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# **FOREWORD**

# **Scope and Intended Audience**

**Scope.** This publication describes how to install, configure, administer and use the Avamar Exchange Client.

**Intended Audience.** The information in this publication is primarily intended for:

- System administrators who are responsible for installing software and maintaining servers and clients on a network
- Microsoft Exchange Administrators who are responsible for backing up and maintaining Microsoft Exchange servers

**Prerequisites.** Persons using this publication should have current practical experience with the following:

- Operating system shell commands on your Exchange platform (root permission required)
- The specific version of Microsoft Exchange currently deployed at your site

# **Product Information**

For current documentation, release notes, software updates, as well as information about EMC products, licensing and service, go to the EMC Powerlink web site at http://Powerlink.EMC.com.

# **Your Comments**

Your suggestions will help us continue to improve the accuracy, organization and overall quality of the user publications. Please send your opinion of this document to:

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Please include the following information:

- Product name and version
- Document name, part number and revision (for example, A01)
- Page numbers
- Other details that will help us address the documentation issue

# **Typeface Conventions**

The following table provides examples of standard typeface styles used in this publication to convey various kinds of information.

EXAMPLE	DESCRIPTION
Click <b>OK</b> or - Select <b>File &gt; Close</b> .	Bold text denotes actual Graphical User Interface (GUI) buttons, commands, menus and options (any GUI element that initiates action).
	Also note in the second example that sequential commands are separated by a greater-than (>) character. In this example, you are being instructed to select the <b>Close</b> command from the <b>File</b> menu.
Type: cd /temp	Bold fixed-width text denotes shell commands that must be entered exactly as they appear in this publication.
logfile=FILE	All caps text often denotes a placeholder (token) for an actual value that must be supplied by the user. In this example, FILE would be an actual filename.
Installation Complete.	Regular (not bold) fixed-width text denotes command shell messages. It is also used to list code and file contents.

# **Notes, Tips and Warnings**

The following kinds of notes, tips and warnings appear in this publication:

**IMPORTANT:** This is a warning. Warnings always contain information that if not heeded could result in unpredictable system behavior or loss of data.

**TIP:** This is a tip. Tips present optional information intended to improve your productivity or otherwise enhance your experience with our product. Tips never contain information that will cause a failure if ignored.

**NOTE:** This is a general note. Notes contain ancillary information intended to clarify a topic or procedure. Notes never contain information that will cause a failure if ignored.

# INTRODUCTION

The Avamar Exchange Client provides a complete backup and recovery solution for Microsoft Exchange Server 2007, 2003 and 2000 platforms.

# **Important Terms and Concepts**

Recovery data stored in an Avamar system is inherently on line all the time. Once an Exchange server has been backed up to the Avamar system, the entire Exchange server or one or more Exchange message folders can be quickly recovered without having to locate and mount tape media.

**Exchange 2003 and 2000.** On Exchange 2003 and 2000 platforms, the Avamar Exchange Client adds two plug-ins to the Exchange server — an Avamar Exchange Database plug-in for backing up and restoring the Exchange database and a MAPI-based Avamar Exchange Message plug-in for backing up and restoring the Exchange message folders within individual mailboxes.

**Exchange 2007.** On Exchange 2007 platforms, the Avamar Exchange Client adds two plug-ins to the Exchange server — an Avamar Exchange Database plug-in for backing up and restoring the Exchange database and a MAPI-based Avamar Exchange Message plug-in for backing up and restoring the Exchange message folders within individual mailboxes.

# Standalone and High-Availability Deployments

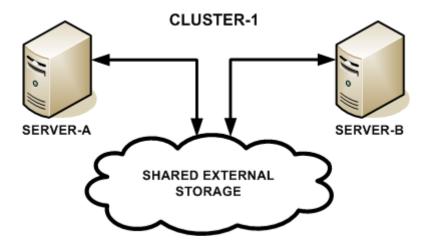
Microsoft Exchange Server can be deployed in various configurations.

The simplest configuration is a single Windows network host running Microsoft Exchange Server. This will be referred to as a "standalone" configuration in the remainder of this publication.

However, most larger enterprises typically deploy Microsoft Exchange Server in some "high-availability" configuration. This typically involves the use of Windows clusters, Exchange 2007 replication, or both.

#### **Windows Clusters**

Windows clusters comprise at least two servers (SERVER-A and SERVER-B) and some amount of shared external storage.



For purposes of our discussion, it is crucial to understand that Windows clusters are not application specific. A Windows cluster can host any windows application, including Microsoft Exchange.

### **Exchange 2007 Replication**

Beginning with Microsoft Exchange 2007, Microsoft has built data replication features directly into Exchange. These features allow Exchange data to be replicated from one Exchange server to another.

