Quest® NetVault® Backup Plug-in *for Exchange* 12.0

User's Guide

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NetVault Backup Plug-in *for Exchange*: at a glance

Quest® NetVault® Backup Plug-in *for Exchange* (Plug-in *for Exchange*) increases confidence in the recoverability of Exchange. It also lets you create flexible backup policies that can account for multiple recovery scenarios. Support for online backups through Exchange Server's Extensible Storage Engine (ESE) and Volume Shadow Copy Service (VSS) lets you select your preferred backup method without requiring you to learn Exchange internals. Through a web-based user interface (WebUI) and automated workflow process, the plug-in offers a centralized way to set up, configure, and define backup and restore policies for your Exchange Servers. These policies include policies deployed in a Database Availability Group (DAG), Local Continuous Replication (LCR), Single Copy Cluster (SCC), or Cluster Continuous Replication (CCR) environment. The plug-in offers a detailed level of control that minimizes downtime by allowing you to restore complete Information Stores, individual Storage Groups, or individual databases. Through integration with a range of backup devices, your data is protected and stored offsite to meet your disaster-recovery and business-continuity goals.

> **i** | **NOTE:** In Exchange 2007, database information and transaction logs are stored as components of the Exchange Server and are called Storage Groups. Exchange 2010 and later do not use Storage Groups and databases are not tied to a specific server. Throughout this document, Quest uses **Storage Group/Mailbox Database** to represent both Exchange Server configurations.

Key benefits

- **Increases confidence and reduces risk while deploying Exchange**: Plug-in *for Exchange* lets you create backup policies that are flexible enough to account for many recovery scenarios. You can choose the best backup method, whether it is ESE or VSS, without having to worry about understanding Exchange internals.

  Plug-in *for Exchange*'s flexible backup features also include:

  - Protection for Standalone, SCC, LCR, and CCR environments
  - Online ESE- or VSS-based backups
  - Full, Incremental, and Differential Backups while data is online and accessible

- Copy-Only Backups

- Protection down to the individual database

By relying on Plug-in *for Exchange* to implement backup policies, you can focus on more critical tasks without risking your ability to recover what is needed if a failure occurs. In addition, the IT manager's confidence is increased by knowing that email is protected, no matter what.

- **Speeds up restores to reduce downtime**: With Plug-in *for Exchange*, you select what must be restored and the backup set to restore from, and the plug-in automatically performs the restore. To maximize availability, the plug-in is designed for detailed recoveries, which lets you recover complete Information Stores, individual Storage Groups, or individual databases. The plug-in uses an automated workflow with point-and-click options for tasks such as defining backups and scheduling jobs.

  Additional Plug-in *for Exchange* restore features include:

  - Full, Incremental, and Differential Restores

  - Restores of complete Information Store, individual Storage Groups, or individual databases

  - Rename of Storage Groups/Mailbox Databases during restore

  - Restores to Recovery Storage Groups (RSGs) and Recovery Databases (RDBs)

  - Restores to alternate Exchange Server

- **Ensure business continuity**: With offsite backups being an important part of the data-protection for business-critical applications, the plug-in takes advantage of NetVault Backup's integration with a range of backup devices. NetVault Backup lets you select which backup device to store the backup on. You can store the backup online in a virtual tape library (VTL). You can also duplicate the job to physical tape libraries shared by multiple Exchange Servers, other proprietary databases, or even general backup purposes.

- **Eliminate backup windows and reduce storage**: Plug-in *for Exchange* gives you the confidence that your email environment is protected and stored offsite for disaster-recovery purposes. At the same time, it frees administrators from having to be available 24x7 because less-experienced personnel can initiate restores, thus reducing downtime and improving business continuity.

Feature summary

- Protection for Standalone, DAG, SCC, LCR, and CCR environments

- Online ESE- or VSS-based backups

- Full, Incremental, and Differential Backups while data is online and accessible

- Copy-Only Backups

- Protection down to the individual database

- Support for In-Place Archiving

- Full, Incremental, and Differential Restores

- Restores of complete Information Stores, individual Storage Groups, and individual databases

- Rename of Storage Groups/Mailbox Databases during restore

- Restores to RSGs and Recovery Databases (RDBs)

- Restores to alternate Exchange Server

- Rename of Database during restores

- Restore to non-Exchange Server

- Point-and-click WebUI

Target audience

This guide is intended for users who are responsible for the backup and recovery of Exchange Server. Familiarity with Exchange Server administration is assumed. Advanced knowledge of Exchange Server is useful for defining an efficient backup-and-recovery strategy.

Recommended additional reading

Quest recommends that you have the following documentation available for reference when setting up and using this plug-in.

- **Exchange Server 2016 Documentation:** https://technet.microsoft.com/en-us/library/mt170645(v=exchg.160).aspx

- **Exchange Server 2013 Documentation:** http://technet.microsoft.com/en-us/library/bb124558.aspx

- **Exchange Server 2010 Documentation:** http://technet.microsoft.com/en-us/library/bb124558(v=exchg.141).aspx

- **Exchange Server 2007 Documentation:** http://technet.microsoft.com/en-us/library/bb124558(EXCHG.80).aspx

The following documentation is also available:

- *Quest NetVault Backup Installation Guide*: This guide provides details on installing the NetVault Backup Server and Client software.

- *Quest NetVault Backup Administrator's Guide*: This guide explains how to use NetVault Backup and describes the functionality common to all plug-ins.

- *Quest NetVault Backup CLI Reference Guide*: This guide provides a description of the command-line utilities.

You can download these guides from https://support.quest.com/technical-documents.

Defining an Exchange data protection strategy

- Defining a strategy
- Examples of backup sequences
- Understanding snapshot-based backups

Defining a strategy

The purpose of creating Exchange Server backups is to recover an Exchange Server that is damaged from media failure or data corruption. Reliable use of backup and restore for recovery requires a strategy that maximizes data availability and minimizes data loss, while accounting for defined business requirements.

A backup-and-restore strategy is divided into two pieces: a backup piece and a restore piece.

- The backup piece defines the type and frequency of backups that are required to meet the goals for availability of the Exchange Server and for minimizing data loss.

- The restore piece defines who is responsible for performing restores and how restores should be performed to recover from the particular type of damage or failure.

Protecting Exchange Server databases

A database is the finest granularity of storage organization within the Exchange Server schema. Mailboxes are assigned to specific databases, which allows segregation of data by mailbox for security or scalability purposes. Occasionally, critical or high-volume mailboxes are segregated to a separate database to improve performance or to perform more frequent backups.

Databases are used to contain mailboxes, messages, folder stores, and various other data objects supported by the Exchange Server. While they can contain a large variety of data objects, databases are typically one of two types: mail stores and public folder stores. In Exchange Server terminology, a *store* is the same as a database.

Microsoft also differentiates editions of the Exchange Server product by increasing support for concurrent databases. The Enterprise Edition is defined as supporting more concurrent databases than the Standard Edition.

Protecting the Exchange Server transaction log

All changes made to the Exchange Server database are first committed to transaction log files. Any time a user modifies data stored in a mailbox or data is added to the mailbox, that change is written to a transaction log file before it is written to the Exchange Server database.

Reviewing the available backup methods

Plug-in *for Exchange* supports the following backup methods:

- **Extensible Storage Engine (ESE)**
- **Volume Shadow Copy Service (VSS)**

For Exchange 2007, the plug-in supports implementing an ESE or a pure VSS-backup strategy; that is, your backup strategy should include either ESE backups or VSS backups, not a combination of the two. For Exchange 2010 and later, VSS is the only option supported by Exchange.

Extensible Storage Engine (ESE) backup method

- **Supported Exchange Versions**: Exchange 2007
- **Supported Exchange Deployments**: Standalone, SCCs/Failover Clusters, LCR (Active Copy only), CCR (Active Copy only)

Microsoft supports performing online backups of Exchange Server databases by using the ESE for Exchange 2007 and earlier. ESE, which is provided by Microsoft as a standard Exchange Server component, provides the highest levels of compatibility with Exchange.

> **i** | **IMPORTANT:** Windows Server 2008 supports Exchange Server 2007 SP1 or later; previous versions of Exchange 2007 are not supported. In a standard Exchange Server 2007 SP1 installation, there is an ESE client library (**esebcli2.dll**) in the Exchange Server **Bin** folder. The file version of **esebcli2.dll** is **8.1.240.5** for Exchange Server 2007 SP1. However, if this library is not replicated from the Exchange Bin folder to the Windows Bin folder, an older version of the .dll file might be present in the Windows Bin folder. Plug-in *for Exchange* uses the ESE client library that is available in the Windows Bin folder. If the older version of the library is contained in the Windows Bin folder, a backup or restore job might fail. If a failure occurs, save a copy of the ESE client library from the Windows Bin folder to a safe location, copy the ESE client library from the Exchange Server Bin folder to the Windows Bin folder, and run the backup or restore job again.

Volume Shadow Copy Service (VSS) backup method

- **Supported Exchange Versions**: 2007, 2010, 2013, and 2016
- **Supported Exchange Deployments**: All

Microsoft supports the ability to create snapshots of Exchange data using VSS. Microsoft provides Exchange-specific VSS writers that coordinate with the Exchange Services, operating on behalf of the Plug-in *for Exchange*, to prepare the Storage Group/Mailbox Database files for backups and freeze the input/output (I/O) activity due to Exchange transactions before backing it up, and then to unfreeze and truncate logs after the backup is complete.

VSS is the recommended backup method for Exchange 2007 LCR and CCR environments. When using the VSS-backup method in a CCR environment, administrators can choose whether the active or passive node is backed up.

For Exchange 2010 and later, VSS is the only option supported by Exchange.

Using VSS, you can:

- Use snapshots to perform consistent backups to disk- or tape-based storage devices.
- Create and store snapshots as backups on NetVault Backup-supported disk arrays.

> **i** | **NOTE:** The **Backup Files to Storage** option is supported with any disk-based storage. To use the **Retain Snapshot as Persistent** and **Discard After** options, the data that you back up must reside on a NetVault Backup-supported disk array. Also, for persistent snapshots, only the metadata is copied to the target.

Comparing the ESE and VSS backup methods

When determining the backup method for your Exchange-backup strategy, consider the following differences:

> **i** | **NOTE:** ESE and VSS are not supported on all versions of Exchange. The version of Exchange that you are using dictates which backup methods are available.

- For Exchange 2007 and earlier, VSS-based backups are performed only at the Storage Group level; that is, individual databases cannot be backed up, while ESE-based backups allow you to back up individual databases.

- Restoring an individual database from a VSS-based backup is supported; however, the entire Storage Group must be offline.

- Multiple VSS-based backups can run simultaneously, and each backup job can simultaneously back up multiple Storage Groups, which can reduce backup windows. ESE also allows multiple backup jobs for different Storage Groups to run concurrently; however, each job backs up Mailbox Databases in a serial fashion.

- In LCR and CCR environments, VSS allow backups of either the active copy or the passive copy, while ESE-based backups are only allowed on the active copy. Backing up the passive copy lets you take advantage of the extra resources available at the second copy location. Backing up the passive copy also provides a longer backup window because it is not competing for the same resources against the actual client activity during normal work hours.

- VSS-based backups can be restored to alternate Exchange Servers in the same domain, while ESE-based backups can only be restored to alternate Exchange Servers in a different domain.

Managing transaction log files

When defining an Exchange Server backup strategy, transaction log file management is a primary consideration.

> **i** | **IMPORTANT:** Important: Because all changes made to the Exchange Server database are first committed to transaction log files, Quest strongly recommends that you perform periodic Full or Incremental Backups to prevent excessive accumulation of transaction log files. Failure to perform regular backups, which reduces the number of transaction log files, might eventually cause backup jobs to fail. Also, accumulating thousands of transaction log files negatively impacts the time required to process a backup job and generate the index. If your environment involves frequent changes to the Exchange Server, Quest also recommends increasing the frequency of backups to reduce the accumulation of transaction log files.

Transaction log file truncation

Transaction log file truncation is used to "clean" the Exchange Server Storage Group/Mailbox Database, thus improving performance, and reducing the disk space requirements and the time required to restore a database.

Quest recommends that backups that perform transaction log file truncation be performed regularly. Often, a weekly or semimonthly backup that performs transaction log file truncation is recommended. The optimum frequency might vary considerably, depending on the use and configuration of each Exchange Server.

If you use a **Backup Type** that supports transaction log file truncation, such as the Full and Incremental Backup types, the truncation of transaction log files is performed by the Exchange Server after the plug-in informs it that the backup completed successfully. Also, when the truncation occurs depends on Exchange Server and whether it still needs the logs for more purposes, such as replication; therefore, truncation might not occur immediately after a successful backup is completed.

In a DAG environment, transaction log file truncation is also determined by the replay lag time and truncation lag time properties of the database. The properties are configurable. Replay lag time defines, in minutes, the amount of time to delay log replay for a database copy. Truncation lag time defines, in minutes, the amount of time to delay log deletion for the database copy, after the log file has been replayed into the database copy.

For Exchange Server to truncate a transaction log file, the following criteria must be met:

- Either Circular Logging is enabled, or Circular Logging is disabled and the log file has been included in a successful Full or Incremental Backup.

- The transaction log file sequence is less than the sequence of the last transaction log file committed to the Exchange Server database. The last sequence committed is recorded in the database checkpoint file (.chk).

- In a replication environment, such as a DAG, all other copies of the database have confirmed reception of the transaction log file and replay of its contents to the database file.

In a DAG environment, each database copy keeps transaction log files until all the database copies have confirmed that the transaction log file has been replayed. If one or more passive copies of the database is suspended or offline, log truncation does not occur, resulting in transaction log file buildup and the consumption of disk space.

> **i** | **NOTE:** If your environment experiences transaction log file buildup and your disk space is diminished, check the online status of the passive database copies. If you must keep one or more database copies suspended or offline for a long period of time, such as for maintenance reasons, consider removing the affected passive database copy instead of suspending it or setting it offline. When maintenance is completed, the passive database copy can be added back.

Loose truncation

To reduce the effects of transaction log file buildup due to suspended or offline database copies, Exchange Server 2013 Service Pack 1 introduced **loose truncation**. With loose truncation, each database copy tracks its own available disk space and applies loose truncation when disk space gets significantly low. With loose truncation applied, each passive database copy independently truncates its own transaction log files. For the active database copy, truncation ignores the passive database copy that is farthest behind replaying logs.

Loose truncation is disabled by default. To enable loose truncation, you must edit the Windows registry on each Exchange Server DAG node. Before enabling loose truncation, make sure that it would benefit your data protection goals. For more information about enabling loose truncation, see your Exchange Server documentation.

Full vs. Transaction Logs-Only Backups

Full Backups back up all files for a database, regardless of the type of file. Transaction Logs-Only Backups back up only the transaction log files for a database.

Full Backups allow all database files to be backed up, providing standalone restore capabilities. Depending on the size of the database, Full Backups can be demanding in terms of storage requirements, and time required to complete the backup. For large databases, storage and time requirements might be a significant consideration.

Transaction Logs-Only Backups are lighter-weight backups that are intended to capture new activity since the last Full Backup was performed. This type of backup can radically reduce the backup time and storage requirements for large databases, but it also introduces dependencies on one or more prior backups to perform a complete restore.

> **i** | **IMPORTANT:** VSS-based backups for non-Continuous Replication environments truncate the transaction logs at the completion of Full or Transaction Logs-Only Backups. In LCR and CCR environments, log truncation is delayed by the **Microsoft Exchange Replication Service** until all necessary log files are replayed into the replica copy. Microsoft Exchange Replication Service deletes the backed-up log files both from the active and the passive copy log file paths after it verifies that the to-be-deleted log files have been successfully applied to the passive copy database and both the active and passive copy database check points have passed the log files in question.

Reviewing the backup types

The Plug-in *for Exchange* provides several essential backup types:

- **Full Backups**

- **Copy Backups**

- **Incremental Backups**
- **Differential Backups**

Backup types represent the complete set of options for backing up an Exchange Server with respect to the transaction log management rules.

Full Backups

A Full Backup is the most common type of backup performed. It performs a complete backup of a database or Storage Group/Mailbox Database. A Full Backup does not depend on any other backup and can be restored in a single step.

A Full Backup includes all database files and transaction log files. After a Full Backup is successfully written to a storage device, the Plug-in *for Exchange* informs the Exchange Server that the backup was successful. At that point, the Exchange Server can truncate the transaction log files if you have configured Exchange Server to do so. To keep the Exchange Server in good health and maintain its performance, perform regular Full Backups.

Copy Backups

Sometimes a backup must be taken for a special purpose and should not affect the overall backup and restore procedures for the Exchange Information Store. A Copy Backup is used to back up all database files without performing transaction log file truncation. This backup provides a snapshot of the files as they existed at the time of the backup. A Copy Backup should be used to perform a fast, nonintrusive complete backup of an Exchange Server and is common in scaling and migration scenarios.

Because a Copy Backup does not perform transaction log file truncation, the disk footprint of the Exchange Server does not change as a result of the backup. Therefore, a Copy Backup does not perform any housekeeping measures, and therefore does not maintain the performance of the Exchange Server. Copy Backups should not be considered as a part of a regular backup policy, but as a special-purpose type of backup.

Incremental Backups

Incremental Backups back up the transaction log files that capture the changes made to the database since the most recent Full or Incremental Backup. After the Plug-in *for Exchange* informs the Exchange Server that the backup was successful, the Exchange Server then truncates the transaction logs, which helps with maintenance of the Mailbox Databases. Incremental Backups are fast and correspondingly small.

As with a Transaction Logs-Only Backup, an Incremental Backup must always have a base backup, which is often a Full Backup. Performing an Incremental Backup without first performing a Full Backup might lead to backup failures and prevent you from being able to restore and recover your Exchange Server properly.

Do *not* perform an Incremental Backup in the following conditions:

- **When an Initial Full Backup has not been created**: The transaction log only contains changes made to the database after the last backup was created, which means that a base backup is required.

