IBM Tivoli Storage Manager for Mail
Version 7.1.2

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

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Note:
Before you use this information and the product it supports, read the information in "Notices" on page 235.

Third edition (April 2015)

This edition applies to version 7, release 1, modification 2 of IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server (product number 5608-E06) and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this publication

Use the Data Protection for Microsoft Exchange Server software to perform online backups of Microsoft Exchange Server databases to Tivoli® Storage Manager storage.

This integration with the Microsoft Exchange Server application program interface (API) maximizes the protection of data, thus providing a comprehensive storage management solution.

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

Who should read this publication

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

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

- Microsoft Exchange Server
- Tivoli Storage Manager server
- Tivoli Storage Manager Backup-Archive Client
- Tivoli Storage Manager Application Program Interface
- Microsoft Volume Shadow Copy Service (VSS) technology (knowledge of this application is only assumed if you plan to perform VSS operations)

It is also assumed that if you are using the following operating systems or the directory service, you understand the technology:

- Windows Server 2008
- Windows Server 2008 R2
- Windows Server 2012
- Windows Server 2012 R2
- Active Directory

It is also assumed that you understand one of the following storage systems that is used for the database:

- Any storage device that implements the VSS provider interface as defined in the VSS system provider overview section of this document
- IBM® System Storage® Disk Storage Models DS3000, DS4000®, DS5000™
- IBM System Storage SAN Volume Controller (SVC)
- IBM Storwize® V7000 Disk System
- IBM XIV® Storage System Model 2810 (Gen2)
- IBM System Storage DS8000®™ series

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Publications

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.

To view IBM product documentation, see www.ibm.com/support/knowledgecenter.

Reading syntax diagrams

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

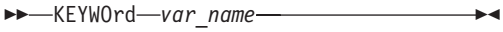
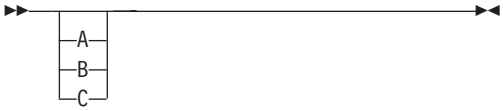
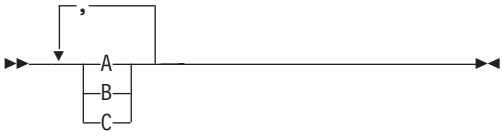
- The ►►— symbol indicates the beginning of a syntax diagram.
- The —► symbol at the end of a line indicates the syntax diagram continues on the next line.
- The ►— symbol at the beginning of a line indicates a syntax diagram continues from the previous line.
- The —►◄ symbol indicates the end of a syntax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

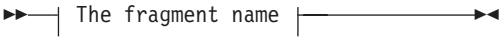
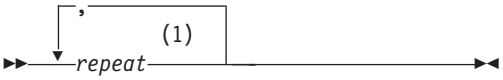
Syntax items, such as a keyword or variable, can be:

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

Syntax diagram description	Example
Abbreviations: Uppercase letters denote the shortest acceptable truncation. If an item is entirely in uppercase letters, it cannot be truncated. You can type the item in any combination of uppercase or lowercase letters. In this example, you can enter KEYWO, KEYWORD, or KEYWOrd.	

Symbols:		
Enter these symbols exactly as they are displayed in the syntax diagram.	*	Asterisk
	{ }	Braces
	:	Colon
	,	Comma
	=	Equal Sign
	-	Hyphen
	()	Parentheses
	.	Period
	'	Single quotation mark
		Space
	"	Quotation mark

Syntax diagram description	Example
Variables: Italicized lowercase items (*var_name*) denote variables. In this example, you can specify a *var_name* when you enter the KEYWORD command.	
Repetition: An arrow that points 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, 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 pointing to the left means you can select more than one item or, in some cases, repeat a single item. In this example, you can choose any combination of A, B, or C.	

Syntax diagram description	Example
Syntax Fragments: Some diagrams because of their length, must fragment the syntax. The fragment name 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:**
Footnote: A footnote in the diagram references specific details about the syntax that contains the footnote. In this example, the footnote by the arrow references the number of times you can repeat the item.	 **Notes:** 1 Specify *repeat* as many as 5 times.

New for Data Protection for Microsoft Exchange Server Version 7.1.2

IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server includes several new features and changes.

New and changed information is indicated by a vertical bar (|) to the left of the change.

Restoring public folder mailboxes in Microsoft Exchange Server 2013 and later environments

In Exchange Server 2013 or later, you can restore all or part of a public folder mailbox by using the mailbox restore views of Microsoft Management Console (MMC).

You can also use the command-line interface to complete this task. Use the **/MAILBOXFilter** and **/MAILBOXRESTOREDESTination** parameters on the **restoremailbox** command.

Restoring archive mailboxes in Microsoft Exchange Server 2010 and later versions

In Exchange Server 2010 or later, you can restore all or part of an archive mailbox by using the mailbox restore views of MMC.

You can also use the command-line interface to complete this task. Use the **/FROMArchive**, **/MAILBOXFilter**, and **/MAILBOXRESTOREDESTination** parameters on the **restoremailbox** command.

Performance improvement for Exchange Server operations

In this release of Data Protection for Microsoft Exchange Server, performance is improved when users, who are not in the Organization Management group, log on and run Exchange Server operations.

Performance improvement in the Mailbox Restore Browser interface

In this release, Data Protection for Microsoft Exchange Server retrieves mailbox information and displays the RDB mailbox list more quickly in the Mailbox Restore Browser interface.

Verifying MAPI connections by using MMC

In Exchange Server 2013 or later, you can verify that the MAPI connection to an Exchange Server is successful and that a user mailbox is online. You can view and update settings such as the registry key for the Exchange Server and the server domain name.

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Chapter 1. Getting started

With IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server, you can back up and restore Microsoft Exchange Server databases to Tivoli Storage Manager storage or local shadow volumes. A *local shadow volume* contains data that is stored on shadow volumes, which are local to a disk storage subsystem.

Data Protection for Exchange Server provides a connection between an Exchange Server and a Tivoli Storage Manager, which allows Exchange Server data to be protected and managed by Tivoli Storage Manager. Data Protection for Exchange Server protects Exchange Server data and improves the availability of Exchange Server databases.

Data Protection for Exchange Server backs up and restores Microsoft Exchange Server databases to Tivoli Storage Manager storage or local shadow volumes. You can use a command-line interface or graphical user interface (GUI) to back up and restore Exchange Server databases.

Beginning with Exchange Server 2010, Microsoft no longer supports the Microsoft Legacy application programming interface (API) for streaming backup and restore operations. Microsoft supports the use of Volume Shadow Copy Service (VSS) technology for backup and restore operations.

Data Protection for Exchange Server uses the Tivoli Storage Manager API to communicate with the Tivoli Storage Manager, and the Exchange API to communicate with Exchange Server.

In addition to these APIs, Data Protection for Exchange Server VSS operations require the Tivoli Storage Manager backup-archive client (VSS Requestor) and Microsoft VSS to produce an online snapshot (point-in-time consistent copy) of Exchange Server data.

You must install Data Protection for Exchange Server on the same system as the Exchange Server. Data Protection for Exchange Server also supports backup and restore operations in a Database Availability Group (DAG) environment.

Related concepts:

"Prerequisites" on page 47

Data Protection for Microsoft Exchange Server capabilities

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

The following table lists the tasks that you can perform with Data Protection for Microsoft Exchange Server:

Table 1. Data Protection for Microsoft Exchange Server capabilities

Feature	Referred to as:	More information:
Back up Exchange Server databases by using Microsoft VSS	VSS backup	"VSS data backups" on page 4

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Table 1. Data Protection for Microsoft Exchange Server capabilities (continued)

Feature	Referred to as:	More information:
Back up Exchange Server Database Availability Group (DAG) databases to a common node so that you can manage all DAG members with a single policy	Back up to DAG node	"Managing Exchange Database Availability Group members by using a single policy" on page 39
Back up databases to the Tivoli Storage Manager server by using an alternate system to a production system	Offloaded backup	"Offloaded VSS backups" on page 5
Restore database backups that are on Tivoli Storage Manager storage to their original location	VSS restore	"VSS data restore characteristics" on page 21
Restore database backups that are on local shadow volumes by using file-level copy mechanisms	VSS Fast Restore	"VSS fast restore processing" on page 11
Restore database backups that are on local shadow volumes by using hardware-assisted volume-level copy mechanisms	VSS Instant Restore	"VSS instant restore processing" on page 11
Restore a database backup to a recovery database, alternate database, or relocated database	Restore into	"VSS backups that are restored to alternate databases" on page 12
Restore individual mailboxes and mailbox item-level data from Data Protection for Microsoft Exchange Server backups	Mailbox restore	"Restoring mailbox data" on page 108
Set up remote computers in the same or a different domain to manage Exchange Server backup and restore operations.	Remote system management	"Managing Data Protection for Exchange Server installations remotely" on page 96
Query the managed capacity for database backups that are on local shadow volumes	**query managedcapacity** command	"Query Managedcapacity command" on page 180
Delete a backup of an Exchange Server database	**delete backup** command	"Delete backup command" on page 169
Manage policy for database backups that are on local shadow volumes	**policy** commands	"Query policy command" on page 181
Integrate with Tivoli Storage FlashCopy Manager	Advanced VSS support	"Transitioning Exchange Server backups from Tivoli Storage FlashCopy Manager to Tivoli Storage Manager" on page 90
Manage Tivoli Storage Manager database backup policy	Server policy	"Impact of policy on Data Protection for Exchange Server" on page 34
Issue the **restorefiles** command to restore database backups to flat files without involving the Exchange Server	**restorefiles** command	"Restorefiles command" on page 199

Data backup processing

Data Protection for Exchange Server can use the Microsoft Volume Shadow Copy Service (VSS) framework to produce a point-in-time, consistent, online copy of Exchange Server data.

Database backup types

With Data Protection for Exchange Server, you can use the common interface in the Volume Shadow Copy Service (VSS) framework to create database backups.

You can back up Data Protection for Exchange Server data by using the following methods:

Table 2. Data Protection for Exchange Server VSS backup types

VSS backup types	
Full backup	With this method, Data Protection for Exchange Server backs up the specified database and associated transaction logs.
Copy backup	With this method, Data Protection for Exchange Server does not delete transaction log files after the backup. Otherwise, this type is similar to a full backup. Use a copy backup to create a full backup of the Exchange Server database without disrupting any backup processes that use an incremental or differential backup.
Incremental backup	With this method, Data Protection for Exchange Server backs up only transaction logs. Transaction log files are not deleted if the backup fails. When you restore an Exchange Server database from an incremental backup, you must complete the following tasks: • Restore the last full backup. • Restore any other incremental backups that occur between the full backup and the incremental backup. • Restore the incremental backup.
Differential backup	With this method, Data Protection for Exchange Server backs up transaction logs. When you follow a full backup with only differential backups, the last full backup and the last differential backup contain all the data that is required to restore the database to the most recent state. When you restore an Exchange Server database from a differential backup, you must complete the following tasks: • Restore the last full backup. • Restore this differential backup, but no other differential backups.

Attention: When you enable circular logging, you cannot use differential or incremental backups. Data loss might occur if the log wraps before the incremental or differential backup ends.

Volume Shadow Copy Service framework

Volume Shadow Copy Service (VSS) provides a common interface model to generate and manage online snapshots of Exchange Server data.

The Microsoft VSS service manages and directs three VSS software components that are used during VSS operations: the VSS writer, the VSS Requestor, and the VSS provider. The VSS writer is the application that stores data on the source volumes. The VSS Requestor is the backup software. The VSS provider is the combined hardware and software that generates the snapshot volume.

The VSS system provider creates and maintains snapshots on local shadow volumes and refers to the default VSS provider that is available with Windows Server. If you use the Windows VSS system provider, no configuration is required. However, you can make changes by using the **VSSADMIN** commands.

With a VSS hardware and software copy provider, you can create shadow copies of running volumes on demand. A hardware provider uses a hardware storage adapter or controller to manage shadow copies at the hardware level. Data Protection for Exchange Server software does not control the VSS hardware provider. The VSS hardware provider is controlled by the hardware vendor. Install and configure the VSS hardware and software provider as required.

Data backup methods

You can use Volume Shadow Copy Service (VSS) to back up Data Protection for Exchange Server data.

You can run Exchange Server backup operations in a Database Availability Group (DAG) environment.

VSS data backups

You can store VSS backups on local VSS shadow volumes, or, when integrated with Tivoli Storage Manager, in Tivoli Storage Manager server storage.

VSS backups eliminate the need for the server or file system to be in backup mode for an extended time. The length of time to complete the snapshot is 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.

You must ensure that sufficient space is available for the snapshot at the storage destination. Both storage destinations require space to store the snapshot until the data transfer to the Tivoli Storage Manager server is complete. After the data transfer to the server is complete, VSS backups that are stored locally on VSS shadow volumes are directly accessible by the system. The snapshot volume is released and the space can be reused.

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

- For data that is backed up to VSS shadow volumes and 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.

If you store VSS backups both locally and to Tivoli Storage Manager server, 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 versions that are maintained is set in the Tivoli Storage Manager policy.

Offloaded VSS backups

By running an offloaded backup, you can move the backup load from the production system to another system. You can reduce the load on network, I/O, and processor resources during backup processing.

Use the **RemoteDSMAGENTNode** parameter to run an offloaded system. Ensure that you install a VSS hardware provider, which supports transportable shadow copy volumes,on the production and secondary systems.

Database Availability Group backups

You can use the high-availability feature of Database Availability Group (DAG) backups for enhanced data and service availability, and automatic recovery from failures. You can use Exchange Server 2010 and later versions with DAG backups to improve Exchange Server data backups and data recovery.

A DAG environment includes the following functions:

- A group of up to 16 mailbox servers that can host to 100 mailbox databases
- Up to 16 online copies of a database (1 active database and up to 15 passive databases)
- Synchronous or lagged replication. With lagged replication, you can delay the replaying of logs on target databases if, for example, there are time differences between source and target databases.
- Automatic migration and failover of active database copies

The following figure illustrates a DAG environment:

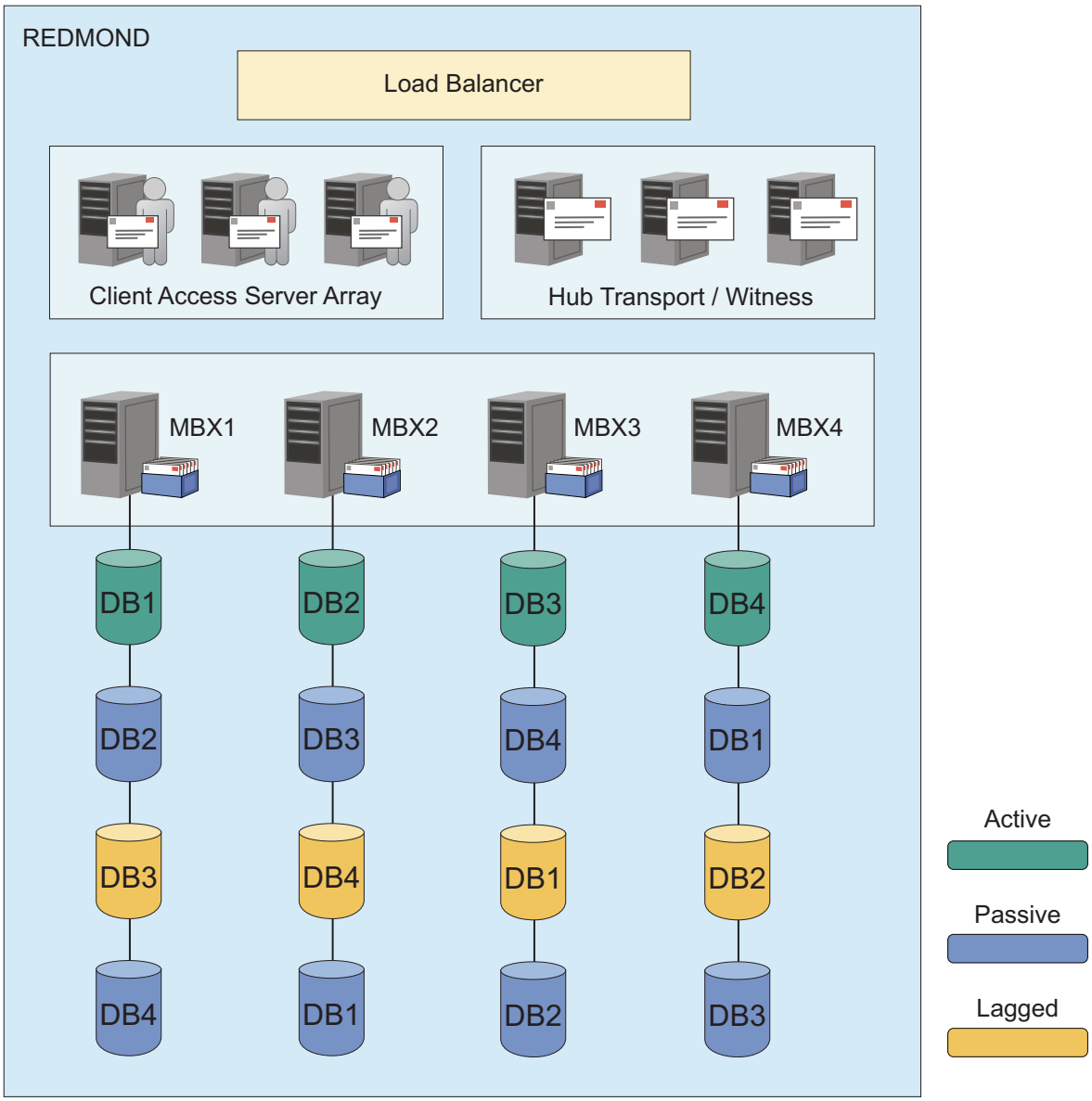

Figure 1. Sample DAG environment

Database copies are mirrored on any node within the DAG. 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. You can create a backup from any active database copy, any passive synchronous copy, or any lagged copy within the DAG. If you back up a lagged database copy, it might take more time to restore the backup because the lagged copy can have more transaction logs to restore and replay. As a best practice, create your backup from a passive synchronous copy and not a lagged copy.
- Move an active database copy to other nodes.
- Query all DAG database copy backups.
- Restore all DAG database copy backups.

- Restore data into an active database, from either active or passive database copy backups.
- Restore data into a recovery or alternate database.
- Process Individual Mailbox Restore (IMR) operations from a DAG database copy backup.
- Delete DAG database copy backups.

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.

Sample DAG configuration

DAG members often hold a subset of the databases in a combination of active and passive copies to optimize use of available server resources.

In the following sample configuration, there are three copies of five databases spread across five servers in a DAG. This configuration ensures that no two server in the DAG have the same set of database copies. The configuration also provides greater resilience to failures. Specifically, three servers must fail before losing access to a database.

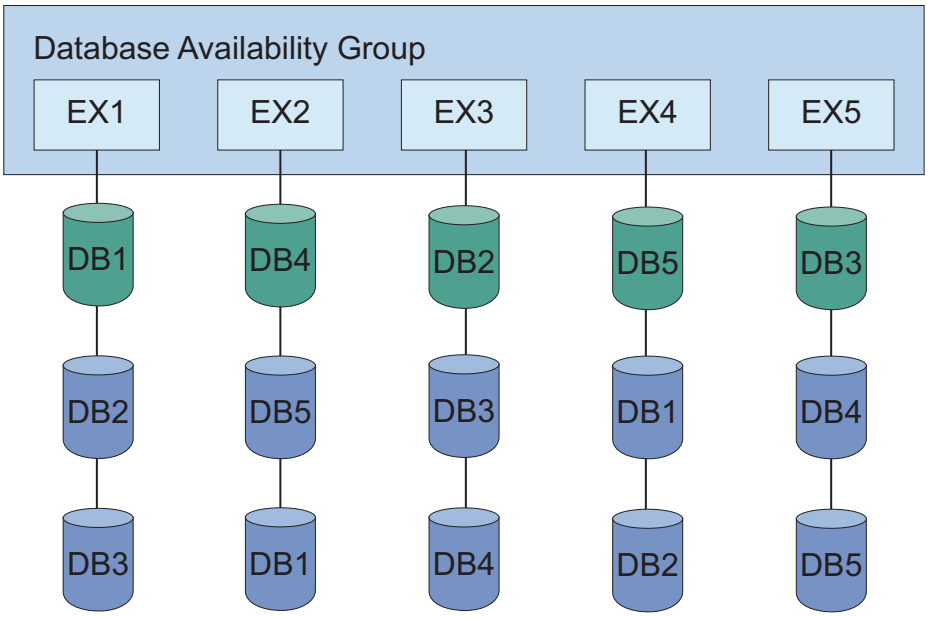

Figure 2. Sample DAG configuration

Backing up solutions

You can back up data from any DAG member and restore the data to any DAG member. You can also back up data from either the active or passive copy. Full and incremental database backups do not need to be completed from the same DAG member. All databases included in a VSS type backup are snapped together.

When backing up data, provide options from backup deployment. You want to distribute the backup workload for scalability and isolate backup activity to a dedicated backup node. Isolating backup activity minimizes the impact to production databases.

Ideally, avoid redundant backups of the same databases. Recognizing all replicas as copies of the same database helps achieve this goal. You can also apply retention policies to "unique" databases.

Allowing backups from any node in the availability group and enabling restores from any node in the availability group is also ideal.

Achieving these goals

The **DAGNODE** parameter provides a common namespace for all backups. Each node authenticates separately with Tivoli Storage Manager. The backup data is stored in **DAGNODE** namespace using the Asnode option.

To indicate that a backup is taken from a passive copy unless no valid passive copy is available, use the **PREFERDAGPASSIVE** parameter.

If the Exchange Server databases belong to a DAG and are an active database copy, the **EXCLUDEAGACTIVE** parameter excludes the databases from the backup.

If the Exchange Server databases belong to a DAG and are a passive database copy, the **EXCLUDEDAGPASSIVE** parameter excludes the databases from the backup.

To specify the minimum amount of time before a backup of another DAG copy of the same database is allowed, use the **MINIMUMBACKUPINTERVAL** parameter.

The synchronization mechanism between the Data Protection client instances on the same DAG ensures that two nodes do not simultaneously start a backup of the same database.

Sample data protection deployments in DAG environments

The following figure illustrates a deployment of a backup task that is distributed across DAG members.

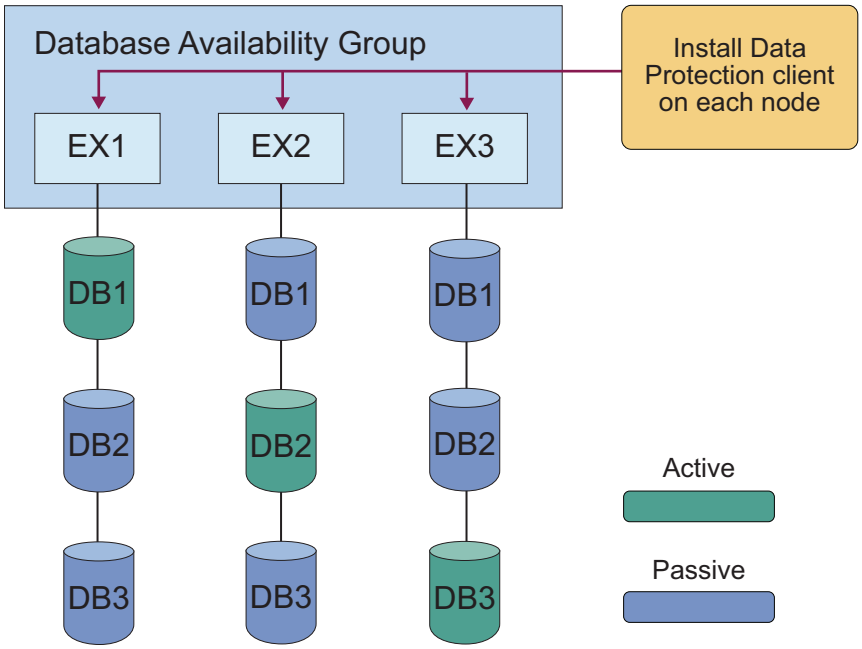

Figure 3. Sample deployment of backup distributed across DAG members

To schedule a CMD type backup on all DAG nodes, the command file contains separate backup commands per database. For example:

```
tdpexcc backup DB1 full /minimumbackupinterval=60 /preferdagpassive
tdpexcc backup DB2 full /minimumbackupinterval=60 /preferdagpassive
tdpexcc backup DB3 full /minimumbackupinterval=60 /preferdagpassive
```

In this deployment, there is one schedule and the same backup command file is used on each node.

The following figure illustrates another possible deployment of a backup distributed across DAG members.

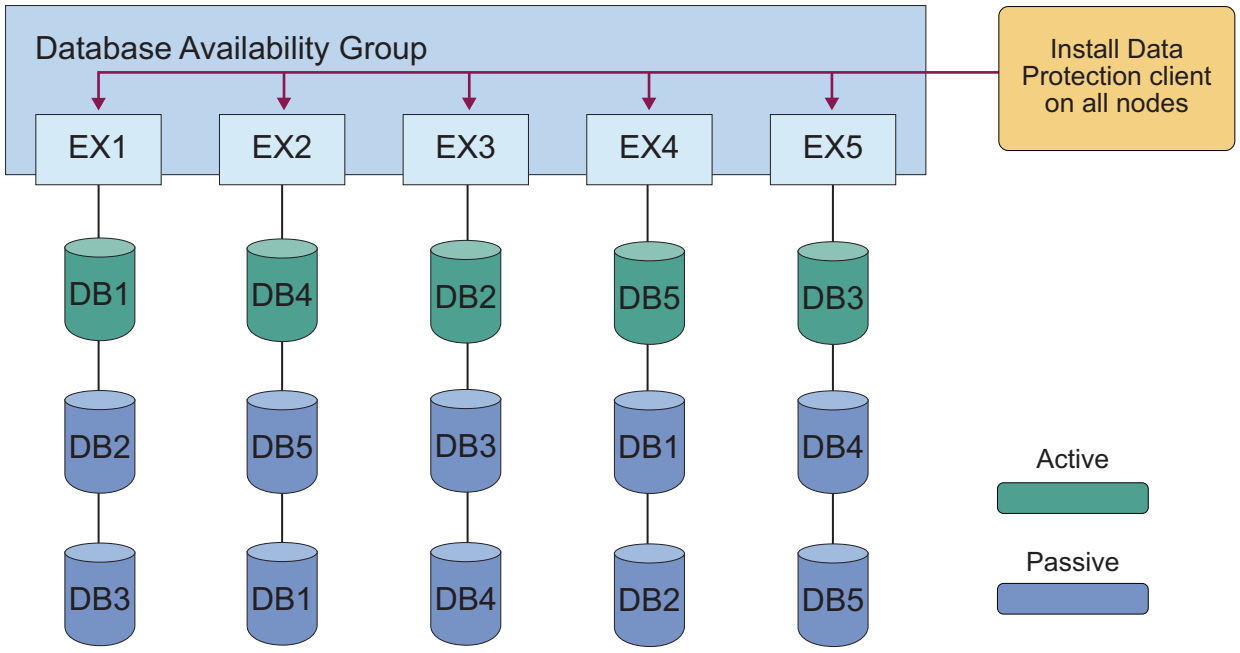

Figure 4. Another sample deployment of backup distributed across DAG members

In this deployment, one schedule and the same backup command file name is used on all nodes. The command file contains separate backup commands per database on that node. For example:

```
tdpexcc backup DB1 full /minimumbackupinterval=60 /preferdagpassive
tdpexcc backup DB2 full /minimumbackupinterval=60 /preferdagpassive
tdpexcc backup DB3 full /minimumbackupinterval=60 /preferdagpassive
```

Again, note that each line is different per node.

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 valid database copies, the integrity check can be skipped by using the `/SKIPINTEGRITYCHECK` flag.

Data restore processing

Data Protection for Exchange Server can use the Microsoft Volume Shadow Copy Service (VSS) framework to complete fast and instant restores of database backups. You also restore VSS backups to an alternate database and complete Exchange mailbox restore operations.

In a VSS restore operation, you restore one or more databases from a VSS backup on Tivoli Storage Manager server storage to the original location on the Exchange Server.

VSS fast restore processing

A VSS fast restore operation restores data from a local snapshot. A VSS fast restore operation 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. Data is overwritten even if a file is marked read-only.

You can use VSS fast restore operations for the following tasks:

- Restore Exchange Server VSS backups, full, copy, incremental, and differential backup types.
- Restore data at the database level.
- Restore a VSS backup to an alternate database.
- Restore a backup from a DAG replica to the production server.
- Restore a backup from a relocated database to the production server.
- Restore local database backups to only the system that created the backup.

VSS instant restore processing

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. Instant restore processing is done at the volume level.

Even though Exchange Server data is restored relatively quickly, the transaction logs must be replayed after a restore operation. The time of recovery for the database increases as the number of logs to be replayed increases.

VSS instant restore is typically used to restore local VSS backups of the SAN-attached volumes from IBM System Storage SAN Volume Controller, IBM System Storage DS8000 series, IBM Storwize V7000, or XIV. The VSS instant restore process requires a VSS hardware provider. For Exchange Server data, you cannot use instant restore processing for differential and incremental backups.

The data that is to be restored must be on a storage system that is valid for VSS instant restore operations. If data is not on an XIV, SAN Volume Controller, or Storwize V7000 systems with space-efficient target volumes, you must ensure that background copies that use the volumes are restored.

You can manually disable VSS instant restore processing so that Tivoli Storage FlashCopy Manager uses VSS fast restore. Instant restore processing is automatically disabled for these VSS restore operations:

- Restore data to an alternate location
- Restore data to an recovery database
- Restore files by issuing the **restorefiles** command

When you plan to implement VSS instant restore operations, consider the following guidelines:

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

For instant restore operations, use the devices that are listed here: Storage Architecture Support for Tivoli Storage FlashCopy Manager (http://www.ibm.com/support/docview.wss?uid=swg21455924).

VSS backups that are restored to alternate databases

Data Protection for Exchange Server can restore an Exchange Server database backup or DAG active or passive database copy backup, to a recovery database or to an alternate (or relocated) database.

This restore method is called *restore into*. If you are restoring a relocated database, use the *restore into* function. You must specify the same database name as the one you are restoring.

Attention: If you use the *restore into* function, VSS instant restore capability is automatically disabled.

Backups to local shadow volumes can be restored only to the system where the backups are created.

Mailbox restore operations

Data Protection for Microsoft Exchange Server can restore Exchange Server mailbox databases to a recovery database. You can interactively restore a mailbox or items from a mailbox on Exchange Server.

With Microsoft Exchange Server, you can use the item recovery feature of the Exchange client to recover messages and folders that were deleted. You can also use the Exchange Server deleted-mailbox to recover deleted mailboxes. Use the Mailbox Restore drag-and-drop function in Data Protection for Microsoft Exchange Server to select mailboxes and mailbox messages to restore.

Related reference:

"Restorefiles command" on page 199

Automated Tivoli Storage Manager server failover for data recovery

If you use Data Protection for Exchange Server with the Tivoli Storage Manager configuration, Data Protection for Exchange Server 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 Data Protection for Exchange Server 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:

- Data Protection node
- VSS requestor 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))

During normal operations, connection information for the secondary server is automatically sent to Data Protection for Exchange Server 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 is 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.

Requirements: To ensure that automated client failover can occur, Data Protection for Exchange Server must meet the following requirements:

- Data Protection for Exchange Server must be at least at V7.1 level or later.
- The primary server, secondary server, and backup-archive client must be at least at V7.1 level or later.
- 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:
  - Data Protection node
  - VSS requestor node
  - Remote DSM agent node for offloaded backups
  - DAG node, if applicable
- Before the connection information for the secondary server can be sent to Data Protection for Exchange Server, 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:
    - Data Protection node
    - DAG node, if applicable

Restriction: The following restrictions apply to Data Protection for Exchange Server 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 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.

Chapter 2. Planning

Before you implement your VSS backup and restore strategies, review the security requirements and other guidelines that are specific to your environment. Consider how to manage your Tivoli Storage Manager policy, and set available Data Protection for Exchange Server configuration options and preferences.

Security requirements

Data Protection for Exchange Server must be registered to the Tivoli Storage Manager server and use the appropriate node name and password when it connects to the Tivoli Storage Manager server.

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

For Data Protection for Exchange Server security, Exchange Server users must have role-based access control (RBAC) permissions to access mailboxes and to run Exchange Powershell cmdlets for restore operations. RBAC permissions are typically set with Exchange Powershell cmdlets in a Microsoft Exchange Server configuration process. For more information, see Understanding Role Based Access Control (http://technet.microsoft.com/en-us/library/dd298183%28v=exchg.150%29.aspx).

If you are authorized by the security policy in your organization, add users in the Exchange Organization Management role group or subgroups. Users in the Exchange Organization Management role group or subgroups have sufficient privileges to optimally complete mailbox restore operations. Users who are not in the Exchange Organization Management role group or subgroups might experience slower performance.

In summary, you must define a minimum set of management roles and role scope for the Exchange Server user.

- Management roles: “Active Directory Permissions”, “Databases”, “ Disaster Recovery”, “Mailbox Import Export”, “View-Only Configuration”, and “View-Only Recipients”.

  To restore an Exchange 2013 public folder mailbox, the Exchange user must also have the `Public Folders` management role. To restore mail to a Unicode `PST` file, the Exchange user must have the `Mailbox Import Export` management role.

  A typical Exchange Powershell cmdlet that sets RBAC permissions is as follows:

  ```
  New-RoleGroup -Name "My Admins" -Roles "Active Directory Permissions", "Databases",
  "Disaster Recovery", "Mailbox Import Export", "Public Folders",
  "View-Only Configuration", "View-Only Recipients" -Members operator1
  ```

  The preceding example creates a new group, My Admins, with minimum roles to run Data Protection for Exchange Server, and assigns user operator1 to this group. The operator1 user can run Data Protection for Exchange Server but with limited Exchange Server privileges, for example, the user cannot create or remove a user mailbox.
- Management role scope. Ensure that the following Exchange objects are within the management role scope of the Exchange Server logon user:

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- The Exchange Server that contains the required data
- The recovery database that Data Protection for Exchange Server creates
- The database that contains the active mailbox
- The database that contains the active mailbox of the user who completes the restore operation

- Verify that the Exchange Server user is a member of a local Administrator group, and has an active Exchange mailbox in the domain.

  By default, Windows adds the Exchange Organization Administrators group to other security groups, including the local Administrators group. For Exchange Server users who are not members of the Exchange Organization Management group, you must manually add the user account to the local Administrators group by using the Local Users and Groups tool on the computer of the domain member (select **Administrative tools** > **Computer Management** > **Local Users and Groups tool**). On a domain controller computer that does not have a local Administrators group or Local Users and Groups tool, manually add the user account to the Administrators group in the domain (select **Administrative tools** > **Active Directory Users and Computers tool**).

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

Exchange Server users who have the required RBAC permissions to complete individual mailbox restore operations can also back up and restore databases by default. Database-level backup and restore operations require less permission than individual mailbox restore operations.

Data backup and restore requirements

Before you run backup and restore tasks, review the following prerequisites.

To protect Microsoft Exchange Server 2010 and 2013 data, verify that your environment is set up correctly as follows:

Microsoft Exchange Server 2010 and 2013 requirements

Data Protection for Exchange Server requires that you have local Administrator privileges.

Membership in the Organization Management group is not required because you might not want to grant Organization Management group permissions to all Exchange Server backup and restore operators. Instead, you can define customized role-based access control (RBAC) roles and management role scope so that Exchange Server users can run only limited operations within a limited scope.

When you complete data backups, the Exchange Server database file size can increase because of increased database commitments that are triggered by backup operations.

Microsoft Exchange Server 2013 requirements

For Exchange Server 2013 mailbox restore operations, the MAPI clients must use RPC over HTTPS (also known as Outlook Anywhere). Microsoft does not support RPC over TCP.

Use Exchange Server 2013 CU2 or later versions, and download the correct MAPI. These software requirements are documented in the Hardware and Software Requirements technote at this location: TSM for Mail - All Requirement Documents (http://www.ibm.com/support/

docview.wss?uid=swg21219345). Follow the link to the requirements technote for your specific release or update level.

If your environment is configured correctly, mailbox restore operations work in the same way as with previous versions of Microsoft Exchange Server.

Data backup planning

The characteristics of VSS backups can affect your backup management tasks. As you decide your backup strategies, be aware of the following VSS backup guidelines.

Related tasks:

"Backing up Exchange Server data" on page 98

VSS backup characteristics

Backups can be stored on local shadow volumes, Tivoli Storage Manager server storage, or both locations. Backups to Tivoli Storage Manager server storage can be offloaded to another system as resource relief for production servers. In addition, backups can be restored to flat files without the involvement of the Exchange Server.

Backups provide an Exchange Server database integrity check function, but do not provide an Exchange Server database zeroing function. Full, copy, incremental, and differential backup types are supported. Different policy settings can be defined for each backup location and backup type (`FULL` or `COPY`).

Exchange Server DAG databases can be backed up under a common DAG node name, regardless of which DAG member runs the backup. The backup can be created 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 the backup to any Exchange Server under the same DAG node.

VSS backup requirements

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

Consider the following requirements when you plan for VSS backups:

- When you perform VSS operations, ensure that you have at least 200 MB of free disk space on your Windows System Drive. This space is used to store the metadata files for Data Protection for Exchange Server.
- 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 VSS snapshot backups only on local shadow volumes, ensure that you understand the implementation and configuration options of your VSS hardware provider.

  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 do not rely on the original volume to restore the data and are less risky. COW implementations require much less disk storage but rely completely on the original volume to restore the data.

- If you run parallel VSS backups, stagger the start time of the backups by at least ten minutes. This interval ensures that the snapshot operations do not overlap.
- If you run parallel VSS backups, configure the parallel instance backups so that snapshots of the same volumes are not created.
- If you run parallel VSS backups, ensure that parallel backups do not create a snapshot of the same LUN.
- Do not place multiple volumes on the same LUN. Configure a single volume, single partition, and single LUN as one-to-one.
- Do not set the `ASNODENAME` option in the `dsm.opt` file when you use Data Protection for Exchange Server. Setting `ASNODENAME` can cause VSS data backups and VSS restore operations to fail.

VSS backup strategies

You might decide to implement different backup strategies depending on your network traffic requirements, backup schedule, and acceptable restore times.

As you consider your backup strategies, follow these guidelines:

- Do not implement incremental and differential backups together.
- If you choose a strategy that involves incremental or differential backups, you must disable circular logging on the databases of the Exchange Server.
- Consider applying Database Availability Group (DAG) database replication technologies. See your Microsoft documentation for more details.

  For another DAG backup strategy, set up all DAG members to back up all of the database copies. Use the **`/MINIMUMBACKUPINTERVAL`** and **`/PREFERDAGPASSIVE`** flags.

Note: Understand all aspects of Exchange Server disaster recovery and the backup recommendations that Microsoft provides.

Full backups only

A full backup strategy is best for Exchange Servers that are relatively small because each backup contains enough data to restore the entire database.

Each backup takes longer to run. However, the restore process is the most efficient because only the most recent (or other appropriate) full backup is restored.

Full backup plus incremental backups

Full backup plus incremental backups is a commonly used strategy when the normal backup schedule or network capacity cannot support a full backup each time.

In such cases, you can implement a periodic full backup followed by a series of incremental backups to minimize the impact on the backup schedule and network traffic during peak usage times. For example, you can schedule full backups on the weekend and incremental backups during the week. You can implement full backups during low usage times and when increased network traffic can be tolerated. The restore process becomes more complex, however, because a full backup, and subsequent incremental backups, must be restored. In addition, transactions within the logs must be applied which increases processing time. The recovery process takes longer as more transactions are applied.

If you use this backup strategy, modify the Tivoli Storage Manager storage management policies to ensure that all incremental backups are collocated on the

Tivoli Storage Manager server. In this way, you can improve data restore performance by reducing the number of media mounts that are necessary to restore a series of incremental backups.

Full backup plus differentials

Data restore operations are more easily implemented with this strategy than with the full plus incremental backup strategy.

This strategy might be useful if your backup schedule and network capacity can facilitate backing up all transaction logs that accumulate between full backups. This strategy requires that only one differential backup plus the last full backup be transferred to accomplish a restore. However, the same amount of data must be transferred in the differential image, as in the series of incremental backups.

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

Carefully consider the potential advantages and whether you can justify the additional resources that are necessary to resend all prior transaction logs with each subsequent differential backup.

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

When you determine policy for your backups, consider the following differences between backing up data to Tivoli Storage Manager storage versus VSS disks.

Tivoli Storage Manager storage

A Tivoli Storage Manager backup operation stores the backed up data on Tivoli Storage Manager server storage. Although this type of backup typically takes longer to process than a backup to local shadow volumes, a Tivoli Storage Manager backup is necessary when long-term storage is needed.

Saving Exchange Server data on tape for archival purposes is an example of needing long-term storage. Tivoli Storage Manager backups are also necessary for disaster recovery situations when the disks that are used for local backups are unavailable. By maintaining multiple backup copies on Tivoli Storage Manager server storage, a point-in-time copy is available if backups on the local shadow volumes become corrupted or deleted.

Backups to Tivoli Storage Manager server storage are dictated by time, not by versions.

Local shadow volumes

Sufficient local storage space must be available on local shadow volumes for a VSS backup strategy to be successful. To accommodate your backup operations, ensure that enough available storage space is assigned to the volumes. Environment and storage resources also impact how many backup versions are maintained on local shadow volumes (for VSS fast restore and VSS instant restore) and how many backup versions are maintained on Tivoli Storage Manager server (VSS restore and longer term storage).

Create different sets of policies for backups to both local shadow volumes and to Tivoli Storage Manager server storage. If you use a VSS provider other than the Windows VSS System Provider, make sure to review the documentation for that specific VSS provider.

You can manage backups to local shadow volumes by time and versions. However, because local snapshots are created more frequently, and VSS storage provisioning and space limitations apply, it is more effective to base policy for local backups to be on version limits. In addition, in Database Availability Group (DAG) environments, all of the DAG members must use the same local VSS policy.

Database Availability Group backup guidelines

You can create a backup from an active copy or from any passive copy in an Exchange Server Database Availability Group (DAG).

When you use Data Protection for Exchange Server with DAGs, consider the following guidelines.

- Use a DAG member to store DAG database backups.
- Ensure that the same VSS policy applies to all DAG members.
- Ensure that the first backup is a `FULL` backup when you move backups to DAG member backups.
- Ensure that previous backups are manually deleted after you move backups to DAG member backups, assuming that those backups are no longer needed.
- Ensure that backups to `LOCAL` are restored only to and expired from the Exchange Server on which the backup is created.
- Ensure that database restore operations run only on the active database.

The high availability feature of DAG backups improves Exchange Server data backups and data recovery. When you back up data in a DAG environment, follow these guidelines:

- To decrease the load on the production Exchange Server, specify that the backups are created from a passive database copy. If no passive copy is available, the backup is created from the active copy of the database. To specify that backups are created from a passive database copy, add `/PREFERDAGPASSIVE` to a backup command.
- Use these command-line backup options to exclude certain databases from backup processing: `/EXCLUDEDAGPASSIVE`, `/EXCLUDEDAGACTIVE`, or `/EXCLUDENONDAGDBS`.
- If at least two valid copies of a database (one active and one passive copy) exist in a DAG environment, you can bypass integrity checking of the database and log files by using the **/SKIPINTEGRITYCHECK** options with the **backup** command.

  Attention: If you directly bypass integrity checking by setting the **/SKIPINTEGRITYCHECK=YES** parameter, the backup that is stored on Tivoli Storage Manager server might not be valid, or data loss can occur. To ensure that at least one active and one passive database copy are available before you skip integrity checking, set the **/SKIPINTEGRITYCHECK=SkipDbCheckIfHealthy** or **/SKIPINTEGRITYCHECK=SkipDbAndLogCheckIfHealthy** parameters.
- To maximize availability, schedule multiple servers to back up copies of each database. Use the `/MINIMUMBACKUPINTERVAL` option to ensure that only one copy is backed up for each backup cycle.

Data restore planning

The characteristics of VSS restore operations can affect your backup management tasks. As you decide your restore strategies, be aware of the following guidelines.

Related tasks:

"Restoring Exchange Server data" on page 103

VSS data restore characteristics

In a VSS restore operation, VSS backups (Exchange database files and log files) that are on Tivoli Storage Manager server storage are restored to their original location.

The following characteristics are true of a VSS data restore operation:

- Supports VSS restore granularity at the database level.
- Supports restoring one or more databases from a VSS snapshot backup that are located on Tivoli Storage Manager server storage.
- Supports data restore operations in a Database Availability Group (DAG) environment.
- Supports restoring a VSS backup (directly from Tivoli Storage Manager server storage) to an alternate system.
- Supports restoring a VSS backup to an alternate database.
- Supports restoring full, copy, incremental, and differential backup types. Database copy backup types are not supported by VSS, and therefore cannot be restored.
- Supports restoring an Exchange Server 2010 and later backup from a DAG replica into the production server.
- Supports restoring a backup from a relocated database into the production server.

VSS restore guidelines

Unless otherwise specified, a *VSS restore* refers to all restore types that use VSS, including VSS restore, VSS fast restore, and VSS instant restore operations. Review the following guidelines before you complete a VSS restore operation.

Install any Microsoft VSS-related urgent fixes.

