400
Server : JUNE
Volume Occupancy : 10.12MB
Backup Date/Time : 03/31/2013 07:35:50
Backup State : Active
Management Class : DEFAULT
Mounted as :
Object Name : 20130331073550
Instant Restore Supported : No
```

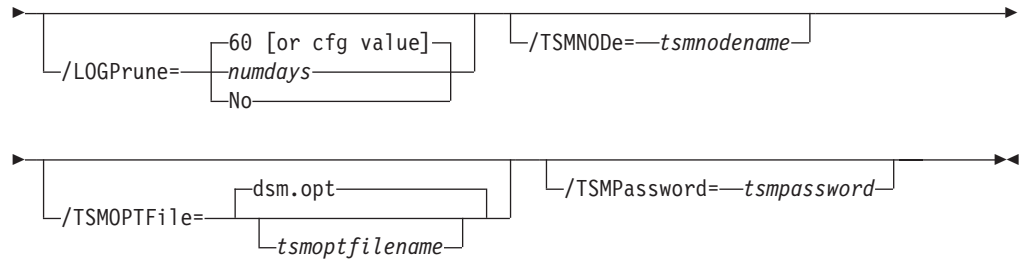
## Query managedcapacity command

When you plan for storage, if you want to determine the amount of managed capacity in use, use the **query managedcapacity** command.

The **query managedcapacity** command displays capacity that is related information about the volumes that are represented in local inventory that is managed by Tivoli Storage FlashCopy Manager. This command is valid for all Windows operating systems that are supported by Tivoli Storage FlashCopy Manager.

### FCMCLI command





## Parameters

### `/CONFIGfile=configfilename`

Use the **/CONFIGfile** parameter to specify the name (*configfilename*) of the configuration file that contains the values to use for a **query managedcapacity** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Tivoli Storage FlashCopy Manager installation directory is used. If the **/CONFIGfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is `fcmcfg.xml`.

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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

### **/Details**

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

### `/LOGFile=logfilename`

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

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

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

If the **/LOGFile** parameter is not specified, log records are written to the default log file, `fcm.log`.

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

### `/LOGPrune=numdays|No`

Use the **/LOGPrune** parameter to disable log pruning or to explicitly request that the log is to be pruned for one command run. By default, log pruning is enabled and done one time 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 graphical user interface or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager command that might prune the log file, do one of the following actions to prevent the log file from being pruned:

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

**/TSMNODE=tsmnode***name*

Use the *tsmnode* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMOPTFile=tsmoptfile***name*

Use the *tsmoptfile* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is *dsm.opt*.

**/TSMPassword=tsmpassword**

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS** GENERATE in the Tivoli Storage FlashCopy Manager options file (*dsm.opt*), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS** GENERATE is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS** PROMPT is in effect, and you do not specify a password value on the command line, you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

For examples of how to use the **query managedcapacity** command, use the following list:

- To display the total amount of managed capacity in use in the local inventory, enter the **fccli query managedcapacity** command.

- To display a detailed listing of total amount of managed capacity and the snapped volumes in use, enter the **fccli query managedcapacity /detailed** command.

## Restore command

Use the **restore** command to restore a Tivoli Storage FlashCopy Manager backup.

You must have local registry rights to run a Tivoli Storage FlashCopy Manager for Exchange restore.

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

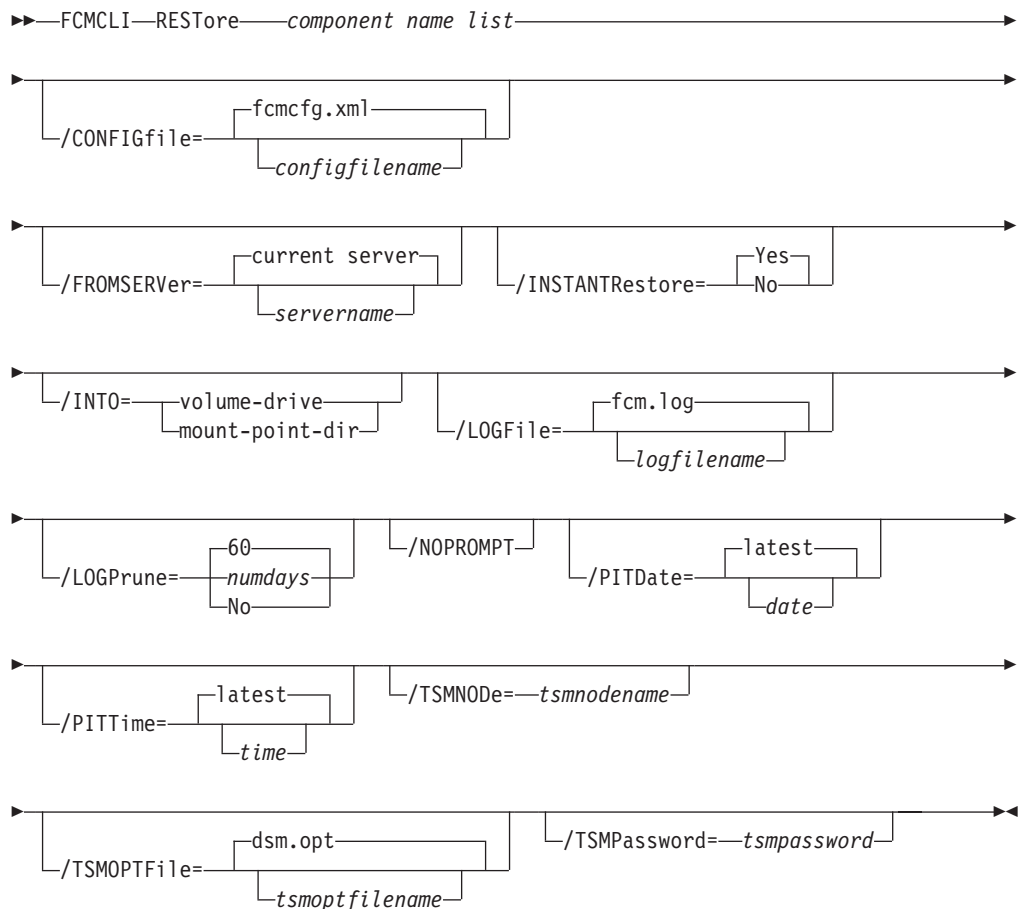
- “VSS restore considerations” on page 177
- “Restore VSS backups into other locations” on page 27

The GUI provides an easy-to-use, flexible interface to help you run a restore operation. The interface presents information in a way that allows multiple selection and, in some cases, automatic operation.

### Restore syntax

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

#### FCMCLI command





## Restore positional parameter

The positional parameter immediately follows the **restore** command and precedes the optional parameters.

Specify the following positional parameter with the **restore** command:

### *component name list*

Specify a list of volume or mount points to restore. The list must contain all non-qualified objects or all qualified objects. The list cannot contain a combination of non-qualified objects and qualified objects.

Specify the component name list by using the following syntax:

```
comp-1[(object-1-id)][,comp-2[(object-2-id)]...]
```

where *comp-n* is the component to restore, and *obj-id-n* is the object ID of the specific backup to restore. The object ID can be obtained through the **query backup** command.

For example:

```
fcmccli restore g:(20110311124516),h:(20110211034512),r:(20101114164310)
```

## Restore optional parameters

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

### **/CONFIGfile=***configfilename*

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

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Tivoli Storage FlashCopy Manager installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is `fcmcfg.xml`.

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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

See "Update config positional parameters" on page 305 for descriptions of available configuration parameters.

### **/FROMSERVER=***server-name*

Use the **/fromserver** parameter to specify the name of the server where the original backup was done. The default is the local server.

### **/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 are on local shadow volumes. An IBM Systems Storage SAN Volume Controller, DS8000, the XIV system, or IBM Storwize V7000 storage subsystem is required to perform VSS instant restores.

You can specify:

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

**No** Use file level copy to restore the files from a VSS backup on local shadow volumes. Bypassing volume-level copy means that Exchange log files and the checkpoint file are the only data overwritten on the source volumes.

When you complete VSS instant restores with DS8000, make sure that any previous background copies (that involve the volumes that are being restored) are completed before you initiate the VSS instant restore. 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.

**/INTO**=*volume-drive* | *mount-point-dir*

Use the **/into** parameter to restore the backup that is stored on Tivoli Storage Manager server to an alternate destination.

You can specify either *volume-drive* or *mount-point-dir*. The *volume-drive* or *mount-point-dir* location that you specify must be present on the server; the location is not dynamically created.

The **/into** parameter is supported for one restore per command. Multiple restore specifications with the **/into** parameter are not supported.

The following sample provides an example of how to use the parameter:

```
FCMCLI RESTORE M: /INTO=P:
```

**/LOGFile**=*logfile*

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

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager installation directory.

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

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

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

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

**/LOGPrune**=*numdays* | **No**

Use the **/logprune** parameter to disable log pruning or to explicitly request to prune the log for one command run. By default, log pruning is enabled and done one time 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 GUI or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or

**dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager command that might prune the log file, do 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.

#### **/NOPROMPT**

When the **restore** command is issued, you are prompted to confirm whether to overwrite the volumes you specified for restore. Use the **/noprompt** parameter to bypass this prompt and proceed with the restore operation.

#### **/PITDate=*date***

Use the **/pitdate** parameter with the **/pittime** parameter to establish a point in time for which you want to restore the latest version of your backups. Backups that were backed up on or before the date and time you specified, and, which were not deleted before the date and time you specified, are processed. Backup versions that you create after this date and time are ignored. Specify the appropriate date in the *date* variable; use the same format that you selected with the DATEFORMAT option in the Tivoli Storage FlashCopy Manager options file.

If neither *date* nor *time* is specified, then no date and time are established. By default the backup is restored from the most recent available backup.

If either *date* or *time* is specified, then the backup is restored from the earliest backup that is selected after the established restore date and time. If no backup after the established date and time is found, by default the backup is restored from the most recent available backup.

#### **Notes:**

- If you specify both *date* and *time*, this selection establishes the restore period.
- If you specify *date* and you do not specify *time*, *time* defaults to a value of 23:59:59. This selection establishes the *date* at the specified date.
- If you specify *time* without *date*, then *date* defaults to the current date. This selection establishes the restore date and time as the current date at the specified *time*.

#### **/PITTime=*time***

Use the **/pittime** parameter with the **/pitdate** option to establish a point in time for which you want to restore the latest version of your backups. Files or images that were backed up on or before the date and time you specify, and that were not deleted before the date and time you specify, are processed. Backup versions that you create after this date and time are ignored. This option is ignored if you do not specify the **/pitdate** parameter. Specify the appropriate time in the *time* variable; use the same format that you selected with the TIMEFORMAT option in the Tivoli Storage FlashCopy Manager options file.

If neither *date* nor *time* is specified, then no date and time are established. By default the backup is restored from the most recent available backup.

If either *date* or *time* is specified, then the backup is restored from the earliest backup that is selected after the established restore date and time. If no backup after the established date and time is found, by default the backup is restored from the most recent available backup.

**Notes:**

- If you specify both *date* and *time*, this selection establishes the restore period.
- If you specify *date* and you do not specify *time*, *time* defaults to a value of 23:59:59. This selection establishes the *date* at the specified date.
- If you specify *time* without *date*, then *date* defaults to the current date. This selection establishes the restore date and time as the current date at the specified *time*.

**/TSMNODE=***tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMOPTFile=***tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is *dsm.opt*.

**/TSMPassword=***tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (*dsm.opt*), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS PROMPT** is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

## Restore examples

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

In this example, the `fccli restore K:,L: /INSTANTRestore=No` command restores volumes K: and L:. The following output is displayed:

```
FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.