- **After an Incremental Backup containing multiple Storage Groups/Mailbox Databases fails**: In this case, a Full Backup must first be performed before an Incremental Backup can be performed. When an Incremental Backup that contains multiple Storage Groups/Mailbox Databases fails, some of the transaction logs are truncated and permanently lost. At that point, the transactions have already been deleted from the Exchange Server logs. Although the data still exists within the Exchange Server, errors would occur if you attempted to restore Incremental Backups that were created after a failed Incremental Backup job. This issue does not apply to a failed Incremental Backup that contains only a single Storage Group/Mailbox Database.

- **After the Transaction Log is manually truncated**: In this case, a Full or Differential Backup must be performed before an Incremental Backup. Microsoft strongly recommends against manually truncating transaction logs.

Differential Backups

Differential Backups back up the transaction log files that capture the changes made since the most recent Full or Incremental Backup. Differential Backups do not perform transaction log truncation, and therefore do not maintain the operating health of the Exchange Server.

Subsequent Differential Backups increase in size and in duration because each Differential Backup includes the transaction log files that were also included in the previous Differential Backup, and the transaction log files that have been generated since the previous Differential Backup. For example, if a Full Backup was taken on Sunday with Differential Backups scheduled for Monday through Saturday, Monday's Differential includes the transaction log files generated since the Full Backup on Sunday, while Tuesday's Differential includes the transaction log files generated on Monday and those files generated on Tuesday. Wednesday's Differential includes the transaction log files for Monday, Tuesday, and Wednesday, and so on.

As with a Transaction Logs-Only Backup, a Differential Backup must always have a base backup, which is often a Full Backup. Performing a Differential Backup without first performing a Full Backup might lead to backup failures and prevent you from being able to restore and recover your Exchange Server properly.

When used with Full Backups, Differential Backups provide acceptable trade-offs with good backup performance, good restore performance, and reasonable overall database maintenance through the Full Backup.

Incremental vs. Differential Backups

Because Exchange Server truncates transaction log files after they are backed up in Incremental Backups, subsequent Incremental Backups are quicker. They are quicker because only the transaction log files that have been created since the last Incremental Backup are backed up. However, restore sequences that use Incremental Backups require that every Incremental taken between the Full Backup and the point of failure must be restored in succession. This process can result in longer restores due to the increased human intervention required to initiate the multiple restore jobs.

Differential Backups do not truncate the transaction log files after they are backed up. Subsequent Differential Backups take increasing longer because all the transaction log files since the last Full Backup are included in the backup. Nevertheless, restore sequences that use Differential Backups require that only one Differential Backup be restored after the Full Backup is restored. This process results in quicker restores because less human intervention is required during the restore process.

An extra consideration when deciding between Incremental and Differential Backups is the desired frequency of transaction log file truncation. When implementing Incremental Backups, the transaction log files are truncated by the Exchange Server at the same frequency as the Incremental Backups. For example, if Incremental Backups are performed daily, the transaction log files are truncated daily. However, with Differential Backups, the transaction log files are truncated only when a Full Backup is performed. Therefore, if the Full Backup is only performed weekly, the transaction log files are only truncated weekly.

Implementing a Differential Backup strategy leads to faster restores but also requires more frequent Full Backups to maintain the operating health of the Exchange Server.

Examples of backup sequences

- **Full Backups only:** When requirements guarantee backup protection up to the previous day, performing Full Backups nightly should be sufficient under the following conditions:

    - Backup windows are large.

    - After-hours email volume is low.

    - Regular transaction log file truncation is required.

- **Full and Incremental Backups:** When requirements guarantee data protection up to the previous day, *backup time should be as fast as possible*, and regular transaction log file truncation is required, Full Backups coupled with Incremental Backups is the best combination.

For example, Full Backups are performed every Sunday night at 11:00 p.m. while Incremental Backups are performed Monday through Saturday at 11:00 p.m. Each Incremental Backup includes the transaction log files that were generated since the previous night's backup whether it be the Sunday evening Full Backup or one of the Incremental Backups from a weekday.

Restoring this type of backup sequence is more time-consuming. For example, if recovery is performed on Tuesday, only Sunday's Full Backup and Monday's Incremental Backup must be restored; whereas, if recovery is performed on Wednesday, Sunday's Full Backup followed by Monday's and Tuesday's Incremental Backups must be restored. Even though the backups are quicker, the restores can take longer due to the intervention that is required to run multiple restore jobs.

- **Full and Differential Backups:** When requirements guarantee data protection up to the previous day, *restore and backup time should be reasonably fast*, and only occasional transaction log file truncation is required, Full Backups coupled with Differential Backups is the best combination.

For example, Full Backups are performed every Sunday night at 11:00 p.m. while Differential Backups are performed Monday through Saturday at 11:00 p.m. Each Differential Backup includes the transaction log files that were generated since the last Full Backup. This process might require more backup time than an Incremental Backup. Regardless of the point to which recovery is necessary, the same number of restore jobs is required. For example, if recovery is performed on Tuesday, Sunday's Full Backup and Monday's Differential Backup must be restored; whereas, if recovery is performed on Thursday, Sunday's Full Backup followed by Wednesday's Differential Backup must be restored. Even though subsequent Differential Backups increase not only in size but in duration, restores are quicker because fewer restore jobs must be run.

Understanding snapshot-based backups

If you are using Exchange 2010 or later, the plug-in can use a hardware or software VSS provider to create persistent or non-persistent VSS-based snapshots. The plug-in uses a VSS provider to create snapshots on the client, and then copies the selected data from the snapshot, or snapshots, to a storage device.

If you are using a standalone Exchange Server deployment, you can use hardware-based, integrated VSS snapshots with the Dell Compellent storage array. (For DAG environments, only VSS backups that use the software-based Microsoft VSS provider are supported.)

To create and use persistent snapshots, the data that you want to back up must reside on NetVault Backup-supported disk arrays. If you attempt to create persistent snapshots with data residing on an unsupported disk array, or with data residing in local drives (for which snapshots are taken using the Microsoft Software VSS Provider), taking the required hardware snapshots fails, and the plug-in defaults to using software snapshots. When taking software snapshots the data is only backed up to storage (even if the option **Backup Files to Storage** is not selected), and non-persistent snapshots are created.

The same issue occurs if your backup includes data that resides in different storage that mixes NetVault Backup-supported disk arrays and unsupported disk arrays or local drives. For example, if your backup includes five Exchange Mailbox Databases, for which three of the Mailbox Databases reside in different volumes in a NetVault Backup-supported disk array, and the other two Mailbox Databases reside in two different local drives on the Exchange Server, and you select **Retain Snapshot as Persistent**, taking hardware snapshots fails because all the Mailbox Databases do not reside on NetVault Backup-supported disk arrays. After failing to take the required hardware snapshots, the plug-in attempts to take software snapshots; if successful, the data is saved to NetVault Backup-managed storage, even if the option **Backup Files to Storage** was not selected.

> **i** | **IMPORTANT:** For DAG deployments, hardware snapshots are not currently supported by the plug-in. If you are running a DAG environment, ensure that the software-based Microsoft VSS provider is in place on all Exchange Servers included in the DAG and ensure that the software-based provider has preference over any vendor's hardware-based VSS provider. Also be aware that NetVault Backup-managed persistent snapshots are not supported in DAG deployments.

For more information about NetVault Backup-supported OS versions and disk arrays, see the *Quest NetVault Backup Compatibility Guide*.

Planning your Exchange Server deployment

- Deployment overview
- Standalone deployment
- High-availability deployments

Deployment overview

Microsoft supports the deployment of Exchange Mailbox Server on either a single server or high-availability environment, including:

- **Database Availability Group (DAG)**
- **Local Continuous Replication (LCR)**
- **Single Copy Cluster (SCC) or Failover Cluster**
- **Cluster Continuous Replication (CCR)**

Deploying the Plug-in *for Exchange* in each of these environments is almost identical because the Plug-in *for Exchange* is installed on the server that hosts the Exchange Server Mailbox Databases. The following topics describe how the Plug-in *for Exchange* is deployed in each type of Exchange Mailbox Server deployment.

Standalone deployment

- **Supported Exchange Server Versions**: All
- **Supported Exchange Server Editions**: All
- **Supported Backup Methods**: ESE and VSS

In a standalone deployment, there is a single Exchange Mailbox Server. The Plug-in *for Exchange* is installed on the server that is designated the Mailbox Server and performs all backups and restores to and from this server. In this type of deployment, no high-availability solution, such as LCR, has been deployed.

While you can install the NetVault Backup Server on the Exchange Mailbox Server, Quest recommends that you use separate machines.

Figure 1. Standalone deployment

- ● NetVault Backup Server software
- ◆ Plug-in for Exchange
- ○ NetVault Backup Client software
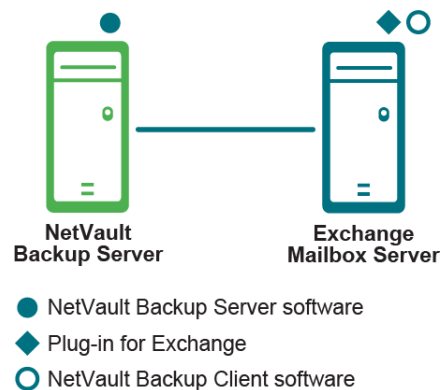
> **i** | **IMPORTANT:** Regardless of the environment, a separate NetVault Backup Server and Exchange Server vs. a single machine configured as both, the Plug-in *for Exchange must* be installed on the host where Exchange Server Mailbox Databases reside. Sample images and procedures throughout this guide assume that this ***two-machine environment*** is in place and that all configuration requirements have been met.

High-availability deployments

High-availability deployments include:

- Single-location Database Availability Group (DAG)
- Local Continuous Replication (LCR)
- Single Copy Cluster (SCC) or Failover Cluster
- Cluster Continuous Replication (CCR)

Single-location Database Availability Group (DAG)

- **Supported Exchange Server Versions**: Exchange 2010 and later
- **Supported Exchange Server Editions**: All
- **Supported Backup Methods**: VSS
- **Plug-in *for Exchange* License Required**: Plug-in *for Exchange* Standard Edition Cluster Support or Plug-in *for Exchange* Enterprise Edition Cluster Support

In an Exchange Single-Location DAG, multiple Exchange Mailbox Servers exist in a single Active Directory Site and are physically located in the same data center. A DAG is created across multiple Mailbox Servers with the Database Copies spread across the multiple Mailbox Servers. In a Single-Location DAG, you create a NetVault Backup Virtual Client where the Plug-in *for Exchange* is installed on each of the Exchange Mailbox Servers.

In the backup process for a DAG environment, the Plug-in *for Exchange* lets you select either all active copies of the databases or a database copy whenever possible. If you choose the latter and there are multiple copies, the copy with the lowest activation preference number is selected. If you choose the latter and a database copy is not available, the active database is selected. For more information about the activation preference number, see *Mailbox Database Copies* at http://technet.microsoft.com/en-us/library/dd979802.aspx.

i | **IMPORTANT:** To support a DAG that does *not* use a cluster name object (CNO) or IP address, create a NetVault Backup Virtual Client that uses a fixed IP address or network name that corresponds to one of the Real Clients in the DAG. If the machine to which the fixed IP address or network name corresponds goes offline for any reason, subsequent backup jobs fail. Either bring the machine back online or update the Virtual Client to use a different IP address or network name.

Figure 2. DAG deployment
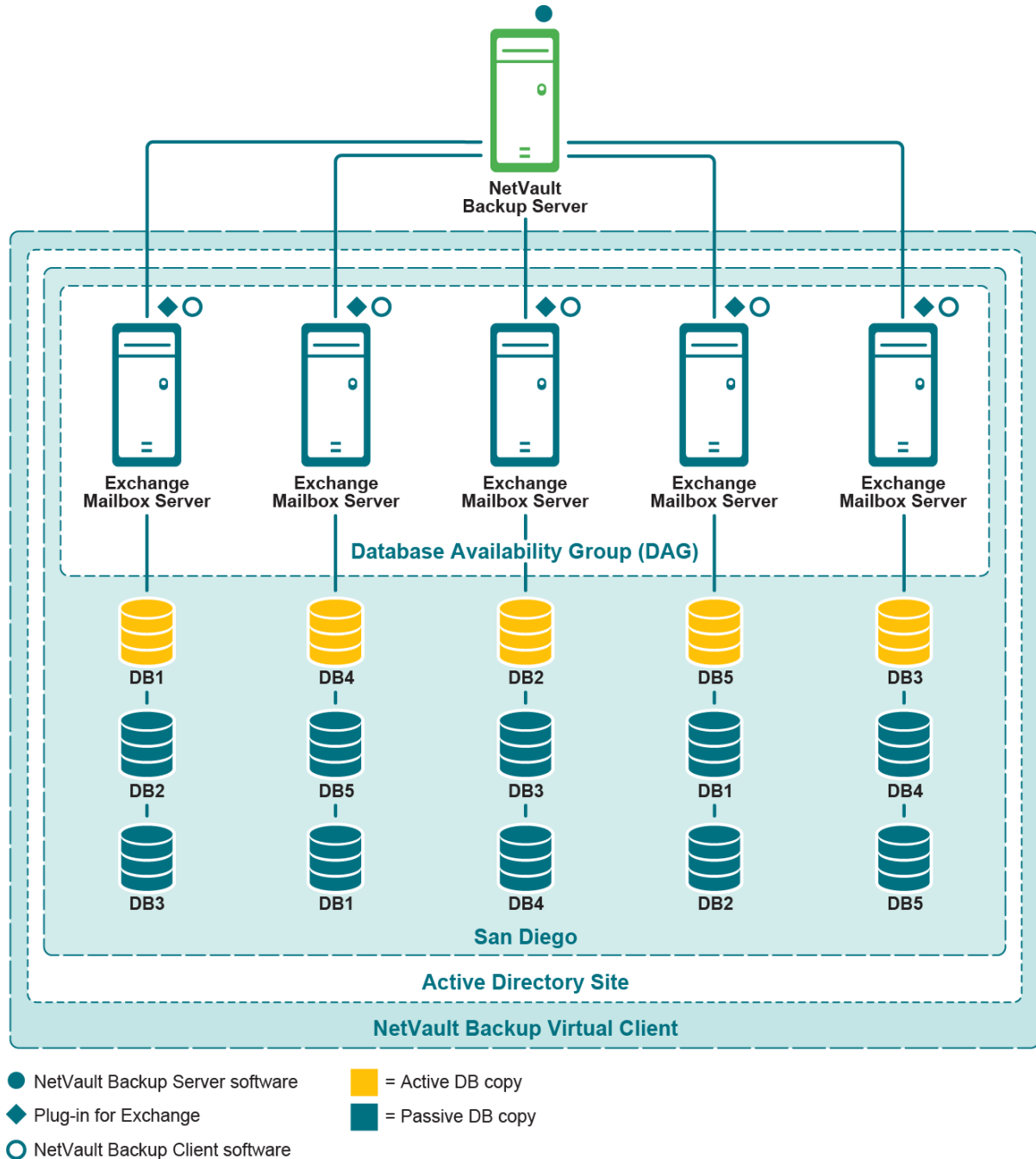
Local Continuous Replication (LCR)

- **Supported Exchange Server Versions**: 2007 only

- **Supported Exchange Server Editions**: All

- **Supported Backup Methods**: ESE (Active Copy only) and VSS (Active or Passive Copy)

LCR is a single Exchange Mailbox Server solution that uses built-in asynchronous log-shipping technology to create and maintain a copy of a Storage Group on a second set of disks. This second set is connected to the same server as the production Storage Group. LCR provides log shipping, log replay, and a manual switch to a secondary copy of the data. For more information, see *Exchange 2007 Local Continuous Replication* at http://technet.microsoft.com/en-us/library/bb125195.aspx.

In an LCR deployment, the Plug-in *for Exchange* is installed on the single Exchange Mailbox Server.

Figure 3. LCR deployment

● NetVault Backup Server software
◆ Plug-in for Exchange
○ NetVault Backup Client software

Single Copy Cluster (SCC) or Failover Cluster

- **Supported Exchange Server Versions**: Exchange 2007 only

- **Supported Exchange Server Editions**: Enterprise only

- **Supported Backup Methods**: ESE and VSS

- **Plug-in *for Exchange* License Required**: Plug-in *for Exchange* Enterprise Edition Cluster Support

SCC or Failover Cluster is a clustered solution that uses a single copy of a Storage Group on storage that is shared between the nodes in the cluster. In an SCC deployment, the Plug-in *for Exchange* is aware of which node is the active node and performs backups of the Active Copy of the Storage Groups. During the restore process, data is restored to the active node. For more information regarding Exchange 2007 SCCs, see *Single Copy Clusters* at: http://technet.microsoft.com/en-us/library/bb125217.aspx.

In an SCC deployment, the plug-in is installed on the Exchange Virtual Server. The Exchange Virtual Server is a group of nodes and hosts that make up the cluster. The NetVault Backup Server sees the cluster as a *single* client, which is called a Virtual Client. When installing the Plug-in *for Exchange* on the Virtual Server, the plug-in is installed on all nodes by using NetVault Backup's Cluster Support. NetVault Backup's Virtual Client is used to back up a single clustered resource, which in this example is the Exchange Virtual Server.