Follow these guidelines for VSS instant restore operations:

- In a DAG environment, stop the Microsoft Exchange Replication Service on the active node before you run the VSS instant restore operation.
- In an Exchange Server 2013 environment, stop the Exchange Search Host Controller Service on the active node before you run the VSS instant restore operation.
- Performing any type of **Restore Into** function automatically disables VSS instant restore.
- A VSS restore ignores the recovery database and is placed directly into the production database unless the **/intodb** parameter is specified.
- If a VSS hardware provider is used, the disks that contain Exchange Server data are configured as basic disks.
- A VSS restore operation requires the restored database to be dismounted.
- Any backup to **LOCAL** can be restored only to the same system.

- When you perform VSS instant restores, you must make sure that any previous background copies (that involve the volumes that are being restored) are completed before you initiate the VSS instant restore. This situation applies to IBM System Storage DS8000 series, Storwize V7000, XIV, and SAN Volume Controller (non-space-efficient) volumes only.
- A VSS instant restore operation overwrites the entire contents of the source volumes. However, you can avoid overwriting the source volumes by setting the **Instant Restore** option to **No** in the Restore Options pane in the **Recover** tab of the Data Protection for Exchange Server GUI. Alternatively, specify **/INSTANTRESTORE=No** on the command-line interface. Both methods bypass volume-level copy and use file-level copy instead to restore the files from a VSS backup that are on local shadow volumes.
- If you perform a VSS restore of a database that was relocated (system file path, log file path, or database file path), you must use the **Restore Into** function and specify the same database name as the one you are restoring. The restore operation fails if you do not specify the same database name.
- When a VSS restore operation from local shadow volumes is complete, the bytes transferred display *0*. This display occurs because no data (*0*) is restored from the Tivoli Storage Manager server.
- Do not set the `ASNODENAME` option in the `dsm.opt` file when you use Data Protection for Microsoft Exchange Server. Setting `ASNODENAME` can cause VSS backups and VSS restores to fail.

Database Availability Group restore guidelines

You can perform data restore operations in a Database Availability Group (DAG) environment including restoring an Exchange Server 2010 and later backup from a DAG replica into the production server.

When you restore backups in a DAG environment, consider the following guidelines:

- Restore your backups to the active database copy.
- You can restore backups to Tivoli Storage Manager to any Exchange Server in the domain. However, backups to LOCAL can be restored only on the server where the backup is created.
- To restore a backup to a server that is hosting a passive database copy, make the copy active before you restore the backup.
- When the backup is restored, you can move the active database copy back to the passive state.

Mailbox restore guidelines

When you restore mailboxes and mailbox data, you can choose where to restore the mail, and how to restore the mail. You can restore mailbox data from the GUI or command-line interface of Tivoli Storage FlashCopy Manager.

From these interfaces, you have options for restoring data interactively with the Mailbox Restore Browser or directly from Exchange Server database files. When you restore mailboxes and mailbox data on Exchange Server 2010 and later, ensure that your environment is set up to meet the following requirements:

- The administrator account that is used to perform the mailbox restore operation must have an active Exchange mailbox in the domain.

- Temporary space is required to accommodate the mailbox database during data 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**

  Alternatively, set these two optional parameters in the Data Protection for Exchange Server 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.

  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 the 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 at this web page: TSM for Mail - All Requirement Documents (http://www.ibm.com/support/docview.wss?uid=swg21219345)

  Follow the link to the requirements technote for your specific release or update level.
- 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.
- When you restore mailboxes directly from Exchange Server database files, verify that read and write access to the EDB file is available, and verify that the Exchange Server transaction log files are available.

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.

Data Protection for Exchange Server with IBM SAN Volume Controller and IBM Storwize V7000

Data Protection for Exchange Server exploitation of IBM SAN Volume Controller and IBM Storwize V7000 FlashCopy capabilities on Windows depends on the Volume Shadow Copy Service (VSS) hardware provider for IBM SAN Volume Controller and IBM Storwize V7000.

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

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

- If the VSS provider is configured to use incremental FlashCopy, only one backup version is allowed. 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 the snapshot from the VSS inventory but the FlashCopy relationship remains with the IBM SAN Volume Controller and IBM 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 depend on the volume that is deleted (that is, the target volumes that are already created) 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 IBM SAN Volume Controller and IBM Storwize V7000 space-efficient target volumes, and multiple backup versions exist, the backup that is 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 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 a space-efficient target that is the only target in the cascade is not destructive.
  - If a space-efficient target volume runs out of space to store the data from changed blocks on the source volume, that target volume and all target volumes that depend on that target volume go offline and render those backup versions unusable.

A space-efficient backup version is defined by a FlashCopy to a space-efficient target volume that has a background copy rate of zero. Space-efficient backup versions are not created when space-efficient target volumes are used, enabled with the `autoexpand` option, and a background copy rate is set to greater than zero. The target volumes grow to the allocated size of the source volumes when the background copy is completed.

Given these characteristics, the following requirements apply to Data Protection for Exchange Server support of IBM SAN Volume Controller and IBM 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 those targets are space-efficient when the background copy rate is set to 0.

- To determine how much storage space is required for each local backup, the backup LUNs require the same amount of storage space as the original LUNs. For example, if you have a 100-GB database on a 200-GB LUN, you need a 200-GB LUN for each backup version.
- When you use space-efficient backup versions, consider these guidelines:
  - 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 settings in your backup strategy.
  - Enable the `autoexpand` option 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 complete 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 Data Protection for Exchange Server to delete backup versions that are based on the defined policy to ensure that deletion occurs in the correct order. This process avoids the deletion of more backup versions than expected.

Instant restore

Data Protection for Exchange Server supports VSS instant restore operations when multiple backup versions exist on IBM SAN Volume Controller and IBM Storwize V7000 space-efficient target volumes.

However, in this situation, VSS instant restore operations access 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 restored. These snapshot volumes are removed for the VSS instant restore operation to complete successfully. The backups that include the deleted snapshots are deleted from storage. This destructive restore operation occurs only when VSS instant restore operations occur in an environment where Data Protection for Exchange Server manages multiple backup versions on IBM SAN Volume Controller and IBM Storwize V7000 space-efficient target volumes.

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

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

Follow these additional guidelines to help you protect data in IBM SAN Volume Controller and IBM 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 to higher than *85* because such a rate can significantly lengthen response times to I/O from host systems.

You can review the following guidelines before you attempt data 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 the backup versions you require. If you use fully-allocated target volumes, the capacity size of those volumes 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 information about configuring the IBM VSS Hardware Provider for space-efficient target volumes, see the appropriate VSS-related content in the IBM SAN Volume Controller or IBM 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 IBM SAN Volume Controller or IBM Storwize V7000 volumes, and the VDisks in the VSS_FREE pool are space efficient, then VSS instant restore operations from multiple backups is possible. However, the VSS instant restore operation in this environment is destructive.
- Make sure that IBM VSS hardware provider is installed. This provider must be configured to accommodate multiple backup versions on IBM SAN Volume Controller or IBM Storwize V7000 space-efficient target volumes.

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

- While NOCOPY FlashCopy backups can be mounted remotely, you must use either IBM SAN Volume Controller or IBM Storwize V7000 storage to restore a NOCOPY FlashCopy backup.
- You can create a NOCOPY FlashCopy to a space-efficient target. However, protection from physical failures to the source volume is not provided.

Make sure to review your IBM VSS hardware provider documentation for 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 IBM SAN Volume Controller or IBM Storwize V7000.

Space-efficient target volumes go offline when the capacity limit of those volumes 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.

Restriction: When you use VSS instant restore operations with multiple backup versions that exist on IBM SAN Volume Controller or IBM Storwize V7000 space-efficient target volumes, use only full or copy type backups when the backup destination is set to `LOCAL`. A local backup (including any local backups that are created after the one being restored) is deleted by IBM SAN Volume Controller or IBM Storwize V7000 because of the destructive restore behavior. As a result, any full, copy, incremental, or differential local backup is removed and becomes unavailable for restore operations. If you want to use incremental or differential local backups with IBM SAN Volume Controller or IBM Storwize V7000 space-efficient target volumes, disable VSS instant restore capability during any restore operations to avoid this situation.

IBM System Storage requirements

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

The IBM System Storage DS8000 series, 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.
- Do not place non-Exchange Server data on storage volumes that are dedicated to Exchange Server.
- 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 IBM SAN Volume Controller or IBM Storwize V7000 Space Efficient volume (SEV) that has multiple dependent targets, you must delete the snapshots 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 snapshots in this order can cause other snapshots of the same source to be removed.
- (IBM SAN Volume Controller and IBM 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 started earlier and use the same source disk are not yet fully copied. In this situation, schedule local backups for IBM SAN Volume Controller and IBM Storwize V7000 storage subsystems at intervals greater than the time required for the background copy process to complete.

VSS limitations for IBM SAN Volume Controller and IBM Storwize V7000

When you run a Data Protection for Exchange Server VSS backup (non-offloaded) to the backup destination of Tivoli Storage Manager server, in some cases the IBM SAN Volume Controller or IBM Storwize V7000 LUNs remain mapped to the Windows host even though the backup is complete.

In this situation, the Exchange Server data is on IBM SAN Volume Controller or IBM Storwize V7000 disks and the IBM System Storage VSS Hardware Provider is used. To work around this issue, you can use a backup destination other than Tivoli Storage Manager server (BOTH or LOCAL). You can also manually unmap the volumes that are attached to the Windows host.

When you run two Data Protection for Exchange Server VSS backups and if the volumes are large, or the background copy rate is set to a low number, or both conditions occur, the second VSS backup might be presented to be in a hang state. In this situation, the Exchange Server data is on IBM SAN Volume Controller or IBM Storwize V7000 disks. However, the second backup is waiting for the IBM SAN Volume Controller or IBM Storwize V7000 background copy of the first backup to complete before proceeding. IBM SAN Volume Controller or IBM Storwize V7000 does not allow two background copies of the same volume to occur at the same time. There is no indication that the second backup is waiting for the first background copy to complete.

You might also see timeout errors if the previous IBM SAN Volume Controller or IBM Storwize V7000 background copy takes too long. To resolve this issue, schedule your VSS backups so that enough time elapses between backups to accommodate this situation. You can also increase the copy rate of the IBM SAN Volume Controller or IBM Storwize V7000 background copy.

VSS instant restore operations in IBM System Storage DS8000 series, Storwize V7000, XIV, and SAN Volume Controller environments

When you prepare to implement a VSS instant restore operation, consider the type of data that you want to restore and where the backups are located.

Apply these guidelines, which are specific to the IBM System Storage DS8000 series, Storwize V7000, XIV, and SAN Volume Controller environments.

- Restore granularity is at the volume level.
- VSS requires that data must always be restored to the same drive letters and paths as existed during the original backup.
- VSS requires IBM System Storage Support for Microsoft Volume Shadow Copy Service software if you use a IBM System Storage DS8000 series, Storwize V7000, or SAN Volume Controller disk subsystem.
- VSS requires IBM XIV VSS Hardware Provider if you use an XIV disk subsystem.
- Backups must be located on the same XIV, IBM System Storage DS8000 series, Storwize V7000, or SAN Volume Controller storage subsystem to which the backups are restored.
- In a Database Availability Group (DAG) environment, stop the Microsoft Exchange Replication Service on the active node before you run the VSS instant restore operation.

- In an Exchange Server 2013 environment, stop the Exchange Search Host Controller Service on the active node before you run the VSS instant restore operation.

IBM SAN Volume Controller and IBM Storwize V7000 configuration examples

The following configuration examples presents scenarios that you can use to help you plan your data 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*.

Data Protection for Exchange Server 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*.

Data Protection for Exchange Server 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.

Data Protection for Exchange Server 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*).

Data Protection for Exchange Server 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*.

Data Protection for Exchange Server 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*.

Data Protection for Exchange Server 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.

VSS operations in IBM N-series and NetApp environments

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

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

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

In addition, Write Anywhere File Layout (WAFL) reserves space, that is, blocks equal to two times the specified size of the LUN to be used. This space reservation ensures that write operations are allowed for virtual disks. In the following example, you are shown how to calculate the size of these volumes:

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

VSS limitations for NetApp FAS series or IBM N-series

Certain limitations apply to NetApp FAS series and IBM N-series.

Because of the limitations in SnapDrive 4.2 and any supported prior versions, the VSS Provider for NetApp FAS series and IBM N-series, VSS-based operations that use Data Protection for Exchange Server with backup destination set to `LOCAL` must be implemented in specific ways. If you do not comply with the following configuration and operational guidelines, serious conditions can occur such as the premature deletion of snapshots that represent VSS backups to `LOCAL`, backup failure, and out-of-space conditions on the production volumes. When the

limitations in the SnapDrive are addressed by NetApp, Data Protection for Exchange Server VSS operations can be fully used. However, this situation is not applicable when FlexVols are used.

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

If you plan to run VSS backups with backup destination set to `LOCAL`, your backups must adhere to the following guidelines:

- The NAS file server LUNs that are used by a database must be fully dedicated to the database. The Exchange Server databases cannot share LUNs.
- A NAS filer LUN that is used by the Exchange Server databases must be the only LUN on the filer volume. For example, if Exchange Server uses four LUNs, four corresponding filer volumes must exist, where each volume contains one LUN.

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

If you plan to run VSS backups with backup destination set to `LOCAL`, your backups must adhere to the following guidelines:

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

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

Taking the previous considerations into account, you can use the following sample backup procedure to optimally run VSS backups by using both Tivoli Storage Manager and local backup destinations. The following assumptions apply to this sample backup procedure:

- The configuration requirements that are stated are met.
- The VSS backup to Tivoli Storage Manager takes one hour to complete.
- The VSS backup to a local destination takes five minutes to complete.

Your backup procedure can consist of the following backups:

- Daily VSS full backups to a local destination every four hours - 12 a.m., 4 a.m., 8 a.m., 12 p.m., 4 p.m., 8 p.m.
- Daily VSS full backups to Tivoli Storage Manager storage by one of the following two methods:
  - Set **`backupdestination`** to `BOTH` at 12 a.m. This specification creates a 12 a.m. backup to a local destination. Therefore, no separate 12 a.m. backup to local is required.

  - Full offloaded-backup at 1 a.m. No VSS local backup is available to restore VSS backups from between 1 a.m. and 4 a.m., when the next VSS backup to local takes place.
- Run weekly VSS full backups to Tivoli Storage Manager (offloaded backup) 5 a.m.

Tivoli Storage Manager policy management

With Data Protection for Microsoft Exchange Server, you can manage and configure storage management policy for backups. A backup policy determines how backups on local shadow volumes are managed and retained.

Although Tivoli Storage Manager policy determines how Data Protection for Microsoft Exchange Server backups are managed on Tivoli Storage Manager storage, 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 a VSS backup. In addition, verify that enough available storage space 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 affect how many backup versions are maintained on local shadow volumes. The amount of space that is required depends on the VSS provider that you use.

Backup expiration based on policy

Backups expire based on Data Protection for Exchange Server policy.

Expiration is the process by which Exchange Server backup objects are identified for deletion when the expiration date is past or the maximum number of backup versions that must 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 Data Protection for Exchange Server, 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 Data Protection for Exchange Server session.

For Exchange Database Availability Group (DAG) backups that use the DAG node, only the system on which the backup is created can cause a local backup to expire. If a new backup is created on a different system, and it exceeds the number of backups to be retained, the oldest backup expires from the Tivoli Storage Manager server. An expired backup can no longer be restored. However, the physical storage for that backup version is not released until the next time the original system runs a backup, query, or delete operation.

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 Data Protection for Exchange Server 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 Data Protection for Exchange Server policy.

Impact of policy on Data Protection for Exchange Server

Tivoli Storage Manager policy determines how Data Protection for Exchange Server backups are managed on Tivoli Storage Manager storage and on local shadow volumes when the environment is configured for VSS operations.

The Tivoli Storage Manager server recognizes Data Protection for Exchange Server as a node.

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

Tivoli Storage Manager policy can manage the VSS backups that are placed in Tivoli Storage Manager server storage pools. The Tivoli Storage Manager server manages VSS backups.

If you use IBM Tivoli Storage Manager for Copy Services and upgrade to Data Protection for Exchange Server, with the license for Tivoli Storage Manager for Copy Services, you can store VSS backups to local shadow volumes.

The number of local backup versions that are maintained by the Tivoli Storage Manager server is determined by the value that is specified by the Tivoli Storage Manager server **verexists** parameter, which is defined in the copy group of the management class to which the local backup belongs. Allocation of target volume sets is not necessary when you use the system provider. When you do not use the system provider, the number of target volume sets that are allocated for local backups must be equal to the **verexists** parameter. Target volume sets are not applicable to XIV.

For example, if `verexists=3`, then at least three sets of target volumes must be allocated for the backup to complete successfully. If only two sets of target volumes are allocated, the third and subsequent backup attempts fail. If more sets of target volumes exist than the number specified by the **verexists** parameter, these sets are ignored by the Tivoli Storage Manager server. A high number of local backup versions cannot be stored. If you want to have *N* number of local backup versions, set the **verexists** parameter to *N + 1*.

When you use the configuration wizard in the GUI, the **VSSPOLICY** parameter is set in the `tdpexc.cfg` file.

Depending on the policy management settings, LUNs can also be reused for new backups. When a new backup is requested and the maximum number of versions is reached, the software deletes the oldest snapshot (backup) to make space for the new snapshot. If the new request fails after the oldest snapshot is deleted, you have one less backup version than expected.

Policy management of local backups is required to reconcile the local backup repository with the information that is stored on the Tivoli Storage Manager server. For example, if target volume LUNs that are used for a local backup are removed from the storage subsystem, the information that represents the backup on the Tivoli Storage Manager server must be reconciled. Similarly, if the Tivoli Storage

Manager server policy determines that a local backup copy is no longer needed, the local backup manager must free the target volume LUNs to the storage subsystem. The release of the local backup manager is necessary so that these LUNs can be used for future backup operations. Tivoli Storage Manager automatically detects when these situations occur and completes the reconciliation.

Consider the scenario where you use a two-member DAG, named *MEMBER1* and *MEMBER2*. When you complete a backup to **LOCAL** on *MEMBER1* and complete more backups on *MEMBER2*, the backups to **LOCAL** on *MEMBER1* do not expire until the next time you complete a backup, query, or deletion operation on *MEMBER1*. In this scenario, you might use more storage than specified by **verexists**.

Storage space considerations for local shadow volumes

Tivoli Storage Manager requires that sufficient storage space is available to create shadow volumes for VSS backup processing. Even when the VSS backup destination is the Tivoli Storage Manager server, storage space to create a shadow volume is still required, but only on a temporary basis.

The value of the **verexists** parameter that is specified for your local backup policy determines the number of backup versions to retain on local shadow volumes. Therefore, a `verexists=1` setting causes the existing backup to be deleted on local shadow volumes (during a VSS backup to Tivoli Storage Manager server storage) to create enough temporary space for the new snapshot. Therefore, if you want to keep *N* backups on local shadow volumes and you also do VSS backups to Tivoli Storage Manager server storage, provision enough storage space on local shadow volumes and specify `verexists=`*`N+1`*.

If you keep only one backup, the same disk is reused. The process initially removes the existing backup and attempts the new backup. If the new backup fails, no backups exist.

If you retain multiple backups (snapshots), the oldest backup is removed before a new backup is created. If the new backup fails, you might have one less backup than specified by the policy. For example, if you specify to retain five backups, but the latest backup fails, you might have only four backup versions.

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

VSS backups (that Data Protection for Exchange Server creates and stores on local shadow volumes) can be changed and deleted from outside of Tivoli Storage Manager control.

For example, issue the Microsoft **VSSADMIN DELETE SHADOWS** command to remove a VSS backup that is managed by Tivoli Storage Manager. Tivoli Storage Manager is not able to prevent the removal of the backup. In such a situation, Tivoli Storage Manager detects that the backup is removed and reconciles its index of available backups with what is on local shadow volumes. Because backups can be removed, it important for you to establish a strategy that protects VSS backup data that is stored on local shadow volumes from being compromised.

Policy considerations for VSS backups

The following issues can impact your Tivoli Storage Manager policy for managing VSS backups:

- Overall backup strategy.
- Length of time that VSS backups are on Tivoli Storage Manager server storage.
- Number of VSS backup versions on Tivoli Storage Manager server storage.
- Types of VSS backups that are on Tivoli Storage Manager server storage.
- Number of VSS backup versions on local shadow volumes.
- Types of VSS backups on local shadow volumes.
- The amount of available target volume storage that is provisioned for VSS operations.

Specifying policy binding statements

Policy binding statements associate Exchange Server backups with a management policy.

About this task

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

Procedure

Specify the policy binding statements to use to bind snapshots to a policy, either by using the GUI or by manually adding binding statements to the configuration file. A policy statement is defined in the respective configuration file, for example:

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

Binding backups to policies

You can add, update, delete, or change the processing order of existing binding statements.

About this task

A backup policy determines how backups on local shadow volumes are managed and retained.

Procedure

1. From Microsoft Management Console (MMC), select the **Exchange Server** instance from the tree view.
2. On the **Protect** tab, click **Properties** in the Action pane.
3. Select **VSS Policy Binding** from the list of available property pages.

4. Add, update, delete, or change the processing order of existing binding statements.

   Tip: You can use a wildcard character (*) to mean "all". For example, specify a wildcard character in the **Server** field to bind the policy to all Exchange Servers.
5. Optional: Use **Move Up** and **Move Down** to modify the processing order. Policies are processed from the end to the beginning of the file and processing stops at the first match. To ensure that more specific statements are processed before general statements, you must list the more general specification before the more specific statement. Otherwise, the more general specifications match the target before the more specific specifications are reached.
6. Save any new or changed binding statement.
7. Optional: Verify the new or changed policies and bindings as follows:
   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

For VSS backups, VSSPOLICY statements are used to associate VSS backups with management classes. When you change from legacy backups to VSS backups, pay attention to the VSSPOLICY statements that you set for the backup.

The VSSPOLICY statements are entered in the configuration file (for example, `tdpexc.cfg`). A configuration file can include multiple VSSPOLICY statements. The configuration file is read from the end to the beginning of the file. If you are familiar with the Tivoli Storage Manager backup-archive client configuration file, the VSSPOLICY statements in the `tdpexc.cfg` file are read like the INCLUDE statements that are configured in the `dsm.opt` file.

If no VSSPOLICY statements are included in the configuration file, or if the VSSPOLICY statements do not match the type of backup that is set up, the default management class for the policy domain is used. Backup expiration parameters for the default management class might differ from the settings 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 that the backups expire according to the business needs of your environment.

Any policy changes in the `tdpexc.cfg` 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 Server. If the DSMAgent service state is set to Manual (Started), stop the service. The DSMAgent service starts when a VSS backup is initiated, but 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 is the sample syntax of a VSSPOLICY statement:

```
VSSPOLICY srv name "database-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 *"database-name"* variable. You can enter the wildcard character (*) to match all Microsoft Exchange Server databases. 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, `FULL` or `COPY` or the wildcard character (*) that matches all backup types.

The *backup-dest* variable specifies the backup destination. Use the `TSM` option to backup to Tivoli Storage Manager, the `LOCAL` option to back up data 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 is 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    "DB 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 beginning of the file. Use these types of statements so that you explicitly state the management class to use.

Managing Exchange Database Availability Group members by using a single policy

You can prevent Data Protection for Exchange Server 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 Data Protection for Exchange Server to back up database copies from different DAG members under a single DAG node.

All database copies can be managed as a single entity regardless of where the database copies are backed up from, and whether the backup copies are active or passive at the time of the backup. You can set up a minimum interval between database backups, which ensures that the database copies are not backed up at the same time or backed up too frequently.

Procedure

1. Use the Tivoli Storage Manager Configuration Wizard to configure the DAG node.
   - For VSS backups to Tivoli Storage Manager, ensure that you specify a node name in the **DAG Node** field on the TSM Node Names page in the wizard. This node is used to back up all the DAG.
   - For best results, ensure that all the DAG members are configured with the same DAG node name.
2. Ensure that the Tivoli Storage Manager administrator issues the **grant proxynode** command for each member server in the DAG to grant permission to the DAG member server to act as a proxy for the DAG node. If the configuration wizard is not used to configure the Tivoli Storage Manager server, the proxies must be defined. In addition, the backup-archive client node and the Data Protection node need `proxynode` authority. The backup-archive client node also needs `proxynode` authority to act on behalf of the Data Protection node. For example, the Tivoli Storage Manager administrator can issue the following commands on the Tivoli Storage Manager server:

   ```
   register node backup_archive_client_node password
   register node data_protection_node password
   grant proxynode target=data_protection_node agent=backup_archive_client_node
   register node DAG_node password
   grant proxynode target=DAG_node agent=backup_archive_client_node
   grant proxynode target=DAG_node agent=data_protection_node
   ```

3. Ensure that the DAG node and the Data Protection for Exchange Server node are in the same policy domain.
4. Create a backup schedule and specify the **/MINIMUMBACKUPINTERVAL** parameter in a backup command. You must use the Tivoli Storage Manager scheduler to run this schedule. For example, to use a single Tivoli Storage Manager schedule to back up exactly one copy of a database that contains multiple copies, complete the following steps:
   a. Create a command script named `C:\BACKUP.CMD` by issuing this command:

```
TDPEXCC BACKUP DB1 FULL /MINIMUMBACKUPINTERVAL=60
```

b. Copy the `BACKUP.CMD` file to all the DAG members.

c. Create one schedule and associate all the nodes with this schedule.

When the backup schedule runs, the minimum backup interval is observed and only one backup is created.

5. Optional: To decrease the load on the production Exchange server, you can specify that the backups are taken from a valid passive database copy. If a valid passive copy is not available, the backup copy is created from the active copy of the database. To add this specification, add **/PREFERDAGPASSIVE** to a backup command. For example:

```
TDPEXCC BACKUP DB1 FULL /MINIMUMBACKUPINTERVAL=60 /PREFERDAGPASSIVE
```

Configuration and options files in non-default locations

The Data Protection for Exchange Server software uses default configuration and options files. If you want to use non-default configuration and options files, use command line parameters when starting Microsoft Management Console (MMC) graphical user interface to specify alternate configuration and option files when you start Data Protection for Exchange Server.

The MMC graphical user interface used for Data Protection for Exchange Server software is started with the `flashcopymanager.exe` file. The `flashcopymanager.exe` file accepts the following parameters:

```
/mscFilename=filename  # Name of the MMC snap-in control file
/author # Opens the MMC console in author mode.
```

For example:

```
flashcopymanager.exe parameter1=filename parameter2=filename ...
```

The `flashcopymanager.exe` file accepts the following parameters to set the configuration files:

```
/EXCCONFigfile=filename # Exchange configuration file
/EXCOPTFile=filename  # Exchange OPT file
```

You can also start and run multiple instances of the MMC concurrently. With the aforementioned command line parameters, each instance operates using a different configuration based on the configuration and option files specified.

The information is this section does not apply when managing remote Data Protection for Exchange Server installations.

Specifying Data Protection for Exchange Server DAG member name parameters

The system where Data Protection for Exchange Server is installed must be registered to the Tivoli Storage Manager server with a Database Availability Group (DAG) member name.

About this task

When you configure Data Protection for Exchange Server, the Tivoli Storage Manager configuration wizard manages the creation of the Tivoli Storage Manager nodes and node attributes. You can customize the configuration template script to

add additional node attributes, for example, backup compression. Alternatively, to customize Tivoli Storage Manager nodes, you can use the Administrative client options with the **DSMADMC** command.

The DAG member name owns and manages all Data Protection for Exchange Server data that is backed up to the Tivoli Storage Manager server.

Procedure

1. Specify the DAG member name with the **nodename** option in the `dsm.opt` options file. The `dsm.opt` options file is located by default in the Data Protection for Exchange Server installation directory.
2. To run VSS operations, register DAG member names for more systems if required.
3. Configure the following Tivoli Storage Manager parameters when you register your Data Protection for Exchange Server DAG member name (system) to the Tivoli Storage Manager server:
   - **MAXNUMMP** This parameter determines the maximum number of mount points that a client node is allowed to use on the Tivoli Storage Manager server during a backup operation.
   - **TXNGroupmax** This parameter determines the number of files that are transferred as a group between Data Protection for Exchange Server and the Tivoli Storage Manager server, between transaction commit points. This parameter must have a value of 12 or greater.
   - **COMPRESSIon** This parameter determines whether the backup-archive client node compresses data before it sends the data to the Tivoli Storage Manager server during a backup operation. For VSS operations, specify `COMPression=Yes` in the backup-archive client options file (`dsm.opt`) in the backup-archive client directory.

Specifying other Data Protection for Exchange Server configuration parameters

You must configure several Data Protection for Exchange Server parameters.

About this task

The Tivoli Storage Manager administrator must provide you with the node name, password, the communications method, and the appropriate parameters to connect to the Tivoli Storage Manager server. Parameter values are stored in an options file that is located by default in the Data Protection for Exchange Server installation directory.

Procedure

1. Edit the options file, the `dsm.opt` file, by using a text editor.

   The `dsm.opt` options file includes the following parameters, which are necessary for initial configuration:

   COMMMethod

   This option specifies the communication protocol to use between the Data Protection for Exchange Server node and the Tivoli Storage Manager server. Data Protection for Exchange Server supports the same set of communication protocols that are supported by other Tivoli

Storage Manager clients on Windows systems. Depending on the `commmethod` option that you choose, the connectivity parameters for that **commmethod** must also be specified.

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

NODename
The Tivoli Storage Manager node name is the unique name by which Tivoli Storage Manager identifies the system that runs Data Protection for Exchange Server.

2. Although the following options are not necessary for initial configuration, and are not specified by default, modify the default values if necessary:

CLUSTERnode
Leave this option blank. When the option is blank, the default value is used.

COMPRESSIon
This option causes the Tivoli Storage Manager API to compress data before it is sent to the Tivoli Storage Manager server. This data compression reduces traffic and storage requirements. If you enable data compression, performance is impacted in the following ways:

- Processor usage increases on the system on which Data Protection for Exchange Server is running.
- Network bandwidth use is reduced because fewer bytes are sent.
- Storage usage on the Tivoli Storage Manager server is reduced.

If any of the following conditions exist, you might want to specify the `compression yes` option:

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

It might be better to specify the `compression no` option in the following cases:

- The computer that runs Data Protection for Exchange Server has a processor overload; the added processor usage can impact other applications that include the Exchange Server. You can monitor processor and network resource usage with the Performance Monitor program that is included with Windows.
- You are not constrained by network bandwidth; you can achieve the best performance by leaving the default `compression no` option unchanged and enabling hardware compaction on the tape drive, which also reduces storage requirements.

The Tivoli Storage Manager administrator can override the compression option setting for the Data Protection for Exchange Server node when the node is 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 compress the data.

DEDUPLication

Client-side data deduplication is used by the Tivoli Storage Manager API to remove redundant data during data 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 it is sent to the Tivoli Storage Manager server. You can specify `Yes` or `No`. The default value is `No`.

The value of the deduplication option for Data Protection for Exchange Server applies only if the Tivoli Storage Manager administrator allows client-side data deduplication.

The value of the deduplication option for Data Protection for Exchange Server applies only if the Tivoli Storage Manager administrator allows client-side data deduplication.

The **DEDUPLication** and **enablelanfree** options are mutually exclusive. You can use either one option or the other, but not both options together.

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.

ENABLECLIENTENCRYPTKEY

This option encrypts Exchange Server databases during data backup and restore processing by generating one random encryption key per session.

Restriction: You can back up encrypted VSS databases to only the Tivoli Storage Manager server, and not to a local Tivoli Storage FlashCopy Manager server.

Although Tivoli Storage Manager manages the key, you must have a valid database to restore an encrypted object.

Specify the **ENABLECLIENTENCRYPTKEY** *yes* option in the options file. This option specifies the type of encryption to use. You can specify `DES56` (56 bit), `AES128` (128 bit), or `AES256` (256 bit). The most secure data encryption method is `AES256`. The default encryption option is `AES128`.

In the options 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 encrypt the databases. If you make changes in the backup-archive client options file, ensure that you restart the Data Protection for Exchange Server Client Acceptor Daemon (CAD) service for the Exchange Server.

For example, encrypt your Exchange Server database backups by adding the following three options:

a. Add the `enableclientencryptkey yes` option.

b. Add the **encryptiontype** option with the type of encryption to use.

ENABLELANFree

This option allows Data Protection for Exchange Server to run in a LAN-free environment. To run a LAN-free VSS backup with Data Protection for Exchange Server, specify **ENABLELANFree** *yes* in the DSMAGENT (VSS Requestor) options file. For more information about LAN-free environments, see LAN-free client-data backup: Scenario (http://www.ibm.com/support/knowledgecenter/SSSQZW_7.1.1/com.ibm.itsm.sta.doc/c_scenario_lanfree.html).

INCLUDE and EXCLUDE

Use the VSSPOLICY statement in the Data Protection for Exchange Server configuration file to set policy for VSS backups.

The general **include** and **exclude** syntax is displayed:

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

Where `objectNameSpecification` is as follows:

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

And where `backupType` is one of the following types:

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

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

This example excludes `Database 1` from a backup:

```
EXCLUDE "SERVER1\Database 1\...\*"
```

This example binds all objects for database `DB2` to management class `CLASS1`:

```
INCLUDE "SERVER1\DB2\...\*" CLASS1
```

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

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

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

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

This example binds mailbox history objects to management class CLASS4:

```
INCLUDE "\...\MAILBOXINFO\...\*" CLASS4
```

Consider the following behavior when you set **include** and **exclude** statements:

- The wildcard character (*) matches zero or more characters.
- The wildcard character (?) matches any one character.
- The wildcard character (*) within a qualifier replaces zero or more characters only within that qualifier. The qualifier itself must exist in the matching object name. To match zero or more qualifiers, use ellipses (\...\).
- Incremental object names are always unique. These names contain qualifiers with unique values. Incremental object names are generated at the time of the backup and are, therefore, unpredictable and cannot be specified.
- Include/exclude lists are processed from the list end to the beginning and processing stops at the first match. To ensure that more specific specifications are processed, the more general specifications must be listed before the more specific statements. The general specifications are processed after the more specific statements. Otherwise, the more general specification matches the target before the more specific specifications are reached.
- When a match is found, processing of the list stops and the statement that matches is examined.
  - If the statement is an **exclude** statement, the matching object name is not backed up.
  - If the statement is an **include** statement, the matching object name is backed up.

  If the **include** statement contains a ManagementClassName, that management class is associated with the object name for this backup and for all backups of the same name on the current node.
- If a match is not found, the object is backed up by using the default management class for the current node.
- If a match is found for an **include** statement that specifies a management class but the specified management class is not valid for the current node, the default management class for the current node is used.
- Exchange Server database names must be of the correct case, as shown in the results that the **query exchange** or **query tsm** commands display. Data Protection for Exchange Server constants must be lowercase: meta, data, logs. However, now the Windows Tivoli Storage Manager API assumes that the specifications are for a Windows file system and ignores case. Because the specifications might be accepted in the future, the correct case must always be used.

PASSWORDAccess

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

You can manage the default password, as stored in the registry, by using a utility program named `dsmcutil.exe`. This utility program is distributed with the Tivoli Storage Manager backup-archive client package. For more information about using the **dsmcutil** command, see the `dsmcutil.hlp` file or the `dsmcutil.txt` file that are distributed with the Tivoli Storage Manager backup-archive client package.

3. Optionally, complete the following steps:
   a. Create more Data Protection for Exchange Server options files to point to another Tivoli Storage Manager server.
   b. Create more than one options file, where each file contains different parameters to use with a single Tivoli Storage Manager server.

Specifying Data Protection for Exchange Server preferences

Use the property pages in the Data Protection Properties window to customize Data Protection for Exchange Server configuration preferences.

About this task

Data Protection for Exchange Server default configuration parameters are defined in the Data Protection for Exchange Server `tdpexc.cfg` configuration file. These configuration parameters determine preferences such as the location of your log file, how date and time are displayed, and the performance tuning parameters.

You can issue the **tdpexcc set** command in the Data Protection for Exchange Server command-line interface.

Procedure

1. In the tree view of Microsoft Management Console (MMC), select the **Exchange** Server instance for which you want to edit preferences.
2. Click **Properties** in the Actions pane.
3. Edit the property page and click **OK**. For example, to bind VSS backups to Tivoli Storage Manager policy, select **Properties** > **VSS Policy Binding** in MMC, and enter appropriate values in the fields.

   To set policy for VSS backups, select **Properties** > **VSS Policy Binding** in MMC. Then configure the policy.

Related reference:

"Set command" on page 222

Chapter 3. Installing, upgrading, and migrating

Before you start the installation process, review the appropriate prerequisite information, including hardware and software requirements.

Prerequisites

Before you install Data Protection for Microsoft Exchange Server, ensure that your system meets the minimum hardware, software, and operating system requirements.

Hardware and software requirements change over time due to maintenance updates and the addition of operating system, application, and other software currency support.

For the latest requirements, review the Hardware and Software Requirements technote that is associated with the level of your Data Protection for Exchange Server program. This technote is available at this web page: TSM for Mail - All Requirement Documents (http://www.ibm.com/support/docview.wss?uid=swg21219345)

Follow the link to the requirements technote for your specific release or update level.

Installation process might require a reboot

If you do not install all of the prerequisites before starting the installation process, the installation process might require a reboot. As part of the installation process, one or more Microsoft C++ redistributable packages are installed, if they are not already installed on the Windows workstation. These packages can also be automatically updated by the Windows Update service. If the packages are updated, the update can cause the system to reboot when you start the installation program.

Additionally, because the Microsoft Visual Studio C++ redistributable package is a shared Windows component, other applications that have dependencies on the package might be stopped or restarted by Windows as part of the installation or upgrade of the C++ redistributable package. Schedule installations and upgrades during a maintenance window when other applications are not be adversely affected if they are stopped or restarted when the C++ redistributable package is installed. Monitor other applications after the installation is complete. If applications stopped and did not restart, restart the applications.

Minimum hardware requirements

The following hardware is required to install Data Protection for Exchange Server:

Hardware for an x64 system
: Compatible hardware that is supported by the Windows operating system and Exchange Server

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Virtualization environment resources

If you operation in a virtualization environment with Data Protection for Exchange Server, review these resources.

For more information about virtualization environments that can be used with Data Protection for Exchange Server, see this web page: Tivoli Storage Manager (TSM) guest support for Virtual Machines and Virtualization (http://www.ibm.com/support/docview.wss?uid=swg21239546)

Installing and configuring Data Protection for Microsoft Exchange Server

You can quickly install and configure Data Protection for Exchange Server to start protecting your Exchange Server data.

Before you begin

Before you install and configure Data Protection for Exchange Server, verify that you satisfy the hardware and software requirements.

You can obtain the installation package from the product DVD or from an IBM download site.

- If you obtain the package from the product DVD, ensure that the installation files are visible on the DVD drive.
- If you obtain the package from an IBM download site, you must extract the installation files.

About this task

Data Protection for Exchange Server is available in both licensed and maintenance packages. The installation process differs based on the package type.

Licensed package
Includes a license enablement file that is only available from your software distribution channel, such as Passport Advantage®, and includes the initial General Availability release of a product or component.

Maintenance update (fix pack or interim fix package)
Available from the maintenance delivery channel, and can sometimes be used to refresh the software distribution channel. Maintenance packages do not contain license enablement files and must be installed after a licensed package.

See the `README.FTP` file for information about how to install a fix pack or interim fix package. The `README.FTP` file is available in the same directory where the maintenance package is downloaded.

Related concepts:

"Security requirements" on page 15

Installing Data Protection for Exchange Server

Procedure

1. Log on to the system as an administrator.
2. Download the appropriate package file from one of the following websites, or you can access the files from the product DVD:
   - For a first time installation or a new release go to Passport Advantage at IBM Passport Advantage. Passport Advantage is the only website from which you can download a licensed package file.
   - For a maintenance fix, go to this FTP site and to the directory that contains the maintenance fix version that you require, Index of Data Protection for Microsoft Exchange Server patch files (ftp://public.dhe.ibm.com/storage/tivoli-storage-management/patches/tivoli-data-protection/ntexch/).
3. If you download the package from one of the download sites, complete the following steps:
   a. Verify that you have enough space to store the installation files when they are extracted from the product package.
   b. Change to the directory where you placed the executable file.

      Tip: In the next step, the files are extracted to the current directory. The path must contain no more than 128 characters. Extract the installation files to an empty directory. Do not extract the files to a directory that contains previously extracted files, or any other files.
   c. Either double-click the executable file, or enter the following command on the command line to extract the installation files. The files are extracted to the current directory.

      ```
      package_name.exe
      ```

      where `package_name` is like this example:

      ```
      7.1.2.0-TIV-TSMEXC-Win.exe
      ```
4. Follow the installation instructions that are displayed.
5. Click **Finish**.
6. If you plan to use VSS operations, you must install the most recent version of the Tivoli Storage Manager backup-archive client. The backup-archive client is also the VSS Requestor and is available separately.

Completing the installation configuration

Procedure

1. To start the MMC, click **Start** > **All Programs** > **Tivoli Storage Manager** > **Data Protection for Microsoft Exchange Server** > **DP for Exchange Management Console**. If you did not previously configure Data Protection for Exchange Server, the Tivoli Storage Manager configuration wizard starts automatically.
2. If the Tivoli Storage Manager configuration wizard does not start automatically, click **Manage** > **Configuration** > **Wizards** in the tree view, select the wizard, and click **Start** in the Actions pane.
3. Complete the following pages of the wizard:

   Data Protection Selection
   Select **Exchange Server** as the application to protect.

   Requirements Check
   Click any **Failed** or **Warnings** links to resolve errors.

If you do not have all the user roles that are required for individual mailbox restore operations, click the **Warnings** link and follow the wizard prompts to add the missing Exchange Server roles. If you are a member of the Exchange Organization Management group and have sufficient role-based access control (RBAC) permissions, you can automatically add the missing roles. If you are not a member of the Exchange Organization Management group and have insufficient RBAC permissions, you must manually add the missing roles.

TSM Node Names

Specify the Tivoli Storage Manager node names 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 data. This node name is the Tivoli Storage Manager client node name, also known as the DSM agent node name.
- In the **Data Protection for Exchange** field, enter the node name where the Data Protection for Exchange Server application is installed. This node stores the Data Protection for Exchange Server backups. If you configure the **DAG Node**, the DAG database backups are not stored under the Data Protection node. The backups are stored under the DAG node. Regardless, the Data Protection node must be defined.
- In the **DAG Node** field, enter the node name that you want to use to back up databases in an Exchange Server Database Availability Group. 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. This setting can prevent Data Protection for Exchange Server from making too many backups of the same database.

  Important: On the Tivoli Storage Manager server, ensure that you register the DAG node. All DAG members need proxy authority to run backups on behalf of the DAG node.

TSM Server Settings

Specify the Tivoli Storage Manager server address, and choose whether to have the wizard configure the Tivoli Storage Manager server. Alternatively, you can view and change the commands that the configuration wizard uses to configure the Tivoli Storage Manager server, or run manually run the commands.

Custom Configuration

Click **Default** in most situations, or click **Custom** to enter all service-related information.

TSM Configuration

Wait for all components to be provisioned and configured. Click **Re-run** if there are any problems. Click the **Failed** or **Warnings** link for more information if any problems remain.

Completion

The configuration status is displayed. Select the **VSS Diagnostics** check box to begin VSS verification.

If you do not use the wizard to configure the Tivoli Storage Manager server, the Tivoli Storage Manager administrator must configure the server before verification can be completed. If the wizard does not configure the server, it provides a link to a macro that can be provided to the Tivoli Storage Manager administrator as an example of one way to configure the server.

Verifying the configuration

Procedure

1. Verify that VSS is working correctly.

   If the **VSS Diagnostics** check box is selected at the completion of the configuration wizard, the VSS Diagnostics wizard is displayed. You can also start this wizard by clicking **Manage** > **Diagnostics**, and clicking **VSS Diagnostics** in the Actions pane.

   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.

2. Complete the following pages in the VSS Diagnostics wizard:

   Snapshot Volume Selection
   Select the volumes that you want to test and review the VSS provider and writer information.

   VSS Snapshot Tests
   Review event log entries that are logged as the persistent and non-persistent snapshots are taken, and resolve any errors.

   Completion
   Review the test status and click **Finish**.

3. Verify that Data Protection for Exchange Server is configured properly:
   a. 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.
   b. Change **PowerShell** to **Command Line**.
   c. Click the folder icon, and select the `verify_exc.txt` file. Then, click **Open**. These commands are displayed in the command-line pane:

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

   d. With the cursor in the command-line pane, press **Enter** to run the commands to verify your configuration. The configuration is verified when these commands run without warnings or errors.
   e. When verification is complete, you can use Data Protection for Exchange Server to back up and restore Exchange Server data.
   f. Back up and restore a set of test data.

Customizing the configuration

Procedure

After you successfully configure Data Protection for Exchange Server, define your policy settings and scheduled operations to meet your business requirements.

Related concepts:

"Security requirements" on page 15

Installing Data Protection for Exchange Server on a local system

You can install Data Protection for Exchange Server from a DVD. The setup wizard guides you through the process of installing Data Protection for Exchange Server.

Before you begin

Before you install and configure Data Protection for Exchange Server , verify that you satisfy the hardware and software requirements.

You can obtain the installation package from the product DVD or from an IBM download site.

- If you obtain the package from the product DVD, ensure that the installation files are visible on the DVD drive.
- If you obtain the package from an IBM download site, you must extract the installation files.

About this task

Data Protection for Exchange Server is available in both licensed and maintenance packages. The installation process differs between these two package types.

Licensed package
Includes a license enablement file that is only available from your software distribution channel, such as Passport Advantage, and includes the initial General Availability release of a product or component.

Maintenance update (fix pack or interim fix package)
Available from the maintenance delivery channel, and can sometimes be used to refresh the software distribution channel. Maintenance packages do not contain license enablement files and must be installed after a licensed package.

See the `README.FTP` file for information about how to install a fix pack or interim fix package. The `README.FTP` file is available in the same directory where the maintenance package is downloaded.

Procedure

Install Data Protection for Exchange Server by using the setup wizard. The wizard installs the product and any prerequisites such as the .NET Framework and Report Viewer.

1. Log on as an administrator.
2. Download the appropriate package file from one of the following websites, or you can access the files from the product DVD:

- For a first time installation or a new release go to Passport Advantage at IBM Passport Advantage. Passport Advantage is the only website from which you can download a licensed package file.
- For a maintenance fix, go to this FTP site and to the directory that contains the maintenance fix version that you require, Index of Data Protection for Microsoft Exchange Server patch files (ftp://public.dhe.ibm.com/storage/tivoli-storage-management/patches/tivoli-data-protection/ntexch/).

3. If you download the package from one of the download sites, complete the following steps:
   - Verify that you have enough space to store the installation files when they are extracted from the product package.
   - Change to the directory where you placed the executable file.

     Tip: In the next step, the files are extracted to the current directory. The path must contain no more than 128 characters. Extract the installation files to an empty directory. Do not extract the files to a directory that contains previously extracted files, or any other files.
   - Either double-click the executable file, or enter the following command on the command line to extract the installation files. The files are extracted to the current directory.

     ```
     package_name.exe
     ```

     where `package_name` is like this example:

     ```
     7.1.2.0-TIV-TSMEXC-Win.exe
     ```
4. Follow the installation instructions that are displayed.
5. If prompted, restart your system before the installation is completed.
6. Click **Finish**. Microsoft Management Console (MMC) is shared among Data Protection for Exchange Server, Data Protection for SQL Server, and Tivoli Storage FlashCopy Manager. If one of these products is installed in a location other than the default location, the setup wizard defaults to the existing installation directory. Use the same directory when you install any of these products on the same computer. The default base directory is `c:\program files\tivoli`.

Related concepts:

"Prerequisites" on page 47

Managing language packs

Each language pack contains language-specific information for Microsoft Management Console (MMC), command-line output, and messages. The installation wizard automatically identifies the language of your geographical area, and loads the language pack for that language.

Manually installing language packs

To view Microsoft Management Console (MMC), command-line output, and messages in a language other than English, install the language pack that you want. The language packs are executable program files that are in their respective language directory on the product DVD.

Before you begin

Ensure that Data Protection for Exchange Server is successfully installed before you install the language packs.

About this task

The `setupfcm.exe` program automatically starts the setup program for MMC language pack if you complete your installation on a computer with a supported language other than English.

The configuration wizard automatically provisions a language pack for any components it provisions.

Procedure

1. Insert the product DVD into the DVD drive and select **Run** from the **Start** menu.
2. Issue the following commands:

   Data Protection for Exchange Server Management Console language packs

   `x:\fcm\aaa\mmc\4120\bbb\setup.exe`

   Data Protection for Exchange Server language packs

   `x:\fcm\aaa\exc\7120\bbb\setup.exe`

   Where `x:` is your DVD drive, *aaa* is `x64`, and *bbb* is the three-letter country code that is associated with that language.
3. Follow the installation instructions in the prompt windows.
4. Click **Finish**.

What to do next

After you install the language pack, you must activate it.

Activating language packs

After you install the language pack, you must activate the language by updating the Data Protection for Exchange Server configuration file (`tdpexc.cfg` by default).

Procedure

Activate the language by using either of the following methods:

- Issue the **set** command with the **language** parameter to specify the language that you want. For example:

  ```
  tdpexcc set lang=fra
  ```

  For a list of available languages and associated three-letter country codes, see the **language** parameter details.
- Use the property pages to set the language by doing the following steps:
  1. Select the Exchange Server instance in the tree view.

2. Click **Properties** in the Actions pane.
3. Select the Regional property page.
4. Click **Regional and Language Options** to ensure that system settings match the language that you want to use. MMC uses system language settings.
5. Select the language from the list of installed language packs. The Data Protection components use language settings from a configuration file.
6. For the best results and correct operation, select the language that matches the system settings. Click **Match MMC language** to automatically update the language to match the system.

Related reference:

"Set positional parameters" on page 223

Implementing a silent (unattended) installation of Data Protection for Microsoft Exchange Server

To implement a silent installation of Data Protection for Exchange Server, you can use the setup program or the Microsoft Installer program. The installation package can be made available on a DVD or in a shared directory on a file server.

About this task

A silent installation is useful when Data Protection for Exchange Server must be installed on a number of different computers with identical hardware. For example, a company might distribute 25 Exchange Server installations across 25 different sites.

To ensure a consistent configuration and to avoid having 25 different people enter Data Protection for Exchange Server parameters, an administrator can choose to produce an unattended installation package and make it available to the 25 sites. The installation package can be placed on a DVD and sent to each of the remote sites, or the package can be placed in a shared directory on a file server for distribution across the different sites.

To implement a silent installation of Data Protection for Exchange Server, you can use the setup program or the Microsoft Installer program.

Silently installing Data Protection for Exchange Server with the setup program

You can use the setup program to silently install Data Protection for Exchange Server.

Before you begin

You must install two components: Data Protection for Exchange Server Management Console and Data Protection for Exchange Server. The setup programs for these components are on the installation media (where `x:` is your DVD drive):

Data Protection for Exchange Server Management Console setup program
(64-bit) `x:\fcm\x64\mmc\4120\enu\setup.exe`

Data Protection for Exchange Server setup program
(64-bit) `x:\fcm\x64\exc\7120\enu\setup.exe`

The Data Protection for Exchange Server Management Console and Data Protection for Exchange Server must be installed from an account that is a member of the local Administrators group for the system on which the Exchange Server is running.

Procedure

1. Issue the following commands to silently install both components to the default installation directories:

   ```
   x:\fcm\x64\mmc\4120\enu\setup.exe /s /v/qn
   x:\fcm\x64\exc\7120\enu\setup.exe /s /v/qn
   ```

   where `x:` is your DVD drive.

   You must substitute the appropriate feature when you install a language other than English.

2. The following examples are commands that specify the target directory, the features, language transform, start suppression, and logging. Specify each command on a single line.

   ```
   x:\fcm\x64\mmc\4120\enu\setup.exe /s /v"INSTALLDIR=\"C:\Program Files\Tivoli\"
   ADDLOCAL=\"Client\" TRANSFORM=1033.mst REBOOT=ReallySuppress /qn /l*v
   \"C:\Temp\DpExcMmcSetupLog.txt\""
   ```

   ```
   x:\fcm\x64\exc\7120\enu\setup.exe /s /v"INSTALLDIR=\"C:\Program Files\Tivoli\tsm\"
   ADDLOCAL=\"Client\" TRANSFORM=1033.mst REBOOT=ReallySuppress /qn /l*v
   \"C:\Temp\DpExcSetupLog.txt\""
   ```

3. Review these guidelines as you complete the 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 Data Protection for Exchange Server software. The installation package includes a number of prerequisites that is installed by Data Protection for Exchange Server. Ensure that all the prerequisites are installed before starting the silent installation, then set the **rebootyesno** option to *No* so that no system restart is required after the silent installation process finishes.

Batch files usage in silent installations

You can create a batch file to begin the silent installation with the parameters that you want to use.

The following script is a sample script (`c:\setup.bat`) of an unattended installation:

```
@echo off
 rem ==================================
 rem sample silent install script
 rem
 call x:\fcm\x64\mmc\4120\enu\setup.exe /s
/v"INSTALLDIR=\"C:\Program Files\Tivoli\" ADDLOCAL=\"Client\" TRANSFORM=1033.mst
 REBOOT=ReallySuppress /qn /l*v \"C:\Temp\DpExcMmcSetupLog.txt\""
```

```
rem
call x:\fcm\x64\exc\7120\enu\setup.exe /s
/v"INSTALLDIR=\"C:\Program Files\Tivoli\tsm\" ADDLOCAL=\"Client\"
TRANSFORM=1033.mst REBOOT=ReallySuppress /qn /l*v \"C:\Temp\DpExcSetupLog.txt\""
rem ===================================
rem code could be added after the
rem installation completes to
rem customize the dsm.opt files
rem if desired
rem ===================================
```

Silently installing Data Protection for Exchange Server with the Microsoft Installer program

You can use the Microsoft Installer (MSI) program, `msiexec.exe`, to implement a silent installation of Data Protection for Exchange Server.

Before you begin

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

Important: Unlike the `setup.exe` and `setupfcm.exe` programs, the `msiexec.exe` program does not include a number of prerequisites that are required by Data Protection for Exchange Server. When you use `msiexec.exe`, you must install all prerequisites manually.

Before you install and configure Data Protection for Exchange Server, verify that you satisfy the hardware and software requirements.

About this task

The following examples show how to use the **msiexec** command to install the Data Protection for Exchange Server Management Console and Data Protection for Exchange Server.

Procedure

1. To install the Data Protection for Exchange Server Management Console, issue each of these **msiexec** commands on a single line.

   ```
   msiexec /i"x:\fcm\x64\mmc\4110\enu\IBM Tivoli Storage Manager for Mail
   - MS Exchange - Management Console.msi" RebootYesNo="No"
   Reboot="Suppress" ALLUSERS=1 INSTALLDIR="c:\program files\tivoli"
   ADDLOCAL="Client" TRANSFORM=1033.mst /qn /l*v "c:\temp\DpExcMmcLog.txt"
   ```

   Where *x:* is your DVD drive.

2. To install Data Protection for Exchange Server, issue each of these **msiexec** commands on a single line:

   ```
   msiexec /i"x:\fcm\x64\exc\7110\enu\IBM Tivoli Storage Manager for Mail
   - MS Exchange.msi" RebootYesNo="No" Reboot="Suppress" ALLUSERS=1
   INSTALLDIR="c:\program files\tivoli\tsm" ADDLOCAL="Client"
   TRANSFORM=1033.mst /qn /l*v "c:\temp\DpExcLog.txt"
   ```

   Where *x:* is your DVD drive.

What to do next

You can install language packs in a similar way. MSI files for the language packs are in the language folders that are associated with each component. For language packs, issue the `ADDLOCAL="LanguageFiles"` command instead of the `ADDLOCAL="Client"` command.

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.

Related concepts:

"Prerequisites" on page 47

Creating and testing a silent installation package on a DVD or a file server

The administrator can choose to make an installation package available by burning a DVD or placing the package in a shared directory on a file server.

Before you begin

Before you begin, you must choose a location for the package. If you are burning a DVD, it is convenient to use a staging directory. If you are placing the package on a file server, you can use a staging directory or build the package directly on the file server.

About this task

Typically, the installation package contains the Data Protection for Exchange Server code distribution files and a batch file for a silent installation.

Procedure

1. Issue the following commands to create the package:

Table 3. Commands for creating a silent installation package

Command	Description
`mkdir c:\tdpdpkg`	Create a staging directory for the silent-install package
`cd /d c:\tdpdpkg`	Go to the staging directory
`xcopy g:\*.* . /s`	Copy the DVD distribution files to the staging directory
`copy c:\setup.bat`	Replace the existing `setup.bat` with the one created in the previous step

   This example uses `c:\tdpdpkg` as a staging directory.
2. After you create the installation package, test the silent installation.
3. After you complete the test, place the package on a DVD or make it available from a shared directory.

4. After you make the package available on a DVD or from a shared directory, complete these steps to run the silent installation package on another computer.

Option	Description

From a silent installation package on DVD:	Enable the `autostart`option to cause the silent installation to begin as soon as the DVD is inserted into the drive. If you do not enable the `autostart`option, start the setup.bat file from the root of the DVD by issuing the following command:
	`cd /d g:\`
	`setup.bat`

From a distribution directory:	If the package is placed in a shared directory that is called `tdpdpkg` at `\\machine1\d$`, another computer can run the `net use x: \\machine1\d$` command to share the drive as drive `x`. You can issue the following command:
	`cd /d x:\tdpdpkg`
	`setup.bat`

In either case, the silent installation begins. Allow enough time for the unattended installation to complete. No visual cues exist to inform you when the installation is finished, although you can add visual cues to the batch file.

Silent installation error messages

The **`setup.exe`** program can produce error messages if it cannot start properly.

In most cases, administrators encounter these messages when a severe error occurs. Users rarely see these messages. When you get an error message, it displays in a message box. Every error message has a number. These messages are system error messages and there is no way to suppress them in your script.

Upgrading Data Protection for Microsoft Exchange Server

You can upgrade Data Protection for Exchange Server from an earlier version of the software.

Procedure

1. Download the updates.
2. To install the updates, run `setupfcm.exe`.
3. To start Microsoft Management Console (MMC), click **Start** > **All Programs** > **Tivoli Storage Manager** > **Data Protection for Microsoft Exchange Server** > **DP for Exchange Management Console**. When you start MMC 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 that are found on the system, the configuration process varies. The wizard provides instructions to guide you through the process.
4. If the configuration wizard does not start automatically, click **IBM Tivoli Storage Manager** in the tree view, and click **Configuration**. Then, double-click **Wizards**.

Data Protection for Exchange Server migration

Migration from earlier versions of Data Protection for Exchange Server is supported.

After you upgrade from an older version of Data Protection for Exchange Server to a newer version, you can use VSS data restore operations to restore VSS backups that were originally created with the older version of the software.

Managing migrated backups to a Database Availability Group node

When you configure Data Protection for Exchange Server to back up databases in a DAG to a common DAG node, all DAG databases are backed up with the new DAG node name.

Before you begin

If you are migrating from a version that is earlier than Data Protection for Exchange Server V6.4, manage the backups from the previous versions by following these guidelines:

- Do not mix backups that are created with previous versions of Data Protection for Exchange Server 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.
- To view or restore a backup that is stored under the previous node name, you must change the Data Protection for Exchange Server configuration.
- You must manually delete backups over time assuming that the old backups are no longer useful.

Procedure

1. After you complete your migration, ensure that the first backup you do is a full backup.
2. To view and restore backups that are stored under the previous Data Protection node name, complete these steps:
   a. Remove the **DAG Node** by using the General properties page, configuration wizard, or the **set** command on the command-line interface.
   b. Restart or refresh Microsoft Management Console (MMC) or command-line interface.
   c. Click the **Recover** tab in MMC, or run a `tdpexcc query tsm *` command. Because the **DAG Node** parameter is not set, Data Protection for Exchange Server lists the backups that are stored under the Data Protection for Exchange Server node.
   d. Proceed to restore one or more of the listed backups.
3. If required, delete the backups that are expired.

Related concepts:

"Tivoli Storage Manager policy management" on page 33

Chapter 4. Configuring

You can use configuration wizards to configure Data Protection for Microsoft Exchange Server, or you can complete the steps manually. For best results, be guided by the step-by-step instructions in the configuration wizards.

About this task

The following list identifies the ways to configure Data Protection for Microsoft Exchange Server software by using the configuration wizard.

TSM Configuration
When you select the TSM Configuration configuration option, you configure Data Protection for Microsoft Exchange Server to work with Tivoli Storage Manager server.

Data Protection for Microsoft Exchange Server must be installed on your system. A Tivoli Storage Manager server must be available to communicate with Data Protection for Microsoft Exchange Server.

Mailbox Restore Only
When you select the Mailbox Restore Only configuration option, you configure Data Protection for Microsoft Exchange Server to restore mailboxes from Exchange database `.EDB` files. Additional 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 Data Protection for Microsoft Exchange Server software functionality. The functionality offered with this configuration option is included in the other configuration options.

Proxy node definitions for VSS backups

Because Data Protection for Exchange Server use the Tivoli Storage Manager backup-archive client to implement VSS backup operations, you must use node names specifically for VSS operations. In addition, you must use a node name for where Data Protection for Exchange Server is installed.

As part of the configuration procedure, a proxy relationship is defined for these node names. By default, this proxy relationship is defined when you run the configuration wizard. Follow the guidelines in this topic to manually complete the configuration.

The proxy relationship allows node names to process operations on behalf of another node name. When you register these nodes to the Tivoli Storage Manager server for VSS operations, do not specify the Tivoli Storage Manager `USerid=NONE` parameter. VSS operations fail when this parameter is specified.

Two types of node names are defined in proxy node relationships:

- *Target node*: A node name that controls data backup and restore operations and also owns the data on the Tivoli Storage Manager server. This node name is specified in the Data Protection for Exchange Server `dsm.opt` file.
- *Agent node*: A node name that processes operations on behalf of a target node. This node name is specified in the backup-archive client `dsm.opt` file.

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To define these nodes, issue the backup-archive client **grant proxy** command. For example:

```
GRANT PROXY TARGET=dpexc_node_name AGENT=dsmagent_node_name
```

Required node names for basic VSS operations

VSS operations require specific node name settings.

To process basic VSS operations, you must have one target node and one agent node.

Table 4. Required node names for basic VSS operations

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

Note: For basic VSS operations, the agent node and target node are on the same system.

Required node names for basic VSS offloaded backups

VSS offloaded backups require specific node name settings.

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

Table 5. Required node names for basic VSS offloaded backups

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

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

Agent node - Local DSMAGENT Node
This node name is where the backup-archive client and VSS provider are installed. This node is responsible for processing the VSS operations as Data Protection for Exchange Server itself does not process any direct VSS operations.

This node name is referred to as the Local DSMAGENT Node and is specified with the **localdsmagentnode** parameter in the Data Protection for Exchange Server configuration file (`tdpexc.cfg` by default). You can use the Properties window of Microsoft Management Console (MMC) by selecting **VSS backup**. From the Properties window, you can update the Local DSMAGENT Node name. Otherwise, use the **tdpexcc set** command to specify this parameter.

Agent node - Remote DSMAGENT Node
This node name is a separate system that must also have the backup-archive client, VSS provider, and the Exchange System Management Tools installed (make sure you install the same level of the Exchange System Management Tools that is installed on your Exchange production server). This node is responsible for moving VSS snapshot data from local shadow volumes to the Tivoli Storage Manager server. It is also responsible for doing the Exchange Integrity Check. This node name is referred to as the Remote DSMAGENT Node and is specified with the **remotedsmagentnode** parameter in the Data Protection for Exchange Server configuration file (`tdpexc.cfg` by default). You can use the Properties window of MMC by selecting **VSS backup**. From here, you can update the Remote DSMAGENT Node name. Otherwise, use the **tdpexcc set** command to specify this parameter.

The choice of available systems depends on whether the systems have access to the local shadow volumes that contain the VSS snapshot backups. This node name is only valid for VSS environments that support shadow copies that can be transported. It is not supported if you are using the default VSS system provider.

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

Configuring Data Protection for Microsoft Exchange Server by using the Tivoli Storage Manager Configuration Wizard

Configuration requirements for Data Protection for Exchange Server, Tivoli Storage Manager, and other applications vary. The requirements depend on which Data Protection for Exchange Server features you want to use. For example, if you plan to use VSS operations, the Tivoli Storage Manager backup-archive client, serving as the VSS Requestor, must also be installed and configured.

Procedure

1. Start Microsoft Management Console (MMC) by clicking **Start** > **All Programs** > **Tivoli Storage Manager** > **Data Protection for Microsoft Exchange Server** > **DP for Exchange Management Console**.
2. From the start page, click **Configuration**. Alternatively, from the tree view, go 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 **Exchange Server**. 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 do not have a license for the application that you are configuring, 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
   - If you do not have all the user roles that are required for individual mailbox restore operations, click the **Warnings** link and follow the wizard prompts to add the missing Exchange Server roles. If you are a member of the Exchange Organization Management group and have sufficient role-based access control (RBAC) permissions, you can automatically add the missing roles. If you are not a member of the Exchange Organization Management group and have insufficient RBAC permissions, you must manually add the missing roles.

c. In the TSM Node Names page, specify the Tivoli Storage Manager node names, which 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 Server data.
   - In the **Data Protection for Exchange** field, enter the node name where the Data Protection application is installed. This node name is used to store the Data Protection for Exchange Server 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 Server node. The backups 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 are backed up from. This setting can prevent Data Protection for Exchange Server 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 so that 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.

   Create a node name that can help you to distinguish the type of backup that runs. 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 Exchange configuration, the DAG node name does not need to relate to the VSS Requestor or the Data Protection for Exchange Server 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 and 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 fields and perform the following actions:

  – 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 option 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, the VSS Requestor is configured in addition to the applications that you selected. 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.
6. Optional: For a VSS configuration, verify that the **Run VSS diagnostics when this wizard exits** option is selected. When this option is selected, a diagnostic process tests the VSS snapshots on your system after you complete the wizard.

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

Related concepts:

"Security requirements" on page 15

Verifying the configuration

After you configure Data Protection for Exchange Server, verify that the configuration wizard automatically installs the Tivoli Storage Manager backup-archive client.

Procedure

1. In MMC, click the **Automate** tab to access the integrated command-line interface.
2. Click the **Open folder** icon, and select the `verify_exc.txt` file.
3. Click **Open**. These commands are displayed in the command-line pane:

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

4. With the cursor in the command-line panel, press Enter to run the commands and verify your configuration. The following examples show the command output that each command generates.
   - Command: **query tdp**

     ```
     C:\Program Files\Tivoli\tsm\TDPExchange>tdpexcc query tdp

     IBM Tivoli Storage Manager for Mail:
     Data Protection for Microsoft Exchange Server
     Version 7, Release 1, Level 2.0
     (C) Copyright IBM Corporation 1998, 2015. All rights reserved.

     Data Protection for Exchange Preferences
     ----------------------------------------

     BACKUPDESTination................... LOCAL
     CLIENTAccessserver..................
     DAGNODe............................. FCMDAG2
     DATEformat ......................... 1
     LANGuage ........................... ENU
     LOCALDSMAgentnode................... PEGUVM1
     LOGFile ............................ tdpexc.log
     LOGPrune ........................... 60
     MOUNTWait .......................... Yes
     NUMberformat ....................... 1
     REMOTEDSMAgentnode.................. PEGUVM2
     STOPservicesonir ................... Yes
     STOREMAILBOXInfo ................... Yes
     TEMPDBRestorepath................... C:\temp\DB
     TEMPLOGRestorepath.................. C:\temp\LOG
     TIMEformat ......................... 1
     IMPORTVSSSNAPSHOTSONLYWhenneeded.... No

     The operation completed successfully. (rc = 0)
     ```

   - Command: **query tsm**

```
C:\Program Files\Tivoli\tsm\TDPExchange>tdpexcc query tsm

IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
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Tivoli Storage Manager Server Connection Information
---------------------------------------------------

Nodename ............................... PEGUVM1_EXC
Network Host Name of Server ............ fvtseries11esx6
TSM API Version ........................ Version 7, Release 1, Level 1.42

Server Name ............................ FVTSERIES11ESX6_SERVER1
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

The operation completed successfully. (rc = 0)
```

- Command: **query exchange**

```
C:\Program Files\Tivoli\tsm\TDPExchange>tdpexcc query exchange

IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
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Querying Exchange Server to gather database information, please wait...

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

Server Name:                 PEGUVM1
Domain Name:                 cvtdomain1.local
Exchange Server Version:     14.3.181.6   (Exchange Server 2010)

Databases and Status
----------------------------------------

Mailbox Database 1474758353
 Circular Logging - Disabled
 DAG Status - None
 Recovery - False
   Mailbox Database 1474758353                  Online

PEGUVM1_DB5G_local
 Circular Logging - Disabled
 DAG Status - None
 Recovery - False
   PEGUVM1_DB5G_local                           Online

PEGUVM1_DB7L_sevsvc
 Circular Logging - Disabled
 DAG Status - Passive (Healthy)
 Recovery - False
   PEGUVM1_DB7L_sevsvc                          Online

PEGUVM1_DB8K_stdsvc
 Circular Logging - Disabled
 DAG Status - Active
 Recovery - False
   PEGUVM1_DB8K_stdsvc                          Online

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

Writer Name            : Microsoft Exchange Writer
Local DSMAgent Node    : PEGUVM1
Remote DSMAgent Node   : PEGUVM2
Writer Status          : Online
Selectable Components  : 4


The operation completed successfully. (rc = 0)
```

Configuring a Data Protection for Microsoft Exchange Server remote system to integrate with Tivoli Storage Manager

By using the TSM Configuration Wizard, you can configure a remote system to communicate with a Tivoli Storage Manager server.

Before you begin

On the local system, verify the following system requirements:

- Windows 7, Windows 8, Windows 2008, Windows 2008 R2, Windows 2012, Windows 2012 R2, or a later version is installed

- PowerShell version 3.0 is installed, if you are running Windows 7, Windows 8, Windows 2008, or Windows 2008 R2. With Windows 2012, PowerShell version 4.0 is installed by default.

On the remote system, verify the following system requirements:

- Windows 2008, Windows 2008 R2, Windows 2012, Windows 2012 R2, or a later version is installed
- Windows PowerShell version 3.0 is installed, if you are running Windows 2008, or Windows 2008 R2. With Windows 2012, PowerShell version 4.0 is installed by default.
- The required workload is configured.

Procedure

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

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

What to do next

To verify that 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 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 Data Protection for Microsoft Exchange Server by using the Mailbox Restore Only Configuration Wizard

Configuration requirements for Data Protection for Exchange Server, Tivoli Storage Manager, and other applications vary. The requirements depend on which Data Protection for Exchange Server features you want to use. For example, if you plan on using VSS operations, the Tivoli Storage Manager backup-archive client (serving as the VSS Requestor), must also be installed and configured.

Procedure

1. Start Microsoft Management Console (MMC) by clicking **Start** > **All Programs** > **Tivoli Storage Manager** > **Data Protection for Microsoft Exchange Server** > **DP for Exchange Management Console**.
2. From the start page, click **Configuration**. Alternatively, from the tree view, go to the **Configuration** node. Then, double-click **Wizards**.
3. In the results pane, double-click **Mailbox Restore Only** to open the Mailbox Restore Only Configuration Wizard.
4. Follow the instructions on the pages of the wizard. Review the results of the requirements check. Correct any errors or warnings in the requirements check.
   a. Click **Show Details** to view a list of individual requirement results. If you do not have all the user roles that are required for individual mailbox restore operations, click the **Warnings** link and follow the wizard prompts to add the missing Exchange Server roles. If you are a member of the Exchange Organization Management group and have sufficient role-based access control (RBAC) permissions, you can automatically add the missing roles. If you are not a member of the Exchange Organization Management group and have insufficient RBAC permissions, you must manually add the missing roles.
   b. Click **Next** to move to the next page of the wizard.
5. Click **Finish** in the Completion page.

Related concepts:

"Security requirements" on page 15

Manually configuring for TSM Configuration

For best results, use the configuration wizards to configure Data Protection for Exchange Server. The wizards provide you with a step-by-step guide of the configuration requirements. However, if you prefer to do these steps manually, follow these configuration instructions.

Configuring the computer that runs the Exchange Server

Perform these steps on the computer where the Exchange Server is installed and running.

Before you begin

Before you begin, ensure that the Exchange Server is running.

If you configure the DSM Agent node (the backup-archive client node) manually, ensure that you set the **PASSWORDAccess** option to`generate` in the `dsm.opt` file for the Tivoli Storage Manager backup-archive client. Also ensure that the stored password for the DSMAGENT Node is valid.

Procedure

1. Specify your Data Protection for Exchange Server node name and communication method in the `dsm.opt` file that is located by default in the Data Protection for Exchange Server installation directory.
2. Using the **set** command, specify your Data Protection for Exchange Server preferences (language, date format, log file) in the `tdpexc.cfg` file in the Data Protection for Exchange Server installation directory.
3. (VSS only) If you are configuring Data Protection for Exchange Server in an Exchange Server Database Availability Group (DAG) environment, issue the **set** command to create a common node name for backing up DAG servers. For example:

   ```
   tdpexcc set DAGNODe=TSMDAG1
   ```

   Where `TSMDAG1` is the DAG node name that is used to back up all databases in a DAG, regardless of which DAG member the database is backed up from.

   Important: On the Tivoli Storage Manager server, ensure that you register the DAG node. All DAG members need proxy authority to run backups on behalf of the DAG node.
4. If you schedule more than one DAG member to back up a database, and you must prevent DAG databases from being backed up too frequently, set the minimum amount of time, in minutes, that passes before a database can be backed up again by using the **/MINimumbackupinterval**. This parameter must be specified as part of a **backup** command script that is run by the Tivoli Storage Manager scheduler.

   For example, include the following statement in the `C:\BACKUP.CMD` script:

   ```
   tdpexcc backup DB1 full /minimumbackupinterval=60
   ```
5. Optional: To reduce the load on a production Exchange Server in a DAG, you can specify the **/PREFERDAGPASsive** parameter. If a healthy passive database copy is not available, this parameter backs up a passive database copy. The backup is created from the active database copy. This parameter must be specified as part of a **backup** command script that is run by the Tivoli Storage Manager scheduler.

   For example, include the following statement in a `C:\BACKUP.CMD` script:

   ```
   tdpexcc backup DB1 full /minimumbackupinterval=60 /preferdagpassive
   ```
6. (VSS only) Specify your **VSSPOLICY** statement in your Data Protection for Exchange Server configuration file. Exchange servers that use the same DAG node name must share the VSS Policy.
7. (VSS only) Configure the Tivoli Storage Manager backup-archive client if it is not already configured. If the backup-archive client is already configured, you

can use existing client services. The backup-archive client Setup Wizard can guide you through the configuration process. In the backup-archive client GUI menu, select **Utilities** > **Setup Wizard** > **Help me configure the TSM Backup Archive Client**. The node name for this system is referred to as the **Local DSMAGENT Node** and is specified with the **localdsmagentnode** parameter in the Data Protection for Exchange Server configuration file (`tdpexc.cfg`).

8. (VSS only) Install and configure the Tivoli Storage Manager Client Acceptor Service (CAD) if it is not already installed and configured. In the backup-archive client GUI menu, select **Utilities** > **Setup Wizard** > **Help me configure the TSM Web Client**. Make sure that the CAD service is running before you proceed to the next step.
9. (VSS only) Install and configure the Tivoli Storage Manager Remote Client Agent Service (DSMAGENT) if it is not already installed and configured. In the backup-archive client GUI menu, select **Utilities** > **Setup Wizard** > **Help me configure the TSM Web Client**. If a DSMAGENT is already installed and configured, you can use the existing one.
10. (VSS only) Install Tivoli Storage FlashCopy Manager if you want to manage local persistent VSS snapshots, which are created for VSS backups to LOCAL, VSS Instant Restores, and you want to run offloaded backups.
11. (VSS only) Add the Microsoft Exchange Server binary path to the PATH statement in the system environment variables. For example:

    ```
    "C:\Program Files\Microsoft\Exchange Server\V15\Bin"
    ```

    Verify that **ESEUTIL.EXE** tool exists in this directory. This tool is used by Data Protection for Exchange Server to run automatic integrity checks on the VSS backup.
12. (VSS only) Install and configure a VSS provider. Consult the VSS provider documentation for information about configuration of that software. You do not need to install and configure any components if you use the default Windows VSS System Provider.
13. (VSS only) Define storage space to hold VSS backups that is on local shadow volumes. Define enough space to store all copies of the VSS backups as designated by your policies. Provisioning storage space to manage VSS snapshots depends on the VSS provider that you use. Consult the VSS Provider documentation for more details.

Related concepts:

"Proxy node definitions for VSS backups" on page 61

Configuring the Tivoli Storage Manager server

Complete these steps on the Tivoli Storage Manager server.

Before you begin

Ensure that the Tivoli Storage Manager server is available.

Procedure

1. Define the policy domains, policy sets, management classes, copy groups, and storage pools. Choose what is necessary to meet your Data Protection for Exchange Server backup and restore requirements. For VSS operations, Tivoli Storage Manager server authentication must be on.
2. Register your Data Protection for Exchange Server node name and password by issuing the Tivoli Storage Manager **register node** command. For example, for VSS operations, this node is the target node. When you register nodes to the

Tivoli Storage Manager server specifically for VSS operations, do not specify the Tivoli Storage Manager **USerid**=NONE parameter. VSS operations fail when this parameter is specified.

3. If not already defined, register your Tivoli Storage Manager backup-archive client node name and password for the system where the Exchange Server is installed. For example, this agent node is the Local DSMAGENT Node for VSS operations.
4. (VSS only) If you plan to run offloaded backups from a particular system, first register the Tivoli Storage Manager backup-archive client node name and password for the system. For example, the agent node is the Remote DSMAGENT Node. *BAOFF* is used here (and in Step 5) to differentiate between this Remote DSMAGENT Node and the Local DSMAGENT Node (Step 3). You can replace *BAOFF* with the node name of your backup-archive client, and remove the *BAOFF* from the **grant proxynode** command.
5. (VSS only) Define the proxy node relationship (for the target node and agent nodes) by issuing the Tivoli Storage Manager **grant proxynode** command. For example:

   ```
   grant proxynode target=DAG node name agent=BAnodename
   ```

6. If you created a node name for backing up databases in an Exchange Server Database Availability Group (DAG), ensure that the following tasks are complete.
   a. Register the Tivoli Storage Manager backup-archive client and DAG node names and passwords with the Tivoli Storage Manager **register node** command.
   b. Ensure that the Tivoli Storage Manager administrator issues the **grant proxynode** command for each member server in the DAG to grant permission to the DAG member server to act as a proxy for the DAG node. If the configuration wizard is not used to configure the Tivoli Storage Manager server, the proxies must be defined. In addition, the backup archive client node and the Data Protection node require proxynode authority. The backup archive client node also requires proxynode authority to act on behalf of the Data Protection node. For example, the Tivoli Storage Manager administrator can issue the following commands on the Tivoli Storage Manager server:

      ```
      register node backup_archive_client_node password
      register node data_protection_node password
      grant proxynode target=data_protection_node agent=backup_archive_client_node
      register node DAG_node password
      grant proxynode target=DAG_node agent=backup_archive_client_node
      grant proxynode target=DAG_node agent=data_protection_node
      ```

What to do next

If any warning messages are displayed during the configuration process, resolve the issue noted in the warning. Some warnings include a link to a macro that you can use to configure Tivoli Storage Manager. Other warnings have links to web sites where you can download the packages that you require to successfully complete the configuration process.

Configuring the system that runs offloaded backups

Perform the following steps on the computer that is running the offloaded backups: This task is for VSS operations only.

Procedure

1. Configure the Tivoli Storage Manager backup-archive client if it is not already configured. If the backup-archive client is already configured, you can use existing client services. In the backup-archive client GUI menu, select **Utilities** > **Setup Wizard** > **Help me configure the TSM Backup Archive Client**. The node name for this system is called the Remote DSMAGENT Node and is specified with the **remotedsmagentnode** parameter in the Data Protection for Exchange Server configuration file (`tdpexc.cfg`) on the local, not offload, system.
2. Install and configure the Tivoli Storage Manager Client Acceptor (CAD) Service and the Remote Client Agent Service (DSMAGENT) if these services are not already installed. If a client CAD Service is already installed and configured, you can use an existing one. Use the backup-archive client Setup Wizard to guide you through the CAD installation process by selecting **Utilities** > **Setup Wizard** > **Help me configure the TSM Web Client**.
3. Install the Microsoft Exchange Server management tools from the Microsoft Exchange Server installation media. Take note of the Microsoft Exchange Server Management tools binary directory (for example: `C:\Program Files\Microsoft\Exchange Server\V15\Bin`). Verify that the `ESEUTIL.EXE` tool is stored in this directory. Data Protection for Exchange Server uses this tool to run automatic integrity checking of the VSS backup. Also, the Exchange Server does not need to be installed or running on this system. Only the Microsoft Exchange Server management tools must be installed on this system. For more information about the necessary license requirements, see the Microsoft Exchange Server documentation.
4. Add the Microsoft Exchange Server binary path to the PATH statement in the system environment variables. For example:

   ```
   "C:\Program Files\Microsoft\Exchange Server\V15\Bin"
   ```
5. Install and configure a VSS provider if you do not use the default system VSS provider. Consult the VSS provider documentation for information about the configuration of that software.

Configuring your system for mailbox restore operations

To use the Data Protection for Microsoft Exchange Server mailbox restore feature, you must complete more configuration in the configuration wizard.

About this task

Because of an Exchange Server requirement, the Data Protection for Microsoft Exchange Server configuration wizard checks that user permissions and software versions are correct.

- Ensure that you have the role-based access control (RBAC) permissions to complete individual mailbox restore operations.
- Install the correct version of Microsoft Exchange Server MAPI Client and Collaboration Data Objects on the Exchange server from which you are running the mailbox restore operations.

  Download and install the Exchange MAPI and Outlook MAPI on different systems.

Procedure

1. If you are using an incorrect Microsoft Exchange Server MAPI Client and Collaboration Data Objects version, click the **Warnings** link and go to the site where you can download the correct version.
2. If you do not have all the management roles that are required for individual mailbox restore operations, click the **Warnings** link and follow the wizard prompts to add the missing Exchange roles. If you are a member of the Exchange Organization Management group, you can automatically add the missing roles. If you are not a member of the Exchange Organization Management group, you must manually add the missing roles.
3. Configure the Client Access Server (CAS) role to run Mailbox Restore operations on Exchange Server 2010 and later versions. For more information about specifying the CAS with the **set** command, see the **Set syntax** command.

Related concepts:

"Security requirements" on page 15

Related reference:

"Set syntax" on page 222

Configuring mailbox history handling for improved performance

Mailbox history includes only the mailboxes from databases than are backed up. If you back up mailbox history with a version of Data Protection for Exchange Server earlier than version 7.1, you can manually delete the old mailbox history.

About this task

Data Protection for Exchange Server backs up a new set of mailbox history data. With the new mailbox history data, you can experience better performance when you back up mailbox history. It is also easier to find the mailbox when you restore a mailbox. Additionally, when you retrieve mailbox history, the mailbox names can be displayed in multiple languages.

Deleting the old mailbox history is not required. If you delete the old mailbox history data, you lose the location history information for the deleted and moved mailboxes in the backup copies that earlier versions of Data Protection for Exchange Server.

Procedure

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

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

   Keep this file for reference. You can use the backup copy when you need location information for the deleted and moved mailboxes
2. If you must restore a mailbox from the old backup copies, and the mailbox location changes before you delete the mailbox history, use the **/MAILBOXORIGLOCATION** parameter to restore the mailbox. After the old backup copies expire, mailbox history works without you having to specify the **/MAILBOXORIGLOCATION** parameter.
3. Complete the following steps to delete the old mailbox history from the Tivoli Storage Manager server.
   a. Start the Tivoli Storage Manager command-line administrative interface, `dsmadmc.exe`.

b. Log on to the Tivoli Storage Manager server.

c. Issue 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 Server node name when the **DAGNODE** is not being used.

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

The following results are displayed:

```
Node Name    Filespace    FSID   Platform   Filespace   Is Files-  Capacity   Pct
             Name                           Type        pace                  Util
                                            Unicode?
-----------  -----------  ----   --------   ---------   ---------  ---------  -----
CXCLAB_EXC   cxcserver.-    52   TDP MSE-   API:ExcD-   No            0 KB      0.0
             com\MAILB-          xchg       ata
             OXINFO
```

4. Issue the following command to delete the filespace for the old mailbox history while bearing in mind that all previous backups, including backups of Exchange Server 2010 data, might be deleted if you do not enter the command correctly.

```
DELete FIlespace node_name file_space_name\MAILBOXINFO
```

For example, the following command deletes the filespace for the mailbox history for the *CXCLAB_EXC* node:

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

Verifying the configuration of Data Protection for Exchange Server

Common errors might occur when a VSS operation runs. If commands complete without errors or warnings, you have verification that the Data Protection for Exchange Server configuration is correct. You can also verify that your Exchange Server is ready to run VSS operations.

Verifying the server configuration from the integrated command line

The configuration is verified as correct when these commands complete without errors or warnings.

Procedure

1. Click the **Automate** tab to access the integrated command-line interface.
2. On the lower half of the screen, click the Open folder icon, and select the `verify_exc.txt` file.
3. Click **Open**. These commands are displayed in the command-line panel:

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

4. With the cursor in the command-line panel, press Enter to run the commands and verify your configuration. The following examples show the command output that each command generates.

Command: `query tdp`

```
C:\Program Files\Tivoli\tsm\TDPExchange>tdpexcc query tdp

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Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
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Data Protection for Exchange Preferences
----------------------------------------

BACKUPDESTination................... LOCAL
CLIENTAccessserver..................
DAGNODe............................. FCMDAG2
DATEformat ......................... 1
LANGuage ........................... ENU
LOCALDSMAgentnode................... PEGUVM1
LOGFile ............................ tdpexc.log
LOGPrune ........................... 60
MOUNTWait .......................... Yes
NUMberformat ....................... 1
REMOTEDSMAgentnode.................. PEGUVM2
STOPservicesonir ................... Yes
STOREMAILBOXInfo ................... Yes
TEMPDBRestorepath................... C:\temp\DB
TEMPLOGRestorepath.................. C:\temp\LOG
TIMEformat ......................... 1
IMPORTVSSSNAPSHOTSONLYWhenneeded.... No

The operation completed successfully. (rc = 0)
```

Command: query tsm

```
C:\Program Files\Tivoli\tsm\TDPExchange>tdpexcc query tsm

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Tivoli Storage Manager Server Connection Information
---------------------------------------------------

Nodename ............................... PEGUVM1_EXC
Network Host Name of Server ............ fvtseries11esx6
TSM API Version ........................ Version 7, Release 1, Level 1.42

Server Name ............................ FVTSERIES11ESX6_SERVER1
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

The operation completed successfully. (rc = 0)
```

Command: query exchange

```
C:\Program Files\Tivoli\tsm\TDPExchange>tdpexcc query exchange

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Querying Exchange Server to gather database information, please wait...

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

Server Name:                 PEGUVM1
Domain Name:                 cvtdomain1.local
Exchange Server Version:     14.3.181.6   (Exchange Server 2010)

Databases and Status
----------------------------------------

Mailbox Database 1474758353
 Circular Logging - Disabled
 DAG Status - None
 Recovery - False
   Mailbox Database 1474758353                  Online

PEGUVM1_DB5G_local
 Circular Logging - Disabled
 DAG Status - None
 Recovery - False
   PEGUVM1_DB5G_local                           Online

PEGUVM1_DB7L_sevsvc
 Circular Logging - Disabled
 DAG Status - Passive (Healthy)
 Recovery - False
   PEGUVM1_DB7L_sevsvc                          Online

PEGUVM1_DB8K_stdsvc
 Circular Logging - Disabled
 DAG Status - Active
 Recovery - False
   PEGUVM1_DB8K_stdsvc                          Online

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

Writer Name            : Microsoft Exchange Writer
Local DSMAgent Node    : PEGUVM1
Remote DSMAgent Node   : PEGUVM2
Writer Status          : Online
Selectable Components  : 4


The operation completed successfully. (rc = 0)
```

Verifying the Exchange Server is ready to start VSS operations

Complete the following tests to verify that your Exchange Server is ready to run VSS operations.

Before you begin

- For best results, complete these tests before you install Tivoli Storage Manager.
- Test the core VSS function first. VSS function can be validated with the Windows Server-embedded **DISKSHADOW** command. The **DISKSHADOW** command is available for Windows Server 2008, Windows Server 2008 R2, and later operating systems.

About this task

The following list identifies the DISKSHADOW tests to complete before any Tivoli Storage Manager components are installed.

Procedure

1. Test non-persistent shadow copy creation and deletion as follows:
   - Run DISKSHADOW in a command window
   - DISKSHADOW>begin backup
   - DISKSHADOW>add volume f: (Database volume)
   - DISKSHADOW>add volume g: (Log volume)
   - DISKSHADOW>create
   - DISKSHADOW>end backup
   - DISKSHADOW>list shadows all (this process might take a few minutes)
   - DISKSHADOW>delete shadows all

   Note: Volumes on drive F and drive G represent the Exchange Database and log volumes. Repeat this test four times, and verify that the Windows Event Log contains no errors.
2. Test persistent shadow copy creation and deletion as follows:
   - Run DISKSHADOW in a command window
   - DISKSHADOW>set context persistent
   - DISKSHADOW>begin backup
   - DISKSHADOW>add volume f: (Database volume)
   - DISKSHADOW>add volume g: (Log volume)
   - DISKSHADOW>create
   - DISKSHADOW>end backup
   - DISKSHADOW>list shadows all (This process might take a few minutes)
   - DISKSHADOW>delete shadows all

   Note: Volumes on drive F and drive G represent the Exchange Server database and log volumes. Repeat this test four times, verify that the Windows Event Log contains no errors.
3. Test non-persistent transportable shadow copy creation and deletion as follows:
   - Run DISKSHADOW on a command window
   - DISKSHADOW>set context persistent
   - DISKSHADOW>set option transportable
   - DISKSHADOW>begin backup
   - DISKSHADOW> add volume f: (Database volume)
   - DISKSHADOW> add volume g: (Log volume)
   - DISKSHADOW>set metadata c:\metadata\exchangemeta.cab (specify the path where you want the metadata to be stored)
   - DISKSHADOW> create
   - DISKSHADOW>end backup
   - Manually copy the `exchangemeta.cab` file from the source server to the offload server and run these two commands:
     – DISKSHADOW>LOAD METADATA *path to exchangemeta.cab*
     – DISKSHADOW>IMPORT

– DISKSHADOW>list shadows all (This process might take a few minutes)
– DISKSHADOW>delete shadows all

Note: Volumes f: and g: represent the Exchange Server database and log volumes. Repeat this test four times, and verify that the Windows Event Log contains no errors.

What to do next

When these tests complete without errors, you can install Tivoli Storage Manager. Use the DiskShadow tool for verification. The DiskShadow tool is preinstalled on the Windows Server operating system.

Note: On the last step of the configuration wizard, a VSS diagnostic check is run to verify the VSS setup. Any warnings must be fixed before you finish the configuration and start a Data Protection for Exchange Server operation.

Common errors returned from VSS operations

You can diagnose the cause of common errors that might occur when a VSS operation runs.

The following two errors are commonly returned:

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

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

Setting user preferences

Use the property pages in the Data Protection Properties window to customize Data Protection for Exchange Server 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 Microsoft Management Console (MMC), select the **Exchange** Server instance for which you want to edit preferences.
2. Click **Properties** in the Actions pane.
3. 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 MMC. 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

Use the Server Information property page to obtain information about the server that provides backup services.

The fields that display depends 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.

For Exchange systems, the domain name, policy set, and management class are listed for the Data Protection node. To get these parameters for the DAG node, log on to the Tivoli Storage Manager server or contact your Tivoli Storage Manager server administrator.

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 retained.

Server Password

Use the Server Password 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.

The following fields are displayed in the property page:

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 the Policy Management property page to add or update a backup policy, which controls 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 the VSS Policy Binding 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 end to the beginning and processing stops when the first matching statement is reached. 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 the Managed Capacity 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 the Diagnostics property page to select the type of tracing to run on various components of Data Protection for Microsoft Exchange Server.

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 Microsoft Management Console (MMC).

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 only MMC.

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 6. 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

Table 6. Diagnostics modes and their usage (continued)

Mode	Components traced along with trace flags used	When to use
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 MMC. 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 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 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 MMC user settings file and passed to the Data Protection component as part of the command. The following file is generated:

```
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:

```
TraceFileExcAPI.trc
```

General (Exchange)

Use the General (Exchange) 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 (CAS) 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 CAS if the local server has the CAS role installed. The CAS that is defined by the logon user mailbox database is used if the local server does not have the CAS role installed.