Exchange 2007 offers three levels of data replication:

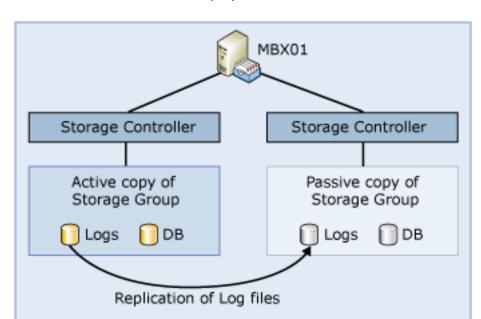
- Local Continuous Replication (LCR)
- Cluster Continuous Replication (CCR)
- Standby Continuous Replication (SCR)

**NOTE:** The following discussion regarding various aspects of Microsoft Exchange 2007 replication draws heavily on content authored by Microsoft Corporation.

However, a complete discussion of Exchange 2007 replication is beyond the scope of this publication. Refer to your Microsoft Exchange 2007 documentation for additional information.

#### **Local Continuous Replication (LCR)**

Local continuous replication (LCR) is a single-server solution that uses built-in asynchronous log shipping and log replay technology to create and maintain a copy of a storage group on a second set of disks that are connected to the same server as the production storage group. The production storage group is referred to as the active copy, and the copy of the storage group maintained



on the separate set of disks is referred to as the passive copy. The following illustration shows a basic LCR deployment.

LCR deployments do not require any special Avamar Exchange Client set up or configuration. Install the Avamar Exchange Client software on the active storage group using the normal (non-cluster) installation procedure. Refer to *Installing/Uninstalling Avamar Exchange Client* (page 19) for additional information.

#### Cluster Continuous Replication (CCR) and Standby Continuous Replication (SCR)

Cluster continuous replication (CCR) is a high availability feature of Microsoft Exchange Server 2007 that combines the asynchronous log shipping and replay technology built into Exchange 2007 with the failover and management features provided by the Windows Cluster service.

CCR is designed to provide high availability for Exchange 2007 Mailbox servers by providing a solution that:

- Has no single point of failure
- · Has no special hardware requirements
- Has minimal shared storage requirements
- Can be deployed in one or two datacenter configurations

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 of the database. 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.

In a CCR environment, the replication capabilities are integrated with the Cluster service to deliver a high availability solution. In addition to providing data and service availability, CCR also provides for scheduled outages. When

updates need to be installed or when maintenance needs to be performed, an administrator can move a clustered mailbox server (called an Exchange Virtual Server in previous versions of Exchange Server) manually to a passive node. After the move operation is complete, the administrator can then perform the needed maintenance.

CCR can be combined with standby continuous replication (SCR) to replicate storage groups locally in a primary data center (using CCR for high availability) and remotely in a secondary or backup datacenter (using SCR for site resilience). The secondary datacenter could contain a passive node in a failover cluster that hosts the SCR targets. This type of cluster is called a standby cluster because it does not contain any clustered mailbox servers, but it can be quickly provisioned with a replacement clustered mailbox server in a recovery scenario. If the primary datacenter fails or is otherwise lost, the SCR targets hosted in this standby cluster can be quickly activated on the standby cluster.

# **System Requirements**

REQUIREMENT	MINIMUM	
Operating System	<ul> <li>Microsoft Windows 2008 Server 64-bit</li> <li>Microsoft Windows 2003 Server 64-bit (Service Pack 1 minimum)</li> <li>Microsoft Windows 2000 Server (Service Pack 2 minimum; Service Pack 3 required for Exchange Server 2003)</li> </ul>	
Filesystems	<ul> <li>FAT16 (not compatible with Exchange Server 2003)</li> <li>FAT32 (not compatible with Exchange Server 2003)</li> <li>NTFS</li> </ul>	
RAM	64 MB.	
Hard Drive Space	100 MB permanent hard drive space (1 GB recommended) for software installation.  Avamar Exchange Client software also requires an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM. This space is used for local cache files.	
Network Interface	10baseT or higher, configured with latest drivers for your platform.	
Web Browser	<ul> <li>Microsoft Internet Explorer 6.0</li> <li>Netscape 6.3.0</li> <li>Optional. Required in order to use Avamar Web Access download and restore features.</li> </ul>	
Adobe Acrobat Reader	5.0 or higher. Available from www.adobe.com. Optional. Required in order to view online documentation.	
Other Software	<ul> <li>Microsoft Exchange Server 2007 SP1</li> <li>Microsoft Exchange Server 2003 SP2</li> <li>Microsoft Exchange Server 2000 SP3</li> </ul>	

# **Capabilities and Limitations**

This topic discusses current capabilities and limitations of the Avamar Exchange Client.

**Different Datasets Must Be Applied to Each Storage Group.** If there is more than one storage group in an Exchange Information Store, each storage group within the Exchange Information Store must be assigned its own dataset. This gives the administrator the flexibility to assign different backup policies to each of the storage groups. If all of the datasets are associated with the same backup schedule, then all of the storage groups will be backed up sequentially during the scheduled window.

Furthermore, when browsing the Exchange Database, if there are other components (for example, "Directory"), each component must be assigned its own dataset.

Similarly, when performing an on-demand backup of an Exchange database, you must also individually select each component, such as an individual storage group or "Directory" of the Exchange Database to be backed up. If you select the entire plug-in by placing a check mark next to the database plug-in, the backup will fail.