Figure 4. SCC deployment
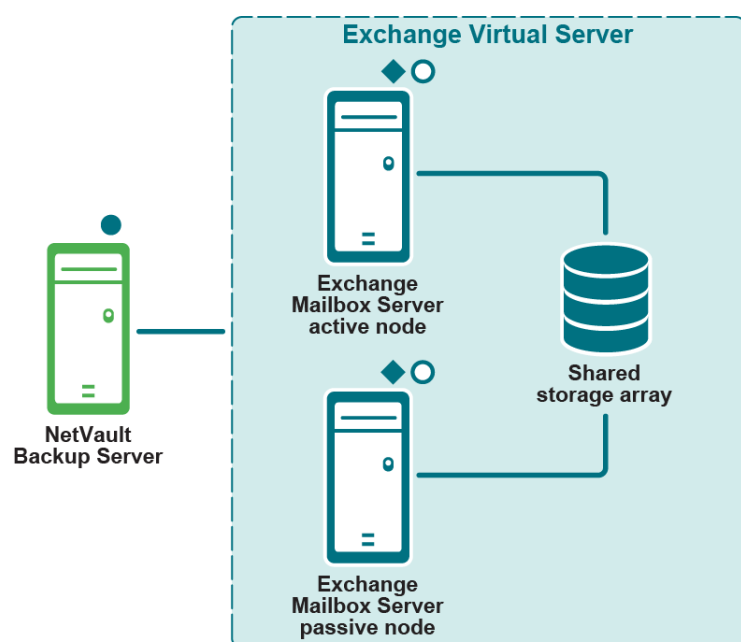
- ● NetVault Backup Server software
- ◆ Plug-in for Exchange
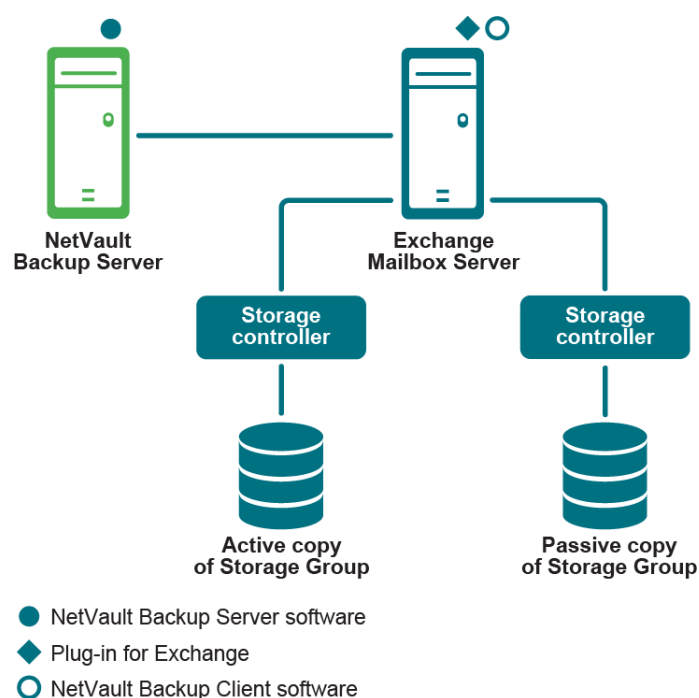- ○ NetVault Backup Client software

Cluster Continuous Replication (CCR)

- **Supported Exchange Server Versions**: 2007 only

- **Supported Exchange Server Editions**: Enterprise only

- **Supported Backup Methods**: ESE (Active Copy only) and VSS (Active or Passive Copy)

- **Plug-in *for Exchange* License Required**: Plug-in *for Exchange* Enterprise Edition Cluster Support

CCR is a clustered solution that uses built-in asynchronous log shipping technology to create and maintain a copy of each Storage Group on a second server in a failover cluster. CCR is either a one or two data-center solution, providing both high availability and site resilience. According to Microsoft, CCR uses the database failure recovery functionality in Exchange 2007 to enable the continuous and asynchronous updating of a second copy of a database with the changes that have been made to the active copy. During installation of the passive node in a CCR environment, each Storage Group and its database is copied from the active node to the passive node. This operation is called *seeding*, and it provides a baseline of the database for replication. After the initial seeding is performed, log copying and replay are performed continuously. For more information, see *Cluster Continuous Replication* at http://technet.microsoft.com/en-us/library/bb124521.aspx.

In a CCR deployment, the plug-in is installed on the Exchange Virtual Server. The Exchange Virtual Server is a group of nodes and hosts that make up the cluster. The NetVault Backup Server sees the cluster as a *single* client, which is called a Virtual Client. When installing the Plug-in *for Exchange* on the Virtual Server, the plug-in is installed on all nodes by using NetVault Backup's Cluster Support. NetVault Backup's Virtual Client is used to back up either the Active or Passive node, which in this example is the Exchange Virtual Server.

The Plug-in *for Exchange* lets you select the Exchange Mailbox Server active node or the passive node as the source for the backups. Using the passive node for backups reduces load on the active node. During the restore process, restores are always targeted to the active node.

Figure 5. CCR deployment

● NetVault Backup Server software
◆ Plug-in for Exchange
○ NetVault Backup Client software
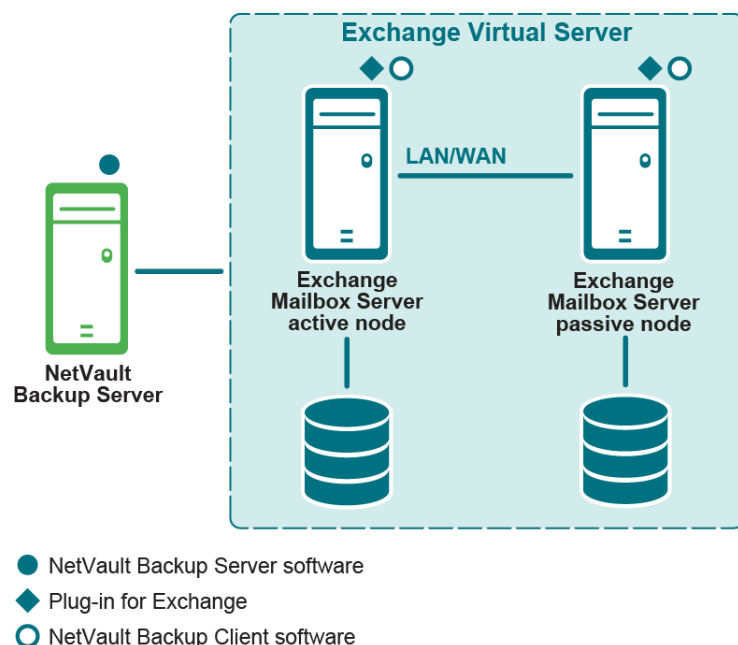
Installing and removing the plug-in

- Installation prerequisites
- Installing or upgrading the plug-in in standalone and LCR deployments
- Installing or upgrading the plug-in in high-availability deployments
- Removing the plug-in from a standalone deployment

Installation prerequisites

Before installing the plug-in, ensure that the requirements outlined in the following topics are met on the machine that is to serve as the Exchange Server.

- Disabling Circular Logging
- Enabling services
- Configuring localization settings
- Enabling and using Deleted Item Recovery features
- Additional requirements for DAG, SCC/Failover Cluster, and CCR deployments

Disabling Circular Logging

If either an Incremental or Differential Backup type is to be created, ensure that **Circular Logging** is disabled. The Exchange Server overwrites files if **Circular Logging** is enabled, making it impossible to reliably restore from the transaction logs. For more information about **Backup Types**, see Reviewing the backup types. To disable **Circular Logging**, perform the steps in the applicable topic:

- Disabling Circular Logging in Exchange 2007
- Disabling Circular Logging in Exchange 2010
- Disabling Circular Logging in Exchange 2013 or 2016

Disabling Circular Logging in Exchange 2007

1 Open the **Exchange Management Console**.

2 Expand **Server Configuration**, and expand the applicable server.

3 Right-click the applicable Storage Group, and select **Properties**.

4 On the **Properties** dialog box, clear the **Enable circular logging** check box, and click **OK**.

5 Close the **Exchange Management Console**, and restart the **Microsoft Exchange Information Store** service for the change to take effect.

For complete instructions, see the relevant Microsoft Exchange 2007 documentation. In addition, see *How to Enable or Disable Circular Logging for a Storage Group* at: http://technet.microsoft.com/en-us/library/bb331968.aspx

Disabling Circular Logging in Exchange 2010

1 Open the **Exchange Management Console**.

2 Navigate to **Organization Configuration > Mailbox**.

3 On the **Database Management** tab, select the applicable database, and click **Properties**.

4 On the **Properties** dialog box, select the **Maintenance** tab, clear the **Enable circular logging** check box, and click **OK**.

5 Close the **Exchange Management Console**, and restart the **Microsoft Exchange Information Store** service for the change to take effect.

For complete instructions, see the relevant Microsoft Exchange documentation. In addition, see: http://technet.microsoft.com/en-us/library/dd297937.aspx and http://technet.microsoft.com/en-us/library/dd351151(v=exchg.150).aspx

Disabling Circular Logging in Exchange 2013 or 2016

By default, Circular Logging is disabled in Exchange 2013 or 2016. If you have enabled it, disable it before using the plug-in.

1 In a web browser, open the Exchange Administration Center (EAC) by accessing the Exchange Control Panel (ECP) URL.

2 Log in using an Administrator account.

3 In the feature pane on the left, click **Servers**.

4 In the tab at the top, click **Databases**.

5 Select the applicable database, and click the **Edit** button.

6 In the new browser window, click **maintenance**.

7 Clear the **Enable circular logging** check box, and click **save**.

For complete instructions, see the relevant Microsoft Exchange documentation.

Enabling services

In **Windows Control Panel > Administrative > Services** for the Exchange Mailbox Servers, verify that the following services are enabled and running:

- **Microsoft Exchange Information Store**

- **Microsoft Exchange System Attendant**

- **Microsoft Exchange Replication Service**—required in DAG, LCR, and CCR environments

For VSS backups, also verify that the following services are enabled and running:

- **Microsoft Software Shadow Copy Provider**

- **Volume Shadow Copy**—started automatically by Microsoft Software Shadow Copy Provider

Configuring localization settings

The plug-in uses traditional Windows code page selection to enable localization, and is therefore subject to certain limitations. The plug-in must be used in an environment with correctly configured localizations settings to function properly.

To ensure correct operation in a localized environment, verify that the following conditions are met:

- All Exchange Server entities—Storage Groups, Mailbox Databases, Public Folder Databases, and so on—must be named using the same language, with no intermixing of languages.

- The Windows Active Code Page must be set to the same language as used in the Exchange Server.

- The language specified in the NetVault Backup Configurator for both the NetVault Backup Server and Clients must match the language set in the Windows Active Code Page.

- If used in a clustered environment, all nodes in the cluster must be configured to use the same language, also conforming to the previous rules.

Configuring the Windows Active Code Page

1   Open the Windows **Control Panel**.

2   Select **Regional and Language Options**.

3   Select the **Advanced** tab.

4   In the **Select a language to match the language version of the non-Unicode programs you want to use** list, select the correct language.

    If the correct language is not listed, install it by following the Microsoft Windows administrative procedures for installing more language support.

Configuring a NetVault Backup Server or Client

1   In the Navigation pane, click **Change Settings**.

2   On the Configuration page, click **Server Settings** or **Client Settings**, whichever is applicable.

3   Under **System and Security**, click **General**.

4   In the **Language Selection** list, select the applicable language, and then click **Apply**.

> **i** **IMPORTANT:** When languages other than English are used in an environment that is not correctly configured, backup and restore operations may not function as expected. The demonstrated behavior may include, but is not limited to:
> - Failure to back up selected items.
> - Backing up or restoring items that were not selected, for example, you select the first Storage Group/Mailbox Database, but the second Storage Group/Mailbox Database is affected.
> - Failure to back up or restore altogether, often with the indication that no matching items were found.

Enabling and using Deleted Item Recovery features

Quest recommends that you enable the **Deleted Item Recovery** functionality in Exchange to reduce the requirement to perform recovery for individual messages or mailboxes. This feature enables the recovery of recently deleted items by saving messages for a predetermined number of days.

- Enabling Deleted Item Recovery in Exchange 2007
- Enabling Deleted Item Recovery in Exchange 2010 and later
- Recovering items in Outlook 2007 or earlier

Enabling Deleted Item Recovery in Exchange 2007

1 Open the **Exchange Management Console** or **Exchange System Manager**.

2 In the console tree, expand **Microsoft Exchange**, expand **Server Configuration**, and then select **Mailbox Store**.

3 Right-click the database, and select **Properties**.

4 Select the **Limits** tab.

5 In the **Deletion settings** area, enter the number of days to retain deleted items in the **Keep deleted item for (days)** field.

6 To save the settings, click **OK**.

Complete instructions for this procedure can be found in the relevant Microsoft Exchange documentation. In addition, you can consult the *Configuring Deleted Mailbox and Deleted Item Retention* article at: http://technet.microsoft.com/en-us/library/bb125266(EXCHG.80).aspx

Enabling Deleted Item Recovery in Exchange 2010 and later

1 Open the **Exchange Management Shell**.

2 To enable recoverable items and specify the number of days deleted items are retained, enter the following command:

```
Set-Mailbox -Identity <MailboxServer> -SingleItemRecoveryEnabled
   $True -RetainDeletedItemsFor <dd.hh:mm:ss>
```

For *<MailboxServer>*, you can use the ADObjectID, alias, distinguished name (DN), domain\account, GUID, LegacyExchangeDN, SMTPAddress, or user principal name (UPN). For the length of time, dd = days, hh = hours, mm = minutes, and ss = seconds.

3 To configure single-item recovery and configure recoverable items for a **mailbox**, enter the following command:

```
Set-Mailbox -Identity <MailboxServer> -RecoverableItemsQuota <Limit>
```

For *<Limit>*, enter the maximum amount of space, for example, 15 GB, that can be used before more items cannot be stored in the Recovery Items Folder.

4 To configure single-item recovery and configure recoverable items for a **Mailbox Database**, enter the following command:

```
Set-MailboxDatabase -Identity <MailboxServer> -RecoverableItemsQuota <Limit>
```

Instructions for these procedures can be found in the relevant Microsoft Exchange documentation: http://technet.microsoft.com/en-us/library/ee364752.aspx

In addition, see *Understanding Recoverable Items* at: http://technet.microsoft.com/en-us/library/ee364755.aspx

Recovering items in Outlook 2007 or earlier

1 Select the **Deleted Items** folder.

2 On the **Tools** menu, select **Recover Deleted Items**, and select the items from the list presented.

3 To have the items restored to your Deleted Items folder, select **Recover Selected Items**.

Complete instructions for this procedure can be found in the relevant Microsoft documentation. In addition, you can consult the *How to Recover a Deleted Item* article at: http://technet.microsoft.com/en-us/library/aa997155(EXCHG.80).aspx

Recovering items in Outlook 2010 or later

1 Select the applicable folder, such as the **Inbox** or a folder that you created.

2 Select the **Folder** tab.

3 On the **Ribbon**, click **Recover Deleted Items**, and select the items from the list presented.

4 To have the items restored to your Deleted Items folder, select **Recover Selected Items**.

Complete instructions for this procedure can be found in the relevant Microsoft documentation. In addition, you can consult the *How to Recover a Deleted Item* article at: http://office.microsoft.com/en-us/outlook-help/recover-deleted-items-HA010355039.aspx

Additional requirements for DAG, SCC/Failover Cluster, and CCR deployments

Verify that the following prerequisites are met before you install the Plug-in *for Exchange* in a DAG, SCC/Failover Cluster, or CCR deployment:

- **Microsoft Exchange DAG, SCC, or CCR environment in place**: You must have a properly configured DAG, SCC, or CCR environment. SCC and CCR are only supported with Exchange Server Enterprise Edition.

- **Separate NetVault Backup Server machine**: The machine that is to serve as the NetVault Backup Server must be properly configured. It *must exist outside* the Exchange Server DAG, SCC, or CCR deployment, and it must have network connectivity to the nodes and hosts within the cluster.

- **NetVault Backup Client name must match host name of Exchange Server in a DAG environment**: Verify that the name specified for the NetVault Backup Client matches the host name of the Exchange Server.

- **Review using NetVault Backup in cluster setup details**: Quest strongly recommends that you review the topic dedicated to cluster functionality in the *Quest NetVault Backup Administrator's Guide* to ensure that you understand how the information presented in the following topics works with Exchange Server DAG, SCC, and CCR functionality.

Installing or upgrading the plug-in in standalone and LCR deployments

You can install or upgrade the plug-in on individual systems, one at a time. You can also deploy the plug-in to multiple machines by creating a deployment task from the WebUI to push the packages to the specified machines. You can use this method for both new and upgrade installations on Windows-based machines. After the packages are installed on the machines, the new machines are automatically added to the NetVault Backup Server.

- Performing a local installation
- Performing a remote installation

Performing a local installation

1 In the Navigation pane, click **Manage Clients**.

2 On the **Manage Clients** page, select the machine that contains the Exchange Server, and click **Manage**.

3 On the **View Client** page, click the **Install Plugin** button ( ).

4 Click **Choose Plug-in File**, navigate to the location of the **".npk"** installation file for the plug-in, for example, on the installation CD or the directory to which the file was downloaded from the website.

   Based on the OS in use, the path for this software may vary on the installation CD.

5 Select the file entitled **"exs-x-x-x-x-x.npk,"** where **xxxxx** represents the version number and platform, and click **Open**.

6 To begin installation, click **Install Plugin**.

   After the plug-in is successfully installed, a message is displayed.

Performing a remote installation

This process is not plug-in-specific. For more information, see the topic on deploying clients and plug-in packages in the *Quest NetVault Backup Administrator's Guide*.

1 In the Navigation pane, click **Guided Configuration**.

2 On the **NetVault Configuration Wizard** page, click **Install Software/Add Clients**.

3 On the **Select Software/Add Clients** page, select **Install NetVault software on remote machines**.

4 In the **Package Store** list, select the applicable repository.

5 Click **Add NetVault plug-in package**.

6 In the **Select packages for deployment** dialog, select the file entitled **"exs-x-x-x-x-x.npk,"** where **xxxxx** represents the version number and platform, and click **Ok**.

   The plug-in file is listed in the deployment table.

7 Click **Next**.

8 On the **Machines to Have NetVault Software Installed** page, select the applicable machines.

9 If you are installing an upgrade, select **Allow existing NetVault client installations to be upgraded**.

10 Click **Install Software/Add Clients**.

   The status is displayed on the next page.

11 After the plug-in is successfully installed, click **Next** to complete the process.

Installing or upgrading the plug-in in high-availability deployments

Installation of Plug-in *for Exchange* for a clustered environment is different from standalone deployment. This process is completed through the creation of a Virtual Client on the NetVault Backup Server. A Virtual Client is a group of nodes and hosts within the cluster. The NetVault Backup Server sees the cluster as a single client that is created to back up a single clustered resource, that is, an Exchange Server Virtual Server. During the Virtual Client creation process, the plug-in is transferred from the NetVault Backup Server to selected nodes within a cluster and installed on each of the selected nodes.