You can find the name of the current CAS, 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 CAS, you can define the CAS 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.

Logging

Use the Logging 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 Data Protection for Exchange Server activity log when a command runs.

Regional

Use the Regional 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 Microsoft Management Console (MMC). 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 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 the VSS Options property page to configure preferences that are used during VSS backup and restore 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. For Exchange Server, this selection is the default.

Local The backup is only stored on local disk.

Both The backup is stored on both Tivoli Storage Manager server storage and local disk.

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 is completed, 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

Use the Custom Settings property page to set your filtering options and control the amount of information that is returned from the server.

Select **Show Refresh Options** in the toolbar in the Recover view.

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.

MAPI Settings

If you use Exchange Server 2013, use the MAPI Settings property page to verify that the user mailbox is online. You can also view and update the MAPI registry key that enables Data Protection for Exchange Server to connect to the Exchange Server.

Data Protection for Exchange Server automatically generates a default value for the registry key. Edit the registry key only if the default value is incorrect.

The values that you enter override the registry key that is in the `HKEY_CURRENT_USER\Software\Microsoft\Windows NT\Current Version\Windows Messaging Subsystem` directory. If you modify the registry incorrectly, the connection to the Exchange Server might fail.

You can use this property page only if you use Exchange Server 2013 or later versions.

RpcHttpProxyMap_TSM

Change the registry key values to reflect the correct domain, endpoint, and Remote Procedure Call (RPC) authentication methods for your environment. By default, the format is:

Domain=Proxy Server,*RpcHttpAuthenticationMethod*,*RpcAuthenticationMethod*,*IgnoreSslCert*

For example:

`companyname.local=https://exchange.companyname.com,ntlm,ntlm,false`

where:

- *Domain* value is the domain suffix of the personalized server ID, for example, `companyname.local`. Specify any domain or a substring of a domain, or the asterisk (*) and question mark (?) wildcard characters, for example, `*.companyname.local`.
- *Proxy Server* value is the RPC proxy server that has the Client Access Server (CAS) role. Specify the fully qualified domain name (FQDN) of the RPC proxy server. Precede the FQDN by `http://` for an HTTP connection, or `https://` for an HTTPS connection. For example, `https://exchange.companyname.com`
- *RpcHttpAuthenticationMethod* value is the method that is used to authenticate RPC-over-HTTP connections. Specify `NTLM`, `Basic`, `Negotiate`, or `WinNT`.
- *RpcAuthenticationMethod* value is the method that is used to authenticate RPC-over-TCP connections. Specify `NTLM`, `Negotiate`, `WinNT`, `Anonymous`, or `None`.
- *IgnoreSslCert* value indicates whether the Exchange Server validates SSL certificates. For the Exchange Server to ignore invalid certificates, specify `False`.

Domain

Change the domain name to reflect the correct domain if for example, you have multiple domains, or the default domain value is incorrect. To match all domains, enter the asterisk (*) wildcard character. When you change this domain value, the *Domain* value of the registry key automatically updates in the `RpcHttpProxyMap_TSM` field.

Use HTTPS authentication

Select this check box if RPC-over-HTTPS is enabled for the Exchange

Server that is hosting the MAPI profile. Otherwise, clear this check box to ensure that HTTP authentication is used for RPC-over-HTTP connections. When you change this authentication value, the *RpcAuthenticationMethod* value of the registry key automatically updates in the `RpcHttpProxyMap_TSM` field.

Related tasks:

"Ensuring successful MAPI connections" on page 99

Specifying configuration and options files in non-default locations

The Data Protection for Microsoft Exchange Server software uses default configuration and options files. If you want to use non-default configuration and options files, use command-line parameters to specify alternative configuration and option files when you start Data Protection for Microsoft Exchange Server.

Before you begin

The information in this procedure does not apply to managing remote Data Protection for Microsoft Exchange Server installations.

About this task

MMC that is used for Data Protection for Microsoft Exchange Server software is started with the `flashcopymanager.exe` file. The `flashcopymanager.exe` file accepts the following parameters:

```
/mscFilename=filename  # Name of the MMC snap-in control file
/author # Opens the MMC console in author mode.
```

For example:

```
flashcopymanager.exe parameter1=filename
 parameter2=filename ...
```

The `flashcopymanager.exe` file accepts the following parameters to set the configuration files:

```
/EXCCONFigfile=filename # Exchange configuration file
/EXCOPTFfile=filename # Exchange OPT file
```

Procedure

Start MMC with the parameters by using `flashcopymanager.exe`. You can also start and run multiple instances of MMC concurrently. With the command-line parameters, each instance operates by using a different configuration that is based on the specified configuration and option files.

Transitioning Exchange Server backups from Tivoli Storage FlashCopy Manager to Tivoli Storage Manager

Configure Tivoli Storage FlashCopy Manager so that you can access both a local and Tivoli Storage Manager server. Use this approach if you move to a Tivoli Storage Manager environment and want to continue interacting with locally managed snapshots until policy marks them for expiration.

Before you begin

If you use the **Standalone** and Tivoli Storage Manager server configuration wizards to configure Tivoli Storage FlashCopy Manager, you do not need to manually implement the following procedures. To interact with a Tivoli Storage Manager, run the **TSM** configuration wizard. To interact with a Tivoli Storage FlashCopy Manager server, run the **Standalone** configuration wizard. You can move from one type of server to another by running the corresponding configuration wizard at any time.

About this task

If you do not use the configuration wizards, coordinate efforts with your Tivoli Storage Manager server administrator to complete the following manual tasks. Some of the following command examples are formatted on multiple lines. Issue each command on a single line.

Configuring the Tivoli Storage Manager server

Procedure

1. Select or create the policy definitions that are used for each type of backup you plan to use. You can provide the administrator with the existing local-defined policy settings in your Tivoli Storage FlashCopy Manager stand-alone environment. Use the GUI or the command-line interface of Data Protection for Microsoft Exchange Server to retrieve this information.
2. Register your Data Protection for Microsoft Exchange Server node name and password with the Tivoli Storage Manager **register node** command. For example:

   ```
   register node DPnodename DPpassword
   ```
3. If not already defined in the Tivoli Storage Manager, register the Tivoli Storage Manager backup-archive client node name and password for the workstation where the Exchange server is installed. For example:

   ```
   register node BAnodename BApassword
   ```
4. Define the proxy node relationship for the Target Node and agent nodes with the Tivoli Storage Manager **grant proxynode** command. For example:

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

Configuring the computer that runs the Exchange Server

Procedure

1. In the directory where the Data Protection for Microsoft Exchange Server is installed, make a copy of the options file named `dsm.opt`. After you begin by using the Tivoli Storage Manager server, the copy is used for access to the Tivoli Storage FlashCopy Manager stand-alone environment. One method of making the copy is to start the Exchange command-line prompt from the Tivoli Storage FlashCopy Manager Snapin: In the Tivoli Storage FlashCopy Manager Snapin Tree view, an Exchange server node is displayed for each Exchange server instance on the computer.
   a. Select an Exchange server instance in the tree view. The integrated command line and an Actions pane are displayed.
   b. Start the Data Protection for Microsoft Exchange Server command line from the Actions pane. Select:

      ```
      Launch Command Line
      ```
   c. To make a copy of the options file, enter:

```
copy dsm.opt dsm_local.opt
```

2. In the same directory, make a copy of the Data Protection for Microsoft Exchange Server configuration file. For example:

   ```
   copy tdpexc.cfg tdpexc_local.cfg
   ```

   Preserve the contents of the local configuration file under these conditions:

   - You specified policy bindings during the use of Tivoli Storage FlashCopy Manager.
   - You are updating the policy bindings to reflect changes in your policy specifications for your Tivoli Storage Manager server usage.

3. In the Tivoli Storage Manager backup-archive client installation directory, make a copy of the VSS requestor options file named `dsm.opt`. Use the Windows **copy** command. For example:

   ```
   C:\Program Files\Tivoli\TSM\baclient>copy dsm.opt dsm_local.opt
   ```

4. In all of the files named `dsm.opt`, modify the `TCPSERVERADDRESS` line. Replace `FLASHCOPYMANAGER` with the IP address of the Tivoli Storage Manager server. For example:

   ```
   TCPServeraddress 9.52.170.67
   ```

   To accomplish this task, use a text editor like Notepad or Wordpad.

5. To access the Tivoli Storage FlashCopy Manager stand-alone environment during the transition period, open a Windows command prompt and change the directory to the Tivoli Storage Manager backup-archive client installation directory. This path is the default:

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

   Create an alternative Windows service for the Tivoli Storage Manager Client Acceptor service by using the **dsmcutil** command. For example:

   ```
   dsmcutil install cad /name:tsmcad4local
   /node:my_backup-archive_client_node
   /password:my_TSM_server_password
   /optfile:"C:\Program Files\Tivoli\TSM\baclient\dsm_local.opt"
   /httpport:1583
   ```

   For more information about using the **dsmcutil** command, see dsmcutil command (http://www.ibm.com/support/knowledgecenter/SSGSG7_7.1.2/com.ibm.itsm.client.doc/c_cfg_dsmcutil_usewin.html).

6. Create an alternate Windows service for the Tivoli Storage Manager remote agent service. For example:

   ```
   dsmcutil install cad /name:tsmcad4remote
   /node:my_backup-archive_client_node
   /password:my_TSM_server_password
   /optfile:"C:\Program Files\Tivoli\TSM\baclient\dsm_remote.opt"
   /httpport:1583
   ```

7. Edit the `dsm_local.opt` file in the Data Protection for Microsoft Exchange Server installation directory. Add this line:

   ```
   HTTPPORT 1583
   ```

8. Start the alternate Tivoli Storage Manager Client Acceptor service:

   ```
   dsmcutil start /name:tsmcad4local
   ```

9. Stop and restart the original Tivoli Storage Manager Client Acceptor service so that the new values in the `dsm.opt` file are activated. You can do this action through the Windows Services GUI or by using the **dsmcutil** command:

```
dsmcutil stop /name:"TSM Remote Client Agent"
dsmcutil stop /name:"TSM Client Acceptor"
dsmcutil start /name:"TSM Client Acceptor"
```

10. As backups start occurring and are managed in the Tivoli Storage Manager server environment, phase out the remaining backups that are created in the Tivoli Storage FlashCopy Manager stand-alone environment. You can choose between two ways of achieving the phase-out:
    a. In the Tivoli Storage FlashCopy Manager stand-alone environment, define a time-based policy that automatically causes the old backups to expire and delete. For example, if you want to expire each backup after it is 30 days old, update the time-based policy by using the command:

       ```
       tdpexcc update policy mypolicy /daysretain=30
       /tsmoptfile=dsm_local.opt
       /configfile=tdpexc_local.cfg
       ```

       You can also change these parameters by using the Local Policy Management dialog that is accessed from the **Utilities** menu of the Data Protection for Microsoft Exchange Server Backup/Restore GUI. For information about how to start the GUI, see the section that describes how to access the Tivoli Storage FlashCopy Manager stand-alone environment.

       The process of expiring backups when their age exceeds the **daysretain** limit depends upon a basic function that is run in the stand-alone environment. The function must include an operation that queries the backups.If you do not regularly use the stand-alone environment client, you can use a scheduler to periodically start a command such as:

       ```
       tdpexcc query tsm * /all
       /tsmoptfile=dsm_local.opt
       /configfile=tdpexc_local.cfg
       ```

       For example, if your backups are created each week, then you can schedule the **query** command to run weekly to cause the expiration of out-of-date backups.

       The last backup that is created while you run the stand-alone environment, is not automatically deleted by the process of expiring the backups. For that result, use the explicit delete operation, as described next.
    b. Alternatively, you can explicitly delete each backup when you determine that it is no longer needed. Use the Data Protection for Microsoft Exchange Server **delete backup** command, or the **Delete Backup** (right mouse-click menu option) in the GUI **Restore** tab.
11. To access the Tivoli Storage FlashCopy Manager stand-alone environment:
    a. Open the Automate tab to access the integrated command-line prompt.
    b. Start Tivoli Storage FlashCopy Manager stand-alone commands by appending the `/tsmoptfile` option, for example:

       ```
       tdpexcc query tsm * /all
       /tsmoptfile=dsm_local.opt
       /configfile=tdpexc_local.cfg
       ```
    c. Start the Tivoli Storage FlashCopy Manager GUI by issuing this command at the command prompt.

       ```
       flashcopymanager.exe /tsmoptfile=dsm_local.opt
       /configfile=tdpexc_local.cfg
       ```
12. If necessary, start the Tivoli Storage FlashCopy Manager stand-alone environment to restore from a backup that was created in that environment.

13. When the transition is complete and you no longer need access to the Tivoli Storage FlashCopy Manager stand-alone environment, you can remove the alternate services. To remove the services, use the Windows Services GUI or the **dsmcutil** command:

```
dsmcutil remove /name:tsmagent4local
dsmcutil remove /name:tsmcad4local
```

Chapter 5. Protecting data

You can back up and restore your Microsoft Exchange Server data by using Microsoft Management Console (MMC) or the command-line interface. If required, you can manage your installations remotely.

Starting Microsoft Management Console

After you complete the configuration process, start Microsoft Management Console (MMC) to protect your Exchange Server data.

Before you begin

If you try to use Data Protection for Exchange Server before you complete the configuration process, the software does not function correctly.

About this task

Data Protection for Exchange Server software is displayed in MMC as a plug-in. MMC uses a navigation tree to organize the computer data that is registered. Each computer icon that is followed by the word *Dashboard* represents a physical computer.

When you register a computer, information about the computer 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 used when you back up and restore 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 more computers in the tree to include in an operation.

Procedure

To start MMC, click **Start** > **All Programs** > **Data Protection for Microsoft Exchange Server** > **DP for Exchange Management Console**.

Starting the Data Protection for Exchange Server command-line interface

You can start the Data Protection for Exchange Server command-line interface by using a Windows command prompt with administrative privileges. Alternatively, you can start the command-line interface from Microsoft Management Console (MMC).

Procedure

1. Start MMC.
2. In the tree view, select the computer node where you want to run the commands.
3. Expand the **Protect and Recover Data** node.

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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. From the drop-down list, change **PowerShell** to **Command Line**.

Related information:

"Command-line overview" on page 159

Managing Data Protection for Exchange Server installations remotely

From a single Data Protection for Exchange Server installation you can manage all of the Data Protection for Exchange Server installations in your enterprise.

Before you begin

To remotely manage systems, Microsoft Windows PowerShell is required. This software requirement is documented in the Hardware and Software Requirements technote at this location: TSM for Mail - All Requirement Documents (http://www.ibm.com/support/docview.wss?uid=swg21219345). Follow the link to the requirements technote for your specific release or update level.

The Windows PowerShell software must be installed and enabled on all Data Protection for Exchange Server installations that you want to manage. For information about downloading, installing, and enabling Windows PowerShell, see this web page: Microsoft Windows Management Framework 3.0 Downloads (http://www.microsoft.com/en-us/download/details.aspx?id=34595)

Procedure

Enable remote management for Data Protection for Exchange Server installations by issuing the following Windows PowerShell command.

```
Enable-PSRemoting -force
```

This command enables remote management in most environments. If you use Microsoft Exchange, complete the following steps:

1. On the primary system, issue the following command:

   ```
   enable-wsmancredssp -role client -delegatecomputer remote_computername
   ```

2. On each remote system that runs Microsoft Exchange, issue the following command:

   ```
   enable-wsmancredssp -role server
   ```

3. Add the Data Protection for Exchange Server servers to the trusted hosts list by issuing the following command on each remote system:

   ```
   Set-Item WSMan:\localhost\Client\TrustedHosts -Value remote_server_name -Force
   ```

4. Verify that Windows PowerShell Remoting is configured correctly by issuing the following cmdlet.

   ```
   invoke-command -computername remote_computername
   -scriptblock {pwd} -Credential administrator
   ```

5. After you make configuration changes, restart the winrm service by entering the following command:

   ```
   Restart-Service winrm
   ```

Adding remote systems

You can add remote systems in MMC.

Procedure

1. From Microsoft Management Console (MMC), in the Actions pane, click **Manage Computers**.
2. Verify that the local system is listed in both the Tree Nodes and Computers panes.
3. From the Tree Nodes pane, click the add icon. The icon is green and resembles the symbol for addition.
4. Type the name and description for the new tree node.
5. From the Computers pane, click the add icon. The computers that 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.
6. 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 that is 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, complete these fields

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

      Location
      The organizational unit that is 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 capability 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 and 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 data columns are optional. The list is processed by position. For the group, if a group does not exist, the group is created.
7. From the Computers pane, click **Test Connection**. The test status is reported in the Message column of the Computers table.

8. Click **OK** to close the Manage Computers window.
9. Verify that 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.
10. 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 that are displayed in the navigation tree, use the GUI controls from the Manage Computers window.

Determining managed storage capacity

You can track the capacity of managed storage assets. This information can be useful when you are calculating storage requirements for license renewal.

About this task

Typically, the capacity that is used by server data differs from the capacity of the volume that contains that data. For example, a set of databases might require a capacity of 1 GB and be on a 10 GB volume. When a snapshot of the volume is created, the Data Protection for Exchange Server managed capacity measurement is 10 GB.

Procedure

1. From Microsoft Management Console (MMC), select an Exchange Server instance.
2. On the **Protect** 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 capacities, click **Show Details**.

Backing up Exchange Server data

By using Microsoft Volume Shadow Copy Service (VSS), you can back up Exchange Server data and mount the backup if required.

About this task

Data Protection for Exchange Server tracks and stores mailbox location history, which is used to automate mailbox restore operations. This action causes a delay to occur before each backup. In small or centralized Active Directory environment, the delay might be a few seconds or minutes. In large or geographically dispersed environments, the delay might take more time.

If you do not plan to use mailbox restore, you can safely disable mailbox history.

Related concepts:

"Data backup planning" on page 17

"Data backup processing" on page 3

Ensuring successful MAPI connections

If you use Exchange Server 2013, use the MAPI Settings property page to verify that the user mailbox is online. You can also view and update the MAPI registry key that enables Data Protection for Exchange Server to connect to the Exchange Server.

Before you begin

Ensure that the correct version of Microsoft Exchange Server MAPI Client and Collaboration Data Objects is installed on the Exchange Server.

About this task

For mailbox restore operations to succeed in Exchange Server 2013 environments, the MAPI client must use Remote Procedure Call over HTTPS (RPC over HTTPS), also known as Outlook Anywhere. You cannot use RPC over TCP.

Procedure

1. From Microsoft Management Console (MMC), select an Exchange Server instance.
2. On the **Protect** tab, click **Properties** in the Action pane.
3. Select **MAPI Settings** from the list of property pages.
4. Verify that the following information is correct in the Exchange Server environment:
   - The mailbox alias field shows the mailbox that you are logged in to. Verify that you can open the mailbox in Microsoft Outlook or Outlook Web Access (OWA).
   - The **Exchange Profile Server** field shows the correct mailbox endpoint on the Exchange Server that has the Client Access Server (CAS) role. Verify that you can open the target mailbox in Outlook or OWA.
5. Edit the registry key only if the default value is incorrect. Use one of the following methods.
   - Enter the registry key value in the `RpcHttpProxyMap_TSM` field.
   - Enter the `Domain` field value and enable or disable the **Use HTTPS authentication** check box. When you change either of these values, the values of the registry key automatically updates in the `RpcHttpProxyMap_TSM` field.

   Consider that the values that you enter override the registry key that is in the `HKEY_CURRENT_USER\Software\Microsoft\Windows NT\Current Version\Windows Messaging Subsystem` directory. If you modify the registry incorrectly, the connection to the Exchange Server might fail.

   RpcHttpProxyMap_TSM

   Change the registry key values to reflect the correct domain, endpoint, and Remote Procedure Call (RPC) authentication methods for your environment. By default, the following format is used.

   `Domain=Proxy Server``,`*`RpcHttpAuthenticationMethod`*`,`
   `RpcAuthenticationMethod``,`*`IgnoreSslCert`*

   For example:

   `companyname.local=https://exchange.companyname.com,ntlm,ntlm,false`

   where:

- *Domain* value is the domain suffix of the personalized server ID, for example, `companyname.local`. Specify any domain or a substring of a domain, or the asterisk (*) and question mark (?) wildcard characters, for example, `*.companyname.local`.
- *Proxy Server* value is the RPC proxy server that has the Client Access Server (CAS) role. Specify the fully qualified domain name (FQDN) of the RPC proxy server. Precede the FQDN by `http://` for an HTTP connection, or `https://` for an HTTPS connection. For example, `https://exchange.companyname.com`
- *RpcHttpAuthenticationMethod* value is the method that is used to authenticate RPC-over-HTTP connections. Specify `NTLM`, `Basic`, `Negotiate`, or `WinNT`.
- *RpcAuthenticationMethod* value is the method that is used to authenticate RPC-over-TCP connections. Specify `NTLM`, `Negotiate`, `WinNT`, `Anonymous`, or `None`.
- *IgnoreSslCert* value indicates whether the Exchange Server validates SSL certificates. For the Exchange Server to ignore invalid certificates, specify `False`.

Domain

Change the domain name to reflect the correct domain if for example, you have multiple domains, or the default domain value is incorrect. To match all domains, enter the asterisk (*) wildcard character. When you change this domain value, the *Domain* value of the registry key automatically updates in the `RpcHttpProxyMap_TSM` field.

Use HTTPS authentication

Select this check box if RPC-over-HTTPS is enabled for the Exchange Server that is hosting the MAPI profile. Otherwise, clear this check box to ensure that HTTP authentication is used for RPC-over-HTTP connections. When you change this authentication value, the *RpcAuthenticationMethod* value of the registry key automatically updates in the `RpcHttpProxyMap_TSM` field.

Related tasks:

"Specifying other Data Protection for Exchange Server configuration parameters" on page 41

"Troubleshooting MAPI connection issues" on page 144

Related reference:

"MAPI Settings" on page 89

Backing up Exchange Server data by using VSS

By using Microsoft Volume Shadow Copy Service (VSS), you can back up Exchange Server data and mount the backup if required.

Before you begin

- You must have a VSS provider that is configured for your environment.
- If you back 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).

  Tip: 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 completes 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 Server workload.

Procedure

1. Start Microsoft Management Console (MMC) 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 MMC.
   a. Filter the list of available databases in the results pane by entering a keyword in the **Search** field.
   b. If you are running backup operations 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 on the **Protect** tab.
3. Specify the backup options. If the backup options are not displayed, click **Show Backup Options**.
   - To use offloaded backups, set the **Offload** option to **True**.

     If you use offloaded backups, specify the remote client node,**RemoteDSMAGENTNode**, that runs the VSS offloaded backups on a remote computer. This option applies only to VSS backups.
   - Select **Skip Integrity Check** and choose one of the following options.

     Table 7. Options for integrity checking

Task	Action
Bypass integrity checking for all database and log files	Select **Yes**
Run integrity checking to verify that all database and log files are free of errors	Select **No** This option is the default.
Bypass integrity checking for database files only if at least two valid copies of a database (one active and one passive copy) exist in a DAG	Select **Skip Database Check If Healthy**
Bypass integrity checking for database and log files only if at least two valid copies of a database (one active and one passive copy) exist in a DAG	Select **Skip Database And Log Check If Healthy**

   - If you are scheduling the backup of databases in an Exchange Server DAG, set the **Minimum Backup Interval** value to 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 database backup 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 time frame. This option prevents all members in a DAG from backing up the database. Specify this setting for tasks that are scheduled to run when you click **Run Scheduled**.
   - If you are scheduling the backup of databases in an Exchange Server DAG, set **PreferDAGPassive** option to **True** to skip the backup for an active database copy unless no valid passive copy is available. If no valid passive copy is available, the backup is created from the valid active database copy.

Specify this setting for tasks that are scheduled to run when you click **Run Scheduled**.

4. In the Actions pane, click **Backup Destination** to specify whether you want the data to be backed up to your local server, a Tivoli Storage Manager server, or both.
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 runs the command that is required to complete the task.
6. To create the backup, select the backup action in the Actions pane. You can run a full, copy, incremental, or differential backup with the VSS backup method.

Related concepts:

"VSS backup requirements" on page 17

"Offloaded VSS backups" on page 5

Related tasks:

"Restoring a Database Availability Group database backup" on page 107

Related reference:

"Backup command" on page 160

Mounting Exchange Server backups

To see a copy of Exchange Server data from a specific point in time, mount a snapshot backup.

About this task

A copy of data from a specific time is also known as a point-in-time consistent copy or online snapshot.

Restriction: You cannot use Microsoft Management Console (MMC) to mount a backup to a different server. To mount a VSS snapshot to a remote server, enter the **mount backup** command at the command line.

Procedure

1. Start MMC.
2. Click **Recover Data** in the welcome page of MMC.
3. In the Actions pane on the **Recover** tab, 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**. On the **Recover** tab, the backup that you mounted is displayed.
5. In the Actions pane, select the **Explore** and **Unmount Backup** tasks for the backup that you mounted.

Deleting Exchange Server backups

You can remove an Exchange Server backup that you created with the VSS backup method. Use this procedure only for deletions that are outside the scope of your standard policy management deletions.

Before you begin

Typically, backups are deleted automatically based on user-defined policy management settings. This procedure is necessary only if you must delete backups that are outside the scope of Tivoli Storage FlashCopy Manager policy definitions.

If you back up Exchange Server Database Availability Group (DAG) databases to Tivoli Storage Manager, you can delete the database backup from the DAG member to a local shadow volume only from the Exchange Server on which the backup is created.

If you delete a remotely-mounted 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 remote mount occurred. The operations to the target volume depend on the VSS hardware provider and the storage device implementation.

After the maximum number of remotely-mounted backup versions or the maximum number of days to retain a backup is exceeded, the associated backup is expired and deleted.

Procedure

1. Start Microsoft Management Console (MMC).
2. Click **Recover Data** in the welcome page of MMC.
3. On the **Recover** tab for the Exchange Server instance, select **View: Database Restore**. In the Results pane, browse to and select one or more database backups to delete.
4. In the Actions pane, click **Delete Backup**. While a backup is being deleted, two tasks are displayed in the task window to show that the deletion is in progress, and that the view is being refreshed.

Restoring Exchange Server data

You can restore an Exchange Server database backup to a recovery database or to an alternate (or relocated) database. You can also restore a replicated database copy in a Database Availability Group (DAG).

Related concepts:

"Data restore planning" on page 21

"Data backup processing" on page 3

Setting data restore options in Microsoft Management Console

To optimize the data restore process for your environment, modify the default options that are available in Microsoft Management Console (MMC).

Procedure

1. On the Recover tab, select **Database Restore**.
2. Click **Show Restore Options** to modify the default restore options as follows:

Table 8. Database restore options

Option	Action
Auto Select	For this option, specify a value of `Yes` (default) to quickly select the backup objects to restore. With automatic selection, when you select the most recent backup to restore, all associated backups are automatically selected, up to the previous full backup. When you specify `Yes`, the automatic selection option applies to full backups, differential backups, and incremental backups, but not to copy backups. This option affects backups in the following ways: • When you click a differential backup, the associated full backup is also selected. • When you click an incremental backup, the associated full backup and all associated earlier incremental backups are also selected. • For VSS backup, automatically selects all databases that were backed up together to the local destination. However, databases that were backed up to Tivoli Storage Manager are not automatically selected.
From Server	Enter the name of the server where the original backup is completed. The default value is the local server.

Table 8. Database restore options (continued)

Option	Action
Instant Restore	For this option, specify a value of **Yes** to use volume-level snapshot restore (instant restore) for local VSS backups if the backup exists on SAN-attached volumes. Specify a value of **No** to disable instant restore, which bypasses volume-level copy and uses file-level copy (fast restore) to restore the files from a local VSS backup. The default value is **Yes**, which uses volume-level snapshot restore if it is available. This option is available for VSS operations only. If you use instant restore for SAN Volume Controller earlier than version 5.1 or DS8000, ensure that any previous background copies that involve the volumes that are being restored are completed before you initiate the instant restore. This option is automatically set to **No** during *restore into* operations. In an instant restore operation, files on the destination file system are overwritten. Incremental and differential backups are automatically converted to file-level restores. An instant restore operation requires that the drive or volume where the mailbox database is located must be available. Any other process or application must not have access to the drive or volume.
Mount Databases After Restore	For this option, specify a value of **Yes** to automatically mount databases after backups are recovered. **No** is the default value for this option.
Replay Restored AND Current Logs	For this option, specify a value of **Yes** to replay any transaction log entries that are displayed in the current active transaction log. This log includes both current and restored logs. **Yes** is the default value for this option. This option is not supported for instant restore.
Replay Restored Logs ONLY	For this option, specify a value of **Yes** to replay only restored logs. **No** is the default value for this option.
Run Recovery	For this option, specify a value of **Yes** to complete the database restore operation. Recovery cannot run if the databases are not online.

Restoring an Exchange Server database

You can use the *restore into* function to restore an Exchange Server database backup to a recovery database or alternate database. You can also restore a DAG active or passive database copy to a recovery database or alternate database.

Before you begin

- Ensure that your system is set up to use the DAG node name (DAGNODE). You can specify 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 Server workload.

- You can restore mailboxes with the Mailbox Restore Browser or Mailbox Restore functions. In some rare cases, however, you might want to restore data into a recovery database or alternate database. Ensure that a recovery database or alternate database exists before you attempt the restore operation.

About this task

- For database backups in the Exchange Server Database Availability Group (DAG) environment, you can restore a database regardless of which DAG member the database was backed up from because all database copies are backed up by using a single DAG node. Local backups must be restored on the node where the backup was completed.
- Running any type of *restore into* function automatically disables VSS instant restore capability.

  When you restore a database by using instant restore processing, data that exists in the destination database is overwritten, and is no longer available after restore processing is complete. When you restore a database by using the *restore into* function, you restore data to an alternate target destination. The data is not restored to the original source destination. For the restore operation to be successful, the alternate target destination must be of equal or greater size as the original source volume.
- To complete restore operations, backups must be taken on the same version of Exchange Server.
- You cannot use multiple instances of Data Protection for Microsoft Exchange Server to restore databases into the recovery database simultaneously.

Procedure

1. From Microsoft Management Console (MMC), create the recovery database if one does not exist. You can also use PowerShell commands (cmdlets) to do this step.
2. Use Data Protection for Exchange Server to restore the mailbox database.
3. From MMC, right-click the backup that you want to restore, and click **Restore Into**, or select the backup and click **Restore Into** in the Actions pane. For example, if `Maildb1` is the name of the relocated database that you are restoring, the command-line entry is as follows:

   ```
   TDPEXCC RESTore Maildb1 FULL /INTODB=Maildb1
   ```
4. When you restore data to a recovery database, specify the option to replay restored logs only; otherwise the restore can fail.
   a. Issue **/recover**=*applyrestoredlogs* at the command prompt.
   b. On the **Restore** tab, select **Replay Restored Logs ONLY**.

   Only transaction logs that are contained in the backup are applied to the mailbox database when a recovery database restore operation is processing.

Related concepts:

"VSS restore guidelines" on page 21

"Mailbox restore guidelines" on page 22

Related reference:

"Restore command" on page 191

Restoring a Database Availability Group database backup

You can restore a replicated database copy in a Database Availability Group (DAG).

About this task

You can use Exchange Management Shell commands, which are provided in parentheses.

Procedure

1. Make the database that you want to restore active (**Move-ActiveMailboxDatabase**).
2. Suspend replication of all passive copies of the database (**Suspend-MailboxDatabaseCopy**).
3. Unmount the active mailbox database (**Dismount-Database**).
4. If you are using VSS instant restore, and the **During Instant Restore, automatically stop and restart necessary Microsoft Exchange services** option is not selected in Microsoft Management Console (MMC), or the **STOPSERVICESONIR** parameter is set to NO at the command line, stop the following replication services on all copies of the database.
   - (DAG environments only) Exchange Replication Service
   - (Exchange Server 2013 only) Exchange Search Host Controller Service
5. Restore the database and logs by using the command line or MMC.

   Restriction: The database must not be mounted automatically after the restore. If you use MMC, ensure that the **Mount Databases After Restore** option is set to **No** in the Restore pane. If you use the command line, set the **/mountdatabases** parameter to NO.

   However, if the **During Instant Restore, automatically stop and restart necessary Microsoft Exchange services** option is selected, or the **STOPSERVICESONIR** parameter is set to YES, you can set the **Mount Databases After Restore** option to YES.
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. (**Get-MailboxDatabaseCopyStatus**)
8. Update or reseed all replicas (**Update-MailboxDatabaseCopy**). By completing this step, you can help to avoid potential transaction log synchronization problems that might arise if replication is resumed directly.
9. Move the active database to the server that you want (**Move-ActiveMailboxDatabase**).

Related concepts:

"Database Availability Group restore guidelines" on page 22

Related reference:

"Restore command" on page 191

Complete restore or replacement of Exchange Server

You can completely recover Exchange Server 2010 and later versions.

For more information, see this article: Backup, Restore, and Disaster Recovery (http://technet.microsoft.com/en-us/library/dd876874.aspx)

Restoring mailbox data

In environments that run Microsoft Exchange Server 2010 and later versions, you can use the Data Protection for Exchange Server mailbox restore feature to run individual mailbox and item-level recovery operations.

Individual mailbox recovery

Data Protection for Exchange Server backs up at the database level, and also restores individual items from the database backup.

Backing up Exchange servers at the mailbox item-level can cause the following issues:

- Insufficient scalability as item-level backups that are run hourly on each day of the week still prove to be an inadequate solution.
- More resource strain is added to the production servers.
- Since database backups are still done, the Exchange data is duplicated as item-level backups. The same data is backed up a second time.

To address these issues, Microsoft provides these features in Exchange:

- "Deleted Item Restore" can be configured to keep items within the Exchange Server databases, even after they are deleted. This option enables the items to be restored later.
- "Deleted Mailbox Restore" can be configured to keep mailboxes within the Exchange Server databases, even after they are deleted. This option enables the items to be restored or reconnected later.
- The recovery database enables a database to be restored to a special database. Wizards and tools are provided by Exchange to extract data from this database. This process can be done without disrupting the production servers.

Restoring mailbox data

Data Protection for Exchange Server backs up mailbox data at the database level, and also restores individual mailbox items from the database backup.

Before you begin

You must have role-based access control (RBAC) permissions to complete individual mailbox restore operations.

About this task

- In Exchange Server 2013, you can restore a public folder mailbox database, a public folder mailbox, or only a part of the mailbox, for example, a specific public folder.
  - To restore an Exchange 2013 public folder mailbox, the Exchange user must have the `Public Folders` management role.
  - You can restore a public folder mailbox only to an existing public folder mailbox that is on the Exchange Server.

- You can restore a public folder only to an existing public folder. The public folder on the Exchange Server must have the same folder path as the public folder to be restored. If the public folder is deleted from the public folder mailbox on the Exchange Server, you must re-create the public folder with the same folder path as the public folder to be restored, before you start the restore operation.
- As a best practice, restore public folder mailboxes separately from user mailboxes. Select only one public folder mailbox to restore at a time if you want to restore a specific public folder in the mailbox, or if you want to restore to a different public folder mailbox than the original mailbox.

  If you restore multiple mailboxes in a single restore operation, and at least one of the mailboxes is a public folder mailbox, the mailboxes are restored only to their original mailbox locations. You cannot specify a filter or an alternate mailbox destination.
- You might restore to a different public folder mailbox than the original mailbox if, for example, the public folder is relocated after the time of the backup. Before you complete the public folder restore operation, ensure that the public folder exists with the same folder path in the alternate mailbox location.

- In Exchange Server 2010 or later, you can restore an archive mailbox or a part of the mailbox, for example, a specific folder. You can restore archive mailbox messages to a mailbox that is on the Exchange Server, to an archive mailbox, or to an Exchange Server `.pst` file.
- If you restore multiple mailboxes, and you want to retain the recovery database after the restore operation is complete, ensure that all the mailboxes are in the same recovery database.
- By default, Data Protection for Exchange Server restores the latest backup that is available for the specified mailbox.

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.

Procedure

1. Start Microsoft Management Console (MMC) and select **Exchange Server** in the tree view.
2. On the **Recover** tab for the Exchange Server instance, 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 restore mail to a Unicode personal folder (`.pst`) file, or you restore a mailbox that is deleted or re-created after the time of the backup, Data Protection for Exchange Server requires a temporary mailbox to store the mailbox messages. Create a temporary mailbox by setting the `Alias of temporary mailbox` option on the Properties page, under the **General** tab.

   Attention: Ensure that the temporary mailbox that you create is on a database with enough disk storage capacity to accommodate all of the mailbox items that you are restoring.
4. Optional: By default, the entire mailbox is restored. You can use the **Item-Level Mailbox Filters** to identify individual messages to restore:
   a. Click **Show Filter Options** and **Add Row**.
   b. In the **Column Name** field, click the down arrow and select an item to filter.

- You can filter public mailbox folders only by the **Folder Name** column.
- You can filter Unicode `.pst` files only by **Backup Date**, **Folder Name** and **All Content** filters.
- You can filter by backup date, and click the default date and time to edit the table cell. To change the date, click the arrow 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 by using the 12-hour clock time convention such as 2 p.m.

  When you specify a backup date, Data Protection for Exchange Server searches for a backup that corresponds to that exact date. If a backup with that exact date is not found, Data Protection for Exchange Server selects the first backup after that date.

c. In the **Operator** field, select an operator.

d. In the **Value** field, specify a filter value.

e. If you want to filter on more items, click **Add Row**.

5. Specify the restore options by clicking **Show Restore Options**.

Table 9. Database restore options

Task	Action
Keep Recovery Database After Restore	Use this option to retain a recovery database after a mailbox restore operation is complete. The default value is **No**. If you set the value to **Yes**, Data Protection for Exchange Server automatically retains the recovery database after mailbox restore processing.
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.
Mailbox Original Location	Use this option only if the mailbox was deleted or re-created 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`, for example, `serv1,db1`.
Mark Restored Messages As Unread	Use this option to automatically mark the mailbox messages as unread after the restore operation is completed. The default value is **Yes**.
Use Existing Recovery Database	Use this option to restore the mailbox from an existing recovery database. The default value is **Yes**. If you set the value to **No** and a recovery database is mounted on the server before you restore the mailbox, Data Protection for Exchange Server automatically removes the recovery database during mailbox restore processing.

6. Click one of the following **Restore** actions to complete the restore operation.

Table 10. Restore options

Task	Action
Restore Mail to Original Location	Select this action to restore mail items to their location at the time of backup.
Restore Mail to Alternate Location	Select this action to restore the mail items to a different mailbox. A window is displayed in which you can 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 mail items to a `.pst` file with one selected mailbox, you are prompted for a file name. When you restore mail items 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 reflects the name of the mailbox at the specified directory. If the `.pst` file exists, the file is used. Otherwise, the file is created. **Restriction:** The contents of each folder cannot exceed 16,383 mail items.
Restore Mail to Unicode PST file	Select this action to restore the mail items to a Unicode `.pst` file. When you restore mail items to a `.pst` file with one selected mailbox, you are prompted for a file name. When you restore mail items 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 reflects the name of the mailbox at the specified directory. If the `.pst` file exists, the file is used. Otherwise, the file is created.

Table 10. Restore options (continued)

Task	Action
Restore Public Folder Mailbox	Select this action to restore a public folder mailbox to an existing online public folder mailbox. You can filter the mailbox and restore a specific public folder to an existing online public folder. In the **Folder to be restored** field, enter the name of the public folder that you want to restore. If you are restoring a subfolder in a parent folder, specify the full folder path in this format: *parent_folder_name*/*sub_folder_name*. To restore all subfolders in a parent folder, use *parent_folder_name*/*. If the full folder path includes spaces, enclose the folder path in double quotation marks, and do not append a backslash character (\) at the end of the folder path. You can also restore all or part of a public folder mailbox to a different public folder mailbox than the original mailbox. In the **Target public folder mailbox** field, specify the destination public folder mailbox that you want to restore to.
Restore Mail to Archive Mailbox	This action applies to a primary mailbox or an archive mailbox. Select this action to restore all or part of either type of mailbox to the original archive mailbox or to an alternate archive mailbox. You can filter the archive mailbox and restore a specific mailbox folder. In the **Folder to be restored** field, enter the name of the folder in the archive mailbox that you want to restore. If you are restoring a subfolder in a parent folder, specify the full folder path in this format: *parent_folder_name*/*sub_folder_name*. To restore all subfolders in a parent folder, use *parent_folder_name*/*. If the full folder path includes spaces, enclose the folder path in double quotation marks, and do not append a backslash character (\) at the end of the folder path. In the **Target archive mailbox** field, specify the archive mailbox destination that you want to restore to.

Related concepts:

"Security requirements" on page 15

Related reference:

"Restoremailbox command" on page 204

Restoring mailbox messages interactively with the Mailbox Restore Browser

You can use the Mailbox Restore Browser to interactively restore a mailbox or items from a mailbox on Exchange Server.

Before you begin

You must have role-based access control (RBAC) permissions to complete individual mailbox restore operations.

If you plan to restore mail or folders by using a Simple Mail Transfer Protocol (SMTP) Server, ensure that you configure the SMTP Server before you attempt a restore operation. Set the configuration in Microsoft Management Console (MMC) by right-clicking **Dashboard** in the tree view and selecting **Properties**. Then, in the E-mail property page, enter the SMTP server and port.

About this task

- In Exchange Server 2013, you can restore a public folder mailbox database, a public folder mailbox, or only a part of the mailbox, for example, a specific public folder. However, you cannot restore individual messages in a public folder by using the Mailbox Restore Browser interface.
  - To restore an Exchange 2013 public folder mailbox, the Exchange user must have the `Public Folders` management role.
  - You can restore a public folder mailbox only to an existing public folder mailbox that is on the Exchange Server.
  - You can restore a public folder only to an existing public folder. The public folder on the Exchange Server must have the same folder path as the public folder to be restored. If the public folder is deleted from the public folder mailbox on the Exchange Server, you must re-create the public folder with the same folder path as the public folder to be restored, before you start the restore operation.
  - As a best practice, restore public folder mailboxes separately from user mailboxes. Select only one public folder mailbox to restore at a time if you want to restore a specific public folder in the mailbox, or if you want to restore to a different public folder mailbox than the original mailbox.

    If you restore multiple mailboxes in a single restore operation, and at least one of the mailboxes is a public folder mailbox, the mailboxes are restored only to their original mailbox locations. You cannot specify a filter or an alternate mailbox destination.
  - You might restore to a different public folder mailbox than the original mailbox if, for example, the public folder is relocated after the time of the backup. Before you complete the public folder restore operation, ensure that the public folder exists with the same folder path in the alternate mailbox location.
- If you restore multiple mailboxes, and you want to retain the recovery database after the restore operation is complete, ensure that all the mailboxes are in the same recovery database.
- By default, Data Protection for Exchange Server restores the latest backup that is available for the specified mailbox.