You have selected a full filesystem RESTORE operation. Performing this restore
will overwrite the volumes that you have specified for restore.

Do you want to continue with the RESTORE operation? (Yes (Y)/No (N)) y

Preparing for a RESTORE operation, please wait...

Starting restore of volume...

Beginning VSS restore of 'K:', 'L:'. This operation could take a while, please wait...

Restoring 'K:', 'L:' via file-level copy from snapshot(s). This process may take
some time. Please wait.

VSS Restore operation completed with rc = 0.

Elapsed Processing Time: 385.23 seconds
```

In this example, the `fccli restore D:\mnt\mp1,D:\mnt\mp2 /PITDATE=10/07/2013 /PITTIME=08:53:36` command restores mount points D:\mnt\mp1 and ,D:\mnt\mp2. The following output is displayed:

```
FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.
```

You have selected a full filesystem RESTORE operation. Performing this restore will overwrite the volumes that you have specified for restore.

Do you want to continue with the RESTORE operation? (Yes (Y)/No (N)) y

Preparing for a RESTORE operation, please wait...

Starting restore of volume...

Beginning VSS restore of 'd:\mnt\mp1', 'd:\mnt\mp2'. This operation could take a while, please wait...

Restoring 'd:\mnt\mp1', 'd:\mnt\mp2' via volume-level copy from snapshot(s). This process may take some time. Please wait.

VSS Restore operation completed with rc = 0.

Elapsed Processing Time: 162.23 seconds

In this example, the `fccli restore K:,L: /FROMSERVER=troyvm1` command restores volumes K: and L: from server troyvm1. The following output is displayed:

```
FlashCopy Manager for Windows:
IBM Tivoli Storage FlashCopy Manager
Version 4, Release 1, Level 0.0
(C) Copyright IBM Corporation 2009, 2013. All rights reserved.
```

You have selected a full filesystem RESTORE operation. Performing this restore will overwrite the volumes that you have specified for restore.

Do you want to continue with the RESTORE operation? (Yes (Y)/No (N)) y

Preparing for a RESTORE operation, please wait...

Starting restore of volume...

Beginning VSS restore of 'K:', 'L:'. This operation could take a while, please wait...

Restoring 'K:', 'L:' via volume-level copy from snapshot(s). This process may take some time. Please wait.

VSS Restore operation completed with rc = 0.

Elapsed Processing Time: 161.57 seconds

## Unmount backup command

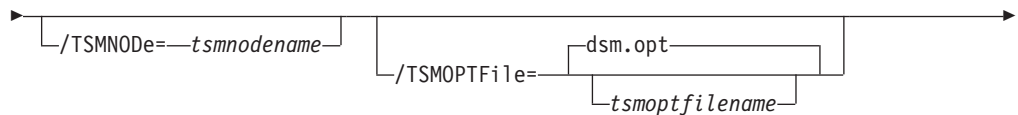
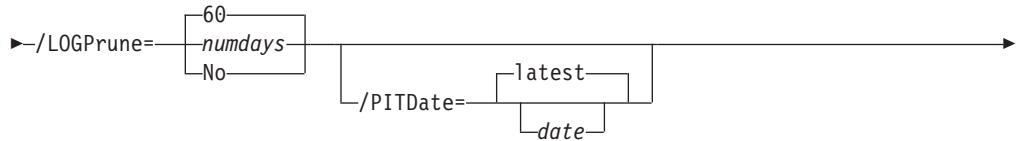
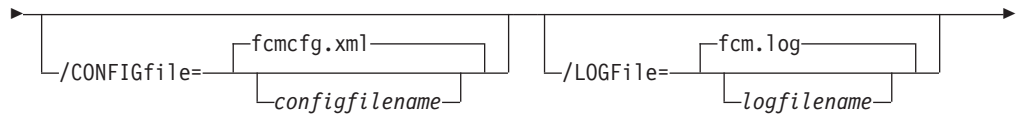
Use the **unmount backup** command to unmount backups that were previously mounted, and are managed by Tivoli Storage FlashCopy Manager or Tivoli Storage Manager.

### Unmount backup syntax

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

#### FCMCLI command

►► FCMCLI—UNMOUNT BACKup—*volume name list*—►►



### Unmount backup positional parameter

The positional parameter immediately follows the **unmount backup** command and precedes the optional parameters.

#### *volume name list*

Use this parameter to specify a drive letter (for example, a:) or list of mount point directories to unmount. The *volume name list* parameter is required.

To specify more than one name, separate them by commas.



## Unmount backup optional parameters

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

### **/CONFIGfile**=*configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager configuration file that contains the values to use for an **unmount 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 installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is `fcmcfg.xml`.

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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

### **/LOGFile**=*logfile*

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

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Tivoli Storage FlashCopy Manager installation directory.

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

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

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

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

### **/LOGPrune**=*numdays* | **No**

Use the **/logprune** parameter to disable log pruning or to explicitly request to prune the log for one command run. By default, log pruning is enabled and done one time 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 GUI or the **update config** 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 - 9999, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **timeformat** or **dateformat** parameter can result in pruning the log file unintentionally. If the value of the **timeformat** or **dateformat** parameter is changed, before you issue a Tivoli Storage FlashCopy Manager command that might prune the log file, do 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.

### **/PITDate=*date***

Use the **/pitdate** parameter with the **/pittime** parameter to establish a point in time for which you want to mount the latest version of your backups. Backups that were backed up on or before the date and time you specified, and, which were not deleted before the date and time you specified, are processed. Backup versions that you create after this date and time are ignored. Specify the appropriate date in the *date* variable; use the same format that you selected with the DATEFORMAT option in the Tivoli Storage FlashCopy Manager options file.

If neither *date* nor *time* is specified, then no date and time are established. By default the backup is mounted from the most recent available backup.

If either *date* or *time* is specified, then the backup is mounted from the earliest backup that is selected after the established mount date and time. If no backup after the established date and time is found, by default the backup is mounted from the most recent available backup.

#### **Notes:**

- If you specify both *date* and *time*, this selection establishes the mount backup period.
- If you specify *date* and you do not specify *time*, *time* defaults to a value of 23:59:59. This selection establishes the *date* at the specified date.
- If you specify *time* without *date*, then *date* defaults to the current date. This selection establishes the mount date and time as the current date at the specified *time*.

### **/PITTime=*time***

Use the **/pittime** parameter with the **/pitdate** option to establish a point in time for which you want to mount the latest version of your backups. Files or images that were backed up on or before the date and time you specify, and that were not deleted before the date and time you specify, are processed. Backup versions that you create after this date and time are ignored. This option is ignored if you do not specify the **/pitdate** parameter. Specify the appropriate time in the *time* variable; use the same format that you selected with the TIMEFORMAT option in the Tivoli Storage FlashCopy Manager options file.

If neither *date* nor *time* is specified, then no date and time are established. By default the backup is mounted from the most recent available backup.

If either *date* or *time* is specified, then the backup is mounted from the earliest backup that is selected after the established mount date and time. If no backup after the established date and time is found, by default the backup is mounted from the most recent available backup.

#### **Notes:**

- If you specify both *date* and *time*, this selection establishes the mount backup period.
- If you specify *date* and you do not specify *time*, *time* defaults to a value of 23:59:59. This selection establishes the *date* at the specified date.
- If you specify *time* without *date*, then *date* defaults to the current date. This selection establishes the mount date and time as the current date at the specified *time*.

**/REMOTECOMPUTER**=*computername*

Enter the computer name or IP address of the remote system where the backup was created.

**/REMOTECOMPUTERUser**=*user*

Enter the user name that is used to log on to the server specified with the **REMOTECOMPUTER** parameter. If a domain is required to log on with the domain account, enter *Domain\User*. To log on to the local account, the domain is not required. There is no default value.

**/REMOTECOMPUTERPassword**=*passwd*

Enter the password for the user name that is specified with the **REMOTECOMPUTERUser** parameter. There is no default value.

**/TSMNODE**=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. You can store the node name in the Tivoli Storage Manager options file (*dsm.opt*). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

**/TSMOPTFile**=*tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Tivoli Storage Manager options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Tivoli Storage FlashCopy Manager is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is *dsm.opt*.

**/TSMPassword**=*tsmpassword*

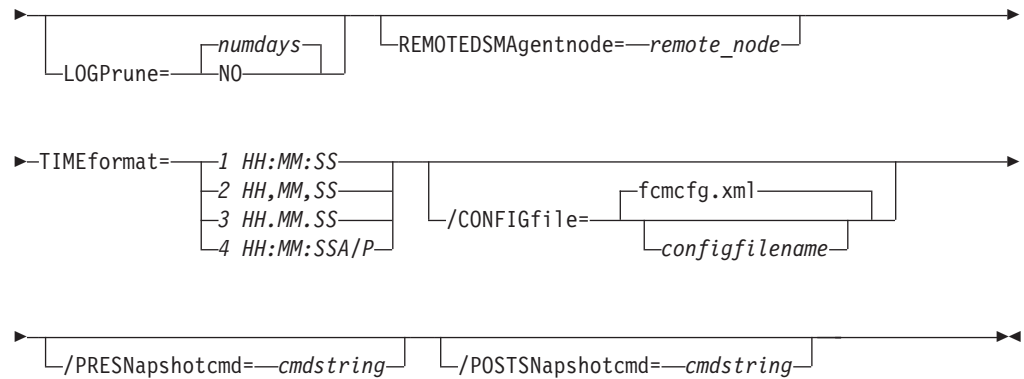
Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server. If you specified **PASSWORDACCESS GENERATE** in the Tivoli Storage FlashCopy Manager options file (*dsm.opt*), supplying the password is not necessary here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Tivoli Storage FlashCopy Manager connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS GENERATE** is in effect, the command-line value is ignored unless the password for this node is not yet stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS PROMPT** is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Tivoli Storage FlashCopy Manager uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.





## Update config positional parameters

Positional parameters immediately follow the **update config** command and precede the optional parameters.

The following positional parameters specify the values in the Tivoli Storage FlashCopy Manager configuration file. You can set only one value for each **update config** 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 format is the default.
- 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 (`fcml.log` by default). You can avoid losing existing log file data by doing one of the following actions:

- After you change the value of the **dateformat** parameter, make a copy of the existing log file before you run Tivoli Storage FlashCopy Manager.
- Specify a new log file with the **/logfile** parameter.

### **IMPORTVSSSNAPSHOTSONLYWhenneeded**=Yes | No

By default, the parameter is set to No. This default setting means that local persistent VSS snapshots are automatically imported to the Windows system where the snapshots are created. By importing the VSS snapshots only when needed, the snapshots are imported to a host for FlashCopy Manager operations. To not automatically import local persistent snapshots to the Windows system where the snapshots are created, set the parameter to Yes.

**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 option 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 system that runs the VSS backups. This positional parameter must be specified for VSS operations to be performed.

**LOGFile**=*logfile*

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

The *logfile* variable identifies the name of the activity log file. If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfile* variable can include a fully qualified path. However, if no path is specified, the log file is assigned to the Tivoli Storage FlashCopy Manager 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 done one time per day. The *numdays* variable represents the number of days to save log entries. You can specify a value of **No** or 0 - 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 by using one of the following formats. Select the format number that corresponds to the format you want to use.

- 1** n,nnn.dd. This format is the default.
- 2** n,nnn,dd.
- 3** n nnn,dd
- 4** n nnn.dd
- 5** n.nnn,dd
- 6** n'nnn,dd

**REMOTEDSMAgentnode**=*remote\_node*

Specifies the remote client node that runs the VSS offloaded backups on a remote computer.

**TIMEformat**=*formatnumber*

Use the **TIMEformat** positional parameter to specify the format in which you want to display the system time.

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

## Update config optional parameters

Optional parameters follow the **update config** command and positional parameters.

**/CONFIGfile**=*configfilename*

Use the **/configfile** parameter to specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager configuration file that contains the values to use for an **update config** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Tivoli Storage FlashCopy Manager installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is `fcmcfg.xml`.

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