**NOTE:** This limitation does not apply to the Exchange 2007 database plugin.

Message Level Backup on Exchange 2007. Starting with Exchange 2007, neither the Messaging API (MAPI) client libraries nor CDO 1.2.1 are provided as a part of the base Exchange 2007 product installation. As a result, you must manually download and install these components in order to use the MAPI-based Exchange Message Plug-in. These components are available as a single download from Microsoft.com at the following location:

http://www.microsoft.com/downloads/details.aspx?FamilyID=E17E7F31-079A-43A9-BFF2-0A110307611E&displaylang=en

Consider Impact of Exchange Server Maintenance Window. By default, Exchange servers typically perform various maintenance activities nightly between 1:00 AM and 5:00 AM. Performing Avamar backups during this maintenance window can prevent these activities from occurring on the Exchange server. Therefore, it is best to avoid scheduling Exchange server backups during the nightly Exchange server maintenance window.

Refer to the following Microsoft Knowledge Base article for additional information about nightly Exchange server maintenance windows:

Microsoft Knowledge Base Article - KB271222, "XADM: Understanding Performance and Scalability Characteristics of Exchange 2000 MDB Online Maintenance"

**NOTE:** This limitation applies to the Exchange Database Plug-in only.

**Validation Not Supported.** The Exchange Database Plug-in does not support backup validation.

**NOTE:** This capability applies to the Exchange Database Plug-in only.

**Unique User Name Required For Each Exchange Server.** If you are backing up more than one Exchange server within an Active Directory forest, you must use a different Windows user account for each Exchange server. This is because each user defined in Active Directory stores an Exchange mailbox as an attribute. It is therefore not possible for Avamar to use one user account to backup more than one Exchange server.

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

**Recommend Restoring an Entire Folder to an Empty Folder.** Restoring individual messages within an existing Exchange folder is possible but is not recommended. Because duplicates messages could be created when restoring to populated folders, the best practice is to:

- 1. Create a temporary dedicated Exchange folder for restoring messages (for example, "restored-messages").
- 2. Restore messages to that folder.
- 3. Use Outlook search and sort features to locate the message or messages you want to add back into your Exchange mailbox.

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

**Initial Message Level Data Deduplication Might Be Low.** Initial message-level data deduplication might be very low across folders and mailboxes. This is particularly true for small messages. The reason for these initial low levels of data deduplication is that each message contains an embedded globally-unique identifier and messages tend to be very small units (usually less than 20KB). This means that each message is effectively unique to Avamar. Data deduplication levels following initialization will be higher because messages that have not changed since the last backup will not be sent to the Avamar server.

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

#### **Browsing More than a Few Thousand Messages Might Be**

**Slow.** Attempting to browse a folder that contains more than a few thousand messages might result in slow performance. Actual performance has been observed to be approximately 48 messages per second.

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

Handling of "/" and "\" in Exchange Object Names. It is generally a bad practice to create Exchange objects with forward or backward slashes embedded in the object name. However, the Avamar Exchange Client will attempt to handle these situations as gracefully as possible, subject to the following limitations and known behavior:

- Forward and backward slashes in mailboxes, folders and the subject line can be backed up and restored properly. However, if you attempt to browse folders or messages that contain forward or backward slashes, the following substitutions are made:
  - "/" is replaced with "/"
  - "\" is replaced with "\"

For example, a folder named "\Infected" is displayed in Avamar Administrator as "\Infected" and a subject line "/home/admin/dpn.pm" is displayed as "/home/admin/dpn.pm"

- 2. If you attempt to browse folders that contain forward or backward slashes from the Avamar Administrator Backup window, the folders will appear to be empty. The contents actually exist, they just cannot displayed in the Backup window.
- 3. You cannot restore a message to a folder name that contains a forward or backward slash.

For example, although you can select to restore to an existing folder named "\Infected," you cannot specify a redirected restore to a folder named "\Infected."

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

**Login Errors.** If the client running the Avamar Exchange Message plug-in cannot log into the information store to browse the store, Avamar Administrator displays an empty list.

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

**Error Reported if There are Duplicate Folders in Mailboxes.** When browsing a backup within Avamar Administrator, if there are duplicate folders within a mailbox, Avamar Administrator will report the following error:

Event Code: 21007 Category: SYSTEM Severity: PROCESS Summary: Internal Administrator Client error. View Details: index unmatched

This situation typically occurs as the result of a client name change and latencies in Windows Active Directory updates. If this occurs, rename one of the duplicate folders to a different name or wait for the next Active Directory update to complete.

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

**Backup Size is Larger than Size Reported by Exchange.** Avamar server stores Exchange messages in Transport-Neutral Encapsulation Format (TNEF). This format requires more storage space on the Avamar server than is required inside an Exchange database. This difference in storage capacity used by the Avamar server is at least an additional 10KB per message.

For this reason, initial backup progress bytes reported by Avamar Administrator will be larger than the size reported by Exchange; Progress bytes reported by subsequent backups will be more in line with the Exchange sizes.

Additionally, when browsing backups to restore message folders, sizes reported by Avamar Administrator will be the size required to restore that folder inside Exchange, not the amount of storage space actually consumed on the Avamar server.