Restriction: Only mailboxes within the same database can be restored in a single mailbox restore action.

Procedure

1. Start MMC.
2. Under the **Protect and Recover Data** node in the tree, select **Exchange Server**.
3. On the Recover panel, click **View** > **Mailbox Restore Browser**.
4. In the Select Source window, specify the mailbox that you want to restore. Choose from the actions in the following table:

Table 11. Selecting mailboxes to restore

Task	Action
Browse mailboxes and select one to restore	1. From the drop-down list, select **Browse Mailboxes**. 2. Select a mailbox. 3. Click **OK**. **Tip:** Use the **Search** field to filter the mailboxes. You can also sort the mailboxes by columns.
Specify a mailbox to restore by name	1. In the **Mailbox Name** field, enter the name of the mailbox to restore. 2. Click **OK**.
Restore a mailbox backup that was created at a specific point in time	1. In the **Backup Date/Time** field, click the default date and time to edit the details. 2. To change the date, click the calendar icon, select a date, and press **Enter**. 3. To change the time of day, use the 12-hour system convention such as 2 p.m. 4. Click **OK**.
Review the mailbox backups that are available to restore before you complete the restore operation	1. From the drop-down list, select **Browse Mailboxes**. 2. Select a mailbox for which backups exist. 3. From the **Available Database Backups** list, review the backups that are available for the mailbox and select a backup version to restore. 4. Ensure that the **Backup Date/Time** field reflects the time stamp for the selected mailbox backup. 5. Click **OK**.
Restore a mailbox that was deleted or re-created after the time of the backup	In the Actions pane, click **Properties**, and on the General page, enter the temporary mailbox alias. **Tip:** If you do not enter the alias, the mailbox restore operation uses the administrator mailbox as a temporary storage location.

Table 11. Selecting mailboxes to restore (continued)

Task	Action
Browse all databases in a backup	1. From the drop-down list, select **Browse Databases**. 2. From the list of mailbox databases that are displayed, select a database. 3. Click **OK**. **Tip:** Use the **Search** field to filter the databases. You can also sort the mailboxes by columns.

After the selected mailbox is restored to the recovery database, the restored mailbox and folders are displayed in the results pane.

5. In the results pane, browse the folders and messages that are contained within the selected mailbox. Choose from the following actions to select the mailbox, folder, or message to restore:

Table 12. Previewing and filtering mail items

Task	Action
Preview mailbox items	1. Select a mailbox item to display its contents in the preview pane. 2. When an item contains an attachment, click the attachment icon to preview its contents. Click **Open** or save the item by clicking **Save**.
Filter mailbox items	Use the filter options to narrow the list of folders and messages in the result pane. 1. Click **Show Filter Options** and **Add Row**. 2. Click the down arrow in the **Column Name** field and select an item to filter. You can filter by folder name, subject text, and so on. You can filter public mailbox folders only by the **Folder Name** column. When you select **All Content**, the mailbox items are filtered by attachment name, sender, subject, and message body. 3. In the **Operator** field, select an operator. 4. In the **Value** field, specify a filter value. 5. If you want to filter on more items, click **Add Row**. 6. Click **Apply Filter** to filter the messages and folders.

6. In the Actions pane, click the folder or messages restore task that you want to run. If you click **Save Mail Message Content**, which becomes available only when a message is selected in the preview pane, a Windows Save File window is displayed. Specify the location and message name and click **Save**. The

Restore Progress window opens and shows the progress of the restore operation. Data Protection for Exchange Server restores the mailbox backup to its original mailbox location.

7. To restore a mailbox or mailbox item to either of the following locations, complete the following steps. Choose from the actions in the following table:

Table 13. Restoring a mailbox to another mailbox or .pst file

Task	Action
Restore a mailbox or mailbox item to a different mailbox	1. On the Actions pane, click **Open Exchange Mailbox**. 2. Enter the alias of the mailbox to identify it as the restore destination. 3. Drag the source mailbox to the destination mailbox on the results pane.
Restore a mailbox to an Outlook personal folders (.pst) file	1. On the Actions pane, click **Open PST File**. 2. When the Windows File window opens, select an existing .pst file or create a .pst file. 3. Drag the source mailbox to the destination .pst file on the results pane. **Restriction:** You can use the Mailbox Restore Browser only with non-Unicode .pst files.
Restore Public Folder Mailbox	Select this action to restore a public folder mailbox to an existing online public folder mailbox. You can filter the mailbox and restore a specific public folder to an existing online public folder. In the **Folder to be restored** field, enter the name of the public folder that you want to restore. If you are restoring a subfolder in a parent folder, specify the full folder path in this format: *parent_folder_name/sub_folder_name*. To restore all subfolders in a parent folder, use *parent_folder_name/**. If the full folder path includes spaces, enclose the folder path in double quotation marks, and do not append a backslash character (\) at the end of the folder path. You can also restore all or part of a public folder mailbox to a different public folder mailbox than the original mailbox. In the **Target public folder mailbox** field, specify the destination public folder mailbox that you want to restore to.

In the Actions pane, the **Close Exchange Mailbox** and **Close PST File** tasks are displayed only when a destination mailbox or .pst file is opened.

8. Optional: Remove the recovery database by clicking **Close Mailbox to Restore**. This option is displayed only after a recovery database is created. Data Protection for Exchange Server removes the recovery database 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 MMC.

   If MMC also detects a recovery database that is created outside of Data Protection for Exchange Server, it 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** option.

Related concepts:

"Mailbox restore operations" on page 12

Related tasks:

"Troubleshooting mailbox restore errors" on page 144

Restoring mailboxes directly from Exchange database files

If 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.

Before you begin

If you use Tivoli Storage Manager for Virtual Environments software, review the following guidelines before you restore the mailbox:

- You can use Tivoli Storage Manager for Virtual Environments to back up an Exchange Server in a virtual machine. For more information about the **backup** command, see Backup command (http://www.ibm.com/support/knowledgecenter/SS8TDQ_7.1.2/com.ibm.itsm.ve.doc/r_ve_vmcli_backup.html).
- To restore mailboxes from the backups that are created by Tivoli Storage Manager for Virtual Environments, mount the virtual volumes that contain the EDB file and log files with read/write access. You can obtain read/write access 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 that contains the log files on an unused drive letter. In this way, you can apply the transaction logs to the EDB file.

If you use Data Protection for Exchange Server to back up the Exchange Server, you can enter the following command to restore the database files to a local disk:

```
tdpexcc RESTOREFILES
```

Verify that read/write access to the EDB file is available.

Verify that the Exchange Server transaction log files are available.

Procedure

1. From the Exchange server, start Data Protection for Exchange Server.
2. After you log on to Data Protection for Exchange Server, in the navigation area, select the **Exchange Server** node and the **Recover** tab. The Mailbox Restore Browser view opens.
3. In the Actions pane, click **Open EDB File on Disk**.
4. In the window, enter or browse to the location of the EDB file.

5. In the window, enter or browse to the location of the log file directory. Specifying a path to the log file directory is not required. However, the amount of time that is necessary to complete the restore operation 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 operation is complete, click **Close Mailbox to Restore**. You are prompted to save or delete the recovery database folder.

Related reference:

"Restoremailbox command" on page 204

Restoring a deleted mailbox or items from a deleted mailbox

You can use the Data Protection for Exchange Server mailbox restore operation to restore a mailbox (or items from a mailbox) that was deleted from an Exchange Server.

Before you begin

If you are restoring a mailbox that was deleted or re-created since the time of the backup, you must specify a temporary mailbox with enough storage capacity to accommodate all the mailbox items that you are restoring. Specify a temporary mailbox by setting the **/TEMPMAILBOXAlias** parameter. If the **/TEMPMAILBOXAlias** parameter is not set, the default mailbox is the logon user mailbox.

Procedure

Decide where the mailbox data from the deleted mailbox is to be restored. With the mailbox restore operation, you have three options as follows:

1. Restore the deleted mailbox data to the original location. Before you run the mailbox restore operation, re-create the mailbox that is using Exchange.
2. Restore the deleted mailbox data into an active alternative mailbox in an online Exchange Server.
3. Restore the deleted mailbox data into an Exchange Server personal folders (`.pst`) file.

Related reference:

"Restoremailbox optional parameters" on page 208

"Restoremailbox command" on page 204

Viewing, printing, and saving reports

You can access reports on recent activity and historical managed capacity. You can determine which licenses and software are installed.

Procedure

1. Select **Reporting** in the **Manage** section. A list of available reports is displayed. Each report provides a summary of the report contents.
2. Select a report from the list. The selected report displays.
3. To print or save the current report, click the appropriate icon at the top of the report.

Chapter 6. Protection of Microsoft Exchange Server data hosted in VMware environments

For Microsoft Exchange Server workloads that are running in a VMware ESXi virtual guest machine, you can use Tivoli Storage Manager software to take application-consistent backups of virtual machines that are hosting Microsoft Exchange Server data. You can also recover the backup from the virtual machine.

Before you back up data, identify your recovery point objective (RPO). The RPO helps you decide how often to back up data and affects the cost that is associated with data backups.

For example, you can schedule frequent virtual machine backups for necessary recovery points. The recovery point of a virtual machine backup is at the point in time of the backup. While change-block tracking and data deduplication offer savings, frequent virtual machine backups can become expensive when you think about how many virtual machine snapshots you are creating and deleting.

Most traditional in-guest data protection methods provide appropriate RPOs, but these in-guest methods lose the efficiencies that are introduced by backing up data at the virtual machine level.

With planning, you can deploy IBM Tivoli Storage Manager for Virtual Environments: Data Protection for VMware and IBM Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server in a way that preserves the backup efficiencies that are offered by backing up data at a virtual machine level while more granular recovery points are guaranteed.

Ensure that you installed and completed the initial configuration tasks that are necessary to start the following products:

- Tivoli Storage Manager for Virtual Environments: Data Protection for VMware, V7.1.2 and later (which includes the Tivoli Storage Manager client)
- Tivoli Storage Manager for Mail: Data Protection for Microsoft Exchange Server, V7.1.2 and later

These software offerings work together to protect Microsoft Exchange Server data in a VMware environment when no other software products are used to back up Microsoft Exchange Server data. Tivoli Storage FlashCopy Manager for VMware cannot be used with this solution.

Installing and configuring for Microsoft Exchange Server data protection in a VMware environment

When you install these software offerings, no specific instructions are needed to protect Microsoft Exchange Server workloads that are running in a VMware ESXi virtual guest machine. Install and configure Data Protection for VMware before you install Data Protection for Microsoft Exchange Server.

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About this task

Follow the installation and configuration instructions that are provided with each software package.

If you install Data Protection for Microsoft Exchange Server before Data Protection for VMware, you cannot specify the VMware datacenter node in the Data Protection for Microsoft Exchange Server configuration wizard because the field is disabled.

The following configuration tasks are specific to the configuration options that you must protect Microsoft Exchange Server workloads that are running in a VMware ESXi virtual guest machine. These options can be set after you complete the initial configuration.

Before you configure to protect Microsoft Exchange Server workloads that run in a VMware ESXi virtual guest machine, complete this checklist:

- Verify that Microsoft Exchange Server databases and mailboxes are hosted on VMware virtual disks.
- Verify that no data is hosted on raw device mapped (RDM) disks in physical compatibility mode, independent disks, or on disks that are attached directly to the guest through in-guest iSCSI.

Procedure

1. Outside of the VM guest, in the data mover, configure Data Protection for VMware to protect Microsoft Exchange databases and mailboxes.
2. Within the guest, verify that Data Protection for VMware is configured to enable the restore of individual Microsoft Exchange databases and mailboxes.
3. Within the guest, configure Data Protection for Microsoft Exchange Server to complete Microsoft Exchange database and mailbox backups and restore individual Microsoft Exchange databases and mailboxes from a virtual machine backup.

What to do next

The information that follows might not exactly apply to your environment. You can adjust the configuration for your environment. The following details describe the scenario that is used:

- A single Microsoft Exchange Server database on a virtual machine that is named *vm_exc10* must be recovered.
- Virtual machine *vm_exc10* is protected by Data Protection for VMware by using the node name *datacenter10*. This node name in the Tivoli Storage Manager server represents the vSphere datacenter. The data mover nodes are called *datamover10* and *datamover20*.
- The virtual machine guest is configured with the virtual machine display name of *vm_exc10* and the Microsoft Windows host name is *EXC10*.
- Data Protection for Microsoft Exchange Server is installed in the guest and is configured to the Tivoli Storage Manager server to use node name *exc10_EXC*.
- The Tivoli Storage Manager client is configured as the VSS requestor node and is using the node name *EXC10_VSS*.

The following list summarizes the scenario:

Machine name
EXC10

VSS requestor node name
EXC10_VSS

Data Protection for Microsoft Exchange Server node name
EXC10_EXC

Virtual machine
vm_exc10

Data mover node names
datamover10 and *datamover20*

Datacenter node name
datacenter10

VM file space
\VMFULL-vm_exc10

Configuring Data Protection for VMware

By default, Data Protection for VMware provides application consistency when you back up virtual machines that are hosting Microsoft Exchange Servers. With these backups, you can recover the virtual machine with Microsoft Exchange Server in a consistent state.

About this task

To recover only select databases or mailboxes from this type of backup with Tivoli Storage Manager, without having to recover the entire virtual machine, preserve information about the state of the Microsoft Exchange Server at the time of the virtual machine snapshot and backup. This information is collected as part of the Microsoft Volume Shadow Copy Services (VSS) interaction that occurs during a virtual machine snapshot.

For Data Protection for VMware to collect the Microsoft VSS metadata for Microsoft Exchange Server, Data Protection for VMware needs to be configured to obtain this information from the virtual machine during the backup task.

Complete the following steps to configure Data Protection for VMware to protect Microsoft Exchange Server workloads.

Procedure

1. Configure Data Protection for VMware to preserve the Microsoft VSS metadata information during a virtual machine backup for systems hosting Microsoft Exchange data.
   a. Locate the options file for the Data Protection for VMware data mover. On Windows systems, the options file is `dsm.opt`. On Linux systems, the options file is `dsm.sys`.
   b. Specify the `INCLUDE.VMTSMVSS` option for the virtual machine. You must set this option for virtual machine backups to preserve the Microsoft VSS metadata information. The information is going to be used by Data Protection for Microsoft Exchange Server at recovery time. Example:
   ```
   INCLUDE.VMTSMVSS vm_display_name
   ```

c. Verify that the VMDKs that host the Microsoft Exchange Server database are not being excluded from the virtual machine backup operation. Repeat this step for all data movers that protect virtual machines that are hosting Microsoft Exchange Server.

2. On each data mover, for example, *datamover10*, store the guest virtual machine credentials to Data Protection for VMware by running the following command from the Tivoli Storage Manager backup-archive client command line:

   ```
   dsmc set password –type=vmguest vm_guest_display_name
   guest_admin_ID guest_admin_pw
   ```

   This command stores the guest virtual machine credentials encrypted on the system that hosts the data mover.

What to do next

(Optional) You can verify the virtual machine backup configuration, including that the VMDKs are being included. In addition, you can view other parameters by issuing the backup command with the preview option through the backup-archive client command line. The following command sample is available.

```
dsmc backup vm vm_display_name -preview -asnode=datacenter_node
```

To run a virtual machine backup, you can also use the Tivoli Storage Manager scheduler to schedule periodic backups of all of your virtual machines. For verification, you can also back up the virtual machine that is hosting the Microsoft Exchange Server by using the backup-archive client command line:

```
dsmc backup vm vm_display_name -asnode=datacenter_node
```

Verification that the configuration backs up data that is viable for restore

Before you can restore individual Microsoft Exchange Server databases from a Data Protection for VMware virtual machine backup, you complete at least one successful virtual machine backup. For the restore to work, the backup needs to contain the necessary Microsoft Exchange Server database metadata. You can verify that the backup includes the correct information.

Enter the following backup-archive client query command on one of the data mover nodes:

```
dsmc query vm vmname -detail -asnode=datacenter_node
```

In the command output, look for the following details:

```
Application(s) protected: MS Exchange 2013 (database-level recovery)
```

Ensure that there are no VMDK status fields for virtual disks that host Microsoft Exchange Server database files that indicate Excluded. The Excluded status indicates that one or more of the VMDKs that is needed to recover a Microsoft Exchange Server database are not being protected. Sample:

```
Query Virtual Machine for Full VM backup
# Backup Date  Mgmt Class  Size    Type    A/I   Virtual Machine
- -----------  ----------  -----  ----    ---   -----------------
1 02/20/2015   STANDARD   43.94GB IFFULL  A     vm_exc10
  12:43:59

 Size of this incremental backup: n/a
 Number of incremental backups since last full: 0
Amount of extra data: 0
TSM object fragmentation: 0
Backup is represented by: 328 TSM objects
Application protection type: TSM VSS
Application(s) protected: MS EXC 2013 (database-level recovery)
VMDK[1]Label: Hard Disk 1
VMDK[1]Name: [ess800_dev2] vm_exc10/vm_exc10 .vmdk
VMDK[1]Status: Protected
...
VMDK[6]Label: Hard Disk 6
VMDK[6]Name: [ess800_dev2] vm_exc10/vm_exc10_5.vmdk
VMDK[6]Status: Protected
```

Configuring Data Protection for Microsoft Exchange Server

After you configure Data Protection for VMware and verify that you created a virtual machine backup suitable for recovery of a single Microsoft Exchange Server database, configure Data Protection for Microsoft Exchange Server inside the guest virtual machine.

About this task

Complete the following steps to configure Data Protection for Microsoft Exchange Server for data recovery.

Procedure

1. Log on to the virtual machine that hosts the Microsoft Exchange database (*vm_exc10*).
2. Verify that the following packages are installed:
   - Data Protection for VMware recovery agent and license (from the Data Protection for VMware product package)
   - Data Protection for Microsoft Exchange Server
   - Tivoli Storage Manager backup-archive client

   You can install the Data Protection for VMware recovery agent, license, and Tivoli Storage Manager backup-archive client together by using the Data Protection for VMware installation program. To install the packages together, select the following advanced installation option: **Install Data Protection for VMware instant restore features only**. Data Protection for Microsoft Exchange Server is installed separately.
3. Configure Data Protection for Microsoft Exchange Server by using the Tivoli Storage Manager configuration wizard. When you open the Tivoli Storage Manager Node Names page of the wizard, enter the VMware datacenter node name, Exchange Server node name, and VSS requestor node name. If the datacenter node name field is disabled, the Data Protection for VMware recovery agent is not installed correctly.
4. After Data Protection for Microsoft Exchange Server is configured, verify that the **`Configuring Recovery Agent`** rule status indicates `Passed`.

5. Log on to one of the data mover instances and complete the following steps. These steps must be run from only one instance of a data mover. Do not repeat these steps for all data mover instances.
   a. For the Tivoli Storage Manager backup-archive client that is configured as the VSS requestor node, for example, *exc10*, give access to the virtual machine backups, for example, file space for *vm_exc10* by using the client **set access** command at the command line.

      You must complete this step because the VSS requestor node accesses the virtual machine backups on behalf of Data Protection for Microsoft Exchange Server.

      This command is run directly from the datacenter node (*datacenter10*). If the current data mover options file (`dsm.opt`) contains an **ASNODE** entry, create a temporary options file. To create a temporary options file, complete the following steps:

      1) Copy the `dsm.opt` file to the `dsm.setaccess.opt` file.
      2) Edit the `dsm.setaccess.opt` file. For any line that contains **ASNODE**, delete the line.
      3) Edit the `dsm.setaccess.opt` file to set the **NODENAME** option to the following entry:

         ```
         NODENAME DC_NODE
         ```

         For example:

         ```
         DC_NODE = datacenter10
         ```

   b. Enter the following command:

      ```
      dsmc set access backup -type=VM vm_name vss_requestor_node
       -optfile=dsm.setaccess.opt
      ```

Example

```
dsmc set access backup –type=VM vm_exc01 exc01 –optfile=dsm.setaccess.opt

ANS1148I "Set Access" command successfully completed.

dsmc query access
Node name: datacenter10
Type  Node  User  Path
------ ------ ------ ------
Backup  exc10  *   \VMFULL-vm_exc10\*\*


ANS1148I "Query Access" command completed successfully
```

If the datacenter node name password is unknown, the Tivoli Storage Manager server administrator must reset the password to run the **set access** command.

Backup management

After the configuration steps are complete, start scheduling backups. Backup management does not require that you set up both a virtual machine backup schedule and a Microsoft Exchange Server backup schedule. You can have one scheduled backup without the other.

The following sections describe how to schedule backups.

Scheduling virtual machine backups

To schedule virtual machine backups, complete the following steps.

Procedure

1. Log on to the Data Protection for VMware user interface.
2. Click the **Backup** tab.
3. Click **Create Schedule** to specify a backup schedule name, source (the virtual machines to include in the backup schedule), and other scheduling options.
4. Verify that the source of the schedule includes the virtual machines that are hosting Microsoft Exchange Server.
5. Verify one of the following services is running:
   - If you are using a Client Acceptor Daemon (CAD)-managed scheduler, on the data mover, ensure that the CAD service is running.
   - If you are using the stand-alone scheduler, ensure that the scheduler service is running.

Results

After the schedule is created, the virtual machines are backed up at the specified time.

Scheduling Microsoft Exchange Server backups

After the virtual machine backup schedule is created, create the Microsoft Exchange Server backup schedule. The frequency of the backups is determined by the recovery point objectives (RPO).

Procedure

1. Start the Data Protection for Microsoft Exchange Server user interface from the virtual machine that is hosting Microsoft Exchange Server.
2. In the navigation pane, expand Manage.
3. Under the Manage node, right-click to select **Scheduling** > **Scheduling Wizard**.
4. Open the **Scheduling Wizard** to identify the schedule name and time.
5. For the Define the Scheduled Task page, select **Command Line**.
6. Click the icon to select the Exchange template. Click **Next**.

   Tip: Alternatively, you can schedule Microsoft Exchange Server backups by using the Tivoli Storage Manager centralized scheduling service. This service helps you to create a backup schedule for all Microsoft Exchange Server instances on a virtual machine.

Verifying backups

After you create a backup, verify that you can query the virtual machine backups and the backups from the Data Protection for Microsoft Exchange Server interface.

About this task

You can recover one or more Microsoft Exchange databases based on your recovery point objectives.

Procedure

1. From the Data Protection for Microsoft Exchange Server Management Console, select a Microsoft Exchange Server.
2. Click the **Recover** tab.
3. Select **View** > **Databases**. A list of Microsoft Exchange database backups that are available for restore is displayed.

   Microsoft Exchange databases that are backed up with Data Protection for VMware are identified with the backup method *vmvss*.

Managing versions of backups

Traditional usage of Data Protection for Microsoft Exchange Server manages expiration of backups by specifying the number of snapshot backups to retain and the length of time to retain snapshots. These parameters are specified in policy statements.

About this task

To retain Microsoft Exchange server backups, complete the following steps.

Procedure

1. Define the retention parameters in the management class that is used for virtual machine backups. For example:

   ```
   Retain extra versions = 30
   Retain only versions = 30
   Versions data exists = nolimit
   Versions data deleted = nolimit
   ```

   Use the `vmmc` option in the data mover option file to specify the management class that is used for the virtual machine backups.
2. Define the retention parameters in the management class that is used for Microsoft Exchange Server backups. For example:

   ```
   Retain extra versions = 0
   Retain only versions = 1
   Versions data exists = nolimit
   Versions data deleted = nolimit
   ```

Results

Backups are retained according to the management class. During the query, backup and restore operations can expire.

Data recovery

After backups are complete, you can recover the data based on your recovery point objectives (RPO).

Recovery means that you are going to restore a full backup of the Microsoft Exchange Server database or mailbox from the Data Protection for VMware backup. Use the `norecovery` option to specify that a rollback does not occur.

If you restore the entire virtual machine, all of the Microsoft Exchange Server databases and mailboxes on the virtual machine are restored and recovered to the point of the virtual machine backup. In this scenario, you cannot restore and recover any backups that were created after that point.

If you want to restore and recover any backups that were created after the virtual machine backup, restore and recover the individual database and mailbox backups.

Restoring databases

You can recover a full Microsoft Exchange database backup from a virtual machine backup by using the Data Protection for Microsoft Exchange Server user interfaces.

About this task

Complete the following steps to start a full database recovery from a virtual machine by using the Data Protection for Microsoft Exchange Server graphical user interface.

Procedure

1. From Microsoft Management (MMC), in the navigation window, from Protect and Recover, select a Microsoft Exchange Server server.
2. Click the **Recover** tab. All backups, including all database backups from a virtual machine backup, are listed.
3. Click restore options to show all options and change the **AutoSelect** and **RunRecovery** options to `False`. When these options are set to `False`, the **Mount Databases After Restore** option is automatically set to `No`. This option setting cannot be changed. After the restore operation is completed successfully, the database is dismounted.
4. Select the appropriate full database backup to restore.
5. In the Actions pane, click **Restore**.

Recovering relocated, new, or deleted databases and mailboxes

The Tivoli Storage Manager backup solution consists of Data Protection for VMware and Data Protection for Microsoft Exchange Server to handle databases and mailboxes that are relocated, created, or deleted after a virtual machine backup.

Before you begin

If you are restoring a mailbox that was deleted or re-created since the time of the backup, you must specify a temporary mailbox with enough storage capacity to accommodate all the mailbox items that you are restoring. Specify a temporary mailbox by setting the **/TEMPMAILBOXAlias** parameter. If you do not set the **/TEMPMAILBOXAlias** parameter, the default mailbox is the mailbox of the user who is logged on.

About this task

When you restore the backups, and complete a full database restore operation from the backup, Data Protection for VMware restores all files that existed at the time of the backup to their original location.

If database or log files are relocated during the backup cycle, Data Protection for Microsoft Exchange Server restore and recovery processing place the files in their original locations.

If any new databases or mailboxes were created during the backup cycle, Data Protection for Microsoft Exchange Server restore and recovery processing re-creates the new files. If any database or log files are deleted during the backup cycle, Data Protection for Microsoft Exchange Server restore and recovery processing removes those files.

Procedure

Decide where the mailbox data from the deleted mailbox is to be restored. Complete the following steps in the mailbox restore operation:

1. Restore the deleted mailbox data to the original location. Before you run the mailbox restore operation, re-create the mailbox that is using Exchange.
2. Restore the deleted mailbox data into an active alternative mailbox in an online Exchange Server.
3. Restore the deleted mailbox data into an Exchange Server personal folders (`.pst`) file.

Recovering data by using the command-line interface

To start a full Microsoft Exchange Server database recovery from a virtual machine by using the command-line interface, complete the following steps.

Procedure

1. Issue the query command to find the database full backups. The following example finds all backups for the Microsoft Exchange database called *exc_db10*.

```
tdpexcc q tsm exc_db10

IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
...
Querying Tivoli Storage Manager server for a list of
data backups, please wait....

Connecting to TSM Server as node "exc_db10"...
Connecting to Local DSM Agent "exc"...
Using backup node "exc_db10"...

 Exchange Server : exc

 Database    : exc_db10

 Backup Date     Size  S Type  Loc  Object Name
------------------- ----  - ----  --- ----------------------
10/15/2014 19:17:26 5.40 B A full  Srv 20141015191726 (VMVSS)

The operation completed successfully. (rc = 0)
```

2. Issue the database dismount command. For example:

```
TDPEXCC UNMOUNT BACKup C:\mount-points-root-dir
```

3. Issue the database restore command with the `norecovery` option. For example:

```
 TDPEXCC RESTore databaseName FULL /BACKUPDEstination=TSM
 /BACKUPMethod=VMVSS /recovery=no
```

   The following sample output results when you issue the command with the Microsoft Exchange Server database called *exc_db10*.

```
TDPEXCC RESTore exc_db10 FULL /BACKUPDEstination=TSM
 /BACKUPMethod=VMVSS

IBM Tivoli Storage Manager for Mail:
```

```
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
(C) Copyright IBM Corporation 1997, 2015. All rights reserved.

Connecting to TSM Server as node "exc_db10"...
Connecting to Local DSM Agent "exc"...
Using backup node "exc_db10"...
Starting Microsoft Exchange restore...

Beginning VSS restore of "exc_db10"'...

Restoring "exc_db10" via file-level copy from snapshot(s).
This operation could take a while, please wait

...

The operation completed successfully. (rc = 0)
```

You can restore to alternate location by adding the **/INTODB** parameter. For example:

```
TDPEXCC RESTore TestDB1 FULL /INTODB=Test2
 /BACKUPDEstination=TSM /BACKUPMethod=VMVSS
```

What to do next

To restore older, inactive backups by using the Data Protection for Microsoft Exchange Server command-line interface (**TDPEXCC**), specify the **Database Object Name** for the specific backup that you want to restore, when you issue the **restore** command.

To obtain the **Database Object Name**, issue the following command:

```
tdpexcc q tsm dbname full /all
```

After you have the **Database Object Name** value, specify the **Database Object Name** on the **/OBJect=objectname** optional parameter of the **TDPEXCC restore** command, where *objectname* is the **Database Object Name**. For example:

```
TDPEXCC RESTore db44 FULL /OBJect=20140311131051 /BACKUPDEstination=TSM
 /BACKUPMethod=VMVSS
```

Recovering data by using cmdlets

To start a full Microsoft Exchange Server database recovery from a virtual machine by using the cmdlets, complete the following steps.

Procedure

1. Issue the query cmdlet to find the database full backups. For example, to find all of the database full backups, enter the following command:

   ```
   Get-DpExcBackup -Name * -FromExcServer *
   ```

2. Issue the database restore cmdlet. For example:

   ```
   Restore-DpExcBackup -Name ExchDb01 -Full
    -BACKUPDESTINATION TSM -FROMEXCSERVer PALADIN20
    -INTODB Zwen
   ```

3. Issue the restore cmdlets with parameter **intodb** to restore to an alternative location. For example:

   ```
   Restore-DpExcBackup -Name ExchDb01 -Full
    -BACKUPDESTINATION TSM -FROMEXCSERVer PALADIN20
    -OBJect 20140923100738 -INTODB ExchDb01_altRdb
   ```

Verification that Microsoft Exchange Server volumes are not excluded during virtual machines backups

Virtual machine virtual disks must contain the volumes that contain the Microsoft Exchange Server databases that are not excluded from the Data Protection for VMware backup processing.

The databases cannot also be on physical compatibility mode raw device mapping (RDM) disks, independent disks, or on disks that are attached directly to the guest through iSCSI.

Ensure that any `EXCLUDE.VMDISK` statements in the Data Protection for VMware data mover that is used to back up the virtual machine do not inadvertently exclude virtual machine disks that are hosting volumes that contain Microsoft Exchange Server files, file space, database, and mailboxes.

For example:

- `vm_exc10.vmdk` contains logical volume C:
- `vm_exc10.vmdk` contains logical volumes E: and F:
- The label for `vm_exc10_1.vmdk` is *Hard Disk 1*.
- The label for `vm_exc10_2.vmdk` is *Hard Disk 2*.
- The Microsoft Exchange database files to be backed up are on the E: and F: drive.

Verify that no statements exclude `vm_exc10_2.vmdk` from the virtual machine backup by ensuring that the data mover does not contain the following or similar statements:

```
EXCLUDE.VMDISK VM_EXC10 "Hard Disk 2"
EXCLUDE.VMDISK * "Hard Disk 2"
```

Alternatively, if you exclude most hard disks, you must explicitly include the wanted virtual machine disks by using one of the following statements:

```
INCLUDE.VMDISK VM_EXC10 "Hard Disk 2"
INCLUDE.VMDISK * "Hard Disk 2"
```

Include and exclude statements are processed from the end to the beginning as they are displayed in the `dsm.opt` file. Enter the statements in the correct order to achieve the wanted goal.

You can specify the exclusion and inclusion of a virtual machine disk from the command-line interface:

```
dsmc backup vm "VM_EXC10:-vmdisk=Hard Disk 2" -asnode=datacenter10
```

Tivoli Storage Manager file space information

Data Protection for VMware backups are stored under the node name of the vSphere datacenter (for example, *datacenter10*).

This example shows the file space information for the virtual machine that is called *vm_exc10*.

```
tsm: ORION>q file datacenter10 f=d

Node Name:  DATACENTER10
Filespace Name: \VMFULL-vm_exc10
Hexadecimal Filespace Name:
FSID: 61
Collocation Group Name:
Platform: TDP VMware
Filespace Type: API:TSMVM
Is Filespace Unicode?: No
Capacity: 0 KB
Pct Util: 0.0
Last Backup Start Date/Time: 03/13/2014 21:29:17
Days Since Last Backup Started: 31
Last Full NAS Image Backup Completion Date/Time:
Days Since Last Full NAS Image Backup Completed:
Last Backup Date/Time From Client (UTC):
Last Archive Date/Time From Client (UTC):
Last Replication Start Date/Time:
Days Since Last Replication  Started:
Last Replication Completion Date/Time:
Days Since Last Replication Completed:
Backup Replication Rule Name: DEFAULT
Backup Replication Rule State: Enabled
Archive Replication Rule Name: DEFAULT
Archive Replication Rule State: Enabled
Space Management Replication Rule Name: DEFAULT
Space Management Replication Rule State: Enabled
At-risk type: Default interval
At-risk interval:
```

Chapter 7. Automating

With Data Protection for Exchange Server *automation* capability, you can run commands from the command line, create scripts, schedule tasks, and use Microsoft Management Console (MMC) to start tasks. The tasks that you can automate are based on the scripts and schedules that you create.

About this task

Data Protection for Exchange Server supports you automating tasks from the command-line interface or Microsoft Windows PowerShell command prompt (Version 3.0 and later). You can also use the **Automate** tab in the MMC.

Preparing to use Windows PowerShell cmdlets with Data Protection for Exchange Server

Data Protection for Exchange Server includes a set of Windows PowerShell cmdlets to help you manage Data Protection for Exchange Server components in your environment.

About this task

The cmdlets that are provided with Data Protection for Exchange Server can be used in supported Windows environments.

Data Protection for Exchange Server cmdlets help support a seamless management environment and greatly improve remote management and automation capabilities. You can aggregate cmdlets together to form commands and use the large volume of existing cmdlets from other vendors.

Before you use the cmdlets, complete the following steps.

Procedure

1. Log on to the system as an administrator.
2. From a Windows PowerShell command prompt, issue the following command:
   ```
   set-executionpolicy remotesigned
   ```
3. Import the Windows PowerShell modules from the `TDPExchange` folder:
   - FmModuleExc.dll
   - FmModuleMMC.dll

   From the Windows PowerShell command prompt, import modules, with the administrator credentials, as follows:
   a. Navigate to the `TDPExchange` folder.
   b. Issue the following commands:
      ```
      import-module .\FmModuleExc.dll
      import-module .\FmModuleMMC.dll
      ```
   c. (Optional) To use the cmdlets in these modules any time that you start Windows PowerShell, add the following lines to your profile. The following path is the default profile path.

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```
$path = (get-itemproperty -path "HKLM:\SOFTWARE\IBM\TDPExchange\
 currentversion\mmc" -ea SilentlyContinue).path
if ($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. For more information about Windows PowerShell cmdlets, consistent naming patterns, parameters, arguments, and syntax, see this web page as a starting point:Microsoft TechNet: Getting Started with Windows PowerShell (http://technet.microsoft.com/en-us/library/hh857337.aspx).

Cmdlets for Microsoft Management Console

The following list identifies the cmdlets that you can use when interacting with Microsoft Management Console (MMC).

- **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
```

For online product information, 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.

Cmdlets for protecting Microsoft Exchange Server data

The following table identifies the cmdlets that you can use to protect Microsoft Exchange Server data.

Table 14. 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
Add-DpExcPolicy	**tdpexcc create policy**	Create a policy for Data Protection for Exchange Server.
Backup-DpExcComponent	**tdpexcc backup**	Back up a Microsoft Exchange Server database.
Copy-DpExcPolicy	**tdpexcc copy policy**	Copy an existing policy.
Dismount-DpExcBackup	**tdpexcc unmount backup**	Dismount a backup.
Get-DpExcBackup	**tdpexcc query tsm ***	Query backups.
Get-DpExcComponent	**tdpexcc query exchange**	Query the Exchange Server for all databases that are available for backup.
Get-DpExcConfig	**tdpexcc query tdp**	Display configuration information.
Get-DpExcConnection	**tdpexcc query tsm**	Query a list of the current values set in the configuration file for Tivoli Storage Manager.
Get-DpExcInformation	**tdpexcc query exchange**	Query general local Exchange Server information.
Get-DpExcMailboxLocationHistory	**tdpexcc q tsm /showMailboxInfo**	Query the mailbox location history.
Get-DpExcManagedCapacity	**tdpexcc query managedcapacity**	Query managed capacity for Microsoft Exchange Server.
Get-DpExcPolicy	**tdpexcc query policy**	Display policy information.
Mount-DpExcBackup	**tdpexcc mount backup**	Mount a backup to provide access to the files that the backup contains.
Remove-DpExcBackup	**tdpexcc delete backup**	Remove the backup.
Remove-DpExcPolicy	**tdpexcc delete policy**	Delete the policy.
Reset-DpExcTsmPassword	**tdpexcc changetsmpassword**	Change the Tivoli Storage Manager password used by Data Protection for Exchange Server.
Restore-DpExcBackup	**tdpexcc restore**	Restore a backup.
Restore-DpExcMailbox	**tdpexcc restore mailbox**	Restore a mailbox.
Set-DpExcConfig	**tdpexcc set paramname**	Set the application configuration parameters in a configuration file.
Set-DpExcPolicy	**tdpexcc update policy**	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
```

For online product information, 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.

Automating tasks

You can automate a workload by entering Windows PowerShell cmdlets or command-line interface commands in the integrated command line.

About this task

You use the Automate view to work with commands. You can create, save, store, and schedule commands to run at the scheduled time.

Procedure

1. To open the Automate view, select a workload that you want to work with and click **Automate**. An integrated command line is available in the task window from which you can enter PowerShell cmdlets or command-line interface commands.
2. Change **PowerShell** to **Command Line**.
3. To run a command, type a command in the details pane and click the **Execute** icon. You can issue the commands with or without specifying `tdpexcc`.

   For example, for each selected workload instance, you can enter a single command or multiple commands, such as:

   ```
   q tsm
   q exc
   ```

   You can also run a saved task by clicking the **Open** icon, selecting the command file, and clicking the **Execute** icon. The output is displayed in the main window.
4. Click the **Save** icon and follow the prompts to save a command for future use.
5. 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. The output of the command is displayed in the results pane.
6. (Optional) Save or send the command output to an email address.

What to do next

You can automate commands from the Protect, Recover, Schedule, and Task List views in Microsoft Management Console (MMC):

1. Start MMC and select the **Exchange Server** instance 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 item for your task in the result pane, and select **Run Scheduled** in the toolbar 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 the field.

Tivoli Storage Manager task scheduler

Review these guidelines when you define a Tivoli Storage Manager schedule.

- If you use the Tivoli Storage Manager-prompted scheduling mode, ensure that the Data Protection for Exchange Server option file specifies the `tcpclientaddress` and `tcpclientport` options. If you want to run more than one scheduler service, use the same `tcpclientaddress`. However, you must use different values for `tcpclientport` in addition to the different node names. As an example, you might want to run more than one scheduler service when you schedule Data Protection for Exchange Server and the regular Windows backup client.

  Server-prompted scheduling is supported only when TCP/IP communication is used. By default, Data Protection for Exchange Server uses the client polling schedule mode.
- If you make any changes that affect the scheduler in the Data Protection for Exchange Server options file, restart the scheduler to activate the changes. For example, the Tivoli Storage Manager server address, the schedule mode, or the client TCP address or port can affect the scheduler. To restart the scheduler, issue the following commands:

  ```
  net stop "Data Protection for Exchange Server Scheduler"
  net start "Data Protection for Exchange Server Scheduler"
  ```
- The default Tivoli Storage Manager scheduler log file (`dsmsched.log`) contains status information for the Tivoli Storage Manager scheduler. In this example, the file is in this path:

  ```
  d:\Program Files\Tivoli\TSM\TDPExchange\dsmsched.log
  ```

  You can override this file name by specifying the `schedlogname` option in the Data Protection for Exchange Server options file.
- Data Protection for Exchange Server creates a log file with statistics about the backed up database objects when the **/logfile** parameter is specified during the **tdpexcc** command. Outputs from the scheduled commands are sent to the scheduler log file (`dsmsched.log`). After scheduled work is completed, check the log to verify that the work is completed successfully.

  When a scheduled command is processed, the scheduler log might contain the following entry:

  ```
  Scheduled event eventname completed successfully
  ```

This result indicates that Tivoli Storage Manager successfully issued the scheduled command that is associated with the *eventname*. No attempt is made to determine whether the command succeeded or failed. To assess the success or failure of the command, evaluate the return code from the scheduled command in the scheduler log. The scheduler log entry for the command return code is prefaced with the following text:

```
Finished command. Return code is:
```

If any scheduled backups fail, the scheduler script exits with the same error code as the failed backup command. A non-zero error code means that the backup failed.

- If `passwordaccess` *generate* is not specified in the `dsm.opt` file, then the Tivoli Storage Manager password must be specified on the **tdpexcc** command. To specify the password, use the **/tsmpassword** parameter in the command file that is run by the scheduler (`excfull.cmd`). You can also specify the password on the Data Protection for Exchange Server command line. For example:

  ```
  tdpexcc query tsm /tsmnode=mars1 /tsmpassword=newpassword
  ```

Chapter 8. Troubleshooting

Data Protection for Exchange supports you in protecting Microsoft Exchange databases.

About this task

If you encounter a problem, you typically start with a symptom, or set of symptoms, and trace the root cause. Problem determination, however, is not the same as problem solving. During the process of problem determination, you might obtain sufficient information to enable you to solve the problem. In some cases, you cannot solve a problem even after you determine its cause. For example, a performance problem might be caused by a limitation of your hardware

Diagnosing problems

One of the most difficult challenges of troubleshooting in a client-server environment is determining which component is the origin of the problem. VSS diagnostic wizards are available to help you test VSS snapshots on your system. You can determine whether the source of the problem is a general VSS issue or a Tivoli Storage Manager issue.

Diagnosing VSS issues

You can test persistent and non-persistent VSS snapshots on your system with the assistance of a VSS diagnostics wizard.

Before you begin

Attention: Do not run these tests if you are already using SAN Volume Controller or Storwize V7000 space-efficient snapshots on your computer. If you do so, existing snapshots might be removed.

Procedure

1. Start Microsoft Management Console (MMC).
2. To open the diagnostics wizard, complete these steps:
   a. Click **Diagnostics** in the results pane of the welcome page.
   b. Click the **VSS Diagnostics** icon in the Action pane

   A list of volumes are displayed, and the status of each test is displayed when it is completed.
3. To view the results of the persistent and non-persistent snapshot testing, complete these steps:
   a. Select the volumes or mount points to test and click **Next**.
   b. Click **Show VSS Information** to view details about the VSS providers, writers, and snapshots that are available on your system.

   The results of the persistent and non-persistent snapshot testing displays as Passed or Failed.
4. Review the results of the snapshot testing and click **Next**. The final results of the persistent and non-persistent snapshot testing display as Success or Unsuccessful.

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5. Depending on the results, complete these steps:
   - If the testing status is a success, click **Finish** and exit the wizard.
   - If the testing status is not successful, click **Previous** and review information in the Rule dialog.
6. Return to the Management window and begin backup operations.

Determining that the problem is a Data Protection for Exchange issue or a general VSS issue

The Data Protection client interacts closely with the backup-archive client (DSMAGENT). The client completes all of the Virtual Shadow Copy Service (VSS) operations. You can test the connectivity between the Data Protection client and the Tivoli Storage Manager and determine whether the source of the problem is the Microsoft VSS service or with the Tivoli Storage Manager.

About this task

- The vssadmin and diskshadow tools are applications that can run backups that use the Microsoft Exchange VSS APIs.

  vssadmin
  A utility that is installed with your operating system. It can show current volume shadow copy backups and all installed shadow copy writers and providers in the command window.

  diskshadow
  The diskshadow tool is available on Windows 2008 server and 2008 R2.

  With these tools, you can determine the following items:
  - Verify VSS provider configurations
  - Rule out any possible VSS problems before you run the Tivoli Storage Manager VSS functions
  - That you might have a VSS configuration problem or a real hardware problem if an operation does not work with diskshadow or vssadmin
  - That you might have a Tivoli Storage Manager problem if an operation works with diskshadow or vssadmin but not with the Tivoli Storage Manager
- For VSS operations, you can re-create the problem with the Microsoft diskshadow tool. If you are able to re-create the problem with the diskshadow tool, the source of the problem is likely to be within the VSS provider or the Exchange server.

Procedure

1. Test the connectivity between the Data Protection client and the Tivoli Storage Manager DSMAgent.
   a. Select the Exchange workload that you want to work with and click the **Automate** tab to open the **Automate** view.
   b. To verify that your installation and configuration is correct, issue the **Query Exchange** command in the lower details pane and click **Execute** (or **Enter**). Alternatively, issue the **TDPEXCC QUERY EXCHANGE** command on the computer where the Exchange server is installed. The results are displayed in the pane.