```
/CONFIGfile="c:\Program Files\fcmcfg.xml"
```

**/PRESnapshotcmd**=*cmdstring*

The **/presnapshotcmd** parameter runs a command or script before a snapshot operation begins. You can use this optional parameter to quiesce an application before a snapshot is created. You can then restart the application after the snapshot is started by using the **/postsnapshotcmd** optional parameter. The *cmdstring* variable specifies the command to run before the snapshot operation begins. You must specify the fully qualified path name for the command script.

**/POSTSNAPSHOTcmd**=*cmdstring*

The **/postsnapshotcmd** parameter runs a command or script after a snapshot operation ends. You can use this optional parameter to resume the application after the snapshot is created. This parameter is used with the **/presnapshotcmd** parameter. The *cmdstring* variable must be a fully qualified path.



## Update config example

This output example provides a sample of the text, messages, and process status that displays when you use the **update config** command.

The **fccli update config localdsmagentnode=server12** command sets the node name server12 as the local system that performs the VSS backups. An example of the output is provided:

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

The **fccli update config numberformat=2** command specifies that the 2 format is used to display numbers (n,nnn,dd.). An example of the output is provided:

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

The **fccli update config localdsmagentnode=server44 /configfile=fcmcfg\_server44.xml** command sets the node name server44 as the local system that performs the VSS backups. This command also specifies that Tivoli Storage FlashCopy Manager operations use the settings in the fcmcfg\_server44.xml configuration file. An example of the output is provided:

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

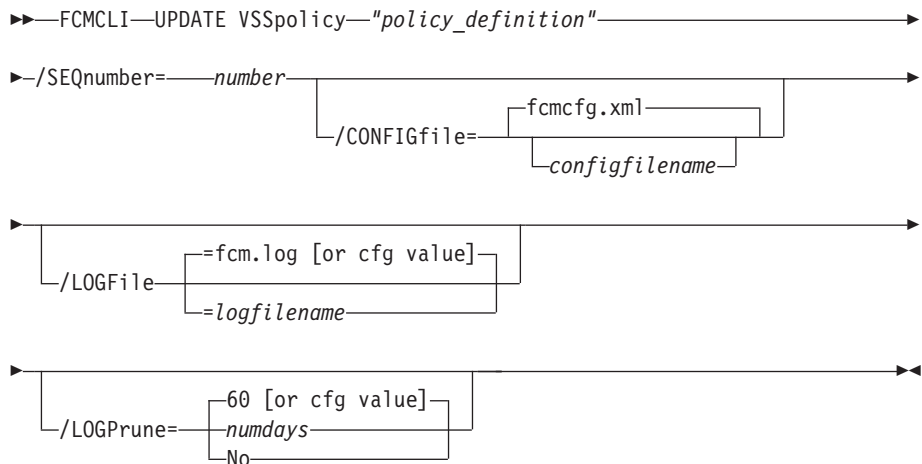
## VSS policy commands

Use VSS policy commands to manage VSS policy binding statements.

### UPDATE VSSPolicy

This command is used to update an existing VSS policy binding statement.

#### FCMCLI command: UPDATE VSSpolicy



#### Parameters:

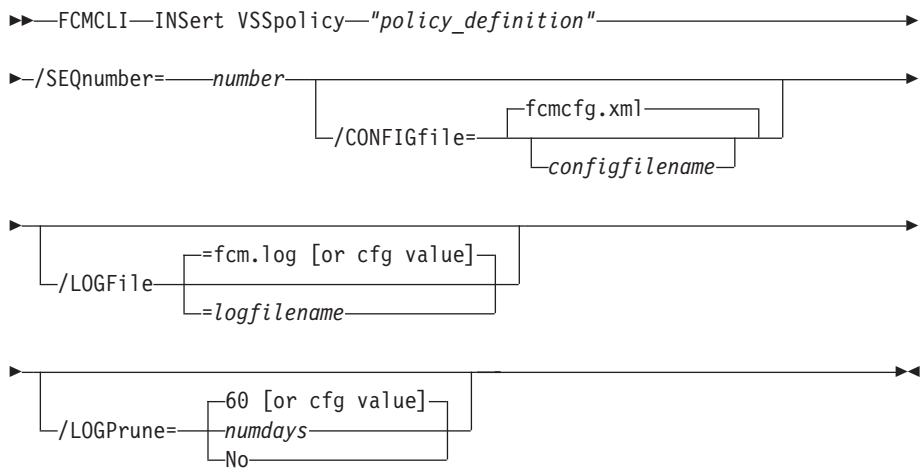
- **policy\_definition**: Specifies the name of the VSS policy binding statement that is being updated.
- **SEQnumber**: Specifies the sequence priority for the updated policy binding statement.

- **CONFIGfile:** Specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager configuration file that contains the values to use with the **update vsspolicy** command.
- **LOGFile:** Specify the name (*logfile*) of the activity log file to use with the **update vsspolicy** command.
- **LOGPrune:** Specify whether to disable log pruning or to prune the log for one command run. By default, log pruning occurs daily. 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.

### INSert VSSpolicy

This command inserts a new VSS policy binding statement at the position that is specified by the **/SEQnumber** parameter.

#### FCMCLI command: INSert VSSpolicy



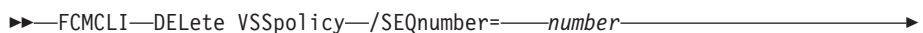
#### Parameters:

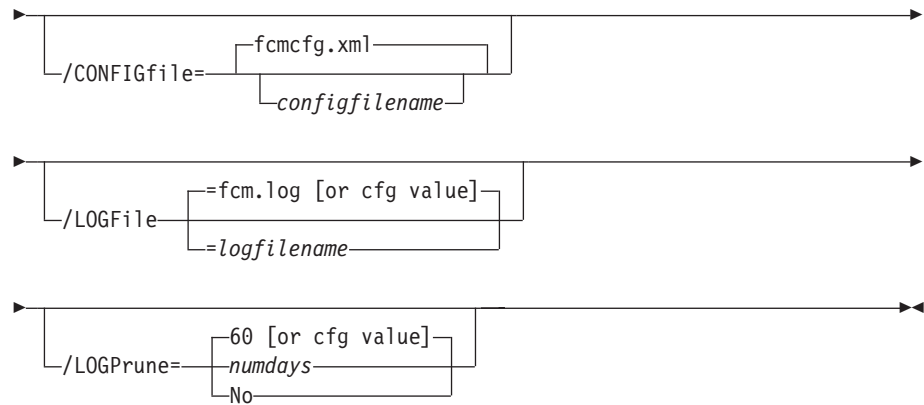
- *policy\_definition*: Specifies the name of the VSS policy binding statement that is being updated.
- **SEQnumber**: Specifies the sequence priority for the inserted policy binding statement.
- **CONFIGfile**: Specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager configuration file that contains the values to use with the **insert vsspolicy** command.
- **LOGFile**: Specify the name (*logfile*) of the activity log file to use with the **insert vsspolicy** command.
- **LOGPrune**: Specify whether to disable log pruning or to prune the log for one command run. By default, log pruning occurs daily. 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.

### DELeTe VSSpolicy

This command is used to delete a VSS policy binding statement at the position that is specified by the **/SEQnumber** parameter.

#### FCMCLI command: DELeTe VSSpolicy





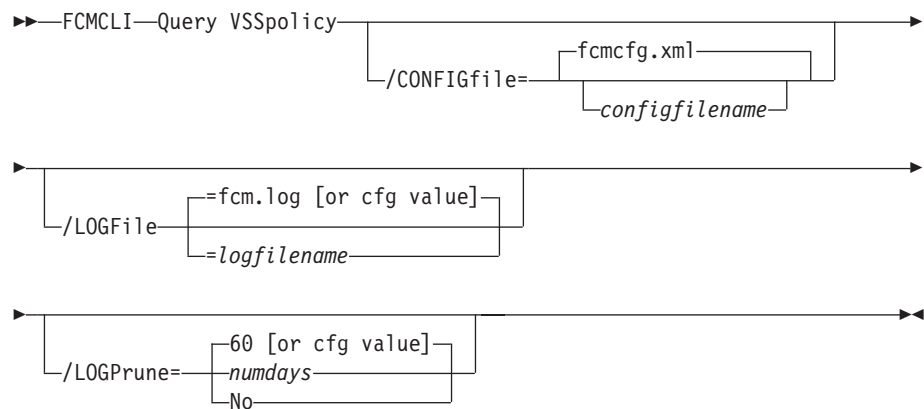
Parameters:

- **SEQnumber:** Specifies the sequence priority for the policy binding statement to delete.
- **CONFIGfile:** Specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager configuration file that contains the values to use with the **delete vsspolicy** command.
- **LOGFile:** Specify the name (*logfile*) of the activity log file to use with the **delete vsspolicy** command.
- **LOGPrune** Specify whether to disable log pruning or to prune the log for one command run. By default, log pruning occurs daily. 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.

**Query VSSpolicy**

This command is used to show the VSS policy binding statements in the configuration file.

**FCMCLI command: Query VSSpolicy**



Parameters:

- **CONFIGfile:** Specify the name (*configfilename*) of the Tivoli Storage FlashCopy Manager configuration file to show.
- **LOGFile:** Specify the name (*logfile*) of the activity log file to use with the **query vsspolicy** command.
- **LOGPrune:** Specify whether to disable log pruning or to prune the log for one command run. By default, log pruning occurs daily. 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.

## VSS policy command examples

The following output examples provide a sample of the text, messages, and process status that displays when you use the VSS policy commands.

In this example, the **fcmdi update vsspolicy "\* \* FULL LOCAL STANDARD" /SEQnumber=2** command updates the default VSS policy binding statement at sequence priority 2. The following output is displayed:

```
UPDATE VSSpolicy was successful.
```

In this example, the **fcmdi insert vsspolicy "\* \* FULL LOCAL STANDARD" /SEQnumber=2** command inserts the default VSS policy binding statement at sequence priority 2. The following output is displayed:

```
INSERT VSSpolicy was successful.
```

In this example, the **fcmdi delete vsspolicy /SEQnumber=1** command deletes the VSS policy binding statement at sequence priority 1. The following output is displayed:

```
DELETE VSSpolicy was successful.
```

In this example, the **fcmdi query vsspolicy /configfile=fmcfgr\_server44.xml** command queries the VSS policy binding statements in the `fmcfgr_server44.xml` configuration file. The following output is displayed:

```
FCM for Windows VSS Policy
```

VSS policy statements are processed from the bottom up and processing stops at the first match. To ensure that more specific specifications are processed at all, the more general specification should be listed before the more specific ones, so as to be processed after the more specific specifications. Otherwise, the more general specification will match the target before the more specific specifications are seen.