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

**Database Service Requires Manual Intervention.** The Database service, shown in the cluster administrator, does not automatically return to online status immediately following a database restore. The interim solution is to manually bring the Database service online following the restore.

**NOTE:** This limitation applies to the Exchange 2007 Database plug-in.

**Messages in Outbox Might Not Be Backed Up.** Messages in the Outbox folder might not be backed up. This can occur for a number of reasons, but all are inherent limitations of Microsoft Exchange, for which there are no known interim solutions.

**NOTE:** This limitation applies to the Exchange Message plug-in.

**Incorrect Initial Reporting of Folder Sizes.** There is a known limitation with the Exchange 2007 Database and Exchange Message plug-ins in which all folder sizes are initially reported to be zero bytes. However, expanding a folder causes the folder size to be correctly updated and all contents to be shown. This does not affect actual restore behavior.

**NOTE:** This limitation applies to the Exchange 2007 Database and Exchange Message plug-ins. It does not apply to the Exchange Database plug-in.

Restore fails if "Skip Mounted Database On Restore" Option is Selected. When performing an Exchange 2007 database restore on a storage group that contains only one database, selecting the Skip mounted database on restore option will cause that restore to fail even if the database is mounted.

**NOTE:** This limitation applies to the Exchange 2007 Database plug-in.

**Known Limitations with Region Profiles.** If you are performing message-level backups, the Region Profile for the AvamarBackupUser account must be the same as the Exchange Server Region Profile. Otherwise, when you attempt to restore message-level backups, Exchange might incorrectly translate certain extended characters, which will corrupt the mailbox. This is a limitation of Microsoft Exchange.

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

**Large Message-Level Backups Might Fail.** There is a known limitation with the MSExchangeIS service in which it can run out of resources during a MAPI restore involving a large number of folders or mailboxes (that is, typically 500 or more). When this occurs, the following error message is returned:

CreateFolder failed 80004005 MAPI E CALL FAILED

This issue is addressed in Microsoft Knowledge Base articles 830829 and 830836 and an interim solution is offered. Refer to the Microsoft Knowledge Base articles for additional information.

**NOTE:** This limitation applies to the Exchange Message Plug-in only.

# INSTALLING/UNINSTALLING AVAMAR EXCHANGE CLIENT

This chapter describes how to install and configure Avamar Exchange Client software on a supported Exchange server in either standalone or high-availability configurations.

# Important Information About Windows Clusters and Exchange 2007 CCR

If you intend to deploy Microsoft Exchange 2007 on either Windows Server 2003 or 2008 and you intend to use the Cluster Continuous Replication (CCR) feature to implement a high-availability solution, you must configure your windows cluster in accordance with the information presented in the following Microsoft TechNet topics:

Windows Server 2003. Refer to TechNet > TechNet Library > Networking and Messaging > Exchange Server > Exchange Server 2007 > Operations > High Availability > Cluster Continuous Replication > Installing Cluster Continuous Replication on Windows Server 2003 at the following URL:

http://technet.microsoft.com/en-us/library/aa997144(EXCHG.80).aspx

Windows Server 2008. Refer to TechNet > TechNet Library > Networking and Messaging > Exchange Server > Microsoft Exchange Server 2007 > Operations > High Availability > Cluster Continuous Replication > Installing Cluster Continuous Replication on Windows Server 2008 at the following URL

http://technet.microsoft.com/en-us/library/bb629714.aspx

**IMPORTANT:** Failure to properly configure your Windows clusters for use with Exchange 2007 CCR in accordance with the information presented in the previously mentioned Microsoft TechNet topics will compromise operational readiness of your Exchange 2007 deployment.

# Quick Reference (Road Map)

The following table is a quick reference ("road map") that lists the applicable installation tasks required to correctly install and configure the Avamar Exchange Client in various environments.

	CNATA	OWOCINIM	EXCHAN	EXCHANGE 2007 REPLICATION	ICATION
INSTALLATION TASK	ALONE	CLUSTER	LCR	SCR	CCR
Install and configure your Windows cluster in accordance with Microsoft guidelines.	2	XES	XES	XES	XES
Install and configure Exchange in accordance with Microsoft guidelines.	YES	XES	XES	XES	XES
Install Avamar Windows Client (page 21).	YES	2	XES	2	2
Install Avamar Windows Cluster Client (page 22).	2	XES	2	XES	XES
Install Avamar Exchange Client (page 25).	YES	2	XES	2	2
Configure Exchange 2007 for message level backups and restores (page 26).	XES	YES	XES	XES	YES
Configure Exchange 2003/2000 for message level backups and restores (page 32).	NOTE: Opt message lev procedure fo	<b>NOTE:</b> Optional. Only required if you intend to p message level backups and restores. Use the corr procedure for your version of Microsoft Exchange.	equired if you nd restores. on of Microso	<b>NOTE:</b> Optional. Only required if you intend to perform message level backups and restores. Use the correct procedure for your version of Microsoft Exchange.	rform
Configure Avamar Exchange Client service (page 38).	YES	XES	XES	χES	YES

# **Installing the Avamar Windows Client**

**IMPORTANT:** You must install both the Avamar Windows Client and the Avamar Exchange Client on your Exchange server.

- 1. Log into the client computer or workstation.
- 2. Point your web browser at the Avamar server by typing the following URL:

#### http://AVAMARSERVER

Where AVAMARSERVER is your actual Avamar system network hostname (as defined in DNS) or IP address.