   The **TDPEXCC QUERY EXCHANGE** command returns information about the following items:
   - Exchange server status

- Circular logging
- VSS components

The following example shows a sample of the output that is generated by the **TDPEXCC QUERY EXCHANGE** command:

```
Volume Shadow Copy Service (VSS) Information
----------------------------------------
Writer Name             : Microsoft Exchange Writer
Local DSMAgent Node     : SERVERA
Writer Status           : Online
Selectable Components   : 4
```

If the **TDPEXCC QUERY EXCHANGE** command does not return all of this information, you might have a proxy configuration problem. Contact the Tivoli Storage Manager server administrator to have the correct server **GRANT PROXY** commands that are issued to enable proxy authority for nodes. If all of the information returned to you seems correct, proceed to the next step.

2. To determine whether the problem is with the Microsoft VSS service or a problem within the Tivoli Storage Manager code, use the vssadmin and diskshadow tools to re-create the error as follows:
   a. Issue **VSSADMIN** commands, as shown in this example:

      ```
      VSSADMIN LIST WRITERS
      VSSADMIN LIST PROVIDERS
      VSSADMIN LIST SHADOWS
      ```

      The **VSSADMIN LIST SHADOWS** command does not list shadow copies of SAN-attached volumes.

      The vssadmin tool uses Microsoft Software Shadow Copy provider to list the shadow copies that are created.

   b. Before you install Tivoli Storage Manager for Mail, test the core VSS function. Do the following diskshadow testing before you install any Tivoli Storage Manager components:
      - Test non-persistent shadow copy creation and deletion by issuing the following **DISKSHADOW** commands:

        ```
        diskshadow>set verbose on
        diskshadow>begin backup
        diskshadow>add volume f: (database volume)
        diskshadow>add volume g: (log volume)
        diskshadow>create
        diskshadow>end backup
        diskshadow>list shadows all
        diskshadow>delete shadows all
        diskshadow>list shadows all
        ```

        Volumes *f:* and *g:* represent the Exchange database and log volumes. Repeat issuing the**DISKSHADOW** commands four times and verify that the Windows event log file contains no errors.

      - Test persistent shadow copy creation and deletion by issuing the following **DISKSHADOW** commands:

        ```
        diskshadow>set context persistent
        diskshadow>set verbose on
        diskshadow>begin backup
        diskshadow>add volume f: (database volume)
        diskshadow>add volume g: (log volume)
        diskshadow>create
        diskshadow>end backup
        diskshadow>list shadows all (this might take a few minutes)
        diskshadow>delete shadows all
        diskshadow>list shadows all
        ```

Volumes *f:* and *g:* represent the Exchange database and log volumes. Repeat issuing the diskshadow commands four times and verify that the Windows event log file contains no errors.

- Test persistent transportable shadow copy creation and deletion by issuing the following **DISKSHADOW** commands:

```
diskshadow>set context persistent
diskshadow>set option transportable
diskshadow>add volume f: (database volume)
diskshadow>add volume g: (log volume)
diskshadow>set metadata c:\metadata\exchangemeta.cab
(the path where you want the metadata stored)
diskshadow>create
```

You must copy the exchangemeta.cab file from the source server to the offload server. After you copy the file, issue the following commands:

```
diskshadow>load metadata newpath/exchangemeta.cab
diskshadow>import
diskshadow>list shadows all (this might take a few minutes)
diskshadow>delete shadows all
```

Volumes *f:* and *g:* represent the Exchange database and log volumes. Repeat issuing the **diskshadow** commands four times and verify that the Windows event log file contains no errors.

3. Perform the following tests to ensure that VSS is working correctly:
   a. Test nonpersistent shadow copy creation and deletion:
      - Run "DISKSHADOW *k*: *l*:" where *k*: and *l*: are the Exchange Server database and log volumes.
      - Repeat the previous step 4 times.
      - Inspect the Windows Event Log to ensure that the results are appropriate.
   b. Test persistent shadow copy creation and deletion:
      - Run "DISKSHADOW -p *k*: *l*:"

        where *k*: and *l*: are the Exchange Server database and log volumes. Run "**DISKSHADOW -da**" if you do not have enough space.
      - Repeat the previous step 4 times.
      - Inspect the Windows Event Log to ensure that the results are appropriate.
   c. Test nonpersistent transportable shadow copy creation and deletion (VSS Hardware Provider environments only):
      - Run "DISKSHADOW -p -t=export.xml *k*:*l*:"

        where *k*: and *l*: are the Exchange Server database and log volumes.
      - Copy the resultant "export.xml" file from computer 1 to computer 2 before you continue to the next step.
      - On the computer you have set aside for offload, run "DISKSHADOW -i=export.xml"
      - Inspect the Windows Event Log to ensure that things look appropriate.

   If any of these tests fail repeatedly, you have a hardware configuration problem or a real VSS Problem. Consult your hardware documentation for known problems or search Microsoft Knowledge Database for any information.

   If all tests pass, continue to Step 4.
4. Re-create your specific problem by using diskshadow. If you can re-create your problem, only through a series of steps (for example: a backup fails only when you perform two consecutive local backups), try to perform those same tests by using diskshadow.

- Exchange VSS backups to Local are simulated by running a diskshadow persistent snapshot.
- Exchange VSS backups to the Tivoli Storage Manager are simulated by running a diskshadow nonpersistent snapshot.
- Exchange VSS backups to Local and to the Tivoli Storage Manager are simulated by running a diskshadow persistent snapshot.
- Offloaded Exchange VSS backups to the Tivoli Storage Manager are simulated by running a diskshadow nonpersistent, transportable snapshot.

See the diskshadow documentation for the specific commands for performing backups.

If you can re-create the problem, it most likely is a general VSS issue. See the Microsoft Knowledge Database for information. If your operation passes successfully with diskshadow, it most likely is a Tivoli Storage Manager or Data Protection for Exchange client problem.

What to do next

For more information, see this technote: Verifying VSS functionality for the Data Protection Exchange backup (https://www.ibm.com/support/docview.wss?uid=swg21403456)

Resolving reproducible problems

When a component fails to operate as designed, try to reproduce the problem and capture information about the current operating environment at the time of the error. You can troubleshoot VSS backup and restore operations, mailbox restore errors, and VSS and SAN Volume Controller, Storwize V7000, or DS8000 problems.

Troubleshooting VSS backup and restore operations

If you encounter a problem during VSS backup and restore processing, attempt to reproduce the problem in your environment.

Procedure

1. Try the operation that failed again.
2. Restart the Tivoli Storage Manager services, including the TSM Client Acceptor and the TSM Remote Client Agent.
3. If the problem still exists, close other applications, especially those applications that interact with Exchange, for example, antivirus applications. Retry the operation that failed.
4. If the problem persists, look for information in the event logs: `tdpexc.log` and `dsmerror.log`. You can also review the messages in the Windows event log. Log entries might exist to help you identify the VSS event that triggers the issue.
5. If you do not find a resolution to the problem in the log files, complete the following steps:
   a. Shut down the Exchange server or the computer.
   b. Restart the Exchange server or the computer.
   c. Run the operation that failed.

Troubleshooting mailbox restore errors

If you encounter a mailbox restore error, determine whether the problem is reproducible on other Exchange servers.

About this task

Some of the mailbox restore errors that you might encounter include MAPI connection issues to the mailbox, insufficient role-based access control (RBAC) permissions to complete the restore operation, or issues with the Mailbox Restore Browser feature.

Troubleshooting insufficient RBAC roles and permissions

For the following mailbox restore errors, ensure that the RBAC roles and management role scope are set on the Exchange objects for the Exchange user.

Procedure

1. If a mailbox fails to open and the error message indicates a missing RBAC permission, ensure that the user who is logged on to the mailbox has the required RBAC roles, and the management scope for those roles includes the database that contains the mailbox. Then, open the mailbox again.
2. If a mailbox restore operation fails and the error message indicates a missing RBAC permission, ensure that the user who is logged on to the mailbox has the required RBAC roles, and the management scope for those roles includes the source and target databases. Then, restart the restore operation.

Related concepts:

"Security requirements" on page 15

Troubleshooting MAPI connection issues

Procedure

To diagnose MAPI-to-mailbox connection issues, enter the **TDPMAPI TESTMAPI** command with these parameters:

/MAILBOXALIAS
This parameter is the alias name for the mailbox that you are logged on to. The parameter refers to the email alias for the user and is the portion of the email address before the @ symbol. Run this command for the mailbox to be restored and the mailbox that you are logged on to.

/EXCSERVER
(Exchange Server 2010 environments) This parameter is the name of the Exchange Server that has the Client Access Server (CAS) role. By default, the parameter points to the local server. Use the Exchange PowerShell command, **get-ExchangeServer | fl**, to determine the Exchange Server that defined the CAS role for the mailbox database. You must specify this parameter when a CAS Load Balancer exists within the environment.

(Exchange Server 2013 environments) This parameter is the name of the mailbox endpoint of the user who is logged in. Use the Exchange Powershell command, **whoami | Get-Mailbox | fl ExchangeGUID**, to determine the value. You must specify this parameter for Exchange Server 2013.

/TRACEFILE
This parameter is the file name that is used to store the output from tracing operations. By default, tracing is turned off. You can qualify the file name by specifying a drive and a full directory path. You must have write permissions for the user that runs the command.

Troubleshooting errors in a Microsoft Exchange 2013 environment

To resolve mailbox restore errors in an Exchange Server 2013 environment, ensure that the Exchange Server mailbox permissions, authentication methods, registry key settings, and the Client Access Server (CAS) role are configured correctly.

Procedure

1. Grant full access permission to the user who is logged on to the target mailbox. When the administrator mailbox is used, Exchange Server 2013 usually blocks full access permission for the administrator by default.
2. To restore an Exchange 2013 public folder mailbox, ensure that the Exchange user has the `Public Folders` management role.
3. Log on to an Exchange Server 2013 mailbox as the Exchange Server administrator.
4. Ensure that you can access the mailbox that you logged on to and the target mailbox in either Microsoft Outlook or Outlook Web Access.
5. Specify an Exchange Server 2013 CAS by setting the **CLIENTACCESSServer**=*servername* parameter. If you are using a load balancer, set the **CLIENTACCESSServer** parameter to point to the CAS instead of the load balancer.
6. Open the administrator mailbox and the target mailbox. On the Actions pane in the Mailbox Restore Browser interface, click **Open Exchange Mailbox**.
7. Verify that the MAPI registry key, `RpcHttpProxyMap_TSM`, is correct to enable Data Protection for Exchange Server to connect to the Exchange Server. Use one of the following methods:
   - Check the registry key that is in the `HKEY_CURRENT_USER\Software\Microsoft\Windows NT\Current Version\Windows Messaging Subsystem` directory. Change the registry key values to reflect the correct domain, endpoint, and Remote Procedure Call (RPC) authentication methods for your environment. For example, you might specify HTTPS as the authentication method if RPC-over-HTTPS connections ares enabled for the Exchange Server that is hosting the MAPI profile. Otherwise, you might use HTTP authentication for RPC-over-HTTP connections.
   - Use the MAPI Settings property page in Microsoft Management Console (MMC) to ensure that the MAPI registry key is correct. Change the registry key values to reflect the correct domain, endpoint, and Remote Procedure Call (RPC) authentication methods for your environment.

   By default, the following registry key format is used.

   Domain=Proxy Server,*RpcHttpAuthenticationMethod*,
   RpcAuthenticationMethod,*IgnoreSslCert*

   where:

   - *Domain* value is the domain suffix of the personalized server ID, for example, `companyname.local`. Specify any domain or a substring of a domain, or the asterisk (*) and question mark (?) wildcard characters, for example, `*.companyname.local`.
   - *Proxy Server* value is the RPC proxy server that has the Client Access Server (CAS) role. Specify the fully qualified domain name (FQDN) of the RPC proxy server. Precede the FQDN by `http://` for an HTTP connection, or `https://` for an HTTPS connection. For example, `https://exchange.companyname.com`

- *RpcHttpAuthenticationMethod* value is the method that is used to authenticate RPC-over-HTTP connections. Specify `NTLM`, `Basic`, `Negotiate`, or `WinNT`.
- *RpcAuthenticationMethod* value is the method that is used to authenticate RPC-over-TCP connections. Specify `NTLM`, `Negotiate`, `WinNT`, `Anonymous`, or `None`.
- *IgnoreSslCert* value indicates whether the Exchange Server validates SSL certificates. For the Exchange Server to ignore invalid certificates, specify `False`.

The default registry key looks like the following example:

```
contoso.com=http://mail.contoso.com,ntlm,ntlm,false
```

Troubleshooting issues with the Mailbox Restore Browser interface on remote systems

An error can occur when many mailboxes are queried on a remote system, which causes an out-of-memory exception.

About this task

If you complete a mailbox restore task on the remote system, the list of mailboxes might not be displayed in the Source mailbox tree view of MMC. You might see the following message:

```
Error: Processing data for a remote command failed with the following error message:
The WSMan provider host process did not return a proper response. A provider
in the host process may have behaved improperly. For more information, see the
about_Remote_Troubleshooting Help topic.OperationStopped: (<Machine_Name>:String)
 [], PSRemotingTransportExceptionJobFailure
```

Procedure

To resolve the out-of-memory exception, increase the default memory value for the remote Powershell session.
For example, to increase the maximum of memory that is allocated per shell to 4 GB, issue the following cmdlets at the Microsoft Windows PowerShell command line.

```
Set-Item WSMan:\localhost\Shell\MaxMemoryPerShellMB 4096
Set-Item WSMan:\localhost\Plugin\Microsoft.PowerShell\Quotas\MaxMemoryPerShellMB
 4096
Restart-Service winrm
```

Troubleshooting an SMTP restore issue that occurs when you restore email with large attachments in the Mailbox Restore Browser interface

If you restore an email with an attachment that is larger than 3 MB to an SMTP server, a Microsoft fix is required.

About this task

You might see the following error message:

```
QFD: System.Net.Mail - SmtpClient class throws exceptions if file attachment
is over 3 MB
```

Procedure

Resolve the issue by applying the fix that is available at this web page: Microsoft Connect Visual Studio and .NET Framework Downloads (http://support.microsoft.com/kb/2183292)

Troubleshooting a limitation with deleted mailbox history in the Mailbox Restore Browser interface

Data Protection for Exchange Server does not record the time when mailboxes are deleted.

About this task

After a mailbox is deleted, the **Available Database Backups** list in the Mailbox Restore Browser continues to list database backups that contained the mailbox prior to its deletion.

From the **Available Database Backups** list, ensure that the backup version that you select, for the restore task, contains a copy of the mailbox. If the database backup is completed after the mailbox was deleted, the mailbox is not available for the restore.

Troubleshooting VSS and SAN Volume Controller, Storwize V7000, or DS8000

If you experience VSS and SAN Volume Controller, Storwize V7000, or DS8000 problems, use these troubleshooting tips to help you discount some common configuration issues.

Procedure

1. Verify connectivity to the CIMOM (Common Information Model Object Manager) as follows:
   a. Refer to your SAN Volume Controller, Storwize V7000, or DS8000 documentation.
   b. Run the **IBMVCFG LIST** command. The default location is `%Program Files%\IBM\Hardware Provider for VSS-VDS`.
   c. Issue the **IBMVCFG SHOWCFG** command to view the provider configuration information.
2. Verify CIMOM operational issues as follows:
   a. If your backup or restore operation fails, check the `IBMVSS.log` file.

      If the backup or restore failure is from a CIMOM failure, the log displays output similar to the following example:

      ```
      Wed Jan 13 17:34:34.793 - Calling AttachReplicas
      Wed Jan 13 17:34:35.702 - AttachReplicas: 909ms
      Wed Jan 131 17:34:35.702 - returnValue: 34561
      Wed Jan 13 17:34:35.718 - AttachReplicas returned: 34561
      ...
      ...
      Wed Jan 13 17:34:35.779 - IBMVSS: AbortSnapshots
      ```

      A return value of 0 means that it was successful.
   b. To determine why a backup or restore operation failed, look at the log files. The files are generated by the CLI or graphical user interface (GUI), depending on how you run your operation. The log files might provide more information about the failure.

3. If the failure seems to be for a different reason than a CIMOM failure, verify your host configuration. Run the latest support levels of the software for SAN Volume Controller, Storwize V7000, or DS8000.
4. If you are unable to resolve these problems, provide the following information to IBM Support:
   - Information that is listed in the Tivoli Storage Manager diagnostic information section
   - HBA type, firmware, and driver levels
   - SDD version
   - SAN Volume Controller microcode version (if applicable)
   - DS8000 microcode version (if applicable)
   - Storwize V7000 microcode version (if applicable)
   - SAN Volume Controller or Storwize V7000 Master Console version (if applicable)
   - For DS8000, the CIM Agent version (if applicable)
   - `IBMVSS.log`
   - `IBMVDS.log`
   - Application Event Log
   - System Event Log

Resolving problems with IBM Support

Contact IBM Support for further assistance if you have a problem that you are unable to solve by applying maintenance fixes, reproducing the issue, or using the information in previous topics. IBM Support might request to see some or all of the trace and log files while investigating a problem that you report.

About this task

Also, you might be asked to set a trace the Data Protection client when using VSS technology, and then collect the log. IBM Support uses the information that is captured in the log file to trace a problem to its source or to determine why an error occurred.

Gathering trace and log files

Data Protection for Exchange Server uses several components. Each component is in its own directory along with its respective troubleshooting files. By using the Trace and Log Files view, you can easily view these files in a central location.

About this task

The following files are examples of the files that you can view, including default log and trace files:

Examples of Data Protection for Exchange Server default log and trace files:

- Installation directory: `C:\Program Files\Tivoli\TSM\TDPExchange`
- `dsierror.log`
- `tdpexc.log`
- *`TraceFileExc.trc`*

If the tdpexc.log is defined in a path other than the default C:\Program Files\Tivoli\TSM\TDPExchange\tdpexc.log, the reports do 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 tdpexc.log.

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

Procedure

1. When you encounter a problem in the Management Console, create trace files by using the Diagnostics property page.
   a. Click **Properties** > **Diagnostics**, and click **Begin**.
   b. Close the property page and reproduce the problem.
   c. Open the Diagnostics property page and click **Stop**. 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. The log files are displayed in the Trace and Log Files view.
2. Click the trace or log file that you want to view. The contents of the file are displayed in the results pane.

Gathering installation log files to debug installation problems

If a problem occurs during the installation process, gather details about the installation process. You can create a detailed log file of the failed installation that can help IBMSupport to analyze and evaluate the problem.

About this task

The installation wizard collects log files for the installation process.

To help you quickly resolve problems, IBMSupport needs the following information:

- Operating system level
- Service pack
- Description of the hardware that is installed and operating in the production environment
- Installation package (from the DVD or downloaded) and level
- Any Windows event log that is relevant to the failed installation
- Windows services that were active during the failed installation (for example, antivirus software)

- Whether you are logged on to the local system console (not through a terminal server)
- Whether you are logged on as a local administrator, not a domain administrator (cross-domain installations are not supported)

Procedure

1. To create a detailed log file (`setup.log`) of the failed installation, enter the following command to run the setup program (`setup.exe`):

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

2. To view the log files, go to **Manage** > **Diagnostics** > **Trace And Log Files** on the navigation pane. The log files are listed in the upper window pane. When you select the log file, the file is displayed in the lower window pane.

Gathering traces for the Data Protection client when using VSS technology

You must gather traces for Data Protection for Exchange Server, the Tivoli Storage Manager application programming interface (API), and the DSMAGENT processes to ensure a good diagnosis of the Volume Shadow Copy Service (VSS) operation.

About this task

To diagnose Data Protection for Exchange VSS operational problems, gather these traces:

- Data Protection for Exchange trace
- Tivoli Storage Manager API trace
- DSMAGENT trace
- Exchange VSS Writer tracing

Procedure

1. Gather the Data Protection for Exchange trace as follows:
   a. To create the trace flag, issue the "**/TRACEFILE**" and "**/TRACEFLAGS**" command-line options with the following example command:

      ```
      TDPEXCC BACKUP SG1 FULL /TRACEFILE=DPTRACE.TXT /TRACEFLAG=SERVICE
      ```

   b. Enable tracing for FlashCopy Manager. For information about how to enable tracing, see Viewing trace and log files for IBM Tivoli Storage FlashCopy Manager for Windows (http://www.ibm.com/support/knowledgecenter/SS36V9_4.1.2/com.ibm.itsm.fcm.win.doc/t_fcm_diag_traceandlogfiles.html)).
2. Gather the Tivoli Storage Manager API trace as follows: Enable tracing with the DP/Exchange `dsm.opt` file and the "**TRACEFILE**" and "**TRACEFLAGS**" keywords. The following text is an example of the entry in the DP/Exchange `dsm.opt` file:

   ```
   TRACEFILE APITRACE.TXT
   TRACEFLAG SERVICE
   ```

3. Gather the DSMAGENT trace as follows: Enable tracing with the `dsmagent (baclient) dsm.opt` file and the "**TRACEFILE**" and "**TRACEFLAGS**" keywords. The following text is an example of the entry in the `dsmagent (baclient) dsm.opt` file:

   ```
   TRACEFILE AGTTRACE.TXT
   TRACEFLAG SERVICE PID TID ENTER ALL_VSS SBRM RESTORE
   ```

   The trace flag, in this instance, is ALL_VSS (you might need different traceflags, depending on the circumstance).

4. Gather the Exchange VSS Writer trace. Event logging is the only extra tracing that can be turned on. Complete these steps to modify the level of event logging for the Exchange Store Writer:
   a. Open Microsoft Management Console (MMC).
   b. Find the server object.
   c. Right-click the server on which you want to increase the logging level and click **Properties** or **Manage Diagnostic Logging Properties**, depending on the Exchange version.
   d. Click the **Diagnostics Logging** tab.
   e. Expand the **MSExchangeIS** node in the **Services** pane and click **System**.
   f. Click **Exchange writer** in the **Categories** pane and select the logging level.
   g. Click **Apply** and then **OK** to close the Properties dialog box.
5. Enable the Volume ShadowCopy service debug trace features in Windows. For information about enabling debug tracing, see the following web pages:
   - How to enable the Volume Shadow Copy service's debug tracing features in Microsoft Windows Server 2003 and Windows 2008 (http://support.microsoft.com/kb/887013)
   - Using Tracing Tools with VSS (http://msdn.microsoft.com/en-us/library/windows/desktop/dd765233%28v=vs.85%29.aspx)

Gathering information about Exchange with VSS before calling IBM

The Data Protection client depends on the operating system and the Exchange application. Collecting all the necessary information about the environment can significantly assist Support in determining the source of problem.

Procedure

Gather as much of the following information as possible before you contact IBM Support:

- The exact level of the Windows operating system, including all service packs and hotfixes that were applied.
- The exact level of the Exchange Server, including all service packs and hotfixes that were applied.
- The exact level of Data Protection for Exchange with Volume Shadow Copy Service (VSS) Backup/Restore support.
- The exact level of the Tivoli Storage Manager API.
- The exact level of the Tivoli Storage Manager server.
- The exact level of the Tivoli Storage Manager backup-archive client.
- The exact level of the Tivoli Storage Manager storage agent (if LAN-free environment).
- The Tivoli Storage Manager server platform and operating system level.
- The output from the Tivoli Storage Manager server **QUERY SYSTEM** command.
- The output from the Data Protection for Exchange **TDPEXCC QUERY EXCHANGE** command.
- The device type (and connectivity path) of the Exchange databases and logs.
- (SAN only) The specific hardware that is being used. For example: HBA, driver levels, microcode levels, SAN Volume Controller or Storwize V7000 levels, DS8000 hardware details.

- Permissions and the name of the user ID being used to run backup and restore operations.
- The name and version of antivirus software.
- (SAN only) The VSS hardware provider level.
- The VSS hardware provider log files. See the documentation of the specific VSS hardware provider on how to enable tracing and collect the trace log files.
- (SAN only) The IBM CIM agent level for DS8000, SAN Volume Controller, or Storwize V7000.
- A list of vendor-acquired Exchange applications that are running on the system.
- A list of other applications that are running on the system.
- A list of the steps that are needed to re-create the problem (if the problem can be re-created).
- If the problem cannot be re-created, list the steps that caused the problem.
- Does the problem occur on other Exchange servers?

Gathering files from Exchange with VSS before calling IBM

You can collect several log files and other data for Data Protection for Exchange Server server diagnosis.

About this task

The Management Console (MMC) automatically collects information in a package file, which you can send to Support. To collect this information manually, refer to the following file list.

Procedure

1. Gather as many of the following files as possible before you contact IBM Support.
   - The contents of the `C:\Program Files\Tivoli\tsm\baclient\adsm.sys\vss_staging` directory and subdirectories. Gather the appropriate directories if you are using the `VSSALTSTAGINGDIR` option.
   - The Data Protection for Exchange Server configuration file. The default configuration file is `tdpexc.cfg`.
   - The Data Protection for Exchange Server Tivoli Storage Manager API options file. The default options file is `dsm.opt`.
   - The Tivoli Storage Manager registry hive export.
   - The Exchange Server registry hive export.
   - The Tivoli Storage Manager Server activity log. The Data Protection client logs information to the server activity log. A Tivoli Storage Manager administrator can view this log for you if you do not have a Tivoli Storage Manager administrator user ID and password.
   - If the Data Protection client is configured for LAN-free data movement, also collect the options file for the Tivoli Storage Manager storage agent. The default name for this file is `dsmsta.opt`.
   - Any screen captures or command-line output of failures or problems.
2. Gather the following Tivoli Storage Manager log files, which can indicate the date and time of a backup, the data that is backed up, and any error messages or completion codes that might help to determine your problem:
   - The Data Protection for Exchange Server log file. The default location of this file is `C:\Program Files\Tivoli\TSM\TDPExchange\tdpexc.log`

- The Tivoli Storage Manager API Error log file. The default location of this file is `C:\Program Files\Tivoli\TSM\TDPExchange\dsierror.log`
- The DSMAGENT error log file. The default location of this file is `C:\Program Files\Tivoli\TSM\baclient\dsmerror.log`
- The `dsmcrash.dmp` and DSMAGENT crash log file, if requested. The default location is `C:\Program Files\Tivoli\TSM\baclient\dsmcrash.log`.

Important: The Windows event log receives information from the Exchange Server and many different components that are involved during a Volume Shadow Copy Service (VSS) operation. Export the event log to a text file format.

3. Use the Data Protection for Exchange console to list the events that originate by Data Protection for Exchange. Select **Dashboard - ServerName** > **Diagnostics** > **System Information** and double-click the `dpevents.ps1` script in the PowerShell section of the **System Information** page. On Windows Server 2008 and later, You can use PowerShell scripting to list the events information. You can also use the export function from within the Event Viewer to do this function. The utility, by default, produces a tabular listing of all event log records in three sections (one section per event log type). Specify the type of event log you require by using one of the following /L parameters:

   /L Application

   /L Security

   /L System

   The following example generates output only for the application and system event logs:

   ```
   cscript c:\windows\system32\eventquery.vbs /L Application >eq_app.out
   cscript c:\windows\system32\eventquery.vbs /L System >eq_sys.out
   ```

   You can use the /V parameter to receive detailed (verbose) output:

   ```
   cscript c:\windows\system32\eventquery.vbs /V >eq.out
   cscript c:\windows\system32\eventquery.vbs /L System /V >eq_sys.out
   ```

   You can use the /FO parameter to specify tabular, list, or comma-separated (CSV) output. You can use the following methods to specify the output:

   /FO TABLE

   /FO LIST

   /FO CSV

   The default format is TABLE. The LIST output puts each column of the record on a separate line. This technique is similar to how the Tivoli Storage Manager administrator's command-line interface (CLI) displays output when it is too wide for tabular display. The CSV output can be loaded into a spreadsheet or database tool for easier viewing. The following example generates a detailed CSV file of the application log:

   ```
   cscript c:\windows\system32\eventquery.vbs /L Application /FO CSV /V >eq_app.out
   ```

   You can get more help information for the tool by using the following example:

   ```
   cscript c:\windows\system32\eventquery.vbs /?
   ```

4. To increase the number of events that are logged by the Microsoft Exchange Writer, use the **`Set-EventLogLevel`** PowerShell cmdlet command. For more information about the **`Set-EventLogLevel`** PowerShell cmdlet command, see the Microsoft documentation.

   The following VSS provider log files can also be helpful, if applicable:

- System Provider - (Windows Event Log)
- IBM System Storage SAN Volume Controller, IBM Storwize V7000, or DS8000 - `%Program Files%\IBM\Hardware Provider for VSS\IBMVss.log`
- NetApp - `%Program Files%\SnapDrive\*.log`
- XIV - zip up all of the files in the `C:\Windows\Temp\xProvDotNet` directory

Viewing and modifying system information

You can view and edit scripts that provide information about system components including, for example, Windows-related services for Data Protection for Microsoft Exchange Server, 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 customized scripts.

Procedure

1. Open the System Information view as follows:
   a. Click **Diagnostics** in the results pane of the welcome 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, as follows:

Action	Steps
Add your own scripts	1. Click **New** in the Actions pane. 2. If you want to copy your scripts directly to the `ProgramFiles\Tivoli\FlashCopyManager\Scripts` directory, make sure that your scripts follow these extension requirements: • PowerShell scripts: *`filename`*`.ps1` • Windows Management Instrumentation (WMI) scripts: *`filename`*`.wmi` • Tivoli Storage Manager scripts: *`filename`*`.tsm` Tivoli Storage FlashCopy Manager uses the file type extension to determine how to run the script.
View or edit an existing script	1. From the list of script files in the results pane, select the name of a script that you want to view or edit. **Tip:** 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 process. 2. To open the script file for viewing or editing, click **Command Editor** in the Actions pane. 3. View or edit the script. 4. Click **OK** to save your changes, or click **Cancel** to exit the System Information Command Editor without saving any changes.

Action	Steps
Delete a script	1. From the list of script files in the results pane, select the name of a script that you want to delete. **Tip:** 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 process. 2. Click **Delete** in the Actions pane.

Emailing files to IBM Support

You can send diagnostic information to IBM Support.

Before you begin

About this task

The Email Support files feature collects all detected configuration, option, system information, trace, and log files. It also collects information about services, operating systems, and application versions. These files are compressed and then attached in an email.

Procedure

1. Start Microsoft Management Console (MMC).
2. Click **Diagnostics** in the results pane of the welcome page.
3. Click the **E-Mail Support files** icon in the Action pane.
4. Enter the required information in the various fields and click **Done**. The information is sent to the designated support personnel and the dialog closes.

Results

Files are collected, compressed, and stored in the `flashcopymanager\problemdetermination` folder. The files are deleted and replaced each time that you email the support files. If the Email feature is not configured, or is blocked by a firewall, or if the files are large, use another method to transfer them. You can copy the files directly from the `flashcopymanager\problemdetermination` folder and transfer the files to another site by using another method such as FTP.

Online IBM support

Multiple online support resources are available for you to use.

The following list identifies where you can find information online:

- Tivoli Storage Manager wiki (https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Storage%20Manager).
- Storage Management community on Service Management Connect (https://www.ibm.com/developerworks/servicemanagement/sm/index.html).
- Tivoli Storage Manager for Mail (http://www.ibm.com/software/products/en/tivostormanaformail). Enter the search term to narrow the search criteria for your support requirements. Examples of search terms that you might use include an authorized program analysis report (APAR) number, release level, or operating system.

Chapter 9. Performance tuning

Many factors can affect the backup and restore performance of your Exchange Server.

Some of these factors, such as hardware configuration, network type, and capacity, are not within the scope of Data Protection for Exchange Server. Some options that are related to Data Protection for Exchange Server can be tuned for optimum performance. In addition, the following issues affect performance:

- Database backups to local shadow volumes eliminates the transfer of data to the Tivoli Storage Manager server.
- During VSS backup processing, the consistency of the database backup is verified. Therefore, backup processing time can be significant. You can improve backup processing performance when you specify the **/SKIPINTEGRITYCHECK** options with the **backup** command to bypass integrity checking.

  Restriction: If you bypass integrity checking, the backup that is stored on Tivoli Storage Manager server might not be valid and data loss can occur, unless the database that you are backing up is in a Database Availability Group (DAG) environment and has at least two valid copies (one active and one passive copy).
- The time that is required to complete a snapshot, ranges from seconds to minutes, depending on the type of VSS provider used. Depending on the size of the database and log files, integrity checking can delay the completion of the backup.
- Backup-archive client settings can affect performance when you back up data to the Tivoli Storage Manager server.
- Performing Data Protection for Exchange Server VSS backups from an Exchange Server DAG passive copy can offload I/O and possibly processor resources from the production server.

If the update for Tivoli Storage Manager server APAR IC86558 is not applied, apply the update.

For VSS backups, the **RESOURCEUTILIZATION** client option is also important. This option increases or decreases the capacity of the client to create multiple sessions. The higher the value, the more sessions the client can start. The range for the option is from *1* to *10*.

If you run multiple backups in parallel, stagger the backup times by several minutes. The staggered backup times ensure that the snapshots are not created at the same time. When you use VSS, only one snapshot set can be created at a time.

Related tasks:

"Specifying other Data Protection for Exchange Server configuration parameters" on page 41

"Managing Exchange Database Availability Group members by using a single policy" on page 39

"Binding backups to policies" on page 36

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LAN-free data movement

Running Data Protection for Exchange Server in a LAN-free environment means that data can be directly sent to storage devices.

When you implement a LAN-free environment, data bypasses potential network congestion. However, you must be properly equipped to operate in a LAN-free environment. For more information about setting up a LAN-free environment, see LAN-free client-data backup: Scenario (http://www.ibm.com/support/knowledgecenter/SSSQZW_7.1.1/com.ibm.itsm.sta.doc/c_scenario_lanfree.html).

In addition to specific LAN-free requirements, you must specify the following options. For VSS backups, specify these options in the backup-archive client options file.

enablelanfree yes
This option specifies whether to enable an available LAN-free path.

lanfreecommmethod
Specifies a communication protocol.

lanfreetcpport
Specifies the TCP/IP port number where the Tivoli Storage Manager Storage Agent is listening.

lanfreetcpserveraddress
Specifies the TCP/IP address for a Tivoli Storage Manager Storage Agent.

For more information about these options, see Installing and configuring the client (https://www.ibm.com/support/knowledgecenter/SSSQZW_7.1.1/com.ibm.itsm.sta.doc/t_extlib_inst_client.html)).

Chapter 10. Reference information

Reference information includes the backup and restore commands that you can issue at the command-line interface as an alternative to using Microsoft Management Console (MMC).

Command-line overview

The name of the Data Protection for Exchange Server command-line interface is **tdpexcc.exe**. This program is in the directory where Data Protection for Exchange Server is installed.

Command-line parameter characteristics

The command-line parameters have the following characteristics:

- 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 value includes spaces, the value must be enclosed in double quotation marks.
- A positional parameter can display only once per command invocation.

Command-line interface help

Issue the **tdpexcc ?** or **tdpexcc help** command to display help for the command-line interface. You can see more specific help for commands by entering a command like the following example: **tdpexcc help backup**, where **backup** is an example of a command.

Related tasks:

"Starting the Data Protection for Exchange Server command-line interface" on page 95

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Backup command

Use the **backup** command to run Exchange Server database backups from the Exchange Server to Tivoli Storage Manager server storage.

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 (created for back up to local shadow volumes) is run, the backup remains active until the backup version is expired on the Tivoli Storage Manager server according to the defined server policy. As a result, different active backups can exist at the same time:

- VSS local (full)
- VSS local (copy)
- VSS Tivoli Storage Manager server (full)
- VSS Tivoli Storage Manager server (copy)

The Exchange database file size might increase as a result of increased database commitments that are triggered by backup operations. This behavior is standard for the Microsoft Exchange server.

For IBM SAN Volume Controller and IBM Storwize V7000 storage subsystems, only one backup is allowed to occur while the background copy process is pending. A new backup is not started until the background copy process for the previous backup is completed. As a result, local backups for IBM SAN Volume Controller and IBM Storwize V7000 storage subsystems must be initiated at a frequency that is greater than the time required for the background copy process to complete.

Data Protection for Exchange Server supports the following types of backup:

Full Back up the entire database and transaction logs. If a successful integrity check and backup are obtained, the Exchange Server truncates the committed log files.

Incremental
Back up the transaction logs. If a successful integrity check and backup are obtained, the Exchange Server deletes the committed log files.

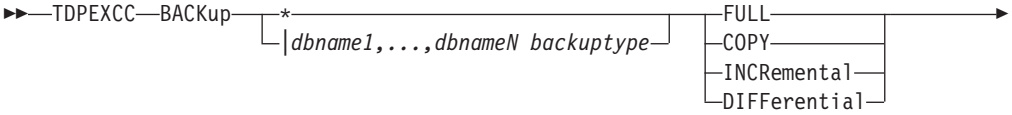
Differential
Back up the transaction logs but do not delete them.

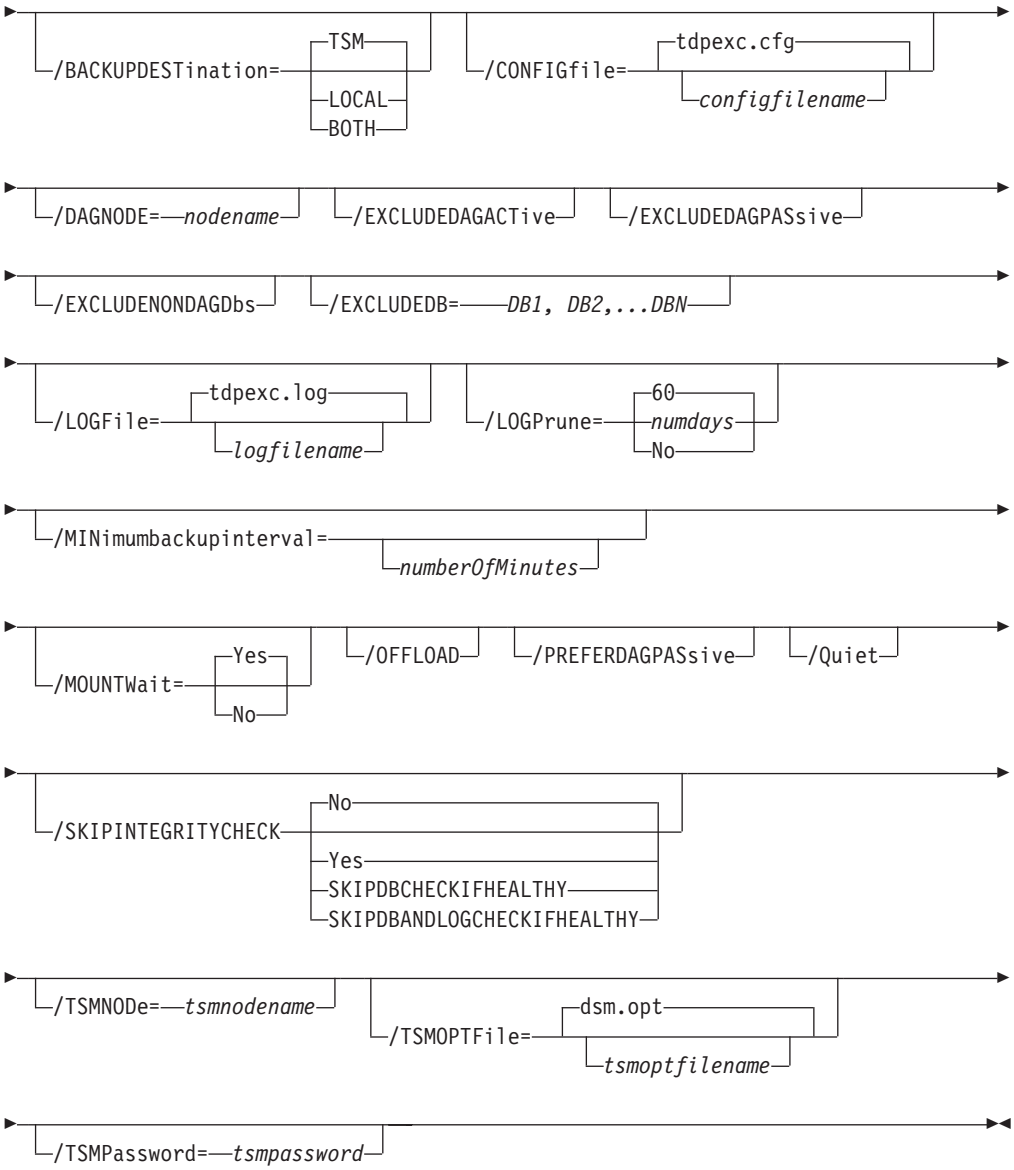
Copy Back up the entire database and transaction logs. Do not delete the transaction logs.

Backup syntax

To view available options and truncation requirements, use the **backup** command.

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:

***** | *db-name1, ...,db-nameN backuptype*

*****
Back up all databases sequentially.

db-name
Back up the specified database. 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 database name is case sensitive.

The following positional parameters specify the type of backup to run:

FULL | COPY | INCRemental | DIFFerential

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

COPY Back up the entire database and transaction logs, do not truncate the transaction logs.

INCRemental
Back up the transaction logs, and if a successful backup is obtained, truncate the transaction logs.

DIFFerential
Back up the transaction logs but do not truncate them.

Backup optional parameters

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

/BACKUPDESTination=TSM|LOCAL|BOTH
Use the **/BACKUPDESTination** parameter to specify the location where the backup is stored.

You can specify:

TSM The backup is stored on Tivoli Storage Manager server storage only. This option is the default value.

LOCAL The backup is stored on local shadow volumes only.

BOTH The backup is stored on Tivoli Storage Manager server storage and local shadow volumes.

/CONFIGfile=*configfilename*
Use the **/CONFIGfile** parameter to specify the name (*configfilename*) of the Data Protection for Exchange Server configuration file that contains the values to use for a **backup** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange Server 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 are backed up from. This setting can prevent Data Protection for Exchange Server from making too many backups of the same database.

/EXCLUDEDAGACTive
Use the **/EXCLUDEDAGACTive** parameter to exclude databases from the backup if they belong to a Database Availability Group and are an active database copy.

/EXCLUDEDAGPASsive

Use the **/EXCLUDEDAGPASsive** parameter to exclude the databases from backup if they belong to a Database Availability Group and are a passive database copy.

/EXCLUDENONDAGDbs

Use the **/EXCLUDENONDAGDbs** parameter to exclude the databases from backup if they do not belong to a Database Availability Group.

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

Use the **/EXCLUDEDB** parameter to exclude the specified databases from the backup operation.

/LOGFile=*logfilename*

Use the **/LOGFile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange Server.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange Server 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 Data Protection for Exchange Server to complete 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**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, a certain number of days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.
- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.

- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

/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.

Setting this parameter specifies that only one database copy can be backed up within a time frame. 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 Data Protection for Exchange Server is to wait for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify:

Yes Wait for tape mounts. This option is the default.

No Do not wait for tape mounts.

/OFFLOAD

Specify this parameter to complete the integrity check and backup of files to Tivoli Storage Manager on the system that is specified by the **remotedsmagentnode** instead of the local system. This parameter is only valid when **/backupdestination**=TSM. This parameter requires a VSS provider that supports transportable shadow copies. It is not supported by the default Windows VSS System Provider.

/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 valid passive copy is available. If no valid passive copy is available, the backup is created from the active database copy.

/Quiet This parameter prevents status information from being displayed. The level of information that is written to the activity log is not affected.

/SKIPINTEGRITYCHECK

Use the **/SKIPINTEGRITYCHECK** parameter to specify whether Data Protection for Exchange Server bypasses the integrity checking of databases and log files, or automatically runs the integrity checking of databases and log files.

You can specify the following values:

No Run integrity checking to verify that all database and log files do not contain integrity issues. This option is the default.

Yes Bypass integrity checking of all database and log files during backup processing.

SKIPDBCHECKIFHEALTHY
Bypass integrity checking of database files only if at least two valid copies of a database (one active and one passive copy) exist in a Database Availability Group (DAG).

SKIPDBANDLOGCHECKIFHEALTHY
Bypass integrity checking of all database and log files during backup processing only if at least two valid copies of a database (one active and one passive copy) exist in a DAG.

Attention: If you do not specify a value with the **/SKIPINTEGRITYCHECK** parameter, integrity checking of database and log files is bypassed. If you bypass integrity checking, the backup that is stored on Tivoli Storage Manager server might not be valid, or data loss can occur.

/TSMNODe=*tsmnodename*
Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

You can store the node name in the Tivoli Storage Manager options file (`dsm.opt`). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to `PROMPT`. This parameter is not valid when **PASSWORDACCESS** is set to `GENERATE` in the options file.

/TSMOPTFile=*tsmoptfilename*
Use the *tsmoptfilename* variable to identify the Data Protection for Exchange Server options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange Server is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

/TSMPassword=*tsmpassword*
Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

If you specified **PASSWORDACCESS** `GENERATE` in the Data Protection for Exchange Server options file (`dsm.opt`), you do not need to supply the password here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time that Data Protection for Exchange Server 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 Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Examples: backup command

These examples show you how to use the **backup** command.