As described in Single-location Database Availability Group (DAG), creating the Virtual Client for managing the DAG installs the Plug-in *for Exchange* on each node included in the cluster. During this process, verify that the NetVault Backup Client is installed on each node and that each NetVault Backup Client is added to the Virtual Client that you create for the DAG. This process ensures that the applicable databases are not excluded from the backup process.

Creating a Virtual Client

When you use the WebUI to add a Virtual Client to a NetVault Backup Server, you specify a Virtual Client Address. NetVault Backup Server uses this address to determine which NetVault Backup Real Client (Exchange Server) to contact to initiate the backup job.

The Virtual Client creation process is not plug-in-specific, and you can find complete details in the topic dedicated to cluster functionality in the *Quest NetVault Backup Administrator's Guide*. However, the process is different if you are using any type of high-availability deployment that has an administrative access point versus a DAG deployment that does *not* use an access point.

- Creating a Virtual Client for a deployment that uses an administrative access point
- Creating a Virtual Client for a DAG that does not use an administrative access point

Creating a Virtual Client for a deployment that uses an administrative access point

Consider the following points during the Virtual Client creation process for a deployment that uses an access point:

- **Only include relevant cluster nodes in the Virtual Client**: The hosts that are to be included in the creation of a Virtual Client should *only* be those nodes or Exchange Mailbox Servers that make up the DAG, SCC, or CCR deployment. During the creation of the Virtual Client, you can specify either the IP address of the Exchange virtual cluster or the name of the Exchange virtual cluster. After the creation of the Virtual Client, the plug-in is transferred to all designated cluster nodes and installed locally. The installed Plug-in *for Exchange* can be used through the Virtual Client to back up and restore the DAG, SCC, or CCR deployment.

  > **i** | **IMPORTANT:** If you are creating a Virtual Client for a DAG configuration and the DAG is configured to use multiple IP addresses, enter either the network name for the DAG or an IP address that allows network access to the DAG from the machine on which the NetVault Backup Server is installed.

- **Assign a name to the Virtual Client**: Quest strongly recommends that the Virtual Server network name assigned to the Exchange Server be used as the NetVault Backup Virtual Client name. When a Virtual Client is browsed, NetVault Backup locates the node currently in control of the clustered application, and reveals the Exchange Server Instance. With a Virtual Client name set up as the Exchange Server Virtual Server network name, it is easier to recognize the Exchange Server Instance for which the Virtual Client was created.

Creating a Virtual Client for a DAG that does not use an administrative access point

For a high-availability deployment with an administrative access point, the Virtual Client Address that you enter is either a virtual IP address or the network name of the cluster. However, for a DAG without an administrative access point, also known as IP-less DAG or no-CNO DAG, you must create a NetVault Backup Virtual Client that uses a fixed IP address or network name that corresponds to one of the Real Clients (Exchange Servers) in the DAG.

Creating a Virtual Client for a DAG without an administrative access point differs slightly from creating a Virtual Client for a DAG that has an administrative access point. If the DAG does not have an administrative access point, enter the IP address or network name of one of the Exchange Servers that participates in the DAG and on which NetVault Backup Client software is installed. In this case, the Virtual Client Address always resolves to the selected Exchange Server (Real Client) instead of to a DAG.

> **i** | **IMPORTANT:** If the Exchange Server (Real Client) to which the fixed IP address or network name corresponds goes offline for any reason, subsequent backup jobs fail. Either bring the Exchange Server back online or update the Virtual Client to use a different IP address or network name for a different Exchange Server (Real Client) that is included in the DAG.

Removing the plug-in from a standalone deployment

For details on removing the Plug-in *for Exchange* in a DAG, SCC, or CCR deployment, see the applicable topic on working with client clusters in the *Quest NetVault Backup Administrator's Guide*.

1 In the Navigation pane, click **Manage Clients**.

2 On the **Manage Clients** page, select the applicable client, and click **Manage**.

3 In the **Installed Software** table on the **View Client** page, select **Plug-in *for Exchange***, and click the **Remove Plugin** button ( ).

4 In the **Confirm** dialog box, click **Remove**.

Configuring the plug-in

* Reviewing Authentication Details: Windows user account permissions
* Configuring the plug-in

Reviewing Authentication Details: Windows user account permissions

Before initiating a backup, configure the plug-in's authentication details and select the Backup Method.

The Plug-in *for Exchange* uses Windows Authentication to provide essential security and access control for sensitive data contained in an Exchange Server's databases. Windows Authentication allows you to log in to a specific Windows user account. You can configure this Windows user account to restrict a user's privileges so that only backups can be performed, or to allow both backups and restores to be performed.

For a user to **back up** Exchange, the Windows user account used must:

* Be a valid domain or local account.
* Be a member of the Power Users group.
* Be a member of the domain's Backup Operators group—for domain accounts.
* Be a member of the Backup Operators group on the machine that Exchange is running on.

To perform a **restore** of Exchange, the Windows user account must be a member of the Administrators group on the machine that Exchange is running on.

The Domain Administrator account has all the permissions necessary to perform backup and restore procedures in the Plug-in *for Exchange* by default.

> **i** | **NOTE:** The **NetVault Process Manager** Service **Log on as** account must be a Local System or an Exchange Administrator Account.

Configuring the plug-in

The plug-in lets you set default options for backup and restore jobs. You can override these options on a per-job basis.

1   In the Navigation Pane, click **Create Backup Job**, and click **Create New** next to the **Selections** list.

2   In the selection tree, open the applicable client node.

3   Click **Plug-in *for Exchange***, and select **Configure** from the context menu.

The **Exchange Server Configuration** dialog box is displayed. If the selected node is a Virtual Client for a DAG, the **Database Availability Group Name** field displays the name of the DAG. The name of the DAG is followed by a check box that lets you enable editing of the DAG name. For all other nodes, the dialog box shows a **Server Name** field, which displays the machine name of the Exchange Server and cannot be edited.

4   If you are using a Virtual Client for a DAG that does *not* use a CNO or IP address, do the following:

    a   Select the **Edit DAG name** check box.

    b   In the **Database Availability Group Name** field, enter the name of the DAG.

       The name that NetVault Backup initially provides is tied to a specific machine in the DAG, which is not usually the name of the DAG itself. To prevent backup and restore jobs from failing, enter the correct name of the DAG.

5   If you are using Exchange 2007, complete the following steps:

    a   From the **Server Role** list, select the applicable role:

       ▫ **Standalone Server**

       ▫ **Local Continuous Replication (LCR)**

       ▫ **Single Copy Cluster (SCC)**

       ▫ **Cluster Continuous Replication (CCR)**

    b   In the **Default Backup Method** section, select the method to use for this server:

       ▫ **Extensible Storage Engine (ESE)**

       ▫ **Volume Shadow Copy Service (VSS)**

       The plug-in supports implementing an ESE or a pure VSS-backup strategy; that is, your backup strategy should include either ESE backups or VSS backups, but not a combination of the two. For more information, see *Defining an Exchange data protection strategy*.

6   In the **Authentication Details** section, edit the following fields:

    ▪ **Exchange Administrator User Name**: Enter either a local or domain Windows account that meets the criteria specified in Reviewing Authentication Details: Windows user account permissions. When the **Exchange Server Configuration** dialog box is opened, this account is displayed by default in the Exchange Administrator User Name field.

    ▪ **Password**: Enter the password associated with the specified user name. For security reasons, this field is displayed blank by default.

    ▪ **Windows Domain**: If a domain account is specified in the **Exchange Administrator User Name** field, enter the name of the domain. The field can be left blank if a local system account is specified. When the **Exchange Server Configuration** dialog box is opened, this domain is displayed by default in the Windows Domain field.

7   In the **Additional Options** section, select the default action for **Incomplete Backup of All Items Selected**.

When multiple items are included in a backup and the plug-in is unable to back up all the selected items, the plug-in lets you specify what action the backup should take. For example, if a job includes multiple Storage Groups/Mailbox Databases and the backup of all but one is successful, you can specify what action the backup job should take.

- **Complete with Warnings — Saveset Retained:** The job returns a status of **"Backup Completed with warnings"** and a backup saveset is created that includes the items that were successfully backed up.

- **Complete without Warnings — Saveset Retained:** The job completes and returns a status of **"Backup Completed."** The errors are logged in the NetVault Backup binary logs and ignored on the **Job Status** page. A backup saveset is created that includes the items that were backed up.

- **Fail — Saveset Retained:** The job returns a status of **"Backup Failed."** However, a backup saveset is generated that includes the items that were successfully backed up.

- **Fail — No Saveset Retained:** The job returns a status of **"Backup Failed"** and no saveset of backed-up objects is kept. That is, even if some of the objects were successfully backed up, the saveset is discarded.

> **i** | **IMPORTANT:** You can override the selected default action selected at the individual backup job level.

8   To specify how frequently the nodes in a DAG or cluster send updates to the plug-in, enter the applicable number in the **Monitor Progress Update Interval (in seconds, 0 = continuous)** field.

Depending on the number of nodes residing in a group or cluster and the amount of data processed during a backup, a significant number of messages are sent to the plug-in. Use this option to limit how frequently messages are recorded.

9   If you must instruct the plug-in to ignore warnings resulting from the Exchange integrity check, select the **Ignore Warning when Consistency Check does not Return Operation Results (Not Recommended)** check box.

> **!** | **CAUTION: By default, the plug-in returns a warning if results to the consistency check of the Exchange database are not returned. This issue causes backup jobs to Complete with Warnings. If you know that the consistency check cannot return results because of how your Exchange environment is configured, this option lets you instruct the plug-in to ignore the warning. Quest discourages use of this option.**

10 To save the settings, click **OK**.

With the authentication details properly configured, you can click the **Exchange Server** node to display the available Storage Groups/Mailbox Databases.

Backing up data

- Selecting data for a backup
- Setting backup options
- Finalizing and submitting the backup job

Selecting data for a backup

You must use sets — Backup Selection Set, Backup Options Set, Schedule Set, Target Set, and Advanced Options Set — to create a backup job.

Backup Selection Sets are essential for Incremental and Differential Backups. Create the Backup Selection Set during a Full Backup, and use it for Full, Incremental, and Differential Backups. The backup job reports an error if you do not use a Selection Set for the Incremental or Differential Backup. For more information, see the *Quest NetVault Backup Administrator's Guide*.

> **i** | **TIP:** To use an existing set, click **Create Backup Job**, and select the set from the **Selections** list.

1 In the Navigation pane, click **Create Backup Job**.

You can also start the wizard from the Guided Configuration link. In the Navigation pane, click **Guided Configuration**. On the **NetVault Configuration Wizard** page, click **Create backup jobs**.

2 In **Job Name**, specify a name for the job.

Assign a descriptive name that lets you easily identify the job when monitoring its progress or restoring data. The job name can contain alphanumeric and nonalphanumeric characters, but it cannot contain non-Latin characters. On Windows, there is no length restriction; however, a maximum of 40 characters is recommended.

3 Next to the **Selections** list, click **Create New**.

4 In the list of plug-ins, open **Plug-in *for Exchange***, and drill down to the name of the Exchange Server or Exchange Virtual Server and its available nodes.

5 If you are using Exchange 2007, complete the following steps:

   a Expand the applicable Microsoft Information Store to display all the Storage Groups contained within. You can also open an individual group to display all databases contained within that group.

   b Select the data that you want to back up by clicking the box to the left of that item, that is, to mark it with a green check. You can also select groups as follows:

   - Entire Exchange Server
   - Entire Microsoft Information Store
   - Individual Storage Groups
   - Sets of Storage Groups
   - Individual Databases
   - Groups of Databases

Selecting the **Microsoft Exchange Server** node is equivalent to selecting the **Exchange Server** or **Virtual Server Node**, in that all databases on the Exchange Server are backed up. However, selecting the **Microsoft Exchange Server** node enables creating a selection set that can be used across multiple installations of Plug-in *for Exchange*.

> **i** | **IMPORTANT:** Backing up individual databases might affect the behavior of log truncation for all databases in the Storage Group. This issue might result in excess log files in the backup, premature truncation of log files, or deferred truncation of log files, depending on the conditions in your environment and the Exchange Server version—including patches—in use.
>
> If an individual database is selected for a VSS-based backup, the entire Storage Group is backed up because VSS backups are performed only at the Storage Group level.

6   If you are using Exchange 2010 or later, complete the following steps:

    a   Expand the applicable Exchange Server to display all the Mailbox Databases contained within

    b   Select the database that you want to back up by clicking the box to the left of that item, that is, to mark it with a green check. You can also select the entire Exchange Server.

        Selecting the **Microsoft Exchange Server** node is equivalent to selecting the **Exchange Server** or **NetVault Backup Virtual Client**, in that all databases included in the DAG or standalone deployment are backed up. However, selecting the **Microsoft Exchange Server** node enables creating a selection set that can be used across multiple installations of Plug-in *for Exchange*.

7   Click **Save**, enter a name in the **Create New Set** dialog box, and click **Save**.

The name can contain alphanumeric and nonalphanumeric characters, but it cannot contain non-Latin characters. On Windows, there is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

Setting backup options

The next step involves creating the Backup Options Set or selecting an existing one.

> **i** | **TIP:** To use an existing set, in the **Plugin Options** list, select the set that you want to use.

1   Next to the **Plugin Options** list, click **Create New**.

2   If you are using Exchange 2007, select the applicable option in the **Backup Method** section:

    ▪   **Extensible Storage Engine (ESE)**

    ▪   **Volume Shadow Copy Service (VSS)**

The **Backup Method** defaults to the **Default Backup Method** selected on the **Exchange Server Configuration** dialog box. The plug-in supports implementing an ESE or a pure VSS backup-strategy; that is, your backup strategy should include either ESE backups or VSS backups, not a combination of the two. Because Exchange 2010 and later only support VSS, you do not have to select a method for these versions. For more information about selecting a backup method for your Exchange Server, see *Defining an Exchange data protection strategy*.

3   In the **Exchange Backup Type** section, select the applicable option.

    ▪   **Full:** A Full Backup performs a complete backup of the set of items that have been selected. A Full Backup does not depend on any other backup and can be restored in a single step. In Exchange Server, a Full Backup includes all database files and transaction log files.

    ▪   **Copy:** A Copy Backup backs up the set of items that have been selected without performing a transaction log file truncation. This backup provides a snapshot of the files as they existed at the time of the backup. A Copy Backup should be used to perform a fast, nonintrusive complete backup of an Exchange Server and is commonly used for offline scaling and migration scenarios.

- **Incremental:** An Incremental Backup backs up the transaction log files of the set of items that have been selected since the most recent Full Backup or Incremental Backup. After the backup is completed, the Exchange Server truncates the transaction logs. This truncation helps maintain the operating health of the Exchange Server.

- **Differential:** A Differential Backup backs up the transaction log files of the set of items that have been selected since the most recent Full Backup or Incremental Backup. Differential Backups do not perform transaction log truncation, and therefore do not maintain the operating health of the Exchange Server.

For more information, see Reviewing the backup types.

4 In the **Snapshot Options** section, complete the following:

- **Backup Files to Storage:** This option, which is selected by default, copies the selected data from snapshots to a storage device. The plug-in uses a VSS provider to create persistent or non-persistent snapshots on the client, and copies the selected data from the snapshot, or snapshots, to the storage device.

- **Retain Snapshot as Persistent**: To retain persistent snapshots on a disk array, select this check box.

  - If the **Backup Files to Storage** and **Retain Snapshot as Persistent** check boxes are both selected, the plug-in copies the selected files to a storage device and adds the snapshot information to the backup index.

  - If you clear the **Backup Files to Storage** check box and select this check box, the plug-in writes only the index entries to the backup stream and creates persistent snapshots on the disk array.

- **Discard After:** If you selected the **Retain Snapshot as Persistent** check box and you want to delete persistent snapshots from a disk array after a specified period, select this check box and complete the expiration fields.

  Regardless of the expiration settings, a snapshot is automatically deleted when the associated saveset is retired. Therefore, this option is only useful when you want to discard a snapshot *before* the associated saveset is retired. To expire a snapshot immediately, you must log in to the storage array, and manually expire the snapshot. Otherwise, the snapshot expires according to the retention policy selected while creating the snapshot.

  i | **NOTE:** To use the **Retain Snapshot as Persistent** and **Discard After** options, the Exchange Mailbox Server that you back up must reside on a NetVault Backup-supported disk array and the vendor's hardware-based VSS provider must be in place. For more information, see Understanding snapshot-based backups.

5 In the **Advanced Options** section, complete the following:

- **Maximum Number of Parallel Streams**: To enable the fastest backups possible, the plug-in uses parallel streams to back up the Storage Groups/Mailbox Databases simultaneously. This option lets you specify the maximum number of parallel streams to use during a backup. The maximum number of parallel streams must meet *both* of the following conditions:

  - Less than or equal to (<=) the number of drives for the backup devices specified on the **Target** tab.

  - Less than **Maximum number of Storage Groups/Mailbox Databases** that can be created. The following table details the maximum number of Storage Groups/Mailbox Databases allowed by each Exchange Server version and edition:

Exchange Server method	Server edition	Maximum number of Storage Groups/Mailbox Databases
Exchange Server 2007	Standard	5 Storage Groups
	Enterprise	50 Storage Groups
Exchange Server 2010	Standard	5 Mailbox Databases
	Enterprise	100 Mailbox Databases

Exchange Server method	Server edition	Maximum number of Storage Groups/Mailbox Databases
Exchange Server 2013	Standard	5 Mailbox Databases
	Enterprise	50 Mailbox Databases
Exchange Server 2016	Standard	5 Mailbox Databases
	Enterprise	100 Mailbox Databases

For example, if you are targeting a Virtual Tape Library configured with two drives and you have 20 Storage Groups, the **Maximum Number of Parallel Streams** should be **2** or less.

> **i** | **NOTE:** In an Exchange 2010 or later DAG deployment, the number of parallel streams is allocated on a per-server basis; therefore, the number applies to each server included in the DAG. For example, if your DAG includes three Exchange Servers and you select two streams for backup, it can create up to six simultaneous streams assuming that there are at least two databases on each server that must be backed up. If there are fewer databases, the streams are not created. If there are fewer drives available, the streams wait until the next drive is available.