You will be automatically redirected to the Avamar secure web server.

Depending on your browser security settings, a security alert dialog box might appear.

3. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

The Secure Log On page appears.

- 4. Page down until the **Downloads and Documents** hyperlink is visible.
- Click **Downloads and Documents**.

The Downloads and Documentation page appears.

**IMPORTANT:** If configuring an Exchange 2007 server, you must install the 64-bit Avamar Windows Client.

If configuring an Exchange 2003 or 2000 server, you must install the 32-bit Avamar Windows Client.

 $\hbox{6. Click the correct operating system hyperlink for your client computer.}\\$ 

A folder listing appears in your browser.

7. Double-click the **AvamarClient-windows-x86-VERSION.msi** install package.

Your browser will prompt you to either open the file "in-place" (on the server) or save it to your local computer. Either method will work. However, if you save the file to your local computer, you must open (double-click) that installation file to continue with this procedure.

8. Open the installation in place (on the server).

The installation wizard appears.

- 9. Follow the on-screen instructions.
- 10. Click **Finish** to complete the installation procedure.

# **Installing the Avamar Windows Cluster Client**

**IMPORTANT:** You must have previously installed the Avamar Windows Client (page 21) on both servers before performing this procedure.

1. Determine which server in the cluster currently has access to the shared external storage for that cluster.

This is the "owning server" for that cluster.

- 2. Log into the owning server
- 3. Point your web browser at the Avamar server by typing the following URL:

#### http://AVAMARSERVER

Where AVAMARSERVER is your actual Avamar server network hostname (as defined in DNS) or IP address.

You will be automatically redirected to the Avamar secure web server.

Depending on your browser security settings, a security alert dialog box might appear.

4. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

The Secure Log On page appears.

5. Page down until the **Documents and Downloads** hyperlink is visible.

**IMPORTANT:** If using Windows Exchange 2007 in a Windows Server 2008 cluster, you must install 64-bit Avamar Windows Cluster Client.

6. Click **Documents and Downloads**.

The Documents and Downloads page appears.

- 7. Click the appropriate operating system hyperlink for your client computer.

  A directory listing appears in your browser.
- 8. Click the **AvamarClientCluster-windows-x86-VERSION.exe** install package.

Your browser will prompt you to either open the file "in-place" (on the server) or save it to your local computer. Either method will work. However, if you save the file to your local computer, you must open (double-click) that installation file to continue with this procedure.

Open the installation in place (on the server).The installation wizard appears.



**NOTE:** If installing into an environment that uses Exchange 2007 replication (page 9) but does not use Windows clustering with shared storage (page 9), you can safely ignore the No shared storage resource is present in this Group advisory.

#### 10. Select or type the following:

	FIELD/OPTION	DESCRIPTION
	Choose a Group for Install or Update.	Select the correct cluster group, on which you want to install this software, from this drop-down list.
GROUP RESOURCES	Network name for backup agent communication	This drop-down list contains all network names (hostnames) assigned to this cluster group.  Select the network name you want to use for Avamar client-server communication from this drop-down list.
GROUP R	Physical disk for backup agent configuration log files	This drop-down list contains all shared external storage drives assigned to this cluster group.  Select the shared external storage drive on which you want to install this software.

FIELD/OPTION		DESCRIPTION
	Do not register client now option	If selected, client associated with this cluster group will not be registered with the Avamar server. This client will have to be manually registered and activated before you can back up any data.
	Administrator server host name or IP address	Administrator server network hostname as defined in DNS.
	Administrator server listen data port	The default data port for Avamar client- server communication is 28001.
		Unless you are using a different data port at your site, you should leave this set to 28001.
LION		Consult your Avamar system administrator for the specific data port you should use when registering this client.
REGISTRATION	Backup domain for this client	Avamar domain where you want this client to reside.
REG!		The default domain is "clients." However, your Avamar system administrator might have defined other domains and subdomains.
		Consult your Avamar system administrator for the specific domain you should use when registering this client.
		IMPORTANT: If typing a sub-domain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character will cause an error and prevent you from registering this client.
	Override automatic backup client name with this name	If you do not want the Avamar client name to be the same as the cluster group name, type another Avamar client name in this field.
	Override default log file location	If selected, after clicking <b>Finish</b> you will be prompted to type the UNC path to a folder where Avamar log files will be written. This entry cannot contain drive letters.
		IMPORTANT: If using Exchange 2007 Cluster Continuous Replication (CCR), you must write Avamar log files to a location that can be accessed by either the primary or secondary storage group in the event that either fails.

- 11. Follow the on-screen instructions.
- 12. Click **Finish** to complete the installation procedure.

**IMPORTANT:** If using Cluster Continuous Replication (CCR), you must start the backup cluster agent from an account that has full access permissions to the folder where Avamar log files are written.