```

Sequence Number 1
Server SERVER44
Component C:
Backup Type FULL
Backup Destination LOCAL
Management Class STANDARD
```



---

## Appendix A. Tivoli support information

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

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

---

## Communities and other learning resources

In addition to product documentation, many forms of assistance are available to help you get started as you deploy and use the Tivoli Storage Manager family of products. These resources can also help you to solve problems that you might have.

You can use forums, wikis, and other social media tools to ask questions, talk to experts, and learn from others.

### User groups

#### Tivoli Global Storage Virtual User Group

Access this user group at <http://www.tivoli-ug.org/storage>.

This group makes it possible for individuals from many different industries and types of organizations to share information and work directly with the IBM product experts. Local chapters also exist where members meet in person to share experiences and hear from guest speakers.

#### ADSM.ORG

Access this mailing list at <http://adsm.org>.

This independently managed Storage Management discussion forum started when Tivoli Storage Manager was known as ADSTAR Distributed Storage Manager (ADSM). The members of this forum have many years of experience with Tivoli Storage Manager in almost every type of IT environment.

To subscribe to the forum, send an email to [listserv@vm.marist.edu](mailto:listserv@vm.marist.edu). The body of the message must contain the following text: `SUBSCRIBE ADSM-L your_first_name your_family_name`.

### Tivoli Storage Manager community on Service Management Connect

Access Service Management Connect at <http://www.ibm.com/developerworks/servicemanagement>. In the Storage Management community of Service Management Connect, you can connect with IBM in the following ways:

- Become involved with transparent development, an ongoing, open engagement between users and IBM developers of Tivoli products. You can access early designs, sprint demonstrations, product roadmaps, and prerelease code.
- Connect one-on-one with the experts to collaborate and network about Tivoli and the Tivoli Storage Manager community.
- Read blogs to benefit from the expertise and experience of others.

- Use wikis and forums to collaborate with the broader user community.

## **Tivoli Storage Manager wiki on developerWorks**

Access this wiki at <https://www.ibm.com/developerworks/servicemanagement/sm/index.html>.

Find the latest best practices, white papers, and links to videos and other resources. When you log on, you can comment on content, or contribute your own content.

## **Tivoli Support Technical Exchange**

Find information about upcoming Tivoli Support Technical Exchange webcasts at [http://www.ibm.com/software/sysmgmt/products/support/supp\\_tech\\_exch.html](http://www.ibm.com/software/sysmgmt/products/support/supp_tech_exch.html). Replays of previous webcasts are also available.

Learn from technical experts who share their knowledge and then answer your questions. The sessions are designed to address specific technical issues and provide in-depth but narrowly focused training.

## **Other social media sites**

### **LinkedIn**

You can join groups on LinkedIn, a social media site for professionals. For example:

- **Tivoli Storage Manager Professionals:** <http://www.linkedin.com/groups/Tivoli-Storage-Manager-Professionals-54572>
- **TSM:** <http://www.linkedin.com/groups?gid=64540>

### **Twitter**

Follow @IBMStorage on Twitter to see the latest news about storage and storage software from IBM.

## **Tivoli education resources**

Use these education resources to help you increase your Tivoli Storage Manager skills:

### **Tivoli Education and Certification website**

View available education at <http://www.ibm.com/software/tivoli/education>.

Use the Search for Training link to find local and online offerings of instructor-led courses for Tivoli Storage Manager.

### **Education Assistant**

Access resources at <http://publib.boulder.ibm.com/infocenter/ieduasst/tivv1r0/index.jsp>.

Scroll to view the list of available training videos. Recorded product demonstrations are also available on a YouTube channel.



---

## Searching knowledge bases

If a problem occurs while you are using one of the Tivoli Storage Manager family of products, you can search several knowledge bases.

Begin by searching the Tivoli Storage Manager Information Center at <http://pic.dhe.ibm.com/infocenter/tsminfo/v7r1>. Within the information center, you can enter words, phrases, or message numbers in the **Search** field to find relevant topics.

## Searching the Internet

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

To search multiple Internet resources, go to the IBM support website at <http://www.ibm.com/support/entry/portal/>. You can search for information without signing in.

Sign in using your IBM ID and password if you want to customize the site based on your product usage and information needs. If you do not already have an IBM ID and password, click **Sign in** at the top of the page and follow the instructions to register.

From the support website, you can search various resources:

- IBM technotes.
- IBM downloads.
- IBM Redbooks® publications.
- IBM Authorized Program Analysis Reports (APARs). Select the product and click **Downloads** to search the APAR list.

## Using IBM Support Assistant

IBM Support Assistant is a complimentary software product that can help you with problem determination. It is available for some Tivoli Storage Manager and Tivoli Storage FlashCopy Manager products.

IBM Support Assistant helps you gather support information when you must open a problem management record (PMR), which you can then use to track the problem. The product-specific plug-in modules provide you with the following resources:

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

You can find more information and download the IBM Support Assistant web page at <http://www.ibm.com/software/support/isa>.

You can also install the stand-alone IBM Support Assistant application on any workstation. You can then enhance the application by installing product-specific plug-in modules for the IBM products that you use. Find add-ons for specific products at <http://www.ibm.com/support/docview.wss?uid=swg27012689>.

## Finding product fixes

A product fix to resolve a software problem might be available from the IBM software support website.

### Procedure

Determine what fixes are available by checking the IBM software support website at <http://www.ibm.com/support/entry/portal/>.

**If you previously customized the site based on your product usage:**

1. Click the link for the product, or a component for which you want to find a fix.
2. Click **Downloads**, and then click **Search for recommended fixes**.

**If you have not previously customized the site:**

Click **Downloads** and search for the product.

## Receiving notification of product fixes

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

### Procedure

1. From the support page at <http://www.ibm.com/support/entry/portal/>, click **Sign in** and sign in using your IBM ID and password. If you do not have an ID and password, click **register now** and complete the registration process.
2. Click **Manage all my subscriptions** in the Notifications pane.
3. Click the **Subscribe** tab, and then click **Tivoli**.
4. Select the products for which you want to receive notifications and click **Continue**.
5. Specify your notification preferences and click **Submit**.

---

## Contacting IBM Software Support

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

### Procedure

1. Ensure that you have completed the following prerequisites:
  - a. Set up a subscription and support contract.
  - b. Determine the business impact of the problem.
  - c. Describe the problem and gather background information.
2. Follow the instructions in "Submitting the problem to IBM Software Support" on page 318.

## Setting up and managing support contracts

You can set up and manage your Tivoli support contracts by enrolling in IBM Passport Advantage®. The type of support contract that you need depends on the type of product you have.

### Procedure

Enroll in IBM Passport Advantage in one of the following ways:

- **Online:** Go to the Passport Advantage website at <http://www.ibm.com/software/lotus/passportadvantage/>, click **How to enroll**, and follow the instructions.
- **By telephone:** For critical, system-down, or high-severity issues, you can call 1-800-IBMSERV (1-800-426-7378) in the United States. For the telephone number to call in your country, go to the IBM Software Support Handbook web page at <http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html> and click **Contacts**.

## Determining the business impact

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

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

## Describing the problem and gathering background information

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

To save time, know the answers to these questions:

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

## Submitting the problem to IBM Software Support

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

### Online

Go to the IBM Software Support website at [http://www.ibm.com/support/entry/portal/Open\\_service\\_request/Software/Software\\_support\\_\(general\)](http://www.ibm.com/support/entry/portal/Open_service_request/Software/Software_support_(general)). Sign in to access IBM Service Requests and enter your information into the problem submission tool.

### By telephone

For critical, system-down, or severity 1 issues, you can call 1-800-IBMSERV (1-800-426-7378) in the United States. For the telephone number to call in your country, go to the IBM Software Support Handbook web page at <http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html> and click **Contacts**.

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## Appendix B. Accessibility features for the Tivoli Storage Manager product family

Accessibility features help users who have a disability, such as restricted mobility or limited vision to use information technology products successfully.

### Accessibility features

The IBM Tivoli Storage Manager family of products includes the following accessibility features:

- Keyboard-only operation using standard operating-system conventions
- Interfaces that support assistive technology such as screen readers

The command-line interfaces of all products in the product family are accessible.

Tivoli Storage Manager Operations Center provides the following additional accessibility features when you use it with a Mozilla Firefox browser on a Microsoft Windows system:

- Screen magnifiers and content zooming
- High contrast mode

The Operations Center and the Tivoli Storage Manager Server can be installed in console mode, which is accessible.

The Tivoli Storage Manager Information Center is enabled for accessibility. For information center accessibility information, see “Accessibility features in the information center” ([http://pic.dhe.ibm.com/infocenter/tsminfo/v7r1/topic/com.ibm.help.ic.doc/iehs36\\_accessibility.html](http://pic.dhe.ibm.com/infocenter/tsminfo/v7r1/topic/com.ibm.help.ic.doc/iehs36_accessibility.html)).

### Vendor software

The Tivoli Storage Manager product family 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.

### IBM and accessibility

See the IBM Human Ability and Accessibility Center (<http://www.ibm.com/able>) for information about the commitment that IBM has to accessibility.



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## Glossary

This glossary provides terms and definitions for Tivoli Storage Manager, Tivoli Storage FlashCopy Manager, and associated products.

The following cross-references are used in this glossary:

- *See* refers you from a nonpreferred term to the preferred term or from an abbreviation to the spelled-out form.
- *See also* refers you to a related or contrasting term.

For other terms and definitions, see the IBM Terminology website at [www.ibm.com/software/globalization/terminology](http://www.ibm.com/software/globalization/terminology).

---

### A

#### **absolute mode**

In storage management, a backup copy-group mode that specifies that a file is considered for incremental backup even if the file has not changed since the last backup. See also *mode*, *modified mode*.

#### **access control list (ACL)**

In computer security, a list associated with an object that identifies all the subjects that can access the object and their access rights.

#### **access mode**

An attribute of a storage pool or a storage volume that specifies whether the server can write to or read from the storage pool or storage volume.

**ACK** See *acknowledgment*.

#### **acknowledgment (ACK)**

The transmission of acknowledgment characters as a positive response to a data transmission.

**ACL** See *access control list*.

#### **activate**

To validate the contents of a policy set and then make it the active policy set.

#### **active-data pool**

A named set of storage pool volumes that contain only active versions of client

backup data. See also *server storage*, *storage pool*, *storage pool volume*.

#### **active file system**

A file system to which space management has been added. With space management, tasks for an active file system include automatic migration, reconciliation, selective migration, and recall. See also *inactive file system*.

#### **active policy set**

The activated policy set that contains the policy rules currently in use by all client nodes assigned to the policy domain. See also *policy domain*, *policy set*.

#### **active version**

The most recent backup copy of a file stored. The active version of a file cannot be deleted until a backup process detects that the user has either replaced the file with a newer version or has deleted the file from the file server or workstation. See also *backup version*, *inactive version*.

#### **activity log**

A log that records normal activity messages that are generated by the server. These messages include information about server and client operations, such as the start time of sessions or device I/O errors.

#### **adaptive subfile backup**

A type of backup that sends only changed portions of a file to the server, instead of sending the entire file. Adaptive subfile backup reduces network traffic and increases the speed of the backup.

#### **administrative client**

A program that runs on a file server, workstation, or mainframe that administrators use to control and monitor the server. See also *backup-archive client*.

#### **administrative command schedule**

A database record that describes the planned processing of an administrative command during a specific time period. See also *central scheduler*, *client schedule*, *schedule*.

#### **administrative privilege class**

See *privilege class*.

**administrative session**

A period of time during which an administrator user ID communicates with a server to perform administrative tasks. See also client node session, session.

**administrator**

A person responsible for administrative tasks such as access authorization and content management. Administrators can also grant levels of authority to users.

**agent node**

A client node that has been granted proxy authority to perform operations on behalf of another client node, which is the target node.