> **i** | **IMPORTANT:** If you use parallel streams, do not select the **Ensure this backup is the first on the media** option in the **Target Storage** section. If the plug-in generates more than one data stream, each data stream targets a separate piece of media and assumes that it is the first backup on the media.

- **Mount unmounted databases before backup**: This option mounts any unmounted databases before attempting to back up the database.

- **Perform VSS Consistency Check:** This option indicates whether a consistency check of the VSS should be performed on the Exchange Storage Groups/Mailbox Databases included in the backup job. Quest recommends that you use this option, which is selected by default.

- **Incomplete Backup of All Items Selected:** When multiple items are included in a backup and the plug-in is unable to back up all the selected items, the plug-in lets you specify what action the backup should take. For example, if a job includes multiple Storage Groups/Mailbox Databases and the backup of all but one is successful, you can specify what action the backup job should take.

  - **Complete with Warnings — Saveset Retained:** The job returns a status of **"Backup Completed with warnings"** and a backup saveset is created that includes the items that were successfully backed up.

  - **Complete without Warnings — Saveset Retained:** The job completes and returns a status of **"Backup Completed."** The errors are logged in the NetVault Backup binary logs and ignored on the **Job Status** page. A backup saveset is created that includes the items that were backed up.

  - **Fail — Saveset Retained:** The job returns a status of **"Backup Failed."** However, a backup saveset is generated that includes the items that were successfully backed up.

  - **Fail — No Saveset Retained:** The job returns a status of **"Backup Failed"** and no saveset of backed-up objects is kept. That is, even if some of the objects were successfully backed up, the saveset is discarded.

- **Backup Algorithm in DAG** (only available in DAG deployments):

  - **All Active**: If you want the Plug-in *for Exchange* on each Mailbox Server to back up only the databases that are active when the backup is performed, select this option.

  - **Backup Database Copies with the Lowest Activation Preference Number**: Select this option if you want the plug-in to select an available database copy. The plug-in selects the copy with the lowest activation preference number for backup. If a database copy is not available for backup or the copy is disabled, the plug-in selects the active database.

  - **Backup Database Copies with the Highest Activation Preference Number**: Select this option if you want the plug-in to select the available database copy with the highest

activation preference number. If a database copy is not available for backup or the copy is disabled, the plug-in selects the active database.

- □ **Backup Databases from preferred Exchange Server whenever possible**: Select this option if you want to specify a list of preferred Exchange Servers to perform backups from and a list of servers to exclude. The plug-in skips database copies that are in a disabled state.

  This option works with the following fields:

  - **If possible Backup Exchange Databases only from the following Exchange Server**: If you selected **Backup Databases from preferred Exchange Server whenever possible**, enter a comma-separated list of Exchange Servers, in order of preference, that should be used to back up the database. If the database, copy or active, is available in the Exchange Server listed first, it is backed up from that server. If not, the plug-in tries the next server in the list, and so on. If there is not an available copy—including the active database—on any of the listed servers, the plug-in uses the server that contains the active database or the database copy with the lowest activation preference number.

  - **If possible do not Backup Exchange Databases from the following Exchange Server**: If you selected **Backup Databases from preferred Exchange Server whenever possible**, enter a comma-separated list of Exchange Servers, in order of preference, that should *not* be used to back up the database. The server listed first has the lowest preference. If the database, copy or active, is available on any other Exchange Server, the database is not backed up from the server listed. The plug-in tries to exclude all servers listed in this field. If the database is *only* available on one of the excluded servers, the plug-in performs the backup using the last server in the list of exclusions.

  - **ⓘ** **NOTE:** The **If possible Backup Exchange Databases only from the following Exchange Server** option takes precedence over **If possible do not Backup Exchange Databases from the following Exchange Server**. If the backup can be performed using a server from the first list, the plug-in does not process the list of excluded servers.

6   If you are performing a VSS-based backup in an LCR or CCR environment, complete the following in the **Volume Shadow Copy Service (VSS)** section:

ⓘ **NOTE:** When performing VSS-based backups in an LCR or CCR environment, the plug-in is able to back up either the active copy or passive copy of the Exchange Server data. By enabling backups of the passive copy, the load on the active node is reduced.

- **Active Copy**: To back up the active copy of all Storage Groups, select this option. This option is the default for Standalone deployments, and the only option available for SCC/Failover Cluster deployments or deployments that have Standby Continuous Replication (SCR) enabled for any of the Storage Groups.

- **Passive Copy**: To back up the passive copy of all Storage Groups, select this option. While available for both CCR and LCR deployments, this option is the default option for CCR deployments and has the following restrictions:

  - □ If you are selecting this option for an LCR deployment, backups are performed only for Storage Groups that have LCR enabled. Storage Groups that do not have LCR enabled are not backed up.

  - □ If SCR is enabled for *any* of the Storage Groups, even in a CCR and LCR deployment, selecting this option causes the backups to fail. Failure occurs because backups cannot be performed from the passive copy.

  - □ When performing backups of passive data, it is important to ensure that the passive copies in CCR and LCR environments have a state of **Healthy** in the **Exchange Management Console**. If the passive copy has a status of **Failed**, the backup fails. The **Failed** passive copy can be returned to a **Healthy** state by deleting it and updating it with the **Update-StorageGroupCopy** command. For more information about the **Update-**

StorageGroupCopy command, see http://technet.microsoft.com/en-us/library/aa998853.aspx.

- ▪ **Mixed (Available only for LCR deployments)**: Selecting this option backs up the passive copies of all Storage Groups along with active copy Storage Groups that are not LCR enabled. This option is the default and the recommended option for LCR deployments that do not have SCR enabled, and has the following restriction:

  If SCR is enabled for *any* of the Storage Groups, selecting this option causes the backups to fail. The **Active Copy** option should be selected for environments where LCR and SCR are simultaneously deployed.

7   Click **Save** to save the set.

8   In the **Create New Set** dialog box, specify a name for the set, and click **Save**.

The name can contain alphanumeric and nonalphanumeric characters, but it cannot contain non-Latin characters. On Windows, there is no length restriction; however, a maximum of 40 characters is recommended.

Finalizing and submitting the backup job

1   Use the **Schedule**, **Target Storage**, and **Advanced Options** lists to configure any additional required options.

2   Click **Save** or **Save & Submit**, whichever is applicable.

> **ⓘ** | **TIP:** To run a job that you have already created and saved, select **Manage Job Definitions** on the Navigation pane, select the applicable job, and click **Run Now**.

You can monitor progress on the **Job Status** page and view the logs on the **View Logs** page. For more information, see the *Quest NetVault Backup Administrator's Guide*.

> **ⓘ** | **IMPORTANT:** Restarting services that host Exchange VSS Writers, including the **Microsoft Exchange Information Store**, **Microsoft Exchange Replication Service**, complete OS reboots, and cluster failovers causes running backup jobs to fail. This failure is due to a loss of in-memory 'backup-in-progress' state that Microsoft maintains for VSS backups.

Restoring data

- Restore and recovery overview
- Restoring data using the plug-in
- Using advanced restore procedures

Restore and recovery overview

When preparing to restore an existing backup, several key concepts are useful to understand. The following topics explore these concepts.

- Reviewing the available restore methods
- Reviewing the Phases of the Restore Sequence

Reviewing the available restore methods

The Restore Method is the technology that is selected to perform the restore. The Plug-in *for Exchange* supports several Restore Methods, each with its own specific purpose.

Extensible Storage Engine (ESE) Restore Method

ESE is the native technology used to perform restore and recovery operations for Exchange Server. ESE is provided from Microsoft as a standard Exchange Server component in Exchange 2007.

When using the ESE Restore Method, all databases being restored must first be dismounted using a Microsoft-approved approach or by selecting the **Dismount Databases Before Restore** option in the **Restore and Recovery Options** tab of the **Restore Options** tab. Failing to dismount the database before performing the restore results in either a **Restore Failure** or a **Restore Completed with Warnings** job status.

> **i** | **IMPORTANT:** Windows Server 2008 supports Exchange Server 2007 SP1 or later; previous versions of Exchange 2007 are not supported. In a standard Exchange Server 2007 SP1 installation, there is an ESE client library (**esebcli2.dll**) in the Exchange Server **Bin** folder. The file version of **esebcli2.dll** is **8.1.240.5** for Exchange Server 2007 SP1. However, if this library is not replicated from the Exchange Bin folder to the Windows Bin folder, an older version of the .dll file might be present in the Windows Bin folder. Plug-in *for Exchange* uses the ESE client library that is available in the Windows Bin folder. If the older version of the library is contained in the Windows Bin folder, a backup or restore job might fail. If a failure occurs, save a copy of the ESE client library from the Windows Bin folder to a safe location, copy the ESE client library from the Exchange Server Bin folder to the Windows Bin folder, and run the backup or restore job again.

Volume Shadow Copy Service (VSS)

During a VSS-based restore, the plug-in instructs the **Exchange Store Writer** to coordinate with the **Exchange Information Store**—on behalf of the plug-in—to prepare the system for the restore, verify the restore targets, put back the data from the backup device, and then replay the transaction logs as needed.

Copy Files Restore Method

Plug-in *for Exchange* lets you restore the raw files from storage to a specific target directory. This method provides greater freedom in restoring database files, particularly when restoring files for nontraditional purposes, such as data mining or compliance auditing.

The Copy Files Restore Method does not require that you dismount databases from the Exchange Server. However, Database Recovery is not supported when using this restore method.

> **i** | **NOTE:** The Copy File Restore Method is required when creating a Staging Area or Target Directory to perform individual mailbox and mailbox item recovery. For more information, see the *Quest Recovery Manager for Exchange User Guide*.

Reviewing the Phases of the Restore Sequence

Each Exchange Server restore scenario has two distinct phases: the Restore Phase and the Recovery Phase.

Restore phase

The Restore Phase is used to transfer all the files included in a backup from storage to the local disk. This process can be done using one of the Restore Methods defined in Reviewing the available restore methods.

When performing restore sequences that include Incremental or Differential Backups, the Restore Phase is performed for each backup that is restored.

Ensure that adequate disk space is available on the volume or volumes where the databases are stored during a restore. If disk space is exhausted during the Restore Phase, the restore job fails.

Recovery phase

In the Recovery Phase, changes that were logged in the transaction log files are reapplied to the corresponding databases to bring the Exchange Server forward in time. This phase is only available when using the ESE or VSS Restore Method.

When restoring sequences of backups (if there are Incremental or Differential Backups), the Recovery Phase is performed one time as the final step in the restore sequence. Recovery is only performed once, regardless of the number of backups included in the restore sequence.

Restoring data using the plug-in

A standard restore procedure includes the steps outlined in the following topics:

- Selecting data for a restore
- Setting restore options
- Setting security options
- Finalizing and submitting the restore job

Selecting data for a restore

1   On the Navigation pane, click **Create Restore Job**.

2   On the **Create Restore Job—Choose Saveset** page, select **Plug-in** *for Exchange* from the **Plugin Type** list.

3   To filter the items displayed in the saveset table further, use the **Client**, **Date**, and **Job ID** lists.

   The table displays the saveset name (job title and saveset ID), creation date and time, and size. By default, the list is sorted by creation date.

   The following table outlines the backup-type identifiers:

Backup method	Backup type	Backup type identifier
Extensible Storage Engine	Full	ESE FULL
	Copy	ESE COPY
	Incremental	ESE INCREMENTAL
	Differential	ESE DIFFERENTIAL
Volume Shadow Copy Service	Full	VSS FULL
	Copy	VSS COPY
	Incremental	VSS INCREMENTAL
	Differential	VSS DIFFERENTIAL

4   In the saveset table, select the applicable item.

   When you select a saveset, the following details are displayed in the **Saveset Information** area: Job ID, job title, server name, client name, plug-in name, saveset date and time, retirement setting, Incremental Backup or not, Archive or not, saveset size, and snapshot-based backup or not.

5   Click **Next**.

6   On the **Create Selection Set** page, select the data that you want to restore.

   NetVault Backup lets you select from the following items for inclusion in a restore job, depending on what version of Exchange you are using:

   ▪   Entire Information Store

   ▪   Individual Storage Groups

   ▪   Sets of Storage Groups

   ▪   Individual Databases—including Mailbox Databases and Public Folder Databases

   ▪   Sets of Databases

7   If you are restoring data from a persistent snapshot, skip to Finalizing and submitting the restore job.

   To restore data from a persistent snapshot, no additional steps are required before you submit the job. After you submit the job, the plug-in automatically obtains the snapshot information from the backup index. If the snapshot is available, the plug-in mounts it locally and restores the selected files from the snapshot. If the snapshot is unavailable, the plug-in restores the file data from the storage media.

Setting restore options

The options displayed on the Restore and Recovery Options tab depend on the version of Exchange Server that you are using. Also, the options that are available for Exchange 2007 depend on the backup method that was used.

Setting restore and recovery options for Exchange 2007

On the **Create Selection Set** page, click **Edit Plugin Options**, and configure the following parameters on the **Restore and Recovery Options** tab:

- **Restore Method:** Select one of the following:

  - **Extensible Storage Engine (ESE)**: To restore selected data using the ESE method, which allows for the recovery of Full, Differential, and Incremental Backup types, select this option. For more information, see Extensible Storage Engine (ESE) Restore Method.

  - **Copy Files to Target Directory Only**: Select this option if you want to restore the raw files from storage to a specific target directory. When choosing this method, database recovery is not available. When restoring using this method, you do not have to dismount databases from the Exchange Server before the start of the restore job.

  - **Volume Shadow Copy Service (VSS)**: (available only for VSS-based backups) Select this option to restore selected data using the VSS method, which allows for the recovery of Full, Differential, and Incremental Backup types. For more information, see Volume Shadow Copy Service (VSS) backup method.

- **Restore Options:** Select the applicable options:

  - **Restore Files from Backup**: This option is selected by default to restore the files selected in a backup set. If the **Perform Recovery (Enable Only on Last Step in Restore Sequence)** option was *not* selected for the last restore job in a restore sequence, run an additional restore job. This job should have the same backup saveset selected, the **Restore Files From Backup** option *cleared*, and the **Perform Recovery (Enable Only on Last Step in Restore Sequence)** option *selected*. With these options set, NetVault Backup performs the recovery without re-transferring the data from the backup media to the Exchange Server.

  - **Temporary Directory Used During Restore**: (for restored log files on ESE-based backups only) Transaction log and patch files are stored in a temporary location during the restore and recovery process. In this field, specify an empty temporary directory for this restore job.

    > **i** | **IMPORTANT:** Ensure that the temporary directory is empty. Failing to do so can cause restore jobs to fail with "Restore Environment Information Corrupted" errors.

  - **Maximum Number of Parallel Streams**: Specify the maximum number of parallel restore streams that to use during the restore. By default, this field displays the maximum number that is allowed based on the version and edition of Exchange Server that was used to generate the backup.

  - **Dismount Databases before Restore (Not Recommended for Restores to Recovery Storage Groups)**: To dismount the databases that have been selected for restore automatically before actually performing the restore, select this option. *All* databases in selected Storage Groups are dismounted when restoring VSS-based backups. Also, databases in RSGs are not dismounted when this option is selected.

  - **Set 'This database can be overwritten by a restore' Flag for Databases (Not Required for ESE Restores to Original Database)**: To restore all databases involved in the restore operation automatically and eliminate the requirement to use an Exchange utility for this operation, select this option. If you do not select this option, Quest recommends that you use the Exchange Management Console, Exchange System Manager, or Exchange Management Shell to set the Overwrite Permissions to ensure a successful restore.

> **IMPORTANT:** Selecting **This database can be overwritten by a restore** has the following limitations:
>
> - When an RSG is configured for a database, the overwrite permission is *not* set for the databases in the RSG. Quest recommends that you do *not* select this option if the restore location is redirected to an RSG.
> - When the restore job has multiple databases in multiple Storage Groups, the overwrite permission is set for all the databases.
> - When you rename a Storage Group, the overwrite permissions are set for all databases in the target Storage Group.
> - When you rename databases, the overwrite permissions are set for the target databases.

- **Suspend Storage Group Replication before Restore**: (only available for Exchange 2007) Select this option to disable replication automatically to all Storage Groups that have replication enabled for LCR and CCR.

- **Update Storage Group Replication after Recovery (Deletes Existing Files and Resumes Replication)**: (only available for Exchange 2007 LCR environments) Select this option to update the replication data for LCR automatically. After the existing replicated database files have been deleted, the replication is updated by copying the new database and log files. This process deletes the existing replicated database and log files. After the restore job has been completed with this option, the status in the Exchange Management Console should be **Healthy**.

  > **NOTE:** After the **Update Storage Group Replication after Recovery** has completed successfully, the Storage Group **Copy Status** restored in the Exchange Management Console might show **Initializing** instead of **Healthy**. However, this status is not a problem because the Copy Status will change to Healthy after a new log file is generated for the active Storage Group.

- **Recovery Options:** Select the applicable options:

  - **Perform Recovery (Enable only on Last Step in Restore Sequence)**: Select this option when performing the last job of a restore sequence. If the restore sequence only includes a Full Backup, select this option for the Full Backup. If the restore sequence includes Incremental or Differential Restores, select this option when restoring the **last backup in the restore sequence**. This option finalizes the restore process after completion of the restore job for which it was selected, that is, the Exchange Server is alerted to perform necessary recovery tasks. All other options in the **Recovery Options** section are disabled unless this option is selected.

    > **IMPORTANT:** When the **Perform Recovery** option is used with the **Mount Databases after Recovery** option, NetVault Backup may not automatically remount all databases included in the restore, after the recovery completes. The Storage Groups that the selected databases belong to can be mounted using the Exchange Management Console (2007) utility. For information about remounting stores, see the relevant Exchange documentation.