This example shows how to run a full VSS backup of exactly one copy of a database that contains multiple copies in an Exchange Server Database Availability Group (DAG). The command instructs Data Protection for Exchange Server to back up only the database KEENVM1_M_DB1 if a minimum of 60 minutes passes since the latest backup of the database, and if no other member in the FCMDAG2 Database Availability Group is backing it up. Include this command in a command script (for example, c:\backup.cmd). Then, define a Tivoli Storage Manager schedule that starts this command script, and associate all DAG nodes to this schedule.

```
tdpexcc backup KEENVM1_M_DB1 full /minimumbackupinterval=60
```

This example shows how to run a full VSS backup of one valid passive copy of a database that contains multiple copies in an Exchange Server Database Availability Group (DAG). If a valid passive copy is not available, the active database copy is backed up. The command instructs Data Protection for Exchange Server to back up only the passive copy of database KEENVM1_M_DB1 if a minimum of 60 minutes passes since the latest backup of the database, and if no other member in the FCMDAG2 Database Availability Group is backing it up. If no passive database copy is available, back up the active database copy. Include this command in a command script (for example, c:\backup.cmd). Define a Tivoli Storage Manager schedule that starts this command script, and associate all DAG nodes to this schedule.

```
tdpexcc backup KEENVM1_M_DB1 full /minimumbackupinterval=60 /preferdagpassive
```

Changetsmpassword command

To change the Tivoli Storage Manager password that is used by Data Protection for Exchange Server, use the **changetsmpassword** command. The password is used to log on to the Tivoli Storage Manager server.

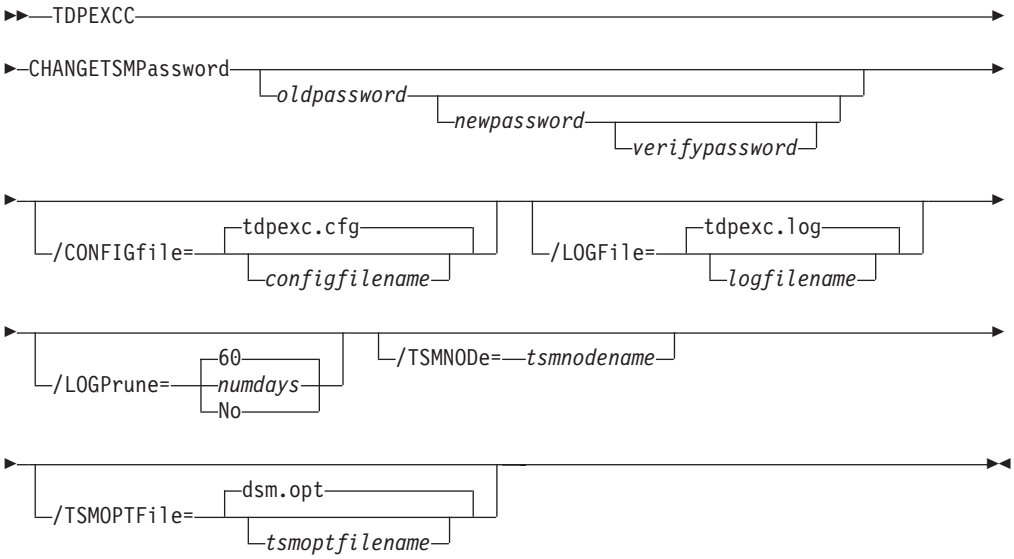
If you do not enter the old and new passwords, Data Protection for Exchange Server prompts you for the old and new passwords. Data Protection for Exchange Server does not display the password on the screen.

The Tivoli Storage Manager password that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Changetsmpassword syntax

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

TDPEXCC command



Changetsmpassword positional parameters

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

oldpassword newpassword verifypassword

oldpassword
Specifies the current password that is used by Data Protection for Exchange Server.

newpassword
Specifies the new password that is used by Data Protection for Exchange Server.

verifypassword
Specifies the new password again for verification.

Changetsmpassword optional parameters

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

/CONFIGfile=*configfilename*
Use the **/configfile** parameter to specify the name of the Data Protection for Exchange Server configuration file that contains the values for the Data Protection for Exchange Server configuration options.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange Server installation directory is used. If the **/configfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is `tdpexc.cfg`.

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

```
/CONFIGfile="c:\Program Files\file.cfg"
```

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange Server.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange Server 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 Data Protection for Exchange Server to perform 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.

Attention: Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays*|**No**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, a certain number of days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.
- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.
- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

/TSMNODe=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

You can store the node name in the Tivoli Storage Manager options file (`dsm.opt`). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to `PROMPT`. This parameter is not valid when **PASSWORDACCESS** is set to `GENERATE` in the options file.

/TSMOPTFile=*tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Data Protection for Exchange Server options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange Server is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

Example: `changetsmpassword` command

The following example changes the Tivoli Storage Manager password that is used by Data Protection for Exchange Server:

```
tdpexcc changetsmpassword oldpw newpw newpw
```

Delete backup command

To delete a VSS backup of an Exchange Server database, use the **delete backup** command.

To complete a Data Protection for Exchange Server delete backup, you must have local registry rights for all versions of Exchange Server. When a full VSS snapshot backup is completed, the backup remains active until the backup version is deleted by issuing the **delete backup** command, or until the backup version is expired by VSS according to the defined policy. Two different active backups can exist at the same time:

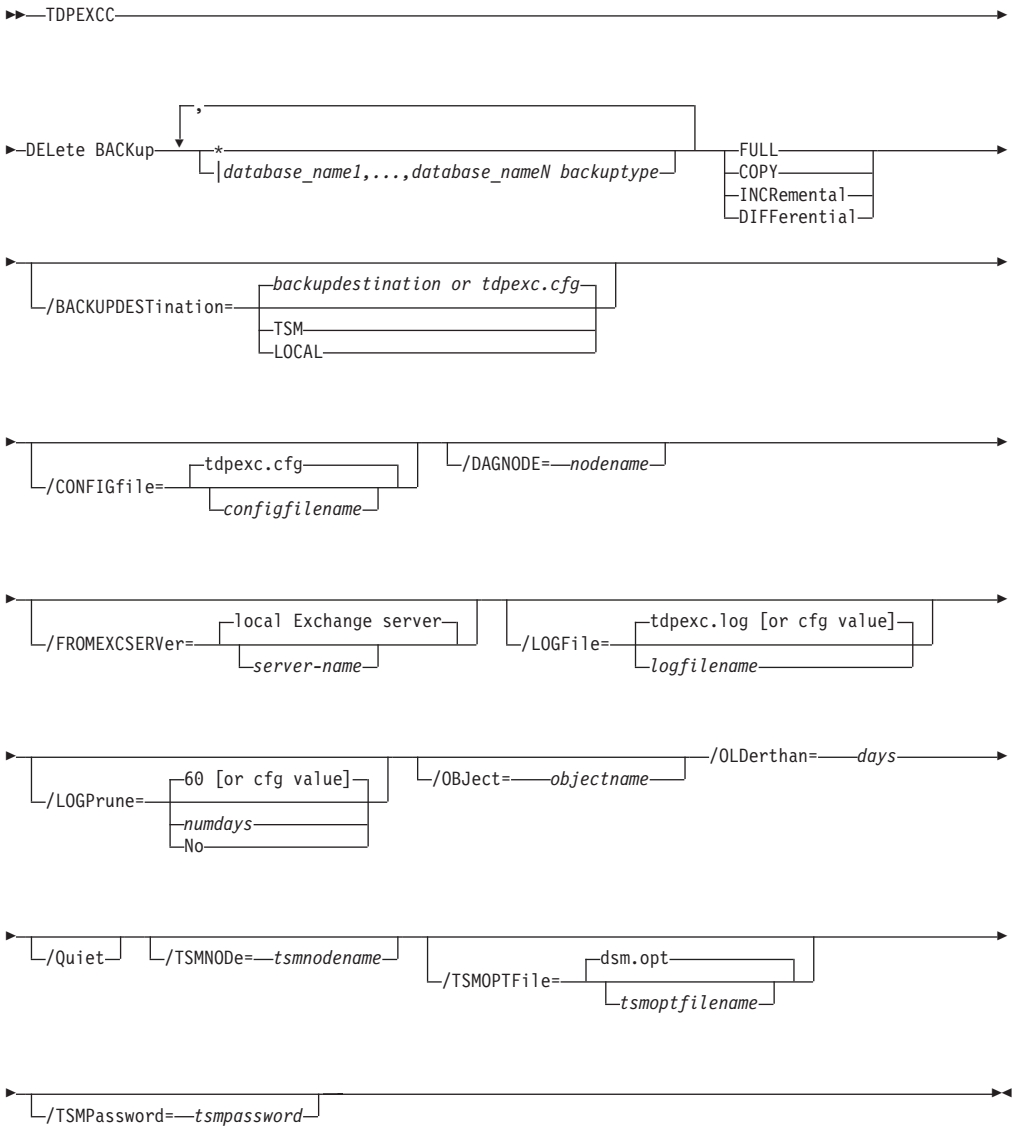
- Full backup, and any associated incremental backups and differential backups.
- Copy backup, and any associated incremental backups and differential backups.

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. The backup seems to be erroneously 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 changed to active) remains inactive. This inactive incremental or differential backup might not display in the query output unless the **/all** parameter is specified with the **query fcm** command.

Delete Backup syntax

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

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:

** | database_name*

* Delete the active backups of all databases.

database_name
Delete a backup of the specified database name. 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 database name. If any database contains commas or blanks, enclose the database name in double quotation marks.

Attention:

- Be careful to delete only the backups you want.
- Deleting incremental or differential backups can cause loss of recovery points.
- Deleting a full backup might cause incremental or differential backups to remain in a suspended state and are considered useless without a corresponding full backup.

The following positional parameters specify the type of delete backup to perform:

FULL|COPY|INCRemental|DIFFerential

FULL Delete full type backups.

COPY Delete copy type backups.

INCRemental
Delete incremental type backups.

DIFFerential
Delete differential type backups.

Delete Backup optional parameters

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

/BACKUPDESTination=TSM|LOCAL
Use the **/backupdestination** parameter to specify the location from where the backup is to be deleted. The default is the value (if present) specified in the Data Protection for Exchange Server preferences file (`tdpexc.cfg`). If no value is present, the backup is deleted from Tivoli Storage Manager server storage.

You can specify:

TSM The backup is deleted from Tivoli Storage Manager server storage. This option is the default value.

LOCAL The backup is deleted from the local shadow volumes.

/CONFIGfile=*configfilename*
Use the **/configfile** parameter to specify the name (*configfilename*) of the Data Protection for Exchange Server configuration file that contains the values to use for a **delete backup** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange Server 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 are backed up from. This setting can prevent Data Protection for Exchange Server 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 performed.

The default is the local Exchange Server. However, you must specify the name if the Exchange Server is not the default.

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange Server.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully-qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange Server installation directory.

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

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

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

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

When using multiple simultaneous instances of Data Protection for Exchange Server to perform operations, use the **/logfile** parameter to specify a different log file for each instance used. This directs logging for each instance to a different log file and prevents interspersed log file records. Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays*|**No**

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

Changes to the value of the **timeformat** or **dateformat** parameter can result in the log file being pruned unintentionally. If the value of the **timeformat**

or **dateformat** parameter has changed, prior to issuing a Data Protection for Exchange Server command that might prune the log file, perform one of the following actions to prevent the log file from being pruned:

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

/OBJect=*objectname*
Use the **/object** parameter to specify the name of the backup object that you want to delete. The object name uniquely identifies each backup object and is created by Data Protection for Exchange Server.

Use the Data Protection for Exchange Server `query tsm * /all` command to view the names of all available backup objects.

The **/object** parameter is used to delete only one incremental backup at a time. When multiple active incremental backups exist, the **/object** parameter must be specified with the **delete** command. If it is not specified, the **delete** command fails.

/OLDerthan=*days*
Use the **/olderthan** parameter to specify how old backup files can be before they are deleted. The days variable can range from 0 - 9999. There is no default value for**/olderthan**.

/Quiet This parameter prevents status information from being displayed. The level of information that is written to the activity log is not affected.

/TSMNODe=*tsmnodename*
Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

You can store the node name in the Tivoli Storage Manager options file (`dsm.opt`). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to `PROMPT`. This parameter is not valid when **PASSWORDACCESS** is set to `GENERATE` in the options file.

/TSMOPTFile=*tsmoptfilename*
Use the *tsmoptfilename* variable to identify the Data Protection for Exchange Server options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange Server is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

/TSMPassword=*tsmpassword*
Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

If you specified **PASSWORDACCESS** `GENERATE` in the Data Protection for Exchange Server options file (`dsm.opt`), you do not need to supply the password here because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange Server connects to the Tivoli Storage Manager server.

If you do specify a password with this parameter when **PASSWORDACCESS** GENERATE is in effect, the command-line value is ignored unless the password for this node has not yet been stored in the registry. In that case, the specified password is stored in the registry and used when you run this command.

If **PASSWORDACCESS** PROMPT is in effect, and you do not specify a password value on the command line, then you are prompted for a password.

The Tivoli Storage Manager password that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Help command

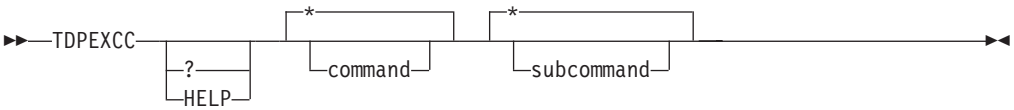
To display help for Data Protection for Exchange Server commands, use the **tdpexcc help** command.

This command lists one or more commands and their parameters. If you cannot see all of the help on a screen, set the width of your screen display 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 Data Protection for Exchange Server **help** command.

The following optional parameters specify the help to be displayed:

*| *command*
Identifies the specific Data Protection for Exchange Server command that is to be displayed. If the wildcard character (*) is used, help for all Data Protection for Exchange Server commands is displayed.

The valid command names are shown:

```
BACKup
CHANGETSMPassword
HELP
MOUNT
Query
RESTore
RESTOREFIles
RESTOREMailbox
SET
```

*| *subcommand*
Help can be displayed for commands that have several subcommands, for

example, the **query** command. If you do not specify a subcommand or the wildcard character (*), help for all Data Protection for Exchange Server **query** commands is displayed.

The valid subcommand names for the **query** command are shown:

```
EXCHange
managedcapacity
policy
TDP
TSM
```

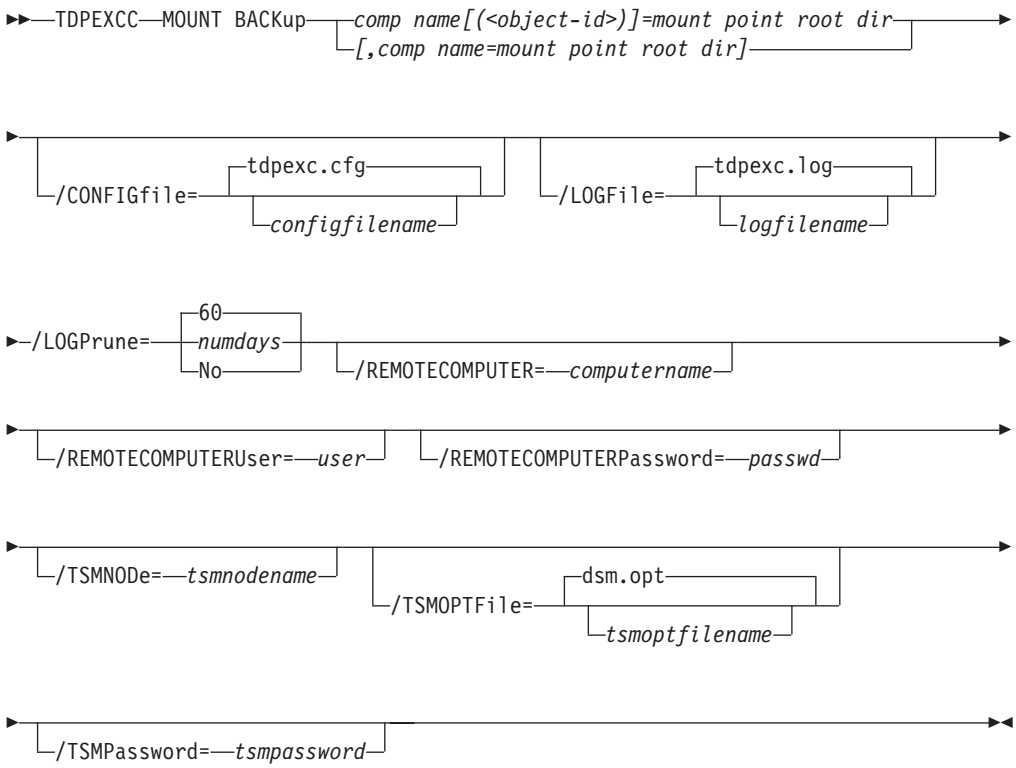
Mount backup command

To mount backups, 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:

```
tdpexcc 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 Data Protection for Exchange Server 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 Data Protection for Exchange Server 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=*logfilename*
Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange Server. The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange Server installation directory.

If the *logfilename* 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**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, a certain number of days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.
- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.
- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

/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 Data Protection for Exchange Server 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 Data Protection for Exchange Server 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 Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

If you specified **PASSWORDACCESS** `GENERATE` in the Data Protection for Exchange Server 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 Data Protection for Exchange Server 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 Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Query Exchange command

To query the local Exchange Server for general information, use the **query exchange** command.

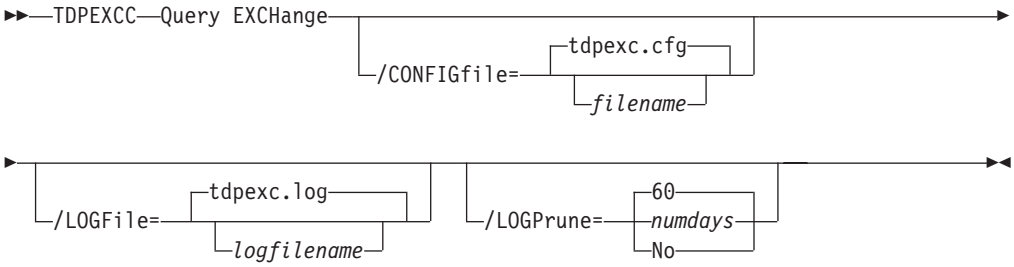
The **query exchange** command returns the following information:

- Exchange Server name and version
- Domain name
- Names of all databases
- Status (online, offline) of all databases
- Circular logging status (enabled, disabled)
- The following 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=*filename*

Use the **/CONFIGfile** parameter to specify the name (*filename*) of the Data Protection for Exchange Server configuration file that contains the values to use for a **query exchange** operation.

The *filename* variable can include a fully qualified path. If the *filename* variable does not include a path, the Data Protection for Exchange Server 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"
```

/LOGFile=*logfilename*

Use the **/LOGFile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange Server. The *logfilename* variable identifies the name of the activity log file. If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange Server 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 Data Protection for Exchange Server to perform 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**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, a certain number of days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.
- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.
- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

Query Managedcapacity command

To determine the amount of managed capacity in use, and to assist with your storage planning, use the **query managedcapacity** command.

Purpose

The **query managedcapacity** command displays capacity that relates to the volumes that are represented in local inventory that is managed by Data Protection for Exchange Server. This command is valid for all Windows operating systems that are supported by Data Protection for Exchange Server.

TDPEXCC command: Query MANAGEDCAPacity

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 : 124.65 GB (133,844,426,752 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 2.0
(C) Copyright IBM Corporation 1998, 2015. 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)
```

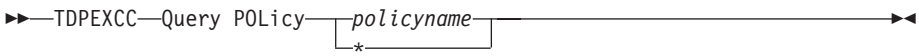
Query policy command

To query local policy information, use the **query policy** command.

Query Policy

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

TDPEXCC command



When you specify *, all policies are queried. The results of the query are displayed:

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

Policy      Number of snapshots to keep    Days to keep a snapshot

--------    ---------------------------    ----------

EXCPOL                      3               60

STANDARD                    2               30
```

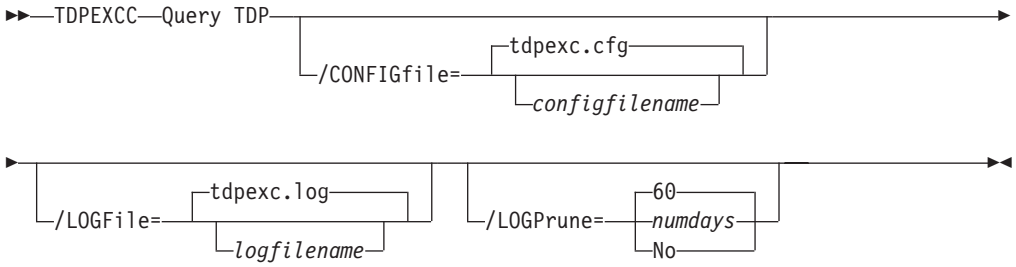
Query TDP command

To query a list of the current values that are set in the configuration file for Data Protection for Exchange Server, use the **query tdp** command.

Query TDP syntax

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

TDPEXCC command: Query TDP



Query TDP optional parameters

Optional parameters follow the **query TDP** command.

/CONFIGfile=*configfilename*

Use the **/CONFIGfile** parameter to specify the name (*configfilename*) of the Data Protection for Exchange Server configuration file that contains the values to use for a **query TDP** operation.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange Server installation directory is used. If the **/CONFIGfile** parameter is not specified, or if the *configfilename* variable is not specified, the default value is `tdpexc.cfg`.

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

```
/CONFIGfile="c:\Program Files\file.cfg"
```

/LOGFile=*logfilename*

Use the **/LOGFile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange Server.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange Server 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 Data Protection for Exchange Server to perform 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**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, a certain number of days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.
- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.
- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

Examples: `query tdp` command

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

The following code sample includes output for a VSS configuration:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2015. All rights reserved.

Data Protection for Exchange Preferences
----------------------------------------

BACKUPDESTination................... LOCAL
CLIENTAccessserver..................
DAGNODe............................. DAG1
DATEformat ......................... 1
LANGuage ........................... ENU
LOCALDSMAgentnode................... TIVVM400
LOGFile ............................ tdpexc.log
LOGPrune ........................... 60
MOUNTWait .......................... Yes
NUMberformat ....................... 1
REMOTEDSMAgentnode..................
TEMPDBRestorepath...................
TEMPLOGRestorepath..................
TIMEformat ......................... 1
IMPORTVSSSNAPSHOTSONLYWhenneeded.... No

Completed
```

Query TSM command

To display Tivoli Storage Manager server information, use the **query tsm** command.

This command displays the following information:

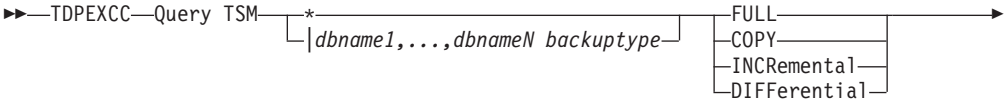
- Tivoli Storage Manager node name
- Network host name of the server
- Tivoli Storage Manager API version
- Server name, type, and version
- Compression mode
- Domain
- Active policy set
- Default management class

This command also displays a list of backups that are stored on the Tivoli Storage Manager server that match the databases that are entered. Active and inactive objects are displayed. However, only the active backup objects are displayed by default. To include inactive backup versions in the list, use the **/all** optional parameter.

Query TSM syntax

To view available options and truncation requirements, use the **query TSM** command.

TDPEXCC command



Query TSM positional parameters

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

The following positional parameters specify the object to query. If none of these positional parameters are specified, only the Tivoli Storage Manager API and Tivoli Storage Manager server information is displayed:

***** | *dbname*

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

dbname
Query all backup objects for the specified database. Multiple entries are separated by commas.

The following positional parameters specify the type of backup to query. If this parameter is not specified, all backup types are displayed:

FULL | COPY | INCRemental | DIFFerential

FULL Query only full backup types

COPY Query copy backup types only

INCRemental
Query only incremental backup types

DIFFerential
Query only differential backup types

Query TSM optional parameters

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

/ACtive
Use the **/ACtive** parameter to display active backup objects only. This setting is the default setting.

/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 Data Protection for Exchange Server configuration file that contains the values for the Data Protection for Exchange Server configuration options.

The *filename* variable can include a fully qualified path. If the *filename* variable does not include a path, the Data Protection for Exchange Server 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"
```

/DAGNODe=*nodename*
Specify the node name that you want to use to back up and restore the databases in an Exchange Server Database Availability Group (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 Data Protection for Exchange Server from making too many backups of the same database.

/DEtail
Use the **/DEtail** parameter to display comprehensive information about the status of the Tivoli Storage Manager server, including the following details:

- Backup compressed

Table 15. Backup compressed values

Value	Status
Yes	One or more objects are compressed.
No	No objects are compressed.
Unknown	It is not known whether the backup is compressed, which includes backups before Data Protection for Exchange Server version 6.3.

- Backup encryption type

Table 16. Backup encryption type values

Value	Status
None	None of the objects are encrypted.
AES-256	The objects are encrypted with AES-256 encryption. The most secure data encryption method is `AES256`.

Table 16. Backup encryption type values (continued)

Value	Status
AES-128	The objects are encrypted with AES-128 encryption.
DES-56	The objects are encrypted with DES-56 encryption.
Unknown	It is not known whether the objects in the database are encrypted, which includes backups before Data Protection for Exchange Server version 6.3.

- Backup client-deduplicated

Table 17. Backup client-deduplicated values

Value	Status
Yes	One or more objects are client-side deduplicated.
No	No objects are client-side deduplicated.
Unknown	It is not known whether the backup is client-side deduplicated, which includes backups before Data Protection for Exchange Server version 6.3.

- Backup supports instant restore

Table 18. Backup supports instant restore values

Value	Status
Yes	One or more objects support instant restore.
No	No objects support instant restore.
Unknown	The backup might not support instant restore. This setting applies to backups before Data Protection for Exchange Server version 6.3.

/FROMEXCSERVer=*servername*

Use the **/fromexcserver** parameter to specify the name of the Exchange Server where the original backup is completed.

The default is the local Exchange Server. However, you must specify the name if the Exchange Server is not the default.

If a DAG node is specified by using the **dagnode** parameter, Data Protection for Exchange Server uses this node name instead of the Data Protection for Exchange Server node to back up databases in an Exchange Server Database Availability Group. Therefore, the **query tsm** command automatically displays 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 Data Protection for Exchange Server.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The

logfilename variable can include a fully qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange Server 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 Data Protection for Exchange Server to complete 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**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, a certain number of days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.
- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.
- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

/REMOTECOMPUTER=*computername*

Enter the IP address or host name for the remote system where you want to query the data backups.

/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.

/SHOWMAILBOXInfo
Use the **/SHOWMAILBOXInfo** parameter to display mailbox history information in backup databases.

/TSMNODe=*nodename*
Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange Server 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=*optfilename*
Use the *optfilename* variable to identify the Data Protection for Exchange Server options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange Server is installed is searched.

If the *optfilename* 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=*password*
Use the *password* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

If you specified `PASSWORDACCESS GENERATE` in the Data Protection for Exchange Server options file (`dsm.opt`), supplying the password here is not necessary 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 that Data Protection for Exchange Server 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 interface, you are prompted for a password.

The Tivoli Storage Manager password that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Examples: `query tsm` command

The **query tsm** command displays information about the Tivoli Storage Manager API and Tivoli Storage Manager server.

The following example includes output from the **tdpexcc query tsm** command:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2015. All rights reserved.

Tivoli Storage Manager Server Connection Information
---------------------------------------------------

Nodename ............................... MALTA_EXC
NetWork Host Name of Server ............ GIJOE
TSM API Version ........................ Version 7, Release 1, Level 2.0

Server Name ............................ GIJOE_SERVER1_230
Server Type ............................ Windows
Server Version ......................... Version 7, Release 1, Level 2.0
Compression Mode ....................... Client Determined
Domain Name ............................ FCM_PDEXC
Active Policy Set ...................... STANDARD
Default Management Class ............... STANDARD

Completed
```

For backups that are created from an Exchange Server Database Availability Group (DAG) member, both the DAG node name and the name of the server on which that backup was run are displayed with the **query tsm** command. The following example queries the Tivoli Storage Manager server for the backup objects that were backed up under the DAG node name DAG2 from DAG member server TIVVM483:

Command:

```
tdpexcc query tsm *
```

Output:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2015. All rights reserved.

Querying Tivoli Storage Manager server for a list of database backups, please wa
it...

Connecting to TSM Server as node 'TIVVM483_EXC'...
Connecting to Local DSM Agent 'TIVVM483'...
Using backup node 'DAG2'...

  DAG              : DAG2

  Database         : RATTEST_DAGDB

     Backup Date        Size     S Fmt  Type   Loc        Object Name
-------------------  ----------- - ---- ----   --- -------------------------
03/27/2014 16:11:14     149.07MB A VSS  full   Srv 20140327161114

                         13.01MB                   Logs
                        136.06MB                   File
03/27/2014 18:02:01      14.00MB A VSS  incr   Srv 20140327180201
                         14.00MB                   Logs
```

The following example queries the Tivoli Storage Manager server in detail for the backup objects that were backed up under the DAG node name DAG2 from DAG member server TIVVM483:

Command:

```
tdpexcc query tsm * /detail
```

Output:

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2015. All rights reserved.

Querying Tivoli Storage Manager server for a list of database backups, please wa
it...

Connecting to TSM Server as node 'TIVVM483_EXC'...
Connecting to Local DSM Agent 'TIVVM483'...
Using backup node 'DAG2'...

Backup Object Information
-------------------------

Exchange Server Name ..................... TIVVM483
Database Availability Group .............. DAG2
Backup Database Name ..................... RATTEST_DAGDB
Backup Method ............................ VSS
Backup Location .......................... Srv
Backup Object Type ....................... full
Mounted as ...............................
Backup Object State ...................... Active
Backup Creation Date / Time .............. 03/27/2014 16:11:14
Backup Compressed ........................ No
Backup Encryption Type ................... None
Backup Client-deduplicated ............... No
Backup Supports Instant Restore .......... No
Backup Object Size / Name .................   149.07MB / 20140327161114 (From DBC
opy)
Backup Object Size / Name .................    13.01MB / Logs
Backup Object Size / Name .................   136.06MB / File
```

Restore command

To restore a backup from Tivoli Storage Manager storage to an Exchange server, use the **restore** command.

When you use the **restore** command, remember the following guidelines:

- 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 in Tivoli Storage Manager storage. You can issue a **tdpexcc query tsm *** command to obtain a list of the object names.

  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.
- To initiate recovery, you must use the **/recover** parameter when you restore the last backup object. In addition, the value of **/templogrestorepath** is not the same value as the current location. If the value is the same, the database can become corrupted.
  - Specify /recover=applyalllogs to replay the restored-transaction log entries and the current active-transaction log entries.

– Specify `/recover=applyrestoredlogs` to replay only the restored-transaction log entries. The current active-transaction log entries are not replayed.

  When you choose this option for a restore, your next backup must be a full or copy backup.

Failure to use the **/recover** parameter when you restore the last backup set leaves the databases unmountable.

- Specify `/mountdatabases=yes` if you are restoring the last backup set and you want the database mounted automatically after the recovery is completed.

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.

The GUI provides an easy-to-use, flexible interface to help you complete a restore operation. The interface presents information in a way that allows multiple selection and, in some cases, automatic operation.

Important:
If the Windows event log, Data Protection for Exchange Server log file, or a command error indicates that a restore operation failed, this failure might be caused by the `restore.env` file that remains behind. This file is created by the Microsoft restore interface and is used for debugging the restore failure. This file is named *Enn*`restore.env` where *Enn* is the base name of the restored transaction log files. After the restore error is resolved, remove any remaining `restore.env` files before you attempt the next restore operation. See the following Microsoft web page: Restore.env file documentation

Data Protection for Exchange Server supports the following types of restore:

Full Restore a full backup.

Copy Restore a copy backup.

Incremental
Restore an incremental backup.

Differential
Restore a differential backup.

Related tasks:

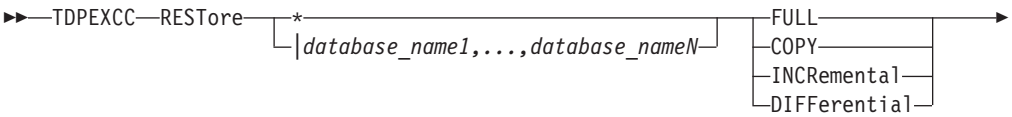
"Restoring an Exchange Server database" on page 105

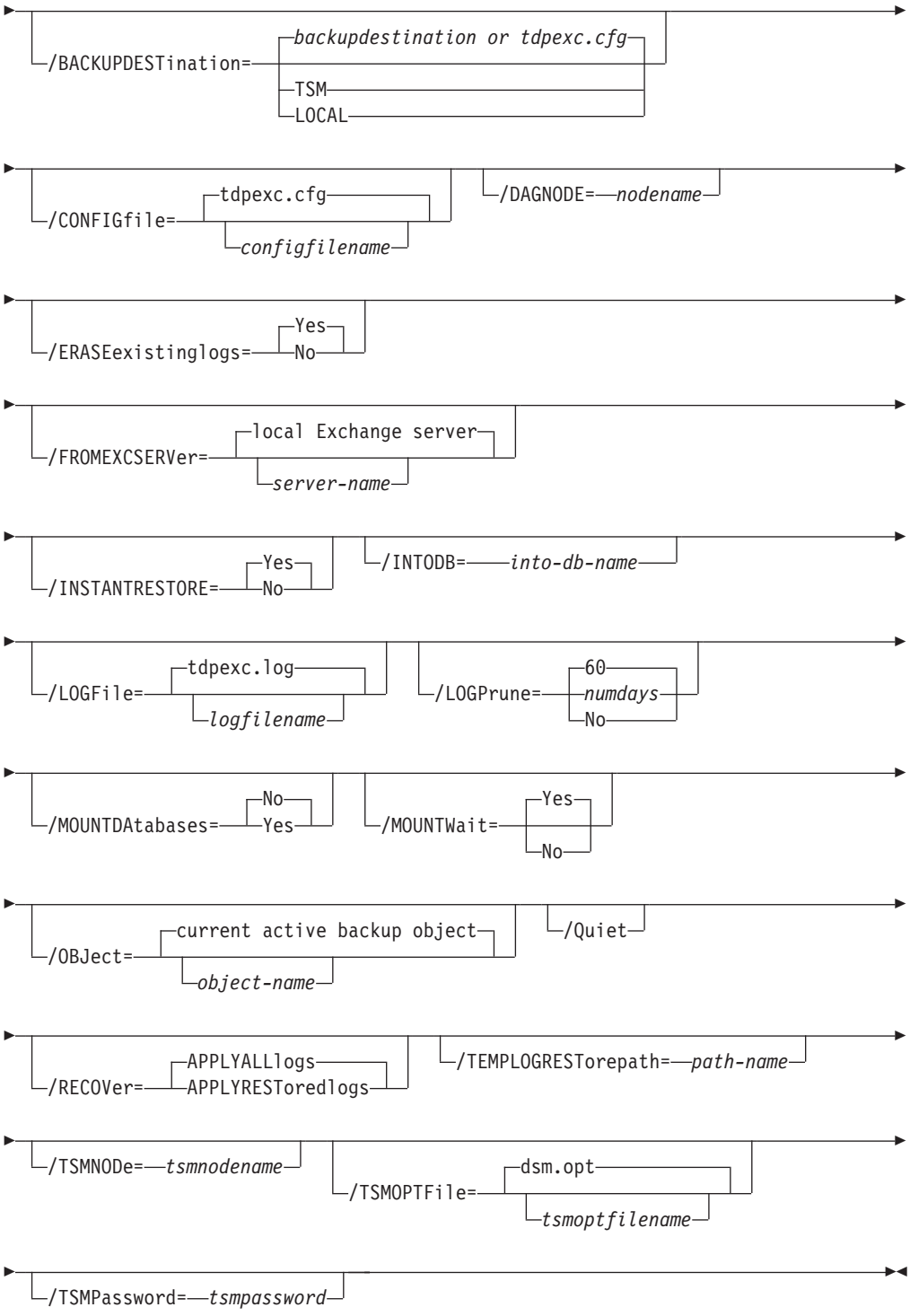
"Restoring a Database Availability Group database backup" on page 107

Restore syntax

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

TDPEXCC command




/BACKUPDESTination=
backupdestination or tdpexc.cfg
TSM
LOCAL
/CONFIGfile=
tdpexc.cfg
configfilename
/DAGNODE=
nodename
/ERASEexistinglogs=
Yes
No
/FROMEXCSERVer=
local Exchange server
server-name
/INSTANTRESTORE=
Yes
No
/INTODB=
into-db-name
/LOGFile=
tdpexc.log
logfilename
/LOGPrune=
60
numdays
No
/MOUNTDAtabases=
No
Yes
/MOUNTWait=
Yes
No
/OBJect=
current active backup object
object-name
/Quiet
/RECOVer=
APPLYALLlogs
APPLYRESToredlogs
/TEMPLOGRESTorepath=
path-name
/TSMNODe=
tsmnodename
/TSMOPTFile=
dsm.opt
tsmoptfilename
/TSMPassword=
tsmpassword

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 database names sequentially.

database_name
Restore 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 parameters specify the type of restore to perform:

FULL | COPY | INCRemental | DIFFerential

FULL Restore a Full type backup.

COPY Restore a Copy type backup.

INCRemental
Restore an Incremental type backup.

DIFFerential
Restore a Differential type backup

Restore optional parameters

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

/BACKUPDESTination=TSM | LOCAL
Use the **/BACKUPDESTination** parameter to specify the location from where the backup is to be restored. The default is the value (if present) specified in the Data Protection for Exchange Server preferences file (`tdpexc.cfg`). If no value is present, the backup is restored from Tivoli Storage Manager server storage.

You can specify:

TSM The backup is restored from Tivoli Storage Manager server storage. `TSM` is the default value.

LOCAL The backup is restored from the local shadow volumes.

/CONFIGfile=*configfilename*
Use the **/CONFIGfile** parameter to specify the name of the Data Protection for Exchange Server configuration file that contains the values for the Data Protection for Exchange Server configuration options.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange Server 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 are backed up from. This setting can prevent Data Protection for Exchange Server from making too many backups of the same database.

/ERASEexistinglogs=YES|NO

Use the **/ERASEexistinglogs** parameter to erase the existing transaction log files for the database that is being restored before you restore the specified databases. If you do not erase existing data, existing transaction logs can be reapplied when the Exchange databases are mounted. This parameter is valid only when you restore a VSS FULL or VSS COPY backup of Exchange Server databases.

/FROMEXCSERVer=*server-name*

Use the **/FROMEXCSERVer** parameter to specify the name of the Exchange Server where the original backup was done.

The default is the local Exchange Server. However, you must specify the name if the Exchange Server is not the default.

If a DAG node is specified by using the **/dagnode** parameter, Data Protection for Exchange Server uses this node name instead of the Data Protection for Exchange Server node to back up databases in an Exchange Server Database Availability Group. Therefore, the **restore** command automatically restores 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 on local shadow volumes. A SAN Volume Controller, Storwize V7000, or IBM System Storage DS8000 series storage subsystem is required to perform VSS instant restore operations.

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. YES 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 database files, log files, and the checkpoint file are the only data overwritten on the source volumes.

When you run VSS instant restore operations, you must make sure that any previous background copies (that involve the volumes that are being restored) are completed before initiating the VSS instant restore. The **/INSTANTREStore** parameter is ignored and VSS instant restore capabilities are automatically disabled when doing any type of VSS restore into operation.

When you run a VSS instant restore in a Database Availability Group (DAG) environment, do not choose the option that automatically mounts the databases after the recovery is completed. As described in the Database Availability Group considerations section, to run the VSS instant restore for

databases in a DAG environment, you must stop the Microsoft Exchange Replication service before doing the VSS instant restore or the restore fails. In this case, after the VSS instant restore is completed, start the Microsoft Exchange Replication service and then finally mount the database.

/INTODB=*into-db-name*

Use the **/INTODB** parameter to specify the name of the Exchange Server database into which the VSS backup is restored. The database name must be specified with the *into-db-name* variable. For example, if RDB is the name of the database into which the VSS backup is restored, the command-line entry would be 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 Maildb1 is the name of the relocated database that is being restored, the command-line entry would be as follows:

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

Considerations:

- There is no default value.
- To restore into a Recovery Database (RDB) or alternate database, an RDB or alternate database must exist before you attempt the restore operation.

/LOGFile=*logfilename*

Use the **/LOGFile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange Server.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange Server installation directory.

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

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

If you do not specify the **/LOGFile** parameter, log records are written to the default log file, tdpexc.log.

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

When you using multiple simultaneous instances of Data Protection for Exchange Server to perform 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 once per day. The *numdays* variable represents the number of days to save log entries. By default, *60* days of log entries are saved in the

pruning process. You can use the Data Protection for Exchange Server GUI or the **set** command to change the defaults so that log pruning is disabled, or so that more or less days of log entries are saved. If you use the command line, you can use the **/LOGPrune** parameter to override these defaults. When the value of the **/LOGPrune** variable *numdays* is a number in the range *0* to *9999*, the log is pruned even if log pruning is already done for the day.

Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in prunning the log unintentionally. If the value of the **TIMEformat** or **DATEformat** parameter is changed, before you issue a Data Protection for Exchange Server 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 is completed. Specify one of the following values:

Yes Mount the databases after the restore operation is completed.

No Do not mount the databases after the restore operation is completed. `No` is the default.

/MOUNTWait=Yes|No

Use the **/MOUNTWait** parameter to specify whether Data Protection for Exchange Server is to wait for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify:

Yes Wait for tape mounts. This 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 you want to restore. The object name uniquely identifies each backup object and is created by Data Protection for Exchange Server.

Use the Data Protection for Exchange Server **query tsm** command to view the names of the 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. The level of information that is written to the activity log is not affected.

/RECOVER=APPLYRESToredlogs|APPLYALLlogs

Use this parameter to specify whether or not you want to run recovery after you restore an object. This parameter is specified on the last backup object restored. To initiate recovery, use the **/RECOVER** parameter when you restore the last backup object. In addition, the value of **/TEMPLOGRESTorepath** is not to be the same value as the current location. If the value is the same, the database can become corrupted. Failure to use

the **/RECOVER** parameter when you restore the last backup set leaves the databases unmountable. If this situation occurs, you can either restore the last backup again and specify the **/RECOVER**=*value* option or you can use the Microsoft **ESEUTIL /cc** command to run recovery manually.

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 are displayed 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.

Considerations:

- When you restore multiple backup objects, the **/RECOVER** option is to be used on the restore of the last object.

  If you specify **/RECOVER**=`APPLYRESToredlogs` when doing a restore, the next backup must be a full backup.

/TEMPLOGRESTorepath=*path-name*
Use the **/TEMPLOGRESTorepath** parameter to specify the default temporary path to use when you are restoring logs and patch files. For best performance, this logger 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 Data Protection for Exchange Server configuration file. The default Data Protection for Exchange Server configuration file is `tdpexc.cfg`.

If you do not specify the **/TEMPLOGRESTorepath** parameter, and the **/TEMPLOGRESTorepath** value does not exist in the Data Protection for Exchange Server configuration file, the `TEMP` environment variable value is used.

When you run 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** is not to be the same value as the current location. If the value is the same, the database can become corrupted.

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

/TSMNODe=*tsmnodename*
Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

You can store the node name in the Tivoli Storage Manager options file (`dsm.opt`). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to `PROMPT`. This parameter is not valid when **PASSWORDACCESS** is set to `GENERATE` in the options file.

/TSMOPTFile=*tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Data Protection for Exchange Server options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange Server is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

/TSMPassword=*tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

If you specified **PASSWORDACCESS** `GENERATE` in the Data Protection for Exchange Server options file (`dsm.opt`), supplying the password here is not necessary because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange Server 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 Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server can be up to *63* characters in length.

Restorefiles command

To restore the flat files from a specified Data Protection for Exchange Server backup into a specified directory, use the **restorefiles** command.

When working with the **restorefiles** command, follow these guidelines:

- This command does not require an Exchange Server to be installed on, or accessible from the system where the **restorefiles** command is run.
- Files can be restored to an alternative system or to an alternative directory on the same system as the Exchange Server.
- 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** command.
- This command is only available on the command-line interface. It is not available in the Data Protection for Exchange Server graphical user interface.

- The **restorefiles** command 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** commands to the same directory:

  For a full backup, enter the following command:

  ```
  tdpexcc restorefiles DB1 FULL /into=d:\temprestore
  ```

  For an incremental restore with backed up log files, enter the following command:

  ```
  tdpexcc restorefiles DB1 INCR /into=d:\temprestore
  ```

- When you use the **restorefiles** command to restore local VSS backups, the command must be issued from the system on which the snapshot was created.

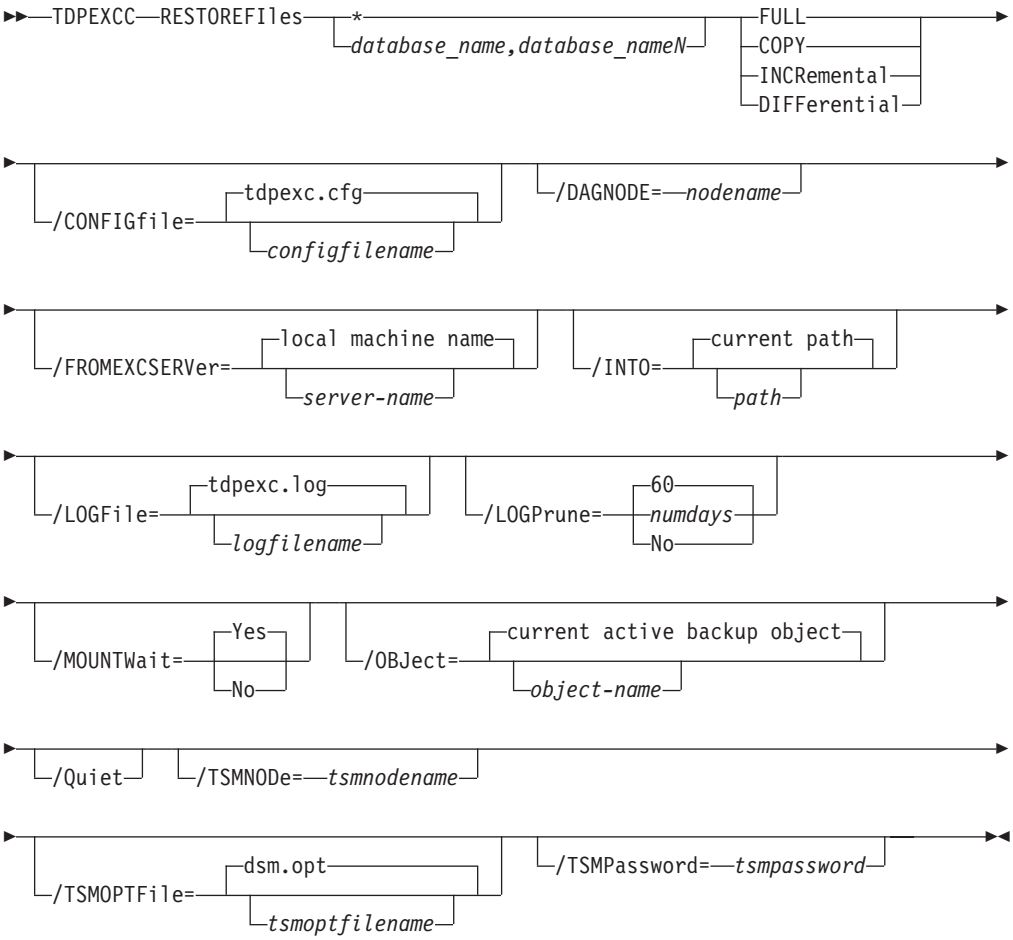
Related concepts:

"Mailbox restore operations" on page 12

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:

***** | *database_name1,...,database_nameN*

***** 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

FULL Restore the files from a Full type backup for VSS.

COPY Restore the files from a Copy type backup for VSS.

INCRemental
Restore the files from an Incremental type backup for VSS.

DIFFerential
Restore the files from a Differential type backup for VSS.

Restorefiles optional parameters

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

/BACKUPDESTINATION
VSS backups can have a backup destination of `TSM` or `LOCAL`.

/CONFIGfile=*configfilename*
Use the **/configfile** parameter to specify the name of the Data Protection for Exchange Server configuration file that contains the values for the Data Protection for Exchange Server configuration options.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Exchange Server 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 are backed up from. This setting can prevent Data Protection for Exchange Server 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 done. The default is the local Exchange Server name.

If a DAG node is specified by using the **/dagnode** parameter, Data Protection for Exchange Server uses this node name instead of the Data Protection for Exchange Server node to back up databases in an Exchange Server Database Availability Group. Therefore, the **restore** command automatically restores the backups that were created by the other DAG members, without having to specify the **/fromexcserver** parameter.

/INTO=*pathname*

Use the **/into** parameter to specify the root directory where files must 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=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Exchange Server.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Data Protection for Exchange Server 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 Data Protection for Exchange Server to run operations, use the **/logfile** parameter to specify a different log file for each instance used. This parameter 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**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, a certain number of days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.

- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.
- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

/MOUNTWait=Yes | No

Use the **/mountwait** parameter to specify whether Data Protection for Exchange Server waits for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify:

Yes Wait for tape mounts. This 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 Data Protection for Exchange Server.

Use the Data Protection for Exchange Server **query tsm *** 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.

/TSMNODe=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

You can store the node name in the Tivoli Storage Manager options file (`dsm.opt`). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to `PROMPT`. This parameter is not valid when **PASSWORDACCESS** is set to `GENERATE` in the options file.

/TSMOPTFile=*tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Data Protection for Exchange Server options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Exchange Server is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is `dsm.opt`.

/TSMPassword=*tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server.

If you specified **PASSWORDACCESS** `GENERATE` in the Data Protection for Exchange Server options file (dsm.opt), supplying the password here is not necessary because the one that is stored in the registry is used. However, to store the password in the registry, you must specify the Tivoli Storage Manager password the first time Data Protection for Exchange Server 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 Data Protection for Exchange Server uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

Restoremailbox command

To restore mailbox-level data or mailbox-item-level data from Data Protection for Exchange Server backups, use the **restoremailbox** command.

The **restoremailbox** command applies to any Data Protection for Exchange Server VSS backups:

- VSS backups that are stored on Tivoli Storage Manager server
- VSS backups that are stored on local shadow volumes

When you use the **restoremailbox** command, follow these guidelines:

- Ensure that you have the required role-based access control (RBAC) permissions to complete individual mailbox restore operations.
- You can restore multiple mailboxes in a single mailbox restore operation.
- You can use the **restoremailbox** command to restore data to a mailbox on the Exchange Server or to an Exchange Server`.pst` file.

  When you restore to a Unicode `.pst` file, except for the **Folder Name** and **All Content** filters, the filters are ignored. 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.

  For non-Unicode `.pst` files, you can limit the range of the mailbox data to restore by using the **/mailboxfilter** parameter to specify filters that are based on the following mailbox message elements:

  – Sender name
  – Folder name
  – Message body
  – Subject line
  – Attachment name

- Range of the message delivery date and time

- In Exchange 2013, you can use the **restoremailbox** command to restore a public folder mailbox database, a public folder mailbox, or only a part of the mailbox, for example, a specific public folder.
  - To restore an Exchange 2013 public folder mailbox, you must have the `Public Folders` management role.
  - You can restore a public folder mailbox only to an existing public folder mailbox that is on the Exchange server.
  - You can restore a public folder only to an existing public folder. The public folder on the Exchange server must have the same folder path as the public folder to be restored. If the public folder is deleted from the public folder mailbox on the Exchange server, you must re-create the public folder with the same folder path as the public folder to be restored, before you start the restore operation.
  - As a best practice, restore public folder mailboxes separately from user mailboxes. Select only one public folder mailbox to restore at a time if you want to restore a specific public folder in the mailbox, or if you want to restore to a different public folder mailbox than the original mailbox.

    If you restore multiple mailboxes in a single restore operation, and at least one of the mailboxes is a public folder mailbox, the mailboxes are restored only to their original mailbox locations. You cannot specify a filter or an alternate mailbox destination.
  - You can restore to a different public folder mailbox than the original mailbox if, for example, the public folder was relocated since the time of the backup. Before you complete the public folder restore operation, ensure that the public folder exists with the same folder path in the alternate mailbox location.
- In Exchange Server 2010 or later, you can use the **restoremailbox** command to restore an archive mailbox or only a part of the mailbox, for example, a specific folder. You can restore archive mailbox messages to an existing mailbox on the Exchange server, to an archive mailbox, or to an Exchange Server `.pst` file.
- You can use the **restoremailbox** command with the following parameter and options:
  - Set the **/KEEPRDB** parameter option to `Yes` to retain a recovery database after one or more mailboxes are restored. Set the parameter value to `No` to automatically remove the recovery database after mailbox restore processing.

    Regardless of the option that you set, Data Protection for Exchange Server retains the recovery database if the mailbox restore operation fails after the recovery database is successfully restored.

    If you restore multiple mailboxes, and you want to retain the recovery database after the restore operation is complete, ensure that all mailboxes are in the same recovery database.
  - Set the **/USEEXISTINGRDB** parameter option to `Yes` to restore a mailbox from an existing recovery database. Set the parameter value to `No` to automatically remove the existing recovery database during mailbox restore processing.
  - Set the **/mailboxoriglocation** parameter to specify the server and the database where the mailbox is at the time of backup. You set this option when the mailbox history is disabled and when the mailbox that you are restoring is either moved or deleted since the time of the backup.
  - If a mailbox is deleted or re-created since the time of the backup, you must use a temporary mailbox with enough capacity to contain all of the mailbox items that you are restoring. The mailbox of the user who is logged in is used as temporary mailbox by default.

You can set the **/tempmailboxalias** optional parameter by selecting **Properties** from the Actions pane. In the **Data Protection Properties** window, 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.

- You can use the **restoremailbox** command on the primary Exchange Server or on an alternate Exchange Server that is in the same domain.

Related tasks:

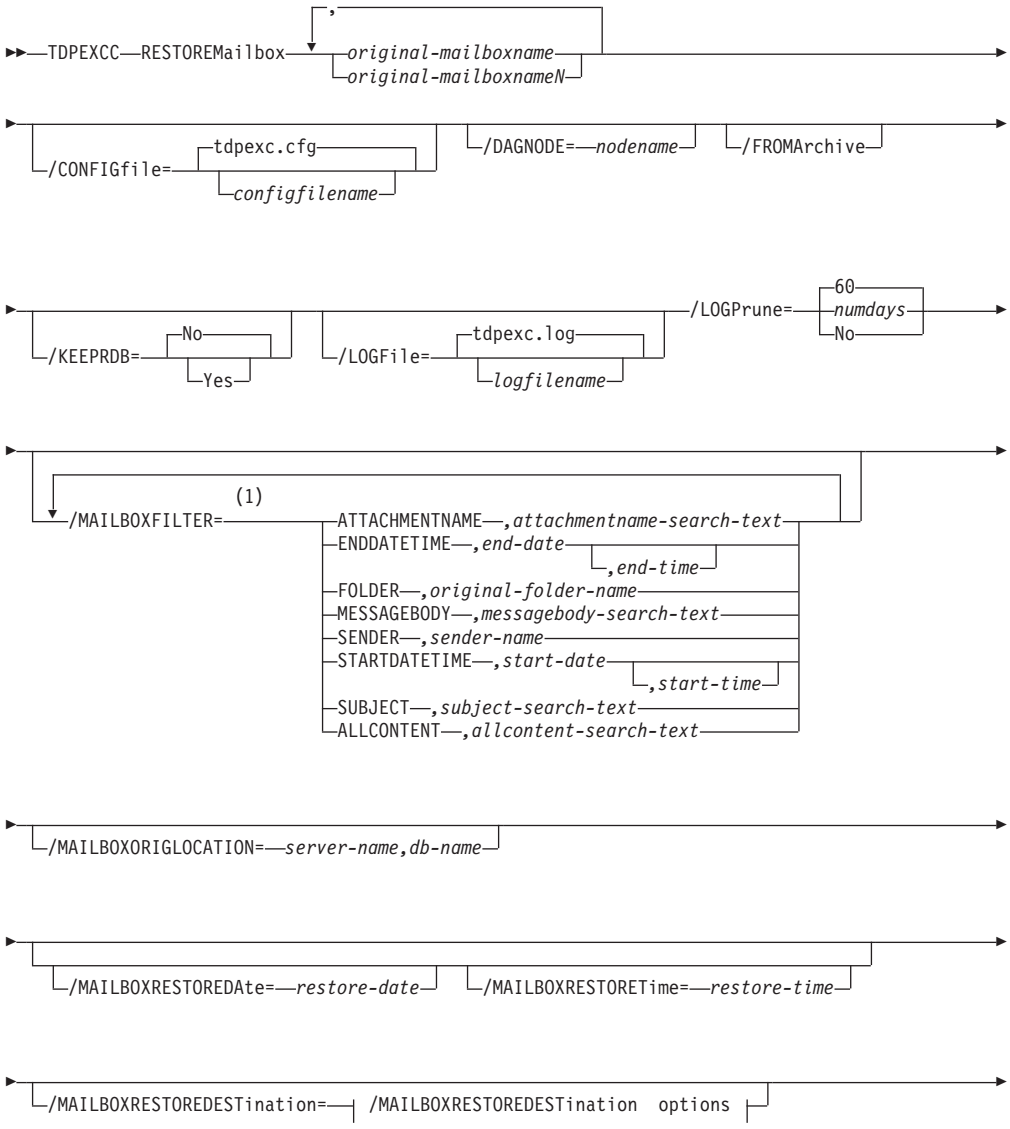
"Restoring mailboxes directly from Exchange database files" on page 117

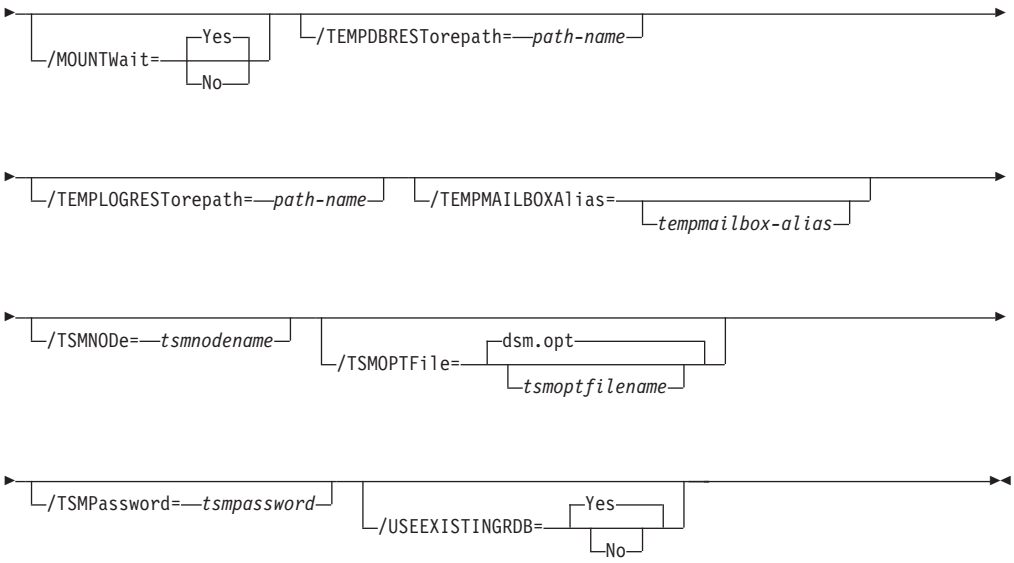
"Restoring mailbox data" on page 108

Restoremailbox syntax

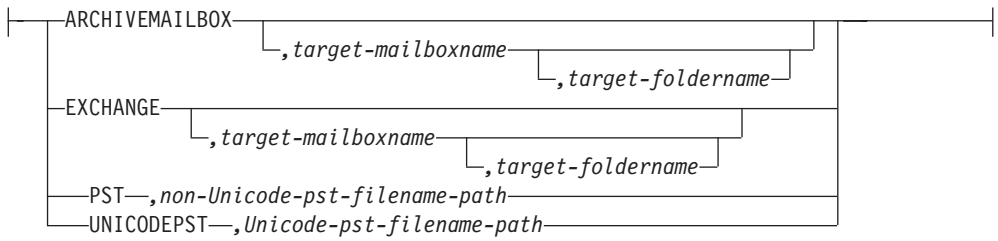
Use the **restoremailbox** command syntax diagram as a reference to view available options and truncation requirements.

TDPEXCC command





/MAILBOXRESTOREDESTination options:



Notes:

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

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, the mailbox-display name, or the mailbox globally unique identifier (GUID). The *original-mailboxname* parameter is required.

To specify more than one name, separate them by commas.

If any mailbox name contains commas or blank spaces, enclose the entire mailbox name in double quotation marks.

Restoremailbox optional parameters

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

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name of the Data Protection for Microsoft Exchange Server configuration file that contains the values for the Data Protection for Microsoft Exchange Server configuration options.

The *configfilename* variable can include a fully qualified path. If the *configfilename* variable does not include a path, the Data Protection for Microsoft Exchange Server 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 are backed up from. This setting can prevent Data Protection for Exchange Server from making too many backups of the same database.

/FROMArchive

Use the **/FROMArchive** parameter only if you are restoring an archive mailbox and you specify the mailbox alias of the primary mailbox. If you specify the primary mailbox alias and you do not specify this parameter option, by default, the primary mailbox is restored.

To restore an archive mailbox to another archive mailbox, specify both the `/FROMArchive` and the `/MAILBOXRESTOREDESTination=ARCHIVEMAILBOX,`*`target-mailboxname`* parameters. For example:

```
tdpexcc restoremailbox "OriginalArchiveMailboxName" /FROMArchive
/MAILBOXRESTOREDESTination=ARCHIVEMAILBOX,"TargetArchiveMailboxName"
```

/KEEPRDB=No|Yes

Use the **/KEEPRDB** parameter to specify whether Data Protection for Microsoft Exchange Server retains a recovery database for reuse in mailbox restore operations, or automatically removes the recovery database after mailbox restore operations.

You can specify the following values:

No Do not retain a recovery database for mailbox restore operations. Remove the recovery database after mailbox restore processing. This option is the default.

Yes Retain the recovery database for mailbox restore operations.

/LOGFile=*logfilename*

Use the **/logfile** parameter to specify the name of the activity log file that is generated by Data Protection for Microsoft Exchange Server.

The *logfilename* variable identifies the name of the activity log file.

If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully qualified path. However, if no path is specified, the log file is written to the Data Protection for Microsoft Exchange Server installation directory.

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

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

If you do not specify the **/logfile** parameter, log records are written to the default log file, `tdpexc.log`.

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

When you use multiple simultaneous instances of Data Protection for Microsoft Exchange Server to process operations, use the **/logfile** parameter to specify a different log file for each instance that is used. This parameter directs logging for each instance to a different log file and prevents interspersed log file records.

Note: Failure to specify a different log file for each instance can result in unreadable log files.

/LOGPrune=*numdays*|**No**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, some days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.
- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.
- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

/MAILBOXFILTER=ATTACHMENTNAME | ENDDATETIME | FOLDER | MESSAGEBODY | SENDER | STARTDATETIME | SUBJECT | ALLCONTENT

Use the **/MAILBOXFILTER** parameter to specify filters to restrict the mailbox data that is restored. When you are restoring to a Unicode `.pst` file, you can apply only the `FOLDER` and `ALLCONTENT` filters. You can apply only the `FOLDER` filter when you are restoring a public folder to an online public folder, or when you are restoring an archive mailbox folder.

You can specify multiple filters; however, you must specify each filter 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.

Note: 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 Data Protection for Exchange options file.

The *end-time* variable is optional. Use the same time format for the *end-time* variable that you selected with the `TIMEFORMAT` option in the Data Protection for Exchange options file.
The ENDDATETIME filter date and time must be later than the STARTDATETIME filter date and time. If no time is specified, all messages that are sent or received on that date are 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.

If you use this parameter to filter a public folder to restore, ensure that you are restoring the folder to an existing public folder that has the same folder path as the public folder to be restored. If the original public folder is deleted after the time of the backup, re-create the public folder. Specify the full path to the folder. If the full directory path includes spaces, enclose the directory path in double quotation marks, and do not append a backslash character (\) at the end of the directory path.

For example, to restore a folder that is named *"SubFolder"* under *"ParentFolder"*, specify *"ParentFolder/SubFolder"* as the folder path. To restore all folders in a parent folder, use *ParentFolder*/*.

If you use this parameter to restore a specific folder in an archive mailbox, ensure that you specify the full directory path to the folder.

To restore an archive mailbox to another archive mailbox, specify both the /MAILBOXFILTER=folder,*original-folder-name* parameter and the /MAILBOXRESTOREDESTination=ARCHIVEMAILBOX,*target-mailboxname* parameter. For example:

```
tdpexcc restoremailbox "OriginalArchiveMailboxName"
/MailboxFilter=folder,"/folderA" /MAILBOXRESTOREDESTination=
ARCHIVEMAILBOX,"TargetArchiveMailboxName"
```

To restore the folder of a mailbox to a Unicode .pst file, you must specify the /MAILBOXFILTER=FOLDER parameter with the /MAILBOXRESTOREDESTination=UNICODEPST parameter. Specify the full directory path to the folder. For example, to restore a folder that is named *"SubFolder"* under *"ParentFolder"*, specify *"ParentFolder/SubFolder"* as the folder path. To restore all folders in a parent folder, use *ParentFolder*/*.

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 Data Protection for Exchange options file.

The *start-time* variable is optional. Use the same time format for the *start-time* variable that you selected with the TIMEFORMAT option in the Data Protection for Exchange options file."
The **STARTDATETIME** filter date and time must be earlier than the **ENDDATETIME** filter date and time. If no time is specified, all messages that are sent or received on that date are 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, message subject line, message body, or message attachment. The match is not case-sensitive. For example, an *allcontent-search-text* of Rob matches Rob, robert, PROBE, and prObe contained within the message sender, the subject line, or the message body.

Enclose the *allcontent-search-text* variable in double quotation marks.

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 after the time of the backup, and no

mailbox location history is available. This parameter is case-sensitive. Data Protection for Microsoft Exchange Server 6.1 (and later versions) maintains mailbox location history.

A **restoremailbox** operation from a backup that is processed by Data Protection for Microsoft Exchange Server 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 the 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 johngrimshawe /MAILBOXORIGLOCATION=serv1,mbdb1
/MAILBOXRESTOREDAte=03/06/2013
/MAILBOXRESTOREDESTination=PST,c:\team54\rcvr.pst
```

/MAILBOXRESTOREDAte=*restore-date*

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

The backup after the specified time is selected because, if an earlier backup is selected, Data Protection for Microsoft Exchange Server misses the emails that are sent between the time of the backup and the specified time. By selecting the first backup after the specified time, Data Protection for Microsoft Exchange Server ensures that all of the emails, up to the specified time, are restored. Specify the appropriate date in the *restore-date* variable; use the same format that you selected with the `DATEFORMAT` option in the Data Protection for Microsoft Exchange Server options file.

If *restore-date* or*restore-time* values are not specified, no date and time is established. By default the mailbox is restored from the most recent available backup.

If either *restore-date* or *restore-time* is specified, then the mailbox is restored from the earliest backup that is taken after the established restoration date and time. If no backup of the mailbox after the established date and time is found, by default the mailbox is restored from the most recent available backup.

- If you specify both *restore-date* and *restore-time*, this selection 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 selection 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 selection establishes the restoration date and time as the current date at the specified *restore-time*.
- Only default time and date formats are accepted. If you use a format other than the default format to specify the time and date, the date and time is ignored.

/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 completed after the date and time is established by the **/mailboxrestoredate** and the **/mailboxrestoretime** parameters.

The backup after the specified time is selected because, if an earlier backup is selected, Data Protection for Microsoft Exchange Server misses the emails that are sent between the time of the backup and the specified time. By selecting the first backup after the specified time, Data Protection for Microsoft Exchange Server ensures that all of the emails, up to the specified time, are restored. Specify the appropriate time in the *restore-time* variable; use the same format that you selected with the TIMEFORMAT option in the Data Protection for Microsoft Exchange Server options file.

If *restore-date* and *restore-time* values are not specified, no date and time is established. By default the mailbox is restored from the most recent available backup.

If either *restore-date* or *restore-time* is specified, the mailbox is restored from the earliest backup that completed 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 selection 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 selection 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 selection establishes the restoration date and time as the current date at the specified *restore-time*.

/MAILBOXRESTOREDESTination=ARCHIVEMAILBOX|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 system behavior 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 system behavior 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:

ARCHIVEMAILBOX,[*target-mailboxname***,***target-foldername***]**

Use the **/MAILBOXRESTOREDESTination** ARCHIVEMAILBOX and **/FROMARCHIVE** parameters to restore archive mailbox messages to its original archive mailbox or to an alternate archive mailbox.

Use /MAILBOXRESTOREDESTination=ARCHIVEMAILBOX,*target-mailboxname* to specify the archive mailbox destination that you want to restore to. You can also specify a target folder name in the archive mailbox.

To restore an archive mailbox into a specific folder of an archive mailbox, specify both the /FROMArchive parameter and the /MAILBOXRESTOREDESTination=ARCHIVEMAILBOX,*target-mailboxname*,*target-foldername* parameters. For example:

```
tdpexcc restoremailbox "OriginalFolderName" /FROMArchive
/MAILBOXRESTOREDESTination=ARCHIVEMAILBOX,"TargetFolderName"
"/folderA"
```

If you specify the /MAILBOXRESTOREDESTination=ARCHIVEMAILBOX parameter without specifying a target mailbox destination, the mailbox messages are restored to the original location in the original archive mailbox.

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 option restores the mailbox data into a subfolder (designated by each original mailbox-alias) of the specified target folder in the active mailbox. The folders from the corresponding original mailbox, which contain the restored mailbox messages, are in each subfolder. The specified folder in the target mailbox contains a subfolder that is designated by the original mailbox alias name. Subfolders that contain the restored mailbox messages are in each parent subfolder. These child 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.

To restore a specific public folder to an alternate public folder mailbox, specify both the /MAILBOXFILTER=folder,*original-folder-name* parameter and the /MAILBOXRESTOREDESTination=EXCHANGE,*target-publicfolder-mailboxname* parameter. For example:

```
tdpexcc restoremailbox "OriginalPublicFolderMailbox"
/MailboxFilter=folder,"/folderA" /MAILBOXRESTOREDESTination=
EXCHANGE,"TargetPublicFolderMailbox"
```

You can restore a public folder only to an existing public folder on the Exchange server. If the public folder is relocated to an alternate mailbox destination after the time of the backup, ensure that it exists in the alternate mailbox location with the same folder path as the folder to be

restored. The restore operation does not automatically re-create the public folder in the destination mailbox.

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. However, when you restore to a mailbox in a target public folder, do not specify a target folder name. A folder name is not required for public folder restore operations.

If the mailbox folder specified by the *target-foldername* variable does not exist in the target mailbox, a folder with the target folder name is created in the target mailbox except for public folder mailboxes.

The target folder contains one subfolder for each original-mailbox that is restored (designated by each original-mailbox alias). The folders from the corresponding original mailbox, which contain the restored mailbox messages, are in each subfolder. 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 specified the **/mailboxfilter** parameter, the subfolder within the folder that you specified contains only the folders with messages that match the filter criteria.

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

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

When 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). The folders from the corresponding original mailbox, which contain the restored mailbox messages, are in each subfolder.

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

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

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

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

PST,*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
  ```

  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 parent-level folder name is the mailbox-alias-name, followed by the rest of the mailbox folders.

- You can specify *non-Unicode-pst-filename-path* as a directory path to have Tivoli Storage FlashCopy Manager for Exchange Server 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 and do not append a backslash character (\) at the end of folder path. 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 Server tries to convert it to a UNC path for you, but it might 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\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 parent-level folder name is the mailbox-alias-name, followed by the rest of the mailbox folders.

- You can specify *Unicode-pst-filename-path* as a directory path to have Tivoli Storage FlashCopy Manager for Exchange Server 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=UNICODEPST,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
```

If the *Unicode-pst-filename-path* variable includes spaces, enclose the entire *Unicode-pst-filename-path* variable entry in double quotation marks and do not append a backslash character (\) at the end of folder path. For example:

```
TDPEXCC RESTOREMAILBOX "george clark"
  /mailboxrestoredestination=UNICODEPST,"c:\mb\dept54\access group"
```

/MOUNTWait=Yes | No

Use the **/mountwait** parameter to specify whether Data Protection for Microsoft Exchange Server waits for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

You can specify:

Yes Wait for tape mounts. This option is the default.

No Do not wait for tape mounts.

/TEMPDBRESTorepath=*path-name*

Use the **/tempdbrestorepath** parameter to specify the default temporary path to use when 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 Data Protection for Exchange configuration file. The default Data Protection for Microsoft Exchange Server configuration file is tdpexc.cfg. If the TEMPDBRESTOREPATH value does not exist in the Data Protection for Microsoft Exchange Server 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 Data Protection for Exchange configuration file. The default Data Protection for Microsoft Exchange Server configuration file is tdpexc.cfg. If you do not specify the **/templogrestorepath** parameter and the TEMPLOGRESTOREPATH value does not exist in the Data Protection for Microsoft Exchange Server 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.

/TSMNODe=*tsmnodename*

Use the *tsmnodename* variable to refer to the Tivoli Storage Manager node name that Data Protection for Microsoft Exchange Server uses to log on to the Tivoli Storage Manager server.

You can store the node name in the Tivoli Storage Manager options file (dsm.opt). This parameter overrides the value in the Tivoli Storage Manager options file if **PASSWORDACCESS** is set to PROMPT. This parameter is not valid when **PASSWORDACCESS** is set to GENERATE in the options file.

/TSMOPTFile=*tsmoptfilename*

Use the *tsmoptfilename* variable to identify the Data Protection for Microsoft Exchange Server options file.

The file name can include a fully qualified path name. If no path is specified, the directory where Data Protection for Microsoft Exchange Server is installed is searched.

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

```
/TSMOPTFile="c:\Program Files\file.opt"
```

The default is dsm.opt.

/TSMPassword=*tsmpassword*

Use the *tsmpassword* variable to refer to the Tivoli Storage Manager password that Data Protection for Microsoft Exchange Server uses to log on to the Tivoli Storage Manager.

If you specified **PASSWORDACCESS** GENERATE in the Data Protection for Microsoft Exchange Server options file (dsm.opt), supplying the password here is not necessary 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 that Data Protection for Microsoft Exchange Server 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 Data Protection for Microsoft Exchange Server uses to log on to the Tivoli Storage Manager server can be up to 63 characters in length.

/USEEXISTINGRDB=Yes|No
Use the **/USEEXISTINGRDB** parameter to specify whether Data Protection for Microsoft Exchange Server restores mailboxes from an existing recovery database, or automatically removes an existing recovery database during mailbox restore operations.

You can specify the following values:

Yes Use an existing recovery database for mailbox restore operations. This option is the default option.

No Do not use an existing recovery database for mailbox restore operations. Remove the recovery database during mailbox restore processing.

Examples: `restoremailbox` command

You can combine the use of the **/KEEPRDB** and **/USEEXISTINGRDB** parameter options with the **restormailbox** command.

Example: Use an existing recovery database for mailbox operations
Use an existing recovery database for restore mailbox operations so that you do not have to restore the recovery database again.

```
tdpexcc restoremailbox <MB> /USEEXISTINGRDB=Yes
```

Example: Retain a recovery database for mailbox operations
Retain a recovery database after a mailbox restore operation so that you can use the recovery database for other restore operations.

```
tdpexcc restoremailbox <MB> /KEEPRDB=YES
```

Example: Retain a recovery database for multiple mailbox restore operations, and then remove it
Because you restore multiple mailboxes at different times, you want to retain the recovery database after the first mailbox restore operation and use it for subsequent restore operations. When you restore the final mailbox, you remove the recovery database.

```
tdpexcc restoremailbox <MB_1> /KEEPRDB=YES
tdpexcc restoremailbox <MB_2> /USEEXISTINGRDB=YES
tdpexcc restoremailbox <MB_n> /KEEPRDB=NO
```

Example: Restore multiple mailboxes simultaneously
Simultaneously restore multiple mailboxes and ensure that the recovery database is automatically removed after each mailbox is restored.

```
tdpexcc restoremailbox <MB_1>,<MB_2> /KEEPRDB=NO
```

Example: Restore multiple mailboxes from an existing recovery database
Simultaneously restore multiple mailboxes from an existing recovery database.

Tip: Mailboxes that are not in the recovery database are bypassed during restore processing, and are indicated in the console output.
Restore the remaining mailboxes that are not in the recovery database.

```
tdpexcc restoremailbox <MB_1>,<MB_2>...<MB_n>
 /USEEXISTINGRDB=YES  /KEEPRDB=NO
tdpexcc restoremailbox <MB_1>,<MB_2>...<MB_n>
 /USEEXISTINGRDB=NO  /KEEPRDB=NO
```

Set command

To set the Data Protection for Exchange Server configuration parameters in a configuration file, use the **set** command.

The values that you set are saved in a Data Protection for Exchange Server configuration file. The default file is `tdpexc.cfg`. Configuration values can also be set in the Data Protection Properties window in Microsoft Management Console (MMC).

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 Data Protection for Exchange Server configuration file. When you use this command, if you do not override a value for the configuration file parameter, the values in the default configuration file are used.

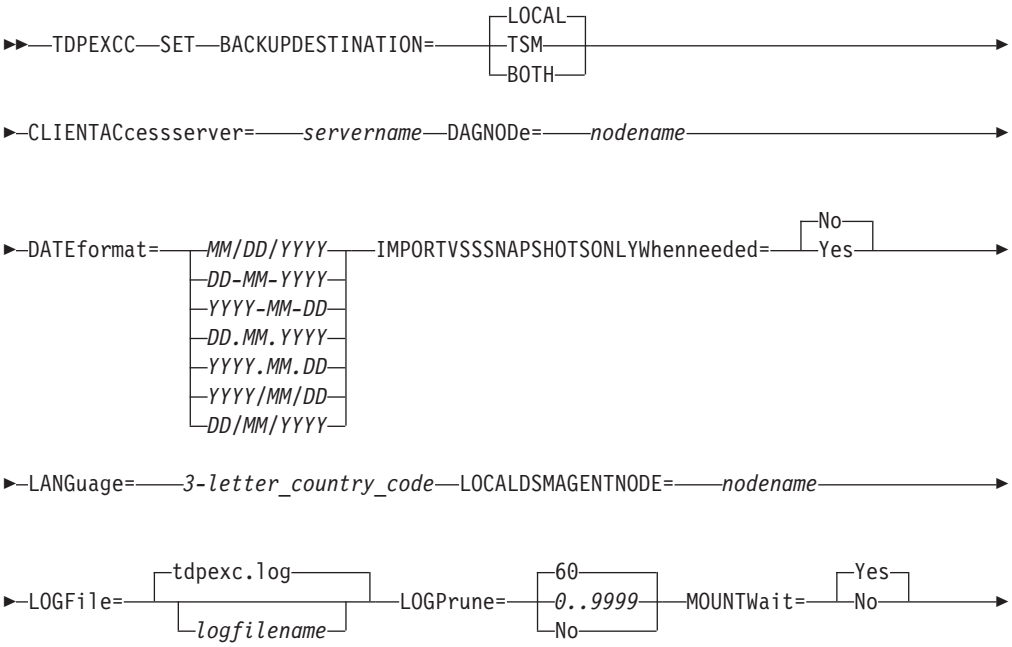
Related tasks:

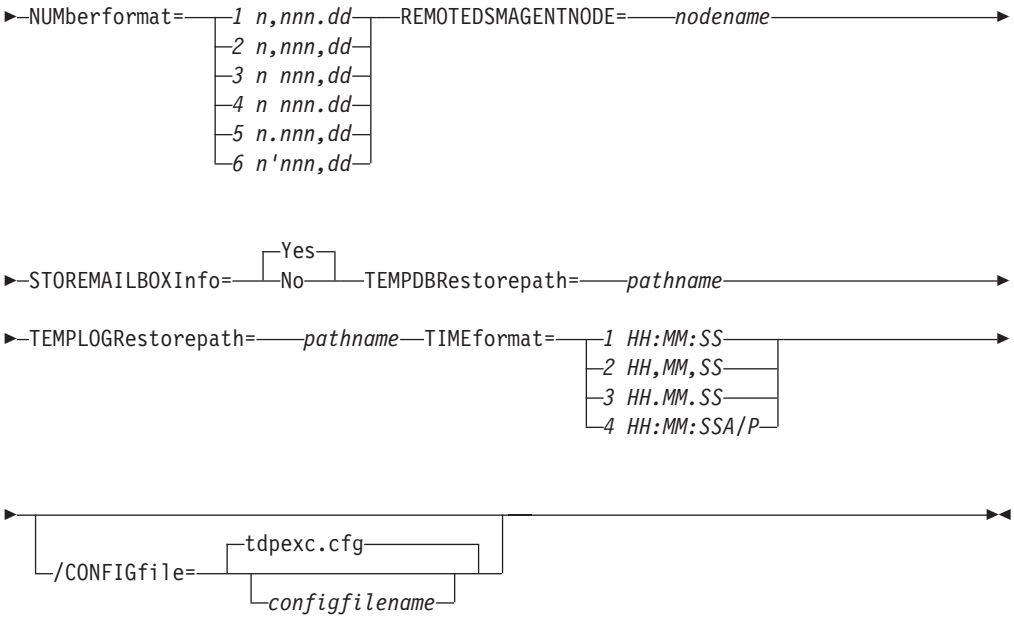
"Specifying Data Protection for Exchange Server preferences" on page 46

Set syntax

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

TDPEXCC command: SET





Related tasks:

"Configuring your system for mailbox restore operations" on page 74

Set positional parameters

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

The following positional parameters specify the values in the Data Protection for Exchange Server configuration file. You can set one value for each **tdpexcc set** command that you run:

BACKUPDESTination=TSM|LOCAL|BOTH

Use the **BACKUPDESTINATION** positional parameter to specify the storage location for your backup. You can specify these options:

TSM The backup is stored on Tivoli Storage Manager server storage only. This option is the default.

LOCAL
The backup is stored only on local shadow volumes.

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.

/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 are backed up from. This setting can prevent Data Protection for Exchange Server from making too many backups of the same database.

DATEformat=*dateformatnum*

Use the **DATEformat** positional parameter to select the format that 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 that 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 Server log file (`tdpexc.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 Data Protection for Exchange Server.
- 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 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 that you want to use to display messages:

CHS Simplified Chinese

CHT Traditional Chinese

DEU Standard German

ENU (Default) American English

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 processed.

LOGFile=*logfilename*

Use the **LOGFile** positional parameter to specify the name of the activity log file that is generated by Data Protection for Exchange Server. The Data Protection for Exchange Server activity log records significant events, such as completed commands and error messages.

The *logfilename* variable identifies the name of the activity log file. If the specified log file does not exist, a new log file is created. If the specified log file exists, new log entries are appended to the file. The *logfilename* variable can include a fully qualified path. However, if no path is specified, the log file is assigned to the Data Protection for Exchange Server installation directory.

/LOGPrune=*numdays*|**No**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, a certain number of days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.
- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.
- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

MOUNTWait=Yes|**No**

Use the **MOUNTWait** positional parameter to specify whether Data Protection for Exchange Server wait for removable media to mount (such as tapes or CDs) or to stop the current operation. This situation occurs when the Tivoli Storage Manager server is configured to store backup data on removable media and waits for a required storage volume to be mounted.

Specify `Yes` for Data Protection for Exchange Server to wait until all initial volumes of any required removable media are made available to the Tivoli Storage Manager server before the command completes.

Specify `No` for Data Protection for Exchange Server to end the command (if removable media are required). An error message displays.

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 (Default) n,nnn.dd

2 n,nnn,dd

3 n nnn,dd

4 n nnn.dd

5 n.nnn,dd

6 n'nnn,dd

REMOTEDSMAgentnode=*nodename*

Specify the node name of the system that moves the VSS data to Tivoli Storage Manager server storage during offloaded backups.

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 Server 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*

To specify the default temporary path to use with mailbox database files, use the **TEMPDBRESTorepath** positional parameter.

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

If the path name includes spaces, you must enclose the entire **TEMPDBRESTorepath** positional parameter entry in double quotation marks. For example:

```
TDPEXCC SET TEMPDBRESTorepath="h:\Exchange Restore Directory"
```

Attention: Do not specify a value of **TEMPDBRESTorepath** that is the same value as the location of the active database. If the value is the same, the database might become corrupted.

Choose a temporary database-restore location that has enough space to hold the entire restore for the database.

Tip: For better performance, the current active-transaction logger should be on a different physical device from the paths that are specified by the values of the **templogrestorepath** parameter setting and the

tempdbrestorepath parameter setting. The paths that are specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting can be on the same or separate physical devices from each other.

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

TEMPLOGRESTorepath=*pathname*
To specify the default temporary path to use when you are restoring logs and patch files, use the **TEMPLOGRESTorepath** positional parameter.

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:

```
TEMPLOGRESTorepath="c:\Program Files\templog"
```

Attention: Do not specify a value of **TEMPDBRESTorepath** 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.

Tip: 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 setting and the **tempdbrestorepath** parameter setting. The paths that are specified by the values of the **templogrestorepath** parameter setting and the **tempdbrestorepath** parameter setting can be on the same or separate physical devices from each other.

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

TIMEformat=*formatnumber*
Use the **TIMEformat** positional parameter to specify the format in which you want system time 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

Related tasks:

"Activating language packs" on page 54

Set optional parameters

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

/CONFIGfile=*configfilename*

Use the **/configfile** parameter to specify the name of the Data Protection for Exchange Server 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 Server 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"
```

Examples: `set` command

The following examples provide a sample of the text, messages, and process status that displays when you use the **set** command.

The following command specifies the file `exchange.log`, in the `d:\tsm\tdpexchange` directory, as the Data Protection for Exchange Server log file instead of the default Data Protection for Exchange Server log file, `tdpexc.log`, in the directory where Data Protection for Exchange Server is installed. An example of the output is displayed.

Command

```
tdpexcc set logfile=d:\tsm\tdpexchange\exchange.log
```

Output

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2015. All rights reserved.

ACO5054I The preference has been set successfully.
```

The following example sets *FCMDAG2* as the DAG node name in the configuration file.

Command

```
tdpexcc set dagnode=FCMDAG2
```

Output

```
IBM Tivoli Storage Manager for Mail:
Data Protection for Microsoft Exchange Server
Version 7, Release 1, Level 2.0
(C) Copyright IBM Corporation 1998, 2015. All rights reserved.

ACN5054I The preference has been set successfully.
```

The following statement is added to the `tdpexc.cfg` configuration file:

```
DAGNODe  FCMDAG2
```

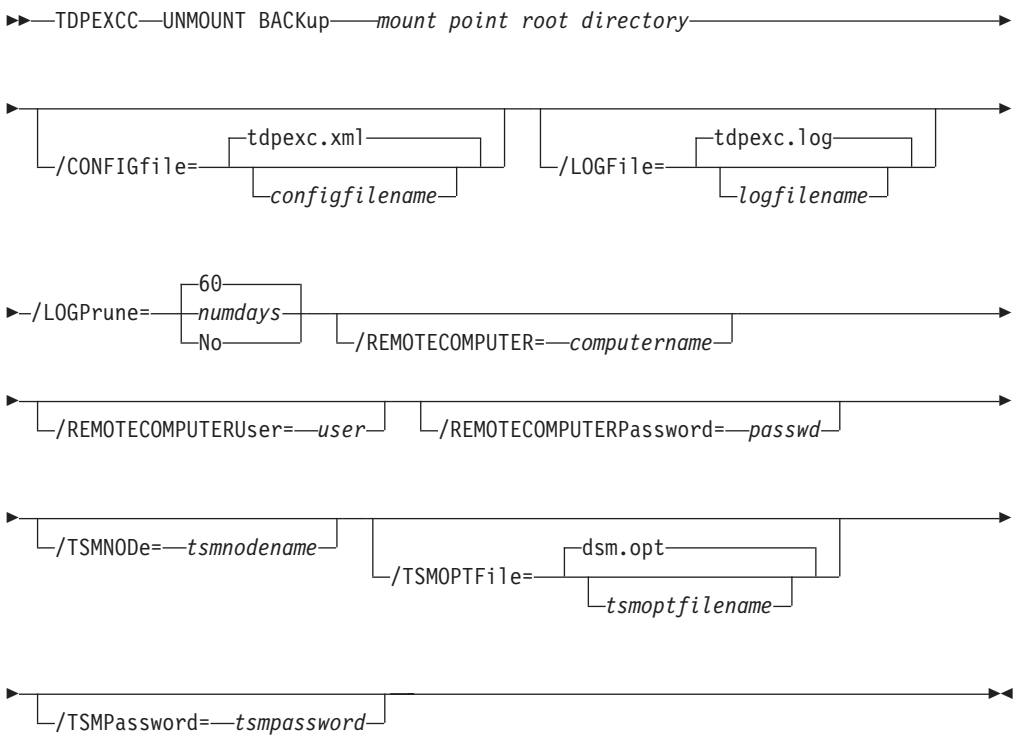
Unmount backup command

To unmount backups that are previously mounted and are managed by Tivoli Storage FlashCopy Manager for Exchange Server, use the **unmount backup** command.

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. For example:

```
mount points root dir
```

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=*logfilename*

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

If the *logfilename* 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**

When you prune log data, you can discard some of the generated logs according to detailed filtering criteria that you set. Depending on the option that you set for the **/LOGPrune** parameter, a certain number of days of data are saved. By default, *60* days of log entries are saved. The option `No` can be entered to disable log pruning.

Regardless of the option that you set for this parameter, you can explicitly request log pruning at any time.

Considerations:

- For *numdays*, the range is *0* to *9999*. A value of *0* deletes all entries in the activity log file except for the current command entries.
- If you specify `no`, the log file is not pruned.
- If you do not specify **/LOGPrune**, the default value is that specified by the **logprune** configurable option in the configuration file. The default value is *60*.
- If you specify **/LOGPrune**, its value is used instead of the value that is stored in the 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 value, *60*, is used.
- Changes to the value of the **TIMEformat** or **DATEformat** parameter can result in an unwanted pruning of the 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, complete one of the following to prevent unintentional 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.

/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.

Appendix. 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 Operations Center help system is enabled for accessibility. For more information, click the question mark icon on the help system menu bar.

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

A glossary is available with terms and definitions for the IBM Tivoli Storage Manager family of products.

See Tivoli Storage Manager glossary (http://www.ibm.com/support/knowledgecenter/SSGSG7_7.1.2/com.ibm.itsm.ic.doc/glossary.html).

To view glossaries for other IBM products, see http://www.ibm.com/software/globalization/terminology/.

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