**aggregate**

An object, stored in one or more storage pools, consisting of a group of logical files that are packaged together. See also logical file, physical file.

**aggregate data transfer rate**

A performance statistic that indicates the average number of bytes that were transferred per second while processing a given operation.

**application client**

A program that is installed on a system to protect an application. The server provides backup services to an application client.

**archive**

To copy programs, data, or files to another storage media, usually for long-term storage or security. See also retrieve.

**archive copy**

A file or group of files that was archived to server storage

**archive copy group**

A policy object containing attributes that control the generation, destination, and expiration of archived files. See also copy group.

**archive-retention grace period**

The number of days that the storage manager retains an archived file when the server is unable to rebind the file to an appropriate management class. See also bind.

**association**

The defined relationship between a client

node and a client schedule. An association identifies the name of a schedule, the name of the policy domain to which the schedule belongs, and the name of a client node that performs scheduled operations.

**audit** To check for logical inconsistencies between information that the server has and the actual condition of the system. The storage manager can audit information about items such as volumes, libraries, and licenses. For example, when a storage manager audits a volume, the server checks for inconsistencies between information about backed-up or archived files that are stored in the database and the actual data that are associated with each backup version or archive copy in server storage.

**authentication rule**

A specification that another user can use to either restore or retrieve files from storage.

**authority**

The right to access objects, resources, or functions. See also privilege class.

**authorization rule**

A specification that permits another user to either restore or retrieve a user's files from storage.

**authorized user**

A user who has administrative authority for the client on a workstation. This user changes passwords, performs open registrations, and deletes file spaces.

**AutoFS**

See automounted file system.

**automatic detection**

A feature that detects, reports, and updates the serial number of a drive or library in the database when the path from the local server is defined.

**automatic migration**

The process that is used to automatically move files from a local file system to storage, based on options and settings that are chosen by a root user on a workstation. See also demand migration, threshold migration.

**automounted file system (AutoFS)**

A file system that is managed by an

automounter daemon. The automounter daemon monitors a specified directory path, and automatically mounts the file system to access data.

---

## **B**

### **backup-archive client**

A program that runs on a workstation or file server and provides a means for users to back up, archive, restore, and retrieve files. See also administrative client.

### **backup copy group**

A policy object containing attributes that control the generation, destination, and expiration of backup versions of files. A backup copy group belongs to a management class. See also copy group.

### **backup retention grace period**

The number of days the storage manager retains a backup version after the server is unable to rebind the file to an appropriate management class.

### **backup set**

A portable, consolidated group of active versions of backup files that are generated for a backup-archive client.

### **backup set collection**

A group of backup sets that are created at the same time and which have the same backup set name, volume names, description, and device classes. The server identifies each backup set in the collection by its node name, backup set name, and file type.

### **backup version**

A file or directory that a client node backed up to storage. More than one backup version can exist in storage, but only one backup version is the active version. See also active version, copy group, inactive version.

**bind** To associate a file with a management class name. See also archive-retention grace period, management class, rebind.

---

## C

**cache** To place a duplicate copy of a file on random access media when the server migrates a file to another storage pool in the hierarchy.

### **cache file**

A snapshot of a logical volume created by Logical Volume Snapshot Agent. Blocks are saved immediately before they are modified during the image backup and their logical extents are saved in the cache files.

**CAD** See client acceptor daemon.

### **central scheduler**

A function that permits an administrator to schedule client operations and administrative commands. The operations can be scheduled to occur periodically or on a specific date. See also administrative command schedule, client schedule.

**client** A software program or computer that requests services from a server. See also server.

### **client acceptor**

A service that serves the Java applet for the web client to web browsers. On Windows systems, the client acceptor is installed and run as a service. On AIX®, UNIX, and Linux systems, the client acceptor is run as a daemon.

### **client acceptor daemon (CAD)**

See client acceptor.

### **client domain**

The set of drives, file systems, or volumes that the user selects to back up or archive data, using the backup-archive client.

### **client node**

A file server or workstation on which the backup-archive client program has been installed, and which has been registered to the server.

### **client node session**

A session in which a client node communicates with a server to perform backup, restore, archive, retrieve, migrate, or recall requests. See also administrative session.

### **client option set**

A group of options that are defined on

the server and used on client nodes in conjunction with client options files.

### **client options file**

An editable file that identifies the server and communication method, and provides the configuration for backup, archive, hierarchical storage management, and scheduling.

### **client-polling scheduling mode**

A method of operation in which the client queries the server for work. See also server-prompted scheduling mode.

### **client schedule**

A database record that describes the planned processing of a client operation during a specific time period. The client operation can be a backup, archive, restore, or retrieve operation, a client operating system command, or a macro. See also administrative command schedule, central scheduler, schedule.

### **client/server**

Pertaining to the model of interaction in distributed data processing in which a program on one computer sends a request to a program on another computer and awaits a response. The requesting program is called a client; the answering program is called a server.

### **client system-options file**

A file, used on AIX, UNIX, or Linux system clients, containing a set of processing options that identify the servers to be contacted for services. This file also specifies communication methods and options for backup, archive, hierarchical storage management, and scheduling. See also client user-options file, options file.

### **client user-options file**

A file that contains the set of processing options that the clients on the system use. The set can include options that determine the server that the client contacts, and options that affect backup operations, archive operations, hierarchical storage management operations, and scheduled operations. This file is also called the dsm.opt file. For AIX, UNIX, or Linux systems, see also client system-options file. See also client system-options file, options file.



**closed registration**

A registration process in which only an administrator can register workstations as client nodes with the server. See also open registration.

**collocation**

The process of keeping all data belonging to a single-client file space, a single client node, or a group of client nodes on a minimal number of sequential-access volumes within a storage pool.

Collocation can reduce the number of volumes that must be accessed when a large amount of data must be restored.

**collocation group**

A user-defined group of client nodes whose data is stored on a minimal number of volumes through the process of collocation.

**commit point**

A point in time when data is considered to be consistent.

**communication method**

The method by which a client and server exchange information. See also Transmission Control Protocol/Internet Protocol.

**communication protocol**

A set of defined interfaces that permit computers to communicate with each other.

**compression**

A function that removes repetitive characters, spaces, strings of characters, or binary data from the data being processed and replaces characters with control characters. Compression reduces the amount of storage space that is required for data.

**configuration manager**

A server that distributes configuration information, such as policies and schedules, to managed servers according to their profiles. Configuration information can include policy and schedules. See also enterprise configuration, managed server, profile.

**conversation**

A connection between two programs over a session that allows them to communicate with each other while processing a transaction. See also session.

**copy backup**

A full backup in which the transaction log files are not deleted so that backup procedures that use incremental or differential backups are not disrupted.

**copy group**

A policy object containing attributes that control how backup versions or archive copies are generated, where backup versions or archive copies are initially located, and when backup versions or archive copies expire. A copy group belongs to a management class. See also archive copy group, backup copy group, backup version, management class.

**copy storage pool**

A named set of volumes that contain copies of files that reside in primary storage pools. Copy storage pools are used only to back up the data that is stored in primary storage pools. A copy storage pool cannot be a destination for a backup copy group, an archive copy group, or a management class (for space-managed files). See also destination, primary storage pool, server storage, storage pool, storage pool volume.

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**D****daemon**

A program that runs unattended to perform continuous or periodic functions, such as network control.

**damaged file**

A physical file in which read errors have been detected.

**database backup series**

One full backup of the database, plus up to 32 incremental backups made since that full backup. Each full backup that is run starts a new database backup series. A number identifies each backup series. See also database snapshot, full backup.

**database snapshot**

A complete backup of the entire database to media that can be taken off-site. When a database snapshot is created, the current database backup series is not interrupted. A database snapshot cannot have incremental database backups associated with it. See also database backup series, full backup.

**data center**

In a virtualized environment, a container that holds hosts, clusters, networks, and data stores.

**data deduplication**

A method of reducing storage needs by eliminating redundant data. Only one instance of the data is retained on storage media. Other instances of the same data are replaced with a pointer to the retained instance.

**data manager server**

A server that collects metadata information for client inventory and manages transactions for the storage agent over the local area network. The data manager server informs the storage agent with applicable library attributes and the target volume identifier.

**data mover**

A device that moves data on behalf of the server. A network-attached storage (NAS) file server is a data mover.

**data storage-management application-programming interface (DSMAPI)**

A set of functions and semantics that can monitor events on files, and manage and maintain the data in a file. In an HSM environment, a DSMAPI uses events to notify data management applications about operations on files, stores arbitrary attribute information with a file, supports managed regions in a file, and uses DSMAPI access rights to control access to a file object.

**data store**

In a virtualized environment, the location where virtual machine data is stored.

**deduplication**

The process of creating representative records from a set of records that have been identified as representing the same entities.

**default management class**

A management class that is assigned to a policy set. This class is used to govern backed up or archived files when a file is not explicitly associated with a specific management class through the include-exclude list.

**demand migration**

The process that is used to respond to an

out-of-space condition on a file system for which hierarchical storage management (HSM) is active. Files are migrated to server storage until space usage drops to the low threshold that was set for the file system. If the high threshold and low threshold are the same, one file is migrated. See also automatic migration, selective migration, threshold migration.

**desktop client**

The group of backup-archive clients that includes clients on Microsoft Windows, Apple, and Novell NetWare operating systems.

**destination**

A copy group or management class attribute that specifies the primary storage pool to which a client file will be backed up, archived, or migrated. See also copy storage pool.

**device class**

A named set of characteristics that are applied to a group of storage devices. Each device class has a unique name and represents a device type of disk, file, optical disk, or tape.

**device configuration file**

1. For a storage agent, a file that contains the name and password of the storage agent, and information about the server that is managing the SAN-attached libraries and drives that the storage agent uses.
2. For a server, a file that contains information about defined device classes, and, on some servers, defined libraries and drives. The information is a copy of the device configuration information in the database.

**disaster recovery manager (DRM)**

A function that assists in preparing and using a disaster recovery plan file for the server.

**disaster recovery plan**

A file that is created by the disaster recover manager (DRM) that contains information about how to recover computer systems if a disaster occurs and scripts that can be run to perform some recovery tasks. The file includes information about the software and

hardware that is used by the server, and the location of recovery media.

**domain**

A grouping of client nodes with one or more policy sets, which manage data or storage resources for the client nodes. See also policy domain.

**DRM** See disaster recovery manager.

**DSMAPI**

See data storage-management application-programming interface.

**dynamic serialization**

Copy serialization in which a file or folder is backed up or archived on the first attempt regardless of whether it changes during a backup or archive. See also shared dynamic serialization, shared static serialization, static serialization.

---