  - **Verify Recovery Completion**: (ESE restores only) Select this option to let the recovery process, which includes replaying the restored log files, complete during the duration of the NetVault Backup Restore job. This option ensures that the status of the Restore job reflects bringing the Mailbox Databases into a consistent state and mounting the databases. Clearing this option ends the NetVault Backup Restore job after the files have been restored to Exchange Server and recovery has been initiated; however, the restore job status does not accurately reflect the status of the databases and the recovery. Therefore, log in locally to the target Exchange Server and verify the status of any restored data.

  - **Replay Current Logs**: (automatic for VSS-based backups) Select this option to instruct the plug-in to request that the target Exchange Server access additional transaction log files that were generated after the point at which the backup was taken. After the transaction log files have been accessed, they are applied during the Exchange Server's recovery operations, that is, after data restore is complete, to bring applicable databases to their most recent state.

> **i** | **IMPORTANT:** If the **Replay Current Logs** option is *cleared* for ESE-based backups, the current transaction logs are not applied during the recovery phase. This selection results in the loss of *all* data that is new or has been changed since the time of the backup.
>
> When restoring VSS-based backups, current logs are automatically replayed. Therefore, if you want to restore up to the point of the last backup, delete the current logs before the VSS Restore is performed.

- **Delete Temporary Log Files after Recovery:** (selected by default) Leave this option selected to delete temporary files and temporary log and patch files from the directory in the **Temporary Directory for Restored Log Files** field after the recovery process is completed. Clearing this option will retain the log and patch files after the recovery process is completed

  > **i** | **IMPORTANT:** The **Delete Temporary Log Files after Recovery** option should be selected in nearly all cases. If this option is not selected, subsequent restores that use the same directory for temporary files may result in restore failures in which Exchange reports incomplete, incongruous, or out-of-sequence log files and may result in database errors.

- **Mount Databases after Recovery**: (selected by default) This option can be selected to mount the dismounted databases within the databases automatically after the restore completes. Quest recommends that you leave this option selected; otherwise, manually mount the databases after completion of the restore to bring it back online.

Setting restore and recovery options for Exchange 2010 and later

On the **Create Selection Set** page, click **Edit Plugin Options**, and configure the following parameters on the **Restore and Recovery Options** tab:

- **Restore Method:** Select one of the following:

  - **Volume Shadow Copy Service (VSS)**: To perform the restore of selected data using the VSS method, which allows for the recovery of Full, Differential, and Incremental Backup types, select this option. For more information, see Volume Shadow Copy Service (VSS) backup method.

  - **Copy Files to Target Directory Only**: Select this option if you want to restore the raw files from storage to a specific target directory. When choosing this method, database recovery is not available. When restoring using this method, you do not have to dismount databases from the Exchange Server before the start of the restore job.

- **Restore Options:** Select the applicable options:

  - **Target Directory:** If you selected the **Copy Files to Target Directory Only** option, update the path for the target if you do not want to use the default.

    > **i** | **IMPORTANT:** Ensure that the temporary directory is empty. Failing to do so can cause restore jobs to fail with "Restore Environment Information Corrupted" errors.

  - **Maximum Number of Parallel Streams**: Specify the maximum number of parallel restore streams to use during the restore. By default, this field displays the maximum number that is allowed based on the version and edition of Exchange Server that was used to generate the backup.

  - **Do Not overwrite existing Files:** The option, which is selected by default, applies to the physical files that an Exchange Server database consists of, including database files, transaction logs, and partial transaction logs. This option works with both of the preceding Restore Method options.

    - To complete a soft recovery, leave this option selected to ensure that the plug-in does *not* overwrite a file of the same name in the specified target directory. For example, if you are restoring files to a database directory in which there are transaction logs and partial transaction logs that were created since the last backup was completed, selecting this option retains the existing logs and recovery includes the existing logs as well as additional transaction logs that were restored from the backup.

- To complete a hard recovery, clear this option to stop the plug-in from checking whether files of the same name exist in the specified target directory. For example, if you are restoring files to an empty database directory or you want to recover files up to the time that the last backup was completed, clearing this option ensures that the files from the last backup are recovered.

  > **i** | **IMPORTANT:** If you are restoring a sequence of Full and Incremental or Differential Backups, use the *same* setting for the **Do Not overwrite existing Files** option for *each* step in the sequence. For example, if you select the option when you restore the base Full Backup, make sure that you select the option for *every* subsequent Incremental or Different Backup as well.

- **Dismount Databases before Restore (Not Recommended for Restores to Recovery Storage Groups)**: To dismount the databases that have been selected for restore automatically before actually performing the restore, select this option. *All* databases in selected Mailbox Databases are dismounted when restoring VSS-based backups. Also, databases in RSGs are not dismounted when this option is selected.

- **Set 'This database can be overwritten by a restore' Flag for Databases (Not Required for ESE Restores to Original Database)**: To restore all databases involved in the restore operation automatically and eliminate the requirement to use an Exchange utility for this operation, select this option. If you do not select this option, Quest recommends that you use the Exchange Management Console, Exchange System Manager, or Exchange Management Shell to set the Overwrite Permissions to ensure a successful restore.

  > **i** | **IMPORTANT:** Selecting **This database can be overwritten by a restore** has the following limitations:
  > - When an RDB is configured for a database, the overwrite permission is not set for the databases in the RDB. Quest recommends that you do not select this option if the restore location is redirected to an RDB.
  > - When you rename a Mailbox Database, the overwrite permissions are set for all databases in the target Mailbox Database.
  > - When you rename databases, the overwrite permissions are set for the target databases.

- **Suspend database Replication before Restore**: (only available for DAG deployments) Select this option to disable database copying automatically for all Mailbox Databases that have DatabaseCopy enabled for DAG.

- **Update database Replication after Recovery (Deletes Existing Files and Resumes Replication)**: (only available for DAG deployments) Select this option to update database copying for DAG automatically. After the existing files of the database copy have been deleted, the database copy is updated by copying the new database and log files. This step deletes the existing database copy and log files. After the restore job has been completed with this option, the status in the **Exchange Management Console** should be **Healthy**. Updating a database copy might take a significant amount of time depending on the size of the database and the network bandwidth and latency.

  > **i** | **NOTE:** After the **Update Database Replication after Recovery** has completed successfully, the Mailbox Database **Copy Status** restored in the Exchange Management Console might show **Initializing** instead of **Healthy**. However, this status is not a problem because the Copy Status will change to Healthy after a new log file is generated for the active Mailbox Database.

- **Recovery Options:** Select the applicable options:

  - **Perform Recovery (Enable only on Last Step in Restore Sequence)**: Select this option when performing the last job of a restore sequence. If the restore sequence only includes a Full Backup, select this option for the Full Backup. If the restore sequence includes Incremental or Differential Restores, select this option when restoring the **last backup in the restore sequence**. This option finalizes the restore process after completion of the restore job for which it was selected, that is, the Exchange Server is then alerted to perform any necessary recovery tasks. All other options in the **Recovery Options** section are disabled unless this option is selected.

> **IMPORTANT:** When restoring VSS-based backups, current logs are automatically replayed. If you want to restore up to the point of the last backup, delete the current logs before the VSS Restore is performed.

- **Mount Databases after Recovery**: (selected by default) This option can be selected to mount the dismounted databases within the databases automatically after the restore completes. Quest recommends that you leave this option selected; otherwise, manually mount the databases after completion of the restore to bring it back online.

Setting security options

To specify job-specific authentication, click the **Security** tab, and configure the following parameters:

- **Exchange Administrator User Name**: By default, this field contains the administrator-level account that was used to back up the original target Exchange Server. You can change this value, but the account named must have the proper backup and restore permissions for the machine that is to serve as the target of the restore.

- **Password**: Enter the password associated with the user name specified in the previous field.

- **Windows Domain**: If a domain account is specified in the **Exchange Administrator User Name** field, enter the name of the domain. The field can be left blank if a local system account is specified.

Finalizing and submitting the restore job

The final steps include setting additional options on the Schedule, Source Options, and Advanced Options pages, submitting the job, and monitoring the progress through the Job Status and View Logs pages. These pages and options are common to all NetVault Backup Plug-ins. For more information, see the *Quest NetVault Backup Administrator's Guide*.

1. To save the settings, click **Ok**, and then click **Next**.

2. In **Job Name**, specify a name for the job if you do not want to use the default setting.

   Assign a descriptive name that lets you easily identify the job when monitoring its progress. The job name can contain alphanumeric and nonalphanumeric characters, but it cannot contain non-Latin characters. On Windows, there is no length restriction; however, a maximum of 40 characters is recommended.

3. In the **Target Client** list, select the machine on which you want to restore the data.

   > **TIP:** You can also click **Choose**, and then locate and select the applicable client in the **Choose the Target Client** dialog box.

4. Use the **Schedule**, **Source Options**, and **Advanced Options** lists to configure any additional required options.

5. Click **Save** or **Save & Submit**, whichever is applicable.

   You can monitor progress on the **Job Status** page and view the logs on the **View Logs** page. For more information, see the *Quest NetVault Backup Administrator's Guide*.

Performing post-restore steps for CCR, SCR, and DAG environments

Complete the steps outlined in the applicable topic:

- Performing post-restore steps for CCR environments
- Performing post-restore steps for SCR environments
- Performing post-restore steps for DAG environments

Performing post-restore steps for CCR environments

After restoring a CCR environment, continuous replication must be resynchronized with the **Update-StorageGroupCopy** command. For more information, see the following Microsoft resources:

- **How to Seed a Cluster Continuous Replication Copy:** http://technet.microsoft.com/en-us/library/bb124706.aspx
- **Update-StorageGroupCopy** command: http://technet.microsoft.com/en-us/library/aa998853.aspx
- **Resume-StorageGroupCopy** command: http://technet.microsoft.com/en-us/library/bb124529.aspx

ℹ | **IMPORTANT:** When performing disaster recovery or restoring to an alternate server, continuous replication is not enabled before initiating the restore; therefore, it is not necessary to disable or resume and update replication.

Performing post-restore steps for SCR environments

After restoring a Storage Group that has been configured with SCR, the passive copy must be resynchronized with the **Update-StorageGroupCopy** command. For more information, see the following Microsoft resources:

- **How to Seed a Cluster Continuous Replication Copy:** http://technet.microsoft.com/en-us/library/bb124706.aspx
- **Update-StorageGroupCopy** command: http://technet.microsoft.com/en-us/library/aa998853.aspx

ℹ | **IMPORTANT:** When performing disaster recovery or restoring to an alternate server, continuous replication is not enabled before initiating the restore; therefore, it is not necessary to disable or resume and update replication.

Performing post-restore steps for DAG environments

If you did not use the **Update database Replication after Recovery** option, use the Exchange Management Console or Shell to update the database copies manually. For more information, see the *Update a Mailbox Database Copy* topic at http://technet.microsoft.com/en-us/library/dd351100.aspx.

Examples of restore sequences

NetVault Backup sees all restore scenarios using the plug-in as a sequence of restores, from the recovery of a series of 10 Incremental Backups to the recovery of a single Full Backup. Therefore, you must follow a specific set of steps to recover data successfully. The following topics offer examples for various backup types. These examples assume that a noncontinuous replication environment is deployed.

- Restoring a standalone Full Backup
- Restoring Incremental Backup sequence
- Restoring Full and Differential Backup sequence

Restoring a standalone Full Backup

Restoring a single Full Backup is seen as a restore sequence by the Plug-in *for Exchange*. Therefore, you must follow these steps to restore a standalone Full Backup and ensure that its recovered data is suitable for use by Exchange.

1   On the Navigation pane, click **Create Restore Job**.

2   On the **Create Restore Job—Choose Saveset** page, select **Plug-in *for Exchange*** from the **Plugin Type** list.

3   In the saveset table, select the applicable item, and then click **Next**.

4   On the **Create Selection Set** page, select the objects to restore.

   For example, you can select the entire Information Store or only the databases that have been corrupted as detailed in Selecting data for a restore.

5   Note which items you selected.

6   Click **Edit Plugin Options**, and select the following options on the **Restore and Recovery Options** tab:

   ▪   Verify that the **Backup Type** is labeled **FULL**.

   ▪   In the **Restore Method** section, select **Extensible Storage Engine (ESE)** or **Volume Shadow Copy Services (VSS)**.

   ▪   In the **Restore Options** section, select **Restore Files from Backup**, enter the **Maximum Number of Parallel Streams**, and select **Dismount Databases before Restore**.

   ▪   In the **Recovery Options** section, select **Perform Recovery**, and then select **Mount Databases after Recovery**. If you are using the **VSS Restore Method**, verify that **Verify Recovery Completion**, **Replay Current Logs**, and **Delete Temp Log Files after Recovery** are also selected.

7   Click the **Security** tab, and enter the proper **Authentication Details**.

8   Complete and submit the job.

   For details, see Finalizing and submitting the restore job.

   On job completion, NetVault Backup finalizes the restore and recovery process and all restored data is accessible to the Exchange Server.

Restoring Incremental Backup sequence

This example assumes that Full Backups are performed every Sunday night at 11:00 p.m. and that Incremental Backups are performed Monday through Saturday at 11:00 p.m. Because recovery is being performed on Wednesday, Sunday's Full Backup followed by Monday's and Tuesday's Incremental Backup must be restored.

Recovering a sequence of Incremental Backups includes the steps outlined in the following topics:

•   Restoring the original Full Backup

•   Restoring all intermediary Incremental Backups

•   Restoring the final Incremental Backup

Restoring the original Full Backup

1   On the Navigation pane, click **Create Restore Job**.

2   On the **Create Restore Job—Choose Saveset** page, select **Plug-in *for Exchange*** from the **Plugin Type** list.

3   In the saveset table, select the Full Backup saveset that served as a starting point for the applicable Incremental Backup sequence, and then click **Next**.

4   On the **Create Selection Set** page, select the objects to restore.

For example, you can select the entire Information Store or only the databases that have been corrupted as detailed in Selecting data for a restore.

5   Note which items you selected.

6   Click **Edit Plugin Options**, and select the following options on the **Restore and Recovery Options** tab:

-    Verify that the **Backup Type** is labeled **FULL**.

-    In the **Restore Method** section, select **Extensible Storage Engine (ESE)** or **Volume Shadow Copy Services (VSS)**.

-    In the **Restore Options** section, select **Restore Files from Backup**, enter the **Maximum Number of Parallel Streams**, and select **Dismount Databases before Restore**.

-    In the **Recovery Options** section, clear **Perform Recovery**. All other options should be disabled.

7   Click the **Security** tab, and enter the proper **Authentication Details**.

8   Complete and submit the job.

For details, see Finalizing and submitting the restore job.

Restoring all intermediary Incremental Backups

1   On the Navigation pane, click **Create Restore Job**.

2   On the **Create Restore Job—Choose Saveset** page, select **Plug-in *for Exchange*** from the **Plugin Type** list.

3   In the saveset table, select the backup saveset that served as the first Incremental Backup in the sequence, and then click **Next**.

4   On the **Create Selection Set** page, select the objects to restore.

5   Click **Edit Plugin Options**, and select the following options on the **Restore and Recovery Options** tab:

-    Verify that the **Backup Type** is labeled **INCREMENTAL**.

-    In the **Restore Method** section, select **Extensible Storage Engine (ESE)** or **Volume Shadow Copy Services (VSS)**.

-    In the **Restore Options** section, select **Restore Files from Backup**, and enter the **Maximum Number of Parallel Streams**.

-    In the **Recovery Options** section, clear **Perform Recovery**. All other options should be disabled.

6   Click the **Security** tab, and enter the proper **Authentication Details**.

7   Complete and submit the job.

For details, see Finalizing and submitting the restore job.

8   Repeat Step 1 through Step 7 for all additional Incremental Backups in the order they were performed except for the *last* Incremental in the sequence.

Specific settings must be made for the last Incremental in the sequence; these settings are covered in the following topic.

Restoring the final Incremental Backup

1   With all previous restores successfully completed, including the original Full and subsequent Incrementals, click **Create Restore Job** on the Navigation pane.

2   On the **Create Restore Job—Choose Saveset** page, select **Plug-in *for Exchange*** from the **Plugin Type** list.

3   In the saveset table, drill down to the last Incremental Backup saveset in the sequence, and then click **Next**.

4   On the **Create Selection Set** page, see the data items that were restored in all previous Incremental Backup restore jobs, and select the *same items* for the restore.

5 Click **Edit Plugin Options**, and select the following options on the **Restore and Recovery Options** tab:

- Verify that the **Backup Type** is labeled **INCREMENTAL**.

- In the **Restore Method** section, select **Extensible Storage Engine (ESE)** or **Volume Shadow Copy Services (VSS)**.

- In the **Restore Options** section, select **Restore Files from Backup**, and enter the **Maximum Number of Parallel Streams**.

- In the **Recovery Options** section, select the following:

  - Select **Perform Recovery**.

  - If the most recent Differential Backup is selected for restore, select **Replay Current Logs**. If the Differential Backup selected for restore is *not* the most recent, that is, you are restoring an Exchange Server to a specific point before the last available Differential Backup job, clear **Replay Current Logs**.

    If this option is selected, the Exchange Server scans all recent logs and updates all data to its most recent state. The Exchange Server performs this process instead of leaving the restored data at the state it was in at the time the Incremental Backup was completed.

    When restoring VSS-based backups, current logs are automatically replayed. Therefore, if you want to restore up to the point of the last backup, the current logs must be deleted before the VSS Restore is performed.

  - Select **Mount Databases after Recovery**.

6 Click the **Security** tab, and enter the proper **Authentication Details**.

7 Complete and submit the job.

For details, see Finalizing and submitting the restore job.

Restoring Full and Differential Backup sequence

This example assumes that Full Backups are performed every Sunday night at 11:00 p.m. and that Differential Backups are performed Monday through Saturday at 11:00 p.m. If recovery is performed on Tuesday, Sunday's Full Backup and Monday's Differential Backup must be restored. If recovery is performed on Thursday, Sunday's Full Backup followed Wednesday's Differential Backup must be restored.