# **Installing the Avamar Exchange Client**

**IMPORTANT:** You must install both the Avamar Windows Client and the Avamar Exchange Client on your Exchange server.

- 1. Log into the client computer or workstation.
- 2. Point your web browser at the Avamar server by typing the following URL:

http://AVAMARSERVER

Where AVAMARSERVER is your actual Avamar system network hostname (as defined in DNS) or IP address.

You will be automatically redirected to the Avamar secure web server.

Depending on your browser security settings, a security alert dialog box might appear.

3. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

The Secure Log On page appears.

- 4. Page down until the **Downloads and Documents** hyperlink is visible.
- 5. Click **Downloads and Documents**.

The Downloads and Documentation page appears.

6. Click the **AvamarExchangeClient** install package.

Your browser will prompt you to either open the file "in-place" (on the server) or save it to your local computer or workstation. Either method will work. However, if you save the file to your local computer or workstation, you must open (double-click) that installation file to continue with this procedure.

7. Open the installation in place (on the server).

The InstallShield Wizard appears.

- 8. Follow the on-screen instructions.
- 9. Click **Finish** to complete the installation procedure.

# Configuring an Exchange 2007 Server for Message Level Backups and Restores

**TIP:** If you do not intend to perform message level backups and restores of your Exchange 2007 server (your intent is to only perform full database backups and restores), you can skip this procedure.

**IMPORTANT:** If your Exchange 2007 server is deployed in a high-availability configuration using Windows clusters, you must perform this entire procedure on all nodes in the cluster with the exception that only the active node can have the backup agent service running at any one time. However, all nodes (including inactive nodes) must be configured to start and run the backup service as AvamarBackupUser.

Task List If you intend to perform message level backups and restores of an Exchange 2007 server, you must perform all the following tasks:

- Download and Install MAPI Client Libraries and CDO 1.2.1 (page 26)
- Create New "AvamarBackupUser" User Account and Mailbox (page 27)
- Create New "AvamarBackupProfile" MAPI Profile (page 29)
- Configure Backup Agent Service to Run as AvamarBackupUser (page 30)
- Activate the AvamarBackupUser Mailbox (page 31)

#### Download and Install MAPI Client Libraries and CDO 1.2.1

**IMPORTANT:** This task is only required on Exchange 2007 servers. Skip this task if configuring an Exchange 2003 or 2000 server.

Starting with Exchange 2007, neither the Messaging API (MAPI) client libraries nor CDO 1.2.1 are provided as a part of the base Exchange 2007 product installation. As a result, you must manually download and install these components in order to use the MAPI-based Exchange Message Plug-in. These components are available as a single download from Microsoft.com at the following location:

http://www.microsoft.com/downloads/details.aspx?FamilyID=E17E7F31-079A-43A9-BFF2-0A110307611E&displaylang=en

# Create New "AvamarBackupUser" User Account and Mailbox

- 1. Log into the Exchange server using an administrative user account.
- 2. Select Start > Programs > Administrative Tools > Active Directory Users and Computers.

The Active Directory Users and Computers application appears.

Create a new user account by selecting Actions > New > User.
 The first New Object - User wizard screen appears.



4. Type the following:

FIELD	DESCRIPTION
Full name	Type the name for this new user account. The suggested name is AvamarBackupUser.
User logon name	Type the logon name for this new user account. The suggested name is AvamarBackupUser. Select the desired Active Directory domain from the drop-down list.
User logon name (pre-Windows 2000)	Type the same logon name from the previous field.

#### 5. Click Next.

The next New Object - User wizard screen appears.



6. Select or type the following:

FIELD/OPTION	DESCRIPTION
Password	Type a logon password for this new user account.
Confirm password	Type the same logon password from the previous field.
Password never expires	Set this option.
	EMC recommends that you leave all other options cleared.

- 7. Select the AvamarBackupUser and select right mouse button **Properties**.

  The User Properties dialog box appears.
- 8. Click the Member Of tab.
- 9. Make this user a member of the follow groups:
  - (a) Administrators
  - (b) Backup Operators
  - (c) Domain Users
  - (d) Exchange Domain Servers
  - (e) Exchange Install Domain Servers
  - (f) Exchange Organizational Administrators
- 10. From the Exchange Management Console, create an AvamarBackupUser mailbox using all the default settings.
- 11. Next, add FullAccess permission to the AvamarBackupUser account using the Exchange Management Shell by typing the following on a single command line:

Get-Mailbox -server SERVERNAME | Add-MailboxPermission
-User AvamarBackupUser -AccessRights FullAccess | Format-List

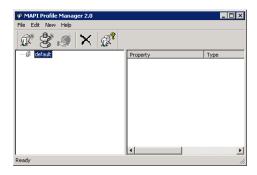
## Create New "AvamarBackupProfile" MAPI Profile

- 1. Log into the Exchange server using the new AvamarBackupUser account.
- 2. Open a Command Prompt.
- 3. Run the profman.exe utility by typing:

cd C:\Program Files\avs\bin

profman.exe

The MAPI Profile Manager window appears.