**E**

**EA** See extended attribute.

**EB** See exabyte.

**EFS** See Encrypted File System.

**Encrypted File System (EFS)**

A file system that uses file system-level encryption.

**enterprise configuration**

A method of setting up servers so that the administrator can distribute the configuration of one of the servers to the other servers, using server-to-server communication. See also configuration manager, managed server, profile, subscription.

**enterprise logging**

The process of sending events from a server to a designated event server. The event server routes the events to designated receivers, such as to a user exit. See also event.

**error log**

A data set or file that is used to record error information about a product or system.

**estimated capacity**

The available space, in megabytes, of a storage pool.

**event** An occurrence of significance to a task or system. Events can include completion or

failure of an operation, a user action, or the change in state of a process. See also enterprise logging, receiver.

**event record**

A database record that describes actual status and results for events.

**event server**

A server to which other servers can send events for logging. The event server routes the events to any receivers that are enabled for the sending server's events.

**exabyte (EB)**

For processor, real and virtual storage capacities and channel volume, 2 to the power of 60 or 1 152 921 504 606 846 976 bytes. For disk storage capacity and communications volume, 1 000 000 000 000 000 000 bytes.

**exclude**

The process of identifying files in an include-exclude list. This process prevents the files from being backed up or migrated whenever a user or schedule enters an incremental or selective backup operation. A file can be excluded from backup, from space management, or from both backup and space management.

**exclude-include list**

See include-exclude list.

**expiration**

The process by which files, data sets, or objects are identified for deletion because their expiration date or retention period has passed.

**expiring file**

A migrated or premigrated file that has been marked for expiration and removal from storage. If a stub file or an original copy of a premigrated file is deleted from a local file system, or if the original copy of a premigrated file is updated, the corresponding migrated or premigrated file is marked for expiration the next time reconciliation is run.

**extend**

To increase the portion of available space that can be used to store database or recovery log information.

**extended attribute (EA)**

Names or value pairs that are associated with files or directories. There are three

classes of extended attributes: user attributes, system attributes, and trusted attributes.

**external library**

A collection of drives that is managed by the media-management system other than the storage management server.

---

**F**

**file access time**

On AIX, UNIX, or Linux systems, the time when the file was last accessed.

**file age**

For migration prioritization purposes, the number of days since a file was last accessed.

**file device type**

A device type that specifies the use of sequential access files on disk storage as volumes.

**file server**

A dedicated computer and its peripheral storage devices that are connected to a local area network that stores programs and files that are shared by users on the network.

**file space**

A logical space in server storage that contains a group of files that have been backed up or archived by a client node, from a single logical partition, file system, or virtual mount point. Client nodes can restore, retrieve, or delete their file spaces from server storage. In server storage, files belonging to a single file space are not necessarily stored together.

**file space ID (FSID)**

A unique numeric identifier that the server assigns to a file space when it is stored in server storage.

**file state**

The space management mode of a file that resides in a file system to which space management has been added. A file can be in one of three states: resident, premigrated, or migrated. See also migrated file, premigrated file, resident file.

**file system migrator (FSM)**

A kernel extension that intercepts all file system operations and provides any space

management support that is required. If no space management support is required, the operation is passed to the operating system, which performs its normal functions. The file system migrator is mounted over a file system when space management is added to the file system.

**file system state**

The storage management mode of a file system that resides on a workstation on which the hierarchical storage management (HSM) client is installed. A file system can be in one of these states: native, active, inactive, or global inactive.

**frequency**

A copy group attribute that specifies the minimum interval, in days, between incremental backups.

**FSID** See file space ID.

**FSM** See file system migrator.

**full backup**

The process of backing up the entire server database. A full backup begins a new database backup series. See also database backup series, database snapshot, incremental backup.

**fuzzy backup**

A backup version of a file that might not accurately reflect what is currently in the file because the file was backed up at the same time as it was being modified.

**fuzzy copy**

A backup version or archive copy of a file that might not accurately reflect the original contents of the file because it was backed up or archived the file while the file was being modified.

---

**G**

**GB** See gigabyte.

**General Parallel File System (GPFS™)**

A high-performance shared-disk file system that can provide data access from nodes in a clustered system environment. See also information lifecycle management.

**gigabyte (GB)**

For processor storage, real and virtual storage, and channel volume, 10 to the

power of nine or 1,073,741,824 bytes. For disk storage capacity and communications volume, 1,000,000,000 bytes.

**global inactive state**

The state of all file systems to which space management has been added when space management is globally deactivated for a client node.

**Globally Unique Identifier (GUID)**

An algorithmically determined number that uniquely identifies an entity within a system. See also Universally Unique Identifier.

**GPFS** See General Parallel File System.

**GPFS node set**

A mounted, defined group of GPFS file systems.

**group backup**

The backup of a group containing a list of files from one or more file space origins.

**GUID** See Globally Unique Identifier.

---

## H

**hierarchical storage management (HSM)**

A function that automatically distributes and manages data on disk, tape, or both by regarding devices of these types and potentially others as levels in a storage hierarchy that range from fast, expensive devices to slower, cheaper, and possibly removable devices. The objectives are to minimize access time to data and maximize available media capacity. See also hierarchical storage management client, recall, storage hierarchy.

**hierarchical storage management client (HSM client)**

A client program that works with the server to provide hierarchical storage management (HSM) for a system. See also hierarchical storage management, management class.

**HSM** See hierarchical storage management.

**HSM client**

See hierarchical storage management client.

---

## I

**ILM** See information lifecycle management.

**image** A file system or raw logical volume that is backed up as a single object.

**image backup**

A backup of a full file system or raw logical volume as a single object.

**inactive file system**

A file system for which space management has been deactivated. See also active file system.

**inactive version**

A backup version of a file that is either not the most recent backup version, or that is a backup version of a file that no longer exists on the client system. Inactive backup versions are eligible for expiration processing according to the management class assigned to the file. See also active version, backup version.

**include-exclude file**

A file containing statements to determine the files to back up and the associated management classes to use for backup or archive. See also include-exclude list.

**include-exclude list**

A list of options that include or exclude selected files for backup. An exclude option identifies files that should not be backed up. An include option identifies files that are exempt from the exclusion rules or assigns a management class to a file or a group of files for backup or archive services. See also include-exclude file.

**incremental backup**

The process of backing up files or directories, or copying pages in the database, that are new or changed since the last full or incremental backup. See also selective backup.

**individual mailbox restore**

See mailbox restore.

**information lifecycle management (ILM)**

A policy-based file-management system for storage pools and file sets. See also General Parallel File System.

**inode** The internal structure that describes the individual files on AIX, UNIX, or Linux

systems. An inode contains the node, type, owner, and location of a file.

**inode number**

A number specifying a particular inode file in the file system.

**IP address**

A unique address for a device or logical unit on a network that uses the Internet Protocol standard.

---

## J

**job file**

A generated file that contains configuration information for a migration job. The file is XML format and can be created and edited in the hierarchical storage management (HSM) client for Windows client graphical user interface. See also migration job.

**journal-based backup**

A method for backing up Windows clients and AIX clients that exploits the change notification mechanism in a file to improve incremental backup performance by reducing the need to fully scan the file system.

**journal daemon**

On AIX, UNIX, or Linux systems, a program that tracks change activity for files residing in file systems.

**journal service**

In Microsoft Windows, a program that tracks change activity for files residing in file systems.

---

## K

**KB** See kilobyte.

**kilobyte (KB)**

For processor storage, real and virtual storage, and channel volume, 2 to the power of 10 or 1,024 bytes. For disk storage capacity and communications volume, 1,000 bytes.



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## L

**LAN** See local area network.

### **LAN-free data movement**

The movement of client data between a client system and a storage device on a storage area network (SAN), bypassing the local area network.

### **LAN-free data transfer**

See LAN-free data movement.

### **leader data**

Bytes of data, from the beginning of a migrated file, that are stored in the file's corresponding stub file on the local file system. The amount of leader data that is stored in a stub file depends on the stub size that is specified.

### **library**

1. A repository for demountable recorded media, such as magnetic disks and magnetic tapes.
2. A collection of one or more drives, and possibly robotic devices (depending on the library type), which can be used to access storage volumes.

### **library client**

A server that uses server-to-server communication to access a library that is managed by another storage management server. See also library manager.

### **library manager**

A server that controls device operations when multiple storage management servers share a storage device. See also library client.

### **local**

1. Pertaining to a device, file, or system that is accessed directly from a user system, without the use of a communication line. See also remote.
2. For hierarchical storage management products, pertaining to the destination of migrated files that are being moved. See also remote.

### **local area network (LAN)**

A network that connects several devices in a limited area (such as a single building or campus) and that can be connected to a larger network.

### **local shadow volume**

Data that is stored on shadow volumes localized to a disk storage subsystem.

**LOFS** See loopback virtual file system.

### **logical file**

A file that is stored in one or more server storage pools, either by itself or as part of an aggregate. See also aggregate, physical file, physical occupancy.

### **logical occupancy**

The space that is used by logical files in a storage pool. This space does not include the unused space created when logical files are deleted from aggregate files, so it might be less than the physical occupancy. See also physical occupancy.

### **logical unit number (LUN)**

In the Small Computer System Interface (SCSI) standard, a unique identifier used to differentiate devices, each of which is a logical unit (LU).

### **logical volume**

A portion of a physical volume that contains a file system.

### **logical volume backup**

A back up of a file system or logical volume as a single object.

### **Logical Volume Snapshot Agent (LVSA)**

Software that can act as the snapshot provider for creating a snapshot of a logical volume during an online image backup.

### **loopback virtual file system (LOFS)**

A file system that is created by mounting a directory over another local directory, also known as mount-over-mount. A LOFS can also be generated using an automounter.

**LUN** See logical unit number.

**LVSA** See Logical Volume Snapshot Agent.



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## M

### macro file

A file that contains one or more storage manager administrative commands, which can be run only from an administrative client using the MACRO command. See also Tivoli Storage Manager command script.

### mailbox restore

A function that restores Microsoft Exchange Server data (from IBM Data Protection for Microsoft Exchange backups) at the mailbox level or mailbox-item level.

### managed object

A definition in the database of a managed server that was distributed to the managed server by a configuration manager. When a managed server subscribes to a profile, all objects that are associated with that profile become managed objects in the database of the managed server.

### managed server

A server that receives configuration information from a configuration manager using a subscription to one or more profiles. Configuration information can include definitions of objects such as policy and schedules. See also configuration manager, enterprise configuration, profile, subscription.

### management class

A policy object that users can bind to each file to specify how the server manages the file. The management class can contain a backup copy group, an archive copy group, and space management attributes. See also bind, copy group, hierarchical storage management client, policy set, rebind.

### maximum transmission unit (MTU)

The largest possible unit of data that can be sent on a given physical medium in a single frame. For example, the maximum transmission unit for Ethernet is 1500 bytes.

**MB** See megabyte.

### media server

In a z/OS® environment, a program that provides access to z/OS disk and tape

storage for Tivoli Storage Manager servers that run on operating systems other than z/OS.

### megabyte (MB)

For processor storage, real and virtual storage, and channel volume, 2 to the 20th power or 1,048,576 bytes. For disk storage capacity and communications volume, 1,000,000 bytes.

### metadata

Data that describes the characteristics of data; descriptive data.

### migrate

To move data to another location, or an application to another computer system.