Recovering a Full and Differential Backup includes the steps outlined in the following topics:

- Restoring the original Full Backup

- Restoring the applicable Differential Backup

Restoring the original Full Backup

1 On the Navigation pane, click **Create Restore Job**.

2 On the **Create Restore Job—Choose Saveset** page, select **Plug-in *for Exchange*** from the **Plugin Type** list.

3 In the saveset table, select the Full Backup saveset that served as a starting point for the applicable Differential Backup sequence, and then click **Next**.

4 On the **Create Selection Set** page, select the objects to restore.

For example, you can select the entire Information Store or only the databases that have been corrupted as detailed in Selecting data for a restore.

5 Note which items you selected.

6 Click **Edit Plugin Options**, and select the following options on the **Restore and Recovery Options** tab:

- Verify that the **Backup Type** is labeled **FULL**.

- In the **Restore Method** section, select **Extensible Storage Engine (ESE)** or **Volume Shadow Copy Services (VSS)**.

- In the **Restore Options** section, select **Restore Files from Backup**, enter the **Maximum Number of Parallel Streams**, and select **Dismount Databases before Restore**.

- In the **Recovery Options** section, clear **Perform Recovery**. All other options should be disabled.

7 Click the **Security** tab, and enter the proper **Authentication Details**.

8 Complete and submit the job.

For details, see Finalizing and submitting the restore job.

Restoring the applicable Differential Backup

1 On the Navigation pane, click **Create Restore Job**.

2 On the **Create Restore Job—Choose Saveset** page, select **Plug-in *for Exchange*** from the **Plugin Type** list.

3 In the saveset table, select the applicable Differential Backup in the sequence, and then click **Next**.

4 On the **Create Selection Set** page, select the objects to restore.

For example, you can select the entire Information Store or only the databases that have been corrupted as detailed in Selecting data for a restore.

5 Click **Edit Plugin Options**, and select the following options on the **Restore and Recovery Options** tab:

- Verify that the **Backup Type** is labeled **DIFFERENTIAL**.

- In the **Restore Method** section, select **Extensible Storage Engine (ESE)** or **Volume Shadow Copy Services (VSS)**.

- In the **Restore Options** section, select **Restore Files from Backup**, and enter the **Maximum Number of Parallel Streams**.

- In the **Recovery Options** section, select the following:

  □ Select **Perform Recovery**.

  □ If the most recent Differential Backup is selected for restore, select **Replay Current Logs**. If the Differential Backup selected for restore is *not* the most recent, that is, you are restoring an Exchange Server to a specific point before the last available Differential Backup job, clear **Replay Current Logs**.

  If this option is selected, the Exchange Server scans all recent logs and updates all data to its most recent state. The Exchange Server performs this process instead of leaving the restored data at the state it was in at the time the Incremental Backup was completed.

  When restoring VSS-based backups, current logs are automatically replayed. Therefore, if you want to restore up to the point of the last backup, the current logs must be deleted before the VSS Restore is performed.

  □ Select **Mount Databases after Recovery**.

6 Click the **Security** tab, and enter the proper **Authentication Details**.

7 Complete and submit the job.

For details, see Finalizing and submitting the restore job.

On job completion, NetVault Backup finalizes the restore and recovery process and all restored data is accessible to the Exchange Server.

Using advanced restore procedures

This topic describes other restore operations that you can perform with the plug-in.

- Renaming Storage Groups/Mailbox Databases
- Moving databases to an alternate Storage Group
- Restoring data to a Recovery Storage Group (RSG) in Exchange 2007
- Restoring data to a Recovery Database (RDB) in Exchange 2010 and later
- Performing a disaster recovery of an Exchange Server
- Recovering to an alternate Exchange Server

Renaming Storage Groups/Mailbox Databases

- **Supported Exchange Versions**: 2007 and 2010
- **Supported Backup Methods**: ESE and VSS (2007 and 2010)

The Plug-in *for Exchange* allows you to rename a Storage Group/Mailbox Database during VSS-based restores. Renaming is useful if you do not want to overwrite the existing version and want to create a copy of the Storage Group/Mailbox Database. The following prerequisites are met before initiating the restore:

Ensure that the following prerequisites are met before initiating the restore:

- For Exchange 2007:
  - **Target Storage Group must exist**: The target Storage Group must be created in the Exchange System Manager or Exchange Management Console.
  - **Database names must match original**: The database names in the target Storage Group must match the database names in the original Storage Group.
  - **Database filenames must match original**: The database filenames in the target Storage Group must match the database filenames in the original Storage Group; however, the database file path or directory for the target Storage Group can be different.

  i | NOTE: Due to a scripting limitation of the Windows PowerShell, the plug-in does not support the use of single or double quotation marks in Storage Group/Mailbox Database names.

- For Exchange 2010 and later:
  - **Target Mailbox Database must exist**: The target Mailbox Database must be created in the Exchange System Manager or Exchange Management Console.
  - **Database names must be different from the original**: The name of the target Mailbox Database must be different from the name of the original database.
  - **Database filenames must be different from the original**: The database filenames in the target Mailbox Database must be different from the database filenames used in the original Mailbox Database.

  i | NOTE: Due to a scripting limitation of the Windows PowerShell, the plug-in does not support the use of single or double quotation marks in Storage Group/Mailbox Database names.

To complete the rename process, perform the following steps.

1. After the prerequisites have been met, click **Create Restore Job**.
2. Select **Plug-in *for Exchange*** from the **Plugin Type** list.
3. Select the Storage Group/Mailbox Database to restore from the backup saveset by following the instructions outlined in Selecting data for a restore, and click **Next**.

4   On the **Create Selection Set** page, click the Storage Group/Mailbox Database that you want to rename and select **Rename** from the context menu.

5   In the **Rename/Relocate** dialog box, enter the existing name of the target Storage Group/Mailbox Database in the **Rename** box, and click **Ok**.

The name of the Storage Group/Mailbox Database is updated to reflect the rename information in parentheses.

6   Continue with the restore procedure as explained in *Setting restore options* and Finalizing and submitting the restore job.

7   Open the **Exchange Management Shell**.

8   Run the applicable command:

- For Exchange 2007:

```
Get-Mailbox -Database <SourceDatabase> |where {$_.ObjectClass
   -NotMatch '(SystemAttendantMailbox|ExOleDbSystemMailbox)'}
      | Move-Mailbox -ConfigurationOnly -TargetDatabase <TargetDatabase>
```

- For Exchange 2010 and later:

```
Get-Mailbox -Database <SourceDatabase> |where {$_.ObjectClass
   -NotMatch '(SystemAttendantMailbox|ExOleDbSystemMailbox)'}
      | Set-Mailbox -Database <TargetDatabase>
```

Replace *<SourceDatabase>* with the name of the original database and *<TargetDatabase>* with the name of the destination.

Moving databases to an alternate Storage Group

- **Supported Exchange Versions**: Exchange 2007

- **Supported Backup Methods**: ESE and VSS

With the restore rename functionality, you can move a database to an alternate Storage Group.

> **i** | **IMPORTANT:** The plug-in does not support the relocation of database file paths. Use the **Exchange Management Console** or the **Exchange System Manager** to relocate a database file path. You can find complete instructions in the relevant Exchange documentation. In addition, see *How to Move a Storage Group Path* at: http://technet.microsoft.com/en-us/library/bb125252.aspx
>
> You cannot use the database rename feature to rename a database in the same Storage Group.
>
> You cannot restore a database to an alternate Storage Group if the same database has already been restored to a different database in that same Storage Group.
>
> If the source Storage Group has multiple databases, you cannot use a single restore job to restore the multiple databases to separate Storage Groups. You can move one database to a Storage Group in the first Restore job and move the next database to a different Storage Group in a subsequent Restore job.

Ensure that the following prerequisites are met before initiating the restore:

- **Target Storage Group must exist**: The target Storage Group must be created in the Exchange System Manager or Exchange Management Console.

- **Database must exist**: The target database must be created in the Exchange System Manager or Exchange Management Console.

To move a database to an alternate Storage Group, perform the following steps.

1   After the prerequisites have been met, click **Create Restore Job**.

2   Select **Plug-in** *for Exchange* from the **Plugin Type** list.

3   Select the Storage Group to restore from the backup saveset by following the instructions outlined in Selecting data for a restore, and click **Next**.

4   On the **Create Selection Set** page, click the Storage Group, and select **Rename** from the context menu.

5   In the **Rename/Relocate** dialog box, enter the existing name of the target Storage Group in the **Rename** box, and click **Ok**.

     The name of the Storage Group is updated to reflect the rename information in parentheses.

6   On the **Create Selection Set** page, expand the Storage Group, click the database being moved, and select **Rename** from the context menu.

7   In the **Rename/Relocate** dialog box, enter the existing name of the target database in the **Rename** box, and click **Ok**.

     The name of the database is updated to reflect the rename information in parentheses.

8   Continue with the restore procedure as explained in Setting restore options, ensuring that the **Set 'This Database Can Be Overwritten by a Restore'** option is selected for ESE-based restores, and Finalizing and submitting the restore job.

Restoring data to a Recovery Storage Group (RSG) in Exchange 2007

The RSG utility lets you create a special Storage Group that can be mounted outside of an actual Exchange Server's configuration to serve as a target for the restore of backed-up data. With an RSG in place, you can restore previously backed-up data to an RSG without disrupting the existing structure of the Exchange Server. This option is useful when previously backed-up individual Storage Group data, for example, Mailbox Stores and their contents, must be reviewed, but the Exchange Server must stay up and running. RSGs can also be useful when correspondence is accidentally deleted or must be recovered if there is a legal inquiry. Lost correspondence can be retrieved by performing individual mailbox or mailbox component recovery.

ℹ️ | **IMPORTANT:** Restoring to an RSG on an alternate Exchange Server is not supported.

You can find a complete description of RSGs and their usage in the relevant Microsoft Exchange documentation. For more information, see *Understanding Recovery Storage Groups* at http://technet.microsoft.com/en-us/library/bb124039.aspx.

•   **Supported Backup Methods**: ESE and VSS

The procedures that follow illustrate the steps required to establish an RSG in Exchange 2007 and how to use NetVault Backup to restore backed-up data to it.

Creating an RSG for Exchange 2007

Setting up an RSG involves two basic steps:

1   Creating an RSG.

2   Adding databases to restore.

You can find complete instructions for these procedures in the relevant Microsoft Exchange documentation. For more information, see *Working with Recovery Storage Groups in Exchange 2007* at http://www.msexchange.org/tutorials/Working-Recovery-Storage-Groups-Exchange-2007.html?printversion.

Restoring data to an RSG for Exchange 2007

With the RSG successfully created and the appropriate databases added to it, you can begin restore procedures of the applicable data to the RSG.

> **IMPORTANT:** To avoid complications in a restore of this type, Quest recommends that you restore individual Storage Groups on a one-per-job basis; that is, only select an individual Storage Group for inclusion in a single restore job.

Depending on your backup-and-recovery strategy, see the applicable procedure in Examples of restore sequences for instructions on restoring data items in a backup saveset to an RSG.

During an RSG restore operation, the Plug-in *for Exchange* will redirect recovered data to the RSG rather than overwriting the original database.

Viewing data restored to an RSG for Exchange 2007

For Exchange Server 2007, the **Exchange Troubleshooting Assistant (ExTRA)** and **Windows PowerShell** included with Exchange 2007 may be used to extract data from a database in an RSG. For information about using these utilities, see the relevant Exchange documentation. For additional information, see *How to Recover a Mailbox by Using a Recovery Storage Group* at: http://technet.microsoft.com/en-us/library/aa997694.aspx

Restoring data to a Recovery Database (RDB) in Exchange 2010 and later

Because Exchange 2010 and later do not use Storage Groups, it includes the RDB feature as a replacement for the RSG. An RDB is similar to RSG in that it is a special database that is created to hold a restored database where data can be extracted without disturbing user access. The RDB enables the recovery of accidentally deleted mailboxes and other email items, as well supporting data recovery for legal inquiries.

You can find a complete description of RDBs and their usage in the relevant Microsoft Exchange documentation. For more information, see *Recovery Databases* at http://technet.microsoft.com/en-us/library/dd876954.aspx.

- **Supported Backup Method**: VSS only

The following procedures illustrate the steps required to establish an RDB in Exchange 2010 or later, and how to use NetVault Backup to restore backed-up data to it. To create an RDB, use the Exchange Management Shell.

Creating an RDB for Exchange 2010 and later

1 Open the **Exchange Management Shell**.

2 Enter the following command:

```
New-MailboxDatabase -Recovery -Name <RDB_Name> -Server <Exchange_Server_Name>
```

> **IMPORTANT:** When you create the RDB, do *not* use **Mount-Database**. If the database is mounted, the initial Exchange Server database transaction logs are generated. These logs might interfere with the restore job and cause it to fail.

You can find complete instructions for this procedure in the relevant Microsoft Exchange documentation. For more information, see *Create a Recovery Database* at http://technet.microsoft.com/en-us/library/ee332321.aspx.

Restoring data to an RDB for Exchange 2010 and later

With the RDB successfully created, you can restore data to it by completing the steps outlined in Renaming Storage Groups/Mailbox Databases. Amend those steps to including the following steps:

1 After you select the **Rename to** check box in the **Rename/Relocate** dialog box, enter the name of the RDB in the text box to direct the backup to the RDB.

2 On the **Create Selection Set** page, click **Edit Plugin Options**, and select the following options on the **Restore and Recovery Options** tab:

   ▪ **Set 'This database can be overwritten by a restore' Flag for Databases (Not Required for ESE Restores to Original Database)**

   ▪ **Perform Recovery (Enable only on Last Step in Restore Sequence)**

   ▪ **Mount Databases after Recovery**

3 If you created the RDB on an Exchange Server that is *not* the active server, select the applicable NetVault Backup Client from the **Target Client** list on the **Create Restore Job** page.

   In a DAG, the plug-in automatically directs the restore job for an RDB to the active server in the cluster. If you created the RDB on an Exchange Server that is not the active server, select the client in the Exchange Server that hosts the RDB.

Extracting the data from the RDB for Exchange 2010 and later

After you have restored the database to the RDB, use the **Exchange Management Shell** to extract the data from the RDB to the active mailboxes.

- Exchange 2010: If you are using the original version of Exchange 2010, use the following command:

```
Restore-Mailbox -Identity <User_Name> -RecoveryDatabase <RDB_Name>
```

  The following example restores a mailbox for a user named Scott from the RDB named RDB1:

```
Restore-Mailbox -Identity Scott -RecoveryDatabase RDB1
```

- Exchange 2010 SP1 and later: If you are using service pack 1 or later of Exchange 2010, use the following command:

```
New-MailboxRestoreRequest -SourceDatabase "<RDB_Name>"
   -SourceStoreMailbox "<SourceMailbox_GUID>" -TargetMailbox "<TargetMailBox>"
   -AllowLegacyDNMismatch
```

  The following example restores a mailbox with a GUID of 1d20855f-fd54-4681-98e6-e249f7326ddd for a user named Scott from the RDB named RDB1:

```
New-MailboxRestoreRequest -SourceDatabase "RDB1"
   -SourceStoreMailbox "1d20855f-fd54-4681-98e6-e249f7326ddd"
   -TargetMailbox "Scott" -AllowLegacyDNMismatch
```

  The optional `AllowLegacyDNMismatch` parameter lets you restore the source mailbox to a mailbox that does not have the same legacy DN value.

You can find complete instructions for this procedure in the relevant Microsoft Exchange documentation. For more information, see *Restore Data Using a Recovery Database* at http://technet.microsoft.com/en-us/library/ee332351.aspx.

Performing a disaster recovery of an Exchange Server

This topic briefly describes how to recover an Exchange system by using backups performed with the Plug-in *for Exchange*. You can use this procedure to rebuild an Exchange Server if the original was destroyed or is otherwise unusable. If you are rebuilding an Exchange Server, the **Active Directory** service should be available in **Disaster Recovery Mode**.

The restore sequence performed should bring the Exchange Server up to the most current point before the failure of the Exchange Server. This sequence could include restoring a Full Backup, a Full Backup plus a Differential Backup, or a Full Backup plus Incremental Backups depending on your Exchange Server backup-and-recovery strategy. However, Quest strongly recommends that you consult the Microsoft documentation for the Exchange version in use for complete details on the proper way to perform this type of recovery. For additional information:

- **Exchange 2007, How to Recover a Lost Exchange Server:** http://technet.microsoft.com/en-us/library/bb123496.aspx

- **Exchange 2010, Recover Exchange Server** or **Recover a Database Availability Group Member Server:** http://technet.microsoft.com/en-us/library/dd876880(v=exchg.141).aspx and http://technet.microsoft.com/en-us/library/dd638206(v=exchg.141).aspx

- **Exchange 2013, Recover Exchange Server** or **Recover a Database Availability Group Member Server:** https://technet.microsoft.com/en-us/library/dd876880(v=exchg.150).aspx and https://technet.microsoft.com/en-us/library/dd638206(v=exchg.150).aspx

- **Exchange 2016, Recover an Exchange Server** or **Recover a Database Availability Group Member Server:** http://technet.microsoft.com/en-us/library/dd876880.aspx and http://technet.microsoft.com/en-us/library/dd638206.aspx

To perform the restore, perform the following steps.

1   **Reinstall the OS.**

    The OS and service pack must be identical to the OS and service pack that was installed when the backup saveset was created.

2   **Reinstall Exchange in Recovery Mode.**

    The Exchange version, edition, and service pack must be identical to the version, edition, and service pack of Exchange that was installed when the backup saveset was created. For complete instructions, see the relevant Microsoft Exchange documentation identified earlier.

3   **If you are using Exchange 2007, create an Exchange Server.**

    This server functions as the target of the relocation restore. If the original Exchange Server had continuous replication such as LCR, CCR, or SCR, continuous replication should *not* be configured before performing the restore. Also, the new Exchange Server must be accessible to the Plug-in *for Exchange* on the new restore target.

4   **Reinstall the NetVault Backup Client and the Plug-in** *for Exchange*.

5   **Add the Exchange Server to the NetVault Backup Domain as a Client.**

    For more information, see the *Quest NetVault Backup Administrator's Guide.*

6   **For details on restoring Exchange backups, see *Restoring data using the plug-in*.**

    > **i** | **IMPORTANT:** Because continuous replication is not enabled before initiating the restore, it is not necessary to disable or resume and update replication when restoring in a disaster-recovery scenario.