4. Click the New Profile toolbar button (shown left).
The New Profile dialog box appears.



- 5. Type AvamarBackupProfile in the Profile Name field and click **OK**. The New Profile dialog box closes.
- 6. Switch to MAPI Profile Manager window
- 7. Select the AvamarBackupProfile.
- 8. Click the Add Service to selected profile toolbar button (shown left). The New Profile dialog box appears.



Select MSEMS (Microsoft Exchange Server) from the list and click **OK**.
 The New Profile dialog box closes and the Microsoft Exchange Server properties dialog box appears.







10. Type the name of your Exchange 2007 mail server in the Microsoft Exchange server field.

**NOTE:** Use default values for the remaining settings.

11. Click **OK**.

The Microsoft Exchange Server properties dialog box closes.

12. Switch to MAPI Profile Manager window and select **File > Exit**. The MAPI Profile Manager window closes.

# Configure Backup Agent Service to Run as AvamarBackupUser

**IMPORTANT:** If your Exchange 2007 server is deployed in a high-availability configuration using Windows clusters, all nodes (including inactive nodes) must be configured to start the backup service as AvamarBackupUser. However, only the active node can have the backup agent service running at any one time.

- 1. Ensure that you are still logged into the Exchange server as AvamarBackupUser or some other administrative user account.
- 2. Launch the Services application by selecting **Start > Programs > Administrative Tools > Services**.

The Services window appears.

3. Locate the Backup Agent service in the Services list and select right mouse button **Properties**.

The Backup Agent Properties dialog box appears.

- 4. Click the Logon tab.
- 5. Set **This account** option.

The **Local system account option** is now cleared.

6. Type AvamarBackupUser in the This account field.

**NOTE:** If your site has more than one Active Directory domain, type the user name with the following syntax: DOMAIN\AvamarBackupUser. Where DOMAIN is the Active Directory domain where the AvamarBackupUser user account resides.

- 7. Type the AvamarBackupUser password in the Password and Confirm Password fields.
- 8. Click OK.

The Backup Agent Properties dialog box closes.

- 9. With the Backup Agent service still selected in the Services list, select right mouse button **Restart**.
- 10. Select **File > Exit**.

The Services window closes.

## **Activate the AvamarBackupUser Mailbox**

The AvamarBackupUser Exchange server mailbox must be activated using one of the following methods:

- 1. Access the AvamarBackupUser mailbox with your Outlook email client.
- 2. Send a test email message to the AvamarBackupUser email account.

# Configuring an Exchange 2003 or Exchange 2000 Server for Message Level Backups and Restores

**TIP:** If you do not intend to perform message level backups and restores (your intent is to only perform full database backups and restores), you can skip this procedure.

**IMPORTANT:** If your Exchange 2003 or 2000 server is deployed in a high-availability configuration using Windows clusters, you must perform this entire procedure on all nodes in the cluster with the exception that only the active node can have the backup agent service running at any one time. However, all nodes (including inactive nodes) must be configured to start and run the backup service as AvamarBackupUser.

Task List If you intend to perform message level backups and restores, you must perform the following tasks:

- Create New "AvamarBackupUser" User Account and Mailbox (page 32)
- Create New "AvamarBackupProfile" MAPI Profile (page 35)
- Configure Avamar Client Agent Service to Run as AvamarBackupUser (page 37)
- Activate the AvamarBackupUser Mailbox (page 37)

# Create New "AvamarBackupUser" User Account and Mailbox

- 1. Log into the Exchange server using an administrative user account.
- 2. Select Start > Programs > Administrative Tools > Active Directory Computers and Users.

The Active Directory Computers and Users application appears.

Create a new user account by selecting Actions > New > User.
 The first New Object - User wizard screen appears.

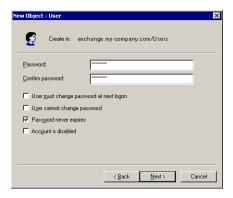


#### 4. Type the following:

FIELD	DESCRIPTION
Full name	Type the name for this new user account. The suggested name is AvamarBackupUser.
User logon name	Type the logon name for this new user account. The suggested name is AvamarBackupUser. Select the desired Active Directory domain from the drop-down list.
User logon name (pre-Windows 2000)	Type the same logon name from the previous field.

#### 5. Click Next.

The next New Object - User wizard screen appears.

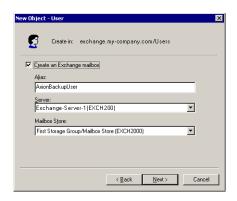


## 6. Select or type the following:

FIELD/OPTION	DESCRIPTION
Password	Type a logon password for this new user account.
Confirm password	Type the same logon password from the previous field.
Password never expires	Set this option. EMC recommends that you leave all other options cleared.

#### 7. Click Next.

The next New Object - User wizard screen appears.



8. Select or type the following:

FIELD/OPTION	DESCRIPTION
Create an Exchange mailbox	Set this option.
Alias	EMC recommends that you leave this set to the default value (the logon user name).
Server	Select an Exchange server from the drop-down list.
Mailbox Store	Select a mailbox store from the drop-down list.