### migrated file

A file that has been copied from a local file system to storage. For HSM clients on UNIX or Linux systems, the file is replaced with a stub file on the local file system. On Windows systems, creation of the stub file is optional. See also file state, premigrated file, resident file, stub file.

### migration

The process of moving data from one computer system to another, or an application to another computer system.

### migration job

A specification of files to migrate, and actions to perform on the original files after migration. See also job file, threshold migration.

### migration threshold

High and low capacities for storage pools or file systems, expressed as percentages, at which migration is set to start and stop.

### mirroring

The process of writing the same data to multiple disks at the same time. The mirroring of data protects it against data loss within the database or within the recovery log.

**mode** A copy group attribute that specifies whether to back up a file that has not been modified since the last time the file was backed up. See also absolute mode, modified mode.

### modified mode

In storage management, a backup copy-group mode that specifies that a file

is considered for incremental backup only if it has changed since the last backup. A file is considered a changed file if the date, size, owner, or permissions of the file have changed. See also absolute mode, mode.

**mount limit**

The maximum number of volumes that can be simultaneously accessed from the same device class. The mount limit determines the maximum number of mount points. See also mount point.

**mount point**

A logical drive through which volumes are accessed in a sequential access device class. For removable media device types, such as tape, a mount point is a logical drive associated with a physical drive. For the file device type, a mount point is a logical drive associated with an I/O stream. See also mount limit.

**mount retention period**

The maximum number of minutes that the server retains a mounted sequential-access media volume that is not being used before it dismounts the sequential-access media volume.

**mount wait period**

The maximum number of minutes that the server waits for a sequential-access volume mount request to be satisfied before canceling the request.

**MTU** See maximum transmission unit.

---

## N

**Nagle algorithm**

An algorithm that reduces congestion of TCP/IP networks by combining smaller packets and sending them together.

**named pipe**

A type of interprocess communication that permits message data streams to pass between peer processes, such as between a client and a server.

**NAS file server**

See network-attached storage file server.

**NAS file server node**

See NAS node.

**NAS node**

A client node that is a network-attached

storage (NAS) file server. Data for the NAS node is transferred by a NAS file server that is controlled by the network data management protocol (NDMP). A NAS node is also called a NAS file server node.

**native file system**

A file system that is locally added to the file server and is not added for space management. The hierarchical storage manager (HSM) client does not provide space management services to the file system.

**native format**

A format of data that is written to a storage pool directly by the server. See also non-native data format.

**NDMP**

See Network Data Management Protocol.

**NetBIOS (Network Basic Input/Output System)**

A standard interface to networks and personal computers that is used on local area networks to provide message, print-server, and file-server functions. Application programs that use NetBIOS do not have to handle the details of LAN data link control (DLC) protocols.

**network-attached storage file server (NAS file server)**

A dedicated storage device with an operating system that is optimized for file-serving functions. A NAS file server can have the characteristics of both a node and a data mover.

**Network Basic Input/Output System**

See NetBIOS.

**Network Data Management Protocol (NDMP)**

A protocol that allows a network storage-management application to control the backup and recovery of an NDMP-compliant file server, without installing vendor-acquired software on that file server.

**network data-transfer rate**

A rate that is calculated by dividing the total number of bytes that are transferred by the data transfer time. For example, this rate can be the time that is spent transferring data over a network.

**node** A file server or workstation on which the

backup-archive client program has been installed, and which has been registered to the server.

**node name**

A unique name that is used to identify a workstation, file server, or PC to the server.

**node privilege class**

A privilege class that gives an administrator the authority to remotely access backup-archive clients for a specific client node or for all clients in a policy domain. See also privilege class.

**non-native data format**

A format of data that is written to a storage pool that differs from the format that the server uses for operations. See also native format.

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**O****offline volume backup**

A backup in which the volume is locked so that no other system applications can access it during the backup operation.

**online volume backup**

A backup in which the volume is available to other system applications during the backup operation.

**open registration**

A registration process in which users can register their workstations as client nodes with the server. See also closed registration.

**operator privilege class**

A privilege class that gives an administrator the authority to disable or halt the server, enable the server, cancel server processes, and manage removable media. See also privilege class.

**options file**

A file that contains processing options. See also client system-options file, client user-options file.

**originating file system**

The file system from which a file was migrated. When a file is recalled, it is returned to its originating file system.

**orphaned stub file**

A file for which no migrated file can be found on the server that the client node is

contacting for space management services. For example, a stub file can be orphaned when the client system-options file is modified to contact a server that is different than the one to which the file was migrated.

---

**P**

**packet** In data communication, a sequence of binary digits, including data and control signals, that are transmitted and switched as a composite whole.

**page** A defined unit of space on a storage medium or within a database volume.

**partial-file recall mode**

A recall mode that causes the hierarchical storage management (HSM) function to read just a portion of a migrated file from storage, as requested by the application accessing the file.

**password generation**

A process that creates and stores a new password in an encrypted password file when the old password expires. Automatic generation of a password prevents password prompting.

**path** An object that defines a one-to-one relationship between a source and a destination. Using the path, the source accesses the destination. Data can flow from the source to the destination, and back. An example of a source is a data mover (such as a network-attached storage [NAS] file server), and an example of a destination is a tape drive.

**pattern-matching character**

See wildcard character.

**physical file**

A file that is stored in one or more storage pools, consisting of either a single logical file, or a group of logical files that are packaged together as an aggregate. See also aggregate, logical file, physical occupancy.

**physical occupancy**

The amount of space that is used by physical files in a storage pool. This space includes the unused space that is created when logical files are deleted from aggregates. See also logical file, logical occupancy, physical file.

**plug-in**

A separately installable software module that adds function to an existing program, application, or interface.

**policy domain**

A grouping of policy users with one or more policy sets, which manage data or storage resources for the users. The users are client nodes that are associated with the policy domain. See also active policy set, domain.

**policy privilege class**

A privilege class that gives an administrator the authority to manage policy objects, register client nodes, and schedule client operations for client nodes. Authority can be restricted to certain policy domains. See also privilege class.

**policy set**

A group of rules in a policy domain. The rules specify how data or storage resources are automatically managed for client nodes in the policy domain. Rules can be contained in management classes. See also active policy set, management class.

**premigrated file**

A file that has been copied to server storage, but has not been replaced with a stub file on the local file system. An identical copy of the file resides both on the local file system and in server storage. Premigrated files occur on UNIX and Linux file systems to which space management has been added. See also file state, migrated file, resident file.

**premigrated files database**

A database that contains information about each file that has been premigrated to server storage.

**premigration**

The process of copying files that are eligible for migration to server storage, but leaving the original file intact on the local file system.

**premigration percentage**

A space management setting that controls whether the next eligible candidates in a file system are premigrated following threshold or demand migration.

**primary storage pool**

A named set of volumes that the server uses to store backup versions of files, archive copies of files, and files migrated from client nodes. See also copy storage pool, server storage, storage pool, storage pool volume.

**privilege class**

A level of authority that is granted to an administrator. The privilege class determines which administrative tasks the administrator can perform. See also authority, node privilege class, operator privilege class, policy privilege class, storage privilege class, system privilege class.

**profile**

A named group of configuration information that can be distributed from a configuration manager when a managed server subscribes. Configuration information can include registered administrator IDs, policies, client schedules, client option sets, administrative schedules, storage manager command scripts, server definitions, and server group definitions. See also configuration manager, enterprise configuration, managed server.

**profile association**

On a configuration manager, the defined relationship between a profile and an object such as a policy domain. Profile associations define the configuration information that is distributed to a managed server when it subscribes to the profile.

---

**Q****quota**

1. For HSM on AIX, UNIX, or Linux systems, the limit (in megabytes) on the amount of data that can be migrated and premigrated from a file system to server storage.
2. For HSM on Windows systems, a user-defined limit to the space that is occupied by recalled files.

---

## R

### **randomization**

The process of distributing schedule start times for different clients within a specified percentage of the schedule's startup window.

### **raw logical volume**

A portion of a physical volume that is comprised of unallocated blocks and has no journaled file system (JFS) definition. A logical volume is read/write accessible only through low-level I/O functions.

### **rebind**

To associate all backed-up versions of a file with a new management class name. For example, a file that has an active backup version is rebound when a later version of the file is backed up with a different management class association. See also *bind*, *management class*.

**recall** To copy a migrated file from server storage back to its originating file system using the hierarchical storage management client. See also *selective recall*.

### **receiver**

A server repository that contains a log of server and client messages as events. For example, a receiver can be a file exit, a user exit, or the server console and activity log. See also *event*.

### **reclamation**

The process of consolidating the remaining data from many sequential-access volumes onto fewer, new sequential-access volumes.

### **reclamation threshold**

The percentage of space that a sequential-access media volume must have before the server can reclaim the volume. Space becomes reclaimable when files are expired or are deleted.

### **reconciliation**

The process of ensuring consistency between the original data repository and the larger system where the data is stored for backup. Examples of larger systems where the data is stored for backup are storage servers or other storage systems.

During the reconciliation process, data that is identified as no longer needed is removed.

### **recovery log**

A log of updates that are about to be written to the database. The log can be used to recover from system and media failures. The recovery log consists of the active log (including the log mirror) and archive logs.

### **register**

To define a client node or administrator ID that can access the server.

### **registry**

A repository that contains access and configuration information for users, systems, and software.

### **remote**

For hierarchical storage management products, pertaining to the origin of migrated files that are being moved. See also *local*.

### **resident file**

On a Windows system, a complete file on a local file system that might also be a migrated file because a migrated copy can exist in server storage. On a UNIX or Linux system, a complete file on a local file system that has not been migrated or premigrated, or that has been recalled from server storage and modified. See also *file state*.

### **restore**

To copy information from its backup location to the active storage location for use. For example, to copy information from server storage to a client workstation.

### **retention**

The amount of time, in days, that inactive backed-up or archived files are kept in the storage pool before they are deleted. Copy group attributes and default retention grace periods for the domain define retention.

### **retrieve**

To copy archived information from the storage pool to the workstation for use. The retrieve operation does not affect the archive version in the storage pool. See also *archive*.



**root user**

A system user who operates without restrictions. A root user has the special rights and privileges needed to perform administrative tasks.

---

**S**

**SAN** See storage area network.

**schedule**

A database record that describes client operations or administrative commands to be processed. See also administrative command schedule, client schedule.

**scheduling mode**

The type of scheduling operation for the server and client node that supports two scheduling modes: client-polling and server-prompted.

**scratch volume**

A labeled volume that is either blank or contains no valid data, that is not defined, and that is available for use. See also volume.

**script** A series of commands, combined in a file, that carry out a particular function when the file is run. Scripts are interpreted as they are run. See also Tivoli Storage Manager command script.

**Secure Sockets Layer (SSL)**

A security protocol that provides communication privacy. With SSL, client/server applications can communicate in a way that is designed to prevent eavesdropping, tampering, and message forgery.