7   If applicable, enable continuous replication including LCR, CCR, and SCR.

Recovering to an alternate Exchange Server

The Plug-in *for Exchange* also lets you take the backup of a Storage Group/Mailbox Database performed on one Exchange Server and restore it to a secondary Exchange Server. This option can be beneficial when you must recover a Storage Group/Mailbox Database to access its contents while leaving the initial Exchange Server untouched and operational. In addition, restoring to a secondary Exchange Server can be a good method for testing the integrity of backed-up data without interfering with a running Exchange Server. This topic offers instructions on restoring Full, Incremental, and Differential Backup types to a secondary Exchange Server.

Before performing this type of restore, the following actions must be performed on the machine that is to serve as the new target for the restored Exchange Server data:

- **Clean installation of Exchange has been performed on the new target server**: Quest recommends that you complete this step on a newly installed Exchange Server, rather than an existing one.

- **Target server established in a different network domain (ESE-based backups only)**: For this operation to work, the target machine for this operation *must* reside on a different network domain than where the original Exchange Server resides. If these two machines are set up on the same domain, NetVault Backup always attempts to recover the selected data to the *original* Exchange Server. VSS-based backups can be restored to target servers in the same network domain.

- **Storage Groups/Mailbox Databases set up on the target machine:**

  - **For ESE-based backups (only applies to Exchange 2007)**: Before attempting the restore of a specific Storage Group, the target machine must be set up to mirror that Storage Group's structure—names and directory paths—as it was displayed on the original machine. For example, if a Storage Group contains five individual Mailbox Databases and originally existed in the root of the C:\ partition, a Storage Group must be established on the target machine with the same name, it must contain five Mailbox Databases all named **the same** as the originals, and it **must** be located in the root of the C:\ partition.

  - **For VSS-based backups (required for Exchange 2010 and later):** The target Storage Group/Mailbox Database names, database names, database filenames, and the database file path or directory cannot match the original Storage Groups/Mailbox Databases; they must be different.

    > **i** | **IMPORTANT:** When you use the Exchange Management Console to create the target database in the destination Exchange Server, do *not* select the Mount Database option. If you select this option, Exchange generates the initial set of database transaction logs. These logs might interfere with the restore job and cause it to fail. By not selecting the Mount Database option, Exchange adds the database to the Exchange Server and creates an empty directory for the database. The restore job populates the directory during completion of the job.

- **NetVault Backup and the Plug-in *for Exchange* must be installed on both machines**: For this operation to work, NetVault Backup and the plug-in must be installed on *both* the original Exchange Server and the machine set up as the new target.

- **Both machines must be added to the NetVault Backup Server as Clients**: On the **Manage Clients** page of the NetVault Backup Server, ensure that *both* machines have been successfully added as NetVault Backup Clients. For details on adding Clients to the NetVault Backup Server, see the *Quest NetVault Backup Administrator's Guide*.

To perform the restore, complete the following steps.

1 After the prerequisite operations are finished, use the NetVault Backup WebUI to restore the applicable Storage Groups/Mailbox Databases.

   This process is similar to the standard restore process illustrated earlier, except for a few steps.

   This sample procedure assumes that a Full Backup is being restored and not an Incremental or Differential Backup. If you intend to recover a series of Incremental or Differential Backups as well, you would follow this procedure to recover the initial Full Backup first. Subsequent Incremental or Differential Backups would then be recovered as a standard restore of this type. The difference is that you must select the alternate Exchange Server from the **Target Client** list.

2 For details on restoring Exchange backups, see *Restoring data using the plug-in*, and note the following exceptions:

- Because continuous replication is not enabled before initiating the restore, you do not have to disable or resume and update replication when restoring to an alternate server.

- If the name of the target database for the restore job is different from the original database that was backed up, that is, you used the Exchange Management Console to create a database, complete the following steps:

    a   On the **Create Selection Set** page, click the original database, and select **Rename** from the context menu.

    b   In the **Rename/Relocate** dialog box, enter the name of the new target Mailbox Database in the **Rename** box, and click **Ok**.

- On the **Restore and Recovery Options** tab, select **Set 'This database can be overwritten by a restore' Flag for Databases (Not Required for ESE Restores to Original Database)**.

- If applicable, change the other options on the **Restore and Recovery Options** tab.

    For more information, see Setting restore options.

- Click the **Security** tab, and complete the applicable **Authentication Details** fields:

    □   **Exchange Administrator User Name**: By default, this field contains the administrator-level account that was used to back up the original target Exchange Server. You can change this value, but the account named must have the proper backup and restore permissions for the machine that is to serve as the target of the restore.

    □   **Password**: Enter the password associated with the user name specified in the previous field.

    □   **Windows Domain**: This field can be left blank, as it is not requirement for recovering to a different Exchange Server.

- In **Job Name**, specify a name for the job if you do not want to use the default setting.

    Assign a descriptive name that lets you easily identify the job when monitoring its progress. The job name can contain alphanumeric and nonalphanumeric characters, but it cannot contain non-Latin characters. On Windows, there is no length restriction; however, a maximum of 40 characters is recommended.

- In the **Target Client** list, select the Exchange Server on which the target database was created.

- Click **Save** or **Save & Submit**, whichever is applicable.

    You can monitor progress on the **Job Status** page and view the logs on the **View Logs** page. For more information, see the *Quest NetVault Backup Administrator's Guide*.

3   Completing post-restore requirements for ESE-based backups:

- If you are restoring into a domain that might have existing user accounts, Quest recommends that you scan and clean the Mailbox Database. This step ensures that any previously disconnected mailboxes are updated appropriately. For complete instructions, see the relevant Microsoft Exchange 2007 documentation. Also, see *Clean-MailboxDatabase* at:
    http://technet.microsoft.com/en-us/library/bb124076.aspx

- Because the Exchange Server acting as the target for the restore was established on a different network domain, none of the user accounts from the original Exchange Server's Active Directory exist in the new domain. Therefore, you must import all the user accounts from the original Exchange Server's Active Directory to the new Exchange Server's Active Directory. In Exchange 2007, you can perform this task by using the Exchange Management Shell scripts. For complete instructions, see the relevant Microsoft Exchange 2007 documentation. Also, see *How to Generate Active Directory Accounts By Using the Mailbox Information in the Mailbox Database* at:
    http://technet.microsoft.com/en-us/library/bb430758.aspx

4   Completing post-restore requirements for VSS-based backups:

Because existing user accounts still point to the previous database, you must use the Exchange Management Console to point to the new database.

    a   Open the **Exchange Management Shell**.

b   Run the applicable command:

▫ For Exchange 2007:

```
Get-Mailbox -Database <SourceDatabase> |where {$_.ObjectClass
    -NotMatch '(SystemAttendantMailbox|ExOleDbSystemMailbox)'}
    | Move-Mailbox -ConfigurationOnly -TargetDatabase <TargetDatabase>
```

▫ For Exchange 2010 and later:

```
Get-Mailbox -Database <SourceDatabase> |where {$_.ObjectClass
    -NotMatch '(SystemAttendantMailbox|ExOleDbSystemMailbox)'}
    | Set-Mailbox -Database <TargetDatabase>
```

Replace *<SourceDatabase>* with the name of the original database and *<TargetDatabase>* with the name of the destination.

Troubleshooting

* Upgrading the plug-in fails
* Diagnosing and resolving VSS-related issues
* Addressing cluster-related issues
* Troubleshooting other issues

Upgrading the plug-in fails

Symptom

If the **nvexchangeserver.exe** process is running when you install an upgrade, the upgrade might fail and display the following message:

```
Failed to install software. A key could not be installed.
```

Solution

To work around this issue, do either of the following on the NetVault Backup Client where Exchange Server is running:

* Use Windows Task Manager to locate and stop the **nvexchangeserver.exe** process.
* Stop and start the **NetVault Backup Service**.

For more information on stopping and starting the NetVault Backup Service, see the *Quest NetVault Backup Administrator's Guide*.

Diagnosing and resolving VSS-related issues

When a VSS-backup job is run, the plug-in might generate one or more shadow copies (snapshots). After completing the job, the plug-in sends the VSS subsystem a notification indicating that the shadow copy can be deleted. Also, if the VSS job is canceled for any reason and the plug-in detects the event, the plug-in sends the same type of notice. However, there are instances in which shadow copies are not deleted, which means that the VSS inadvertently stores obsolete shadow copies.

If the plug-in is unable to create a VSS shadow copy, or if the backup job fails during the processing of taking or managing snapshots, it might indicate that obsolete shadow copies are interfering with the VSS subsystem.

In addition to the NetVault Backup logs and the individual job logs, the following resources can expedite the diagnoses of VSS-related issues with backup and restore jobs.

- **Windows Application Log**: In this log, VSS Writers record detailed error messages that are not logged in the NetVault Backup logs. For more information, see *Windows Application Log* at http://msdn.microsoft.com/en-us/library/ms157312.aspx.

- **Vssadmin and DiskShadow:** You can use Vssadmin to list the VSS writers and providers, display their status, and ensure that the VSS Writers that the plug-in depends on are enabled and available. Vssadmin also indicates whether it has encountered any errors. DiskShadow, which is a newer utility, also provides information that might be useful. For more information, see http://technet.microsoft.com/en-us/library/bb491031.aspx and http://technet.microsoft.com/en-us/library/cc772172(v=WS.10).aspx.

  You can also obtain additional information from a command prompt by typing **vssadmin** or **diskshadow**.

Quest recommends that you use the Vssadmin and DiskShadow utilities to maintain the VSS subsystem, and to address specific issues, such as deleting obsolete shadow copies. You can use these utilities to list the shadow copies stored by the VSS, remove shadow copies, and manage the space allocated in a specific volume for the storage of shadow copies.

> **i** | **NOTE:** In addition to using these utilities to remove the shadow copies, Quest recommends that you restart the Volume Shadow Copy and the Microsoft Software Shadow Copy Provider services before resuming a VSS-backup job. In some instances, you might also have to restart the Microsoft Exchange Information Store service.

Addressing cluster-related issues

Clustered Exchange environments, such as DAG, present more challenges, especially when the plug-in tries to detect all the applicable NetVault Backup Clients or when the clients must communicate with each other. Usually, NetVault Backup scans the network to locate known NetVault Backup Clients. However, under certain conditions, such as when clients are in the same network but different segments or when clients are located in geographically distant networks, the NetVault Backup Clients might not be aware of each other. This issue can cause errors, such as the display of a "Failed to launch Proxy Master in *<NameOfNetVaultBackupClient>*" message in the binary log during a backup job. This message might indicate that the NetVault Backup Client that is running the backup job is not aware of the network location of the client that is specified in the message.

To work around this issue, you can use the **"machines.dat"** file to identify all clients that the NetVault Backup Client must be aware of. Each NetVault Backup Client contains this list of known NetVault Backup Clients in the NetVault Backup installation's **etc** directory. For example, in a typical Windows installation, the path is: **C:\Program Files (x86)\Quest\NetVault Backup\etc\machines.dat**. Adding a known NetVault Backup Client name as an IP address to this file lets the local NetVault Backup Client locate the remote NetVault Backup Client in the network.

If you encounter the "Failed to launch Proxy Master in *<NameOfNetVaultBackupClient>*" message, Quest recommends that you add all NetVault Backup Clients in an Exchange cluster to the specific NetVault Backup Client that runs the backups. In the following steps, the DAG contains three NetVault Backup Clients: Client_1, Client_2, and Client_3. The NetVault Backup Client that manages backups is Client_1, so the "machines.dat" file on Client_1 is the one that you would modify.

To add a client, perform the following steps.

1 Open the NetVault Backup Configurator, and select the **Service** tab.

2 On the **Service** tab, click **Stop Service**.

  NetVault Backup Services are stopped.

3 In Windows, navigate to the **etc** directory where NetVault Backup is installed, for example, C:\Program Files (x86)\Quest\NetVault Backup\….

4 To ensure that you can restore the original settings if necessary, make a backup copy of the **"machines.dat"** file, for example, "machines.dat_saved."

5 Use a text editor to open the original **"machines.dat"** file.

6 Verify that the local NetVault Backup Client, for example, Client_1, is already listed in the file.

```
[Client_1]
```

```
Networks=<IPaddressOfClient_1>
Preferred Address=<IPaddressOfClient_1>
Contact Address=<IPaddressOfClient_1>
```

7   At the end of the file, add a section for each additional client that the local NetVault Backup Client, for
    example, Client_1, must be aware of—replace *<IPaddressOfClient_x>* with the applicable IP address.

```
[Client_2]
Networks=<<IPaddressOfClient_2>
Preferred Address=<IPaddressOfClient_2>
Contact Address=<IPaddressOfClient_2>

[Client_3]
Networks=<IPaddressOfClient_3>
Preferred Address=<IPaddressOfClient_3>
Contact Address=<IPaddressOfClient_3>
```

8   Save the file.

9   Return to the **Service** tab in the NetVault Backup Configurator, and click **Start Service**.

    The Current State changes to Running.

10 If the **Current State** remains **Running**, the changes have been implemented; otherwise, if the state
    changes to **Stopped** after a few seconds, complete the following steps:

    a   Open the Windows Task Manager, and select the **Processes** tab.

    b   To display the processes in alphabetical order, click the **Image Name** column heading.

    c   To determine whether the **nvstatsmngr.exe** or **nvstatsmngr.exe*32** process is listed, check the
        list.

    d   If either process is listed, select it, and click **End Process**.

    e   If a confirmation prompt is displayed, click **End Process**.

    f   Close the Task Manager, return to the NetVault Backup Configurator, and click **Start Service** again.

    After these steps are completed, NetVault Backup automatically updates the information in the
    "machines.dat" file with additional information for each NetVault Backup client that you added.

    For example:

```
[Client_2]
Type=xxxx
UDP Fragment Size=xxxx
Server=xxxx
Description=xxxx
NVVersion=xxxx
NVBuildLevel=xx
Networks=nnn.nnn.nnn.nnn
Preferred Address=nnn.nnn.nnn.nnn
Contact Address=nnn.nnn.nnn.nnn
Fixed entry=xxxx
Id=xx
Version=xxxxxxxx
Outside Firewall=xxxx
```

Troubleshooting other issues

This topic describes some common errors and their solutions. In cases where an error occurs and is not described in this table, obtain the Microsoft Exchange Server error number from the NetVault Backup logs, and then see the relevant Microsoft Exchange Server documentation for help.

Table 1. Troubleshooting

Error message	Explanation
NetVault Backup 10.x service (netvault-pgsql) does not start on Windows	To see if the following message is displayed, check the Windows Event Viewer: PDT FATAL: lock file "postmaster.pid" already exists. NetVault Backup 10.x uses a PostgreSQL database. If the PostgreSQL database does not start, NetVault Backup cannot start. To correct this issue, delete the **"postmaster.pid"** file from the location referenced in the log and restart the NetVault Backup Server. For more information, see https://support.questcom/netvault-backup/kb/122475.
Failed to Connect or Failed to log in as user *<userName>*	Ensure that all relevant Exchange Services are started before initiating backup or restore jobs. These services include: • **Microsoft Exchange Information Store** • **Microsoft Exchange System Attendant** • **Microsoft Exchange Replication Service** (LCR and CCR environments) • **Microsoft Software Shadow Copy Provider** (VSS backups) • **Volume Shadow Copy** (VSS backups)—started automatically by Microsoft Software Shadow Copy Provider
Failed to get Backup Components	Ensure that Exchange Server databases are mounted. Also, when performing backups of passive data, verify that the passive copies in CCR and LCR environments have a state of **Healthy** in the **Exchange Management Console**. If the passive copy has a status of **Failed**, the backup fails. The **Failed** passive copy can be returned to a **Healthy** state by deleting it and updating it with the **Update-StorageGroupCopy** command. For more information about this command, see http://technet.microsoft.com/en-us/library/aa998853.aspx.
No Suitable Media for Job	This error occurs when multiple Storage Groups/Mailbox Databases are backed up simultaneously by using parallel streams and the number of media drives is less than the number of Storage Groups/Mailbox Databases.
An error occurred. Please check that databases are dismounted.	Even if a specific database has been dismounted, if the **This database can be overwritten by a restore** option is not selected on the **Database** tab of the **Store Properties** dialog box, this error occurs.
• Failed to add backup record • Failed to write index of backup to the database These messages indicate that the selected data was backed up, but the job's index information was not properly added by NetVault Backup to its database. Without this index information, the data cannot be properly restored.	**Method 1:** Open the **Manage Devices** page, select the backup media, and click **Scan**. NetVault Backup stores index information for backup jobs in two locations: in the NetVault Database and on the media targeted by the backup. When you scan the backup media, the index information is added to the NetVault Database. To verify that the information was added, open the **Manage Job Definitions** page, and locate the specific job. If you can run the job now, the scan process has corrected the problem. **Method 2:** If the scan has failed, run the backup job again.

Table 1. Troubleshooting

Error message	Explanation
In clustered environments of Exchange Server 2007, the following operations do not work: • Mount and dismount databases • Suspend and update replication of Storage Groups	This problem is isolated to the Exchange Server 2007 RTM version in a clustered environment. Ensure that Exchange Server 2007 RTM has been upgraded to Exchange Server 2007 Service Pack 1 or later.
Replication fails with Event ID 2070 on an LCR database after a successful Incremental or Differential restore	The restore job is completed successfully and the Plug-in *for Exchange* updates the replication for the Storage Group without a problem. However, after a Differential restore on a replicated database, the reseeding process fails on the passive node. If you view the Copy Status field in the Exchange Management Console for the Storage Group, the status is Failed, even though it should have been Healthy. Even if you try to update the replicated copy of the Storage Group, the status remains Failed. To resolve this issue, upgrade the Exchange Server with Update Rollup 9 for Exchange 2007 Service Pack 1. For more information, see https://technet.microsoft.com/en-us/library/bb218741(v=exchg.80).aspx. Alternatively, if you cannot upgrade the Exchange Server, perform a full backup after the restore job and update the replicated copy of the Storage Group.

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Contacting Quest

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