#### 9. Click **Next**.

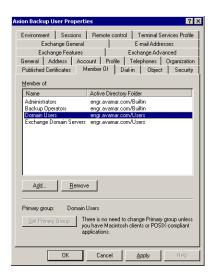
The final New Object - User wizard screen appears.

#### 10. Click Finish.

The New Object - User wizard closes.

11. Select the AvamarBackupUser and select right mouse button **Properties**. The User Properties dialog box appears.

12. Click the Member Of tab.



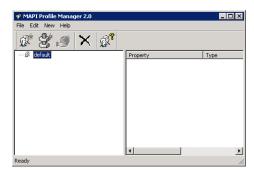
- 13. Make this user a member of the follow groups:
  - (a) Administrators
  - (b) Backup Operators
  - (c) Domain Users
  - (d) Exchange Domain Servers

## Create New "AvamarBackupProfile" MAPI Profile

- 1. Log into the Exchange server using the new AvamarBackupUser account.
- 2. Open a Command Prompt.
- 3. Run the profman.exe utility by typing:

cd C:\Program Files\avs\bin
profman.exe

The MAPI Profile Manager window appears.





4. Click the New Profile toolbar button (shown left).

The New Profile dialog box appears.



- 5. Type AvamarBackupProfile in the Profile Name field and click **OK**. The New Profile dialog box closes.
- 6. Switch to MAPI Profile Manager window
- 7. Select the AvamarBackupProfile.
- 8. Click the Add Service to selected profile toolbar button (shown left). The New Profile dialog box appears.



9. Select MSEMS (Microsoft Exchange Server) from the list and click **OK**.

The New Profile dialog box closes and the Microsoft Exchange Server properties dialog box appears.



10. Type the name of your Exchange 2003 or 2000 mail server in the Microsoft Exchange server field.

**NOTE:** Use default values for the remaining settings.

11. Click **OK**.

The Microsoft Exchange Server properties dialog box closes.

12. Switch to MAPI Profile Manager window and select **File > Exit**. The MAPI Profile Manager window closes.



# Configure Avamar Client Agent Service to Run as AvamarBackupUser

- 1. Ensure that you are still logged into the Exchange server as AvamarBackupUser or some other administrative user account.
- 2. Launch the Services application by selecting **Start > Programs > Administrative Tools > Services**.

The Services window appears.

3. Locate the Avamar Client Agent service in the Services list and select right mouse button **Properties**.

The Avamar Client Agent Properties dialog box appears.

- 4. Click the Logon tab.
- 5. Set **This account** option.

The **Local system account option** is now cleared.

6. Type AvamarBackupUser in the This account field.

**NOTE:** If your site has more than one Active Directory domain, type the user name with the following syntax: DOMAIN\AvamarBackupUser. Where DOMAIN is the Active Directory domain where the AvamarBackupUser user account resides.

- 7. Type the AvamarBackupUser password in the Password and Confirm Password fields.
- 8. Click **OK**.

The Avamar Client Agent Properties dialog box closes.

- 9. With the Avamar Client Agent service still selected in the Services list, select right mouse button **Restart**.
- 10. Select **File > Exit**.

The Services window closes.

## **Activate the AvamarBackupUser Mailbox**

The AvamarBackupUser Exchange server mailbox must be activated using one of the following methods:

- 1. Access the AvamarBackupUser mailbox with your Outlook email client.
- 2. Send a test email message to the AvamarBackupUser email account.

## **Configuring the Avamar Exchange Client Service**

- 1. Select Computer Management > Services and Applications > Services.
- 2. Locate the Avamar Client Agent service in the services list.
- 3. Select right mouse button **Properties**.
- 4. Configure the Avamar Client Agent to login as AvamarBackupUser.

**NOTE:** If the AvamarBackupUser is not yet visible, you should synchronize with your domain controller.

A message dialog box appears with the following message:

The new logon name will not take effect until you stop and restart the service.

5. Click OK.

The message dialog box closes.

6. Manually stop, then restart the Avamar Client Agent service.

# **Uninstalling and Upgrading the Avamar Exchange Client**

Unlike other platforms, previous versions of Avamar Exchange Client software do not have to be explicitly uninstalled before a new version can be installed. If you attempt to install the Avamar Exchange Client on an Exchange server that already has it installed, you will be prompted during installation to select one of the following choices:

- 1. Upgrade current Avamar Exchange Client installation to the new version.
- 2. Remove old Avamar Exchange Client installation.

If you decide to remove the old installation, you will need to re-run the installation file to install the new version (the current installation session becomes an "uninstall" session, then terminates).

You can also use the Windows **Control Panel > Add/Remove Programs** feature to completely uninstall the Avamar Exchange Client.

**IMPORTANT:** Upgrading the Avamar Exchange Client software causes the Avamar Client Agent service to revert to logging in as the local SYSTEM user account, rather than AvamarBackupUser. Therefore, following any Avamar Exchange Client software upgrade, you must reconfigure Avamar Client Agent service to login as AvamarBackupUser and manually stop and restart the service for that change to take affect.

# **USING THE AVAMAR EXCHANGE CLIENT**

This chapter describes how to use the Avamar Exchange Client to backup or recover (restore) to an entire Exchange server or one or more Exchange message folders.