**selective backup**

The process of backing up certain files or directories from a client domain. The files that are backed up are those that are not excluded in the include-exclude list. The files must meet the requirement for serialization in the backup copy group of the management class that is assigned to each file. See also incremental backup.

**selective migration**

The process of copying user-selected files from a local file system to server storage and replacing the files with stub files on the local file system. See also demand migration, threshold migration.

**selective recall**

The process of copying user-selected files from server storage to a local file system. See also recall, transparent recall.

**serialization**

The process of handling files that are modified during backup or archive processing. See also shared dynamic serialization, shared static serialization, static serialization.

**server** A software program or a computer that provides services to other software programs or other computers. See also client.

**server options file**

A file that contains settings that control various server operations. These settings affect such things as communications, devices, and performance.

**server-prompted scheduling mode**

A client/server communication technique where the server contacts the client node when tasks must be done. See also client-polling scheduling mode.

**server storage**

The primary, copy, and active-data storage pools that are used by the server to store user files such as backup versions, archive copies, and files migrated from hierarchical storage management client nodes (space-managed files). See also active-data pool, copy storage pool, primary storage pool, storage pool volume, volume.

**session**

A logical or virtual connection between two stations, software programs, or devices on a network that allows the two elements to communicate and exchange data for the duration of the session. See also administrative session.

**session resource usage**

The amount of wait time, processor time, and space that is used or retrieved during a client session.

**shadow copy**

A snapshot of a volume. The snapshot can be taken while applications on the system continue to write data to the volumes.

**shadow volume**

The data stored from a snapshot of a volume. The snapshot can be taken while applications on the system continue to write data to the volumes.

**shared dynamic serialization**

A value for serialization that specifies that a file must not be backed up or archived if it is being modified during the operation. The backup-archive client retries the backup or archive operation a number of times; if the file is being modified during each attempt, the backup-archive client will back up or archive the file on its last try. See also dynamic serialization, serialization, shared static serialization, static serialization.

**shared library**

A library device that is used by multiple storage manager servers. See also library.

**shared static serialization**

A copy-group serialization value that specifies that a file must not be modified during a backup or archive operation. The client attempts to retry the operation a number of times. If the file is in use during each attempt, the file is not backed up or archived. See also dynamic serialization, serialization, shared dynamic serialization, static serialization.

**snapshot**

An image backup type that consists of a point-in-time view of a volume.

**space-managed file**

A file that is migrated from a client node by the hierarchical storage management (HSM) client. The HSM client recalls the file to the client node on demand.

**space management**

See hierarchical storage management.

**space monitor daemon**

A daemon that checks space usage on all file systems for which space management is active, and automatically starts threshold migration when space usage on a file system equals or exceeds its high threshold.

**sparse file**

A file that is created with a length greater than the data it contains, leaving empty spaces for the future addition of data.

**special file**

On AIX, UNIX, or Linux systems, a file that defines devices for the system, or temporary files that are created by processes. There are three basic types of special files: first-in, first-out (FIFO); block; and character.

**SSL** See Secure Sockets Layer.

**stabilized file space**

A file space that exists on the server but not on the client.

**stanza** A group of lines in a file that together have a common function or define a part of the system. Stanzas are usually separated by blank lines or colons, and each stanza has a name.

**startup window**

A time period during which a schedule must be initiated.

**static serialization**

A copy-group serialization value that specifies that a file must not be modified during a backup or archive operation. If the file is in use during the first attempt, the backup-archive client cannot back up or archive the file. See also dynamic serialization, serialization, shared dynamic serialization, shared static serialization.

**storage agent**

A program that enables the backup and restoration of client data directly to and from storage attached to a storage area network (SAN).

**storage area network (SAN)**

A dedicated storage network tailored to a specific environment, combining servers, systems, storage products, networking products, software, and services.

**storage hierarchy**

A logical order of primary storage pools, as defined by an administrator. The order is typically based on the speed and capacity of the devices that the storage pools use. The storage hierarchy is defined by identifying the next storage pool in a storage pool definition. See also storage pool.

**storage pool**

A named set of storage volumes that is the destination that is used to store client



data. See also active-data pool, copy storage pool, primary storage pool, storage hierarchy.

**storage pool volume**

A volume that has been assigned to a storage pool. See also active-data pool, copy storage pool, primary storage pool, server storage, volume.

**storage privilege class**

A privilege class that gives an administrator the authority to control how storage resources for the server are allocated and used, such as monitoring the database, the recovery log, and server storage. See also privilege class.

**stub** A shortcut on the Windows file system that is generated by the hierarchical storage management (HSM) client for a migrated file that allows transparent user access. A stub is the sparse file representation of a migrated file, with a reparse point attached.

**stub file**

A file that replaces the original file on a local file system when the file is migrated to storage. A stub file contains the information that is necessary to recall a migrated file from server storage. It also contains additional information that can be used to eliminate the need to recall a migrated file. See also migrated file, resident file.

**stub file size**

The size of a file that replaces the original file on a local file system when the file is migrated to server storage. The size that is specified for stub files determines how much leader data can be stored in the stub file. The default for stub file size is the block size defined for a file system minus 1 byte.

**subscription**

In a storage environment, the process of identifying the subscribers to which the profiles are distributed. See also enterprise configuration, managed server.

**system privilege class**

A privilege class that gives an administrator the authority to issue all server commands. See also privilege class.

---

## T

### **tape library**

A set of equipment and facilities that support an installation's tape environment. The tape library can include tape storage racks, mechanisms for automatic tape mounting, a set of tape drives, and a set of related tape volumes mounted on those drives.

### **tape volume prefix**

The high-level-qualifier of the file name or the data set name in the standard tape label.

### **target node**

A client node for which other client nodes (called agent nodes) have been granted proxy authority. The proxy authority allows the agent nodes to perform operations such as backup and restore on behalf of the target node, which owns the data.

**TCA** See trusted communications agent.

### **TCP/IP**

See Transmission Control Protocol/Internet Protocol.

### **threshold migration**

The process of moving files from a local file system to server storage based on the high and low thresholds that are defined for the file system. See also automatic migration, demand migration, migration job, selective migration.

### **throughput**

In storage management, the total bytes in the workload, excluding overhead, that are backed up or restored, divided by elapsed time.

### **timeout**

A time interval that is allotted for an event to occur or complete before operation is interrupted.

### **Tivoli Storage Manager command script**

A sequence of Tivoli Storage Manager administrative commands that are stored in the database of the Tivoli Storage Manager server. The script can run from any interface to the server. The script can include substitution for command parameters and conditional logic. See also macro file, script.

### **tombstone object**

A small subset of attributes of a deleted object. The tombstone object is retained for a specified period, and at the end of the specified period, the tombstone object is permanently deleted.

### **Transmission Control Protocol/Internet Protocol (TCP/IP)**

An industry-standard, nonproprietary set of communication protocols that provides reliable end-to-end connections between applications over interconnected networks of different types. See also communication method.

### **transparent recall**

The process that is used to automatically recall a migrated file to a workstation or file server when the file is accessed. See also selective recall.

### **trusted communications agent (TCA)**

A program that handles the sign-on password protocol when clients use password generation.

---

## U

**UCS-2** A 2-byte (16-bit) encoding scheme based on ISO/IEC specification 10646-1. UCS-2 defines three levels of implementation: Level 1-No combining of encoded elements allowed; Level 2-Combining of encoded elements is allowed only for Thai, Indic, Hebrew, and Arabic; Level 3-Any combination of encoded elements are allowed.

**UNC** See Universal Naming Convention.

### **Unicode**

A character encoding standard that supports the interchange, processing, and display of text that is written in the common languages around the world, plus many classical and historical texts.

### **Unicode-enabled file space**

Unicode file space names provide support for multilingual workstations without regard for the current locale.

### **Universally Unique Identifier (UUID)**

The 128-bit numeric identifier that is used to ensure that two components do not have the same identifier. See also Globally Unique Identifier.

**Universal Naming Convention (UNC)**

The server name and network name combined. These names together identify the resource on the domain.

**UTF-8** Unicode Transformation Format, 8-bit encoding form, which is designed for ease of use with existing ASCII-based systems. The CCSID value for data in UTF-8 format is 1208. See also UCS-2.

**UUID** See Universally Unique Identifier.

---

**V****validate**

To check a policy set for conditions that can cause problems if that policy set becomes the active policy set. For example, the validation process checks whether the policy set contains a default management class.

**version**

A backup copy of a file stored in server storage. The most recent backup copy of a file is the active version. Earlier copies of the same file are inactive versions. The number of versions retained by the server is determined by the copy group attributes in the management class.

**virtual file space**

A representation of a directory on a network-attached storage (NAS) file system as a path to that directory.

**virtual mount point**

A directory branch of a file system that is defined as a virtual file system. The virtual file system is backed up to its own file space on the server. The server processes the virtual mount point as a separate file system, but the client operating system does not.

**virtual volume**

An archive file on a target server that represents a sequential media volume to a source server.

**volume**

A discrete unit of storage on disk, tape or other data recording medium that supports some form of identifier and parameter list, such as a volume label or input/output control. See also scratch volume, server storage, storage pool, storage pool volume.

**volume history file**

A file that contains information about volumes that have been used by the server for database backups and for export of administrator, node, policy, or server data. The file also has information about sequential-access storage pool volumes that have been added, reused, or deleted. The information is a copy of volume information that is recorded in the server database.

**Volume Shadow Copy Service (VSS)**

A set of Microsoft application-programming interfaces (APIs) that are used to create shadow copy backups of volumes, exact copies of files, including all open files, and so on.

**VSS** See Volume Shadow Copy Service.

**VSS Backup**

A backup operation that uses Microsoft Volume Shadow Copy Service (VSS) technology. The backup operation produces an online snapshot (point-in-time consistent copy) of Microsoft Exchange data. This copy can be stored on local shadow volumes or on Tivoli Storage Manager server storage.

**VSS Fast Restore**

An operation that restores data from a local snapshot. The snapshot is the VSS backup that resides on a local shadow volume. The restore operation retrieves the data by using a file-level copy method.

**VSS Instant Restore**

An operation that restores data from a local snapshot. The snapshot is the VSS backup that resides on a local shadow volume. The restore operation retrieves the data by using a hardware assisted restore method (for example, a FlashCopy operation).

**VSS offloaded backup**

A backup operation that uses a Microsoft Volume Shadow Copy Service (VSS) hardware provider (installed on an alternate system) to move IBM Data Protection for Microsoft Exchange data to the Tivoli Storage Manager server. This type of backup operation shifts the backup load from the production system to another system.

**VSS Restore**

A function that uses a Microsoft Volume Shadow Copy Service (VSS) software provider to restore VSS Backups (IBM Data Protection for Microsoft Exchange database files and log files) that reside on Tivoli Storage Manager server storage to their original location.

---

**W****wildcard character**

A special character such as an asterisk (\*) or a question mark (?) that can be used to represent one or more characters. Any character or set of characters can replace the wildcard character.

**workload partition (WPAR)**

A partition within a single operating system instance.

**workstation**

A terminal or personal computer at which a user can run applications and that is usually connected to a mainframe or a network.

**worldwide name (WWN)**

A 64-bit, unsigned name identifier that is unique.

**WPAR** See workload partition.

**WWN** See worldwide name.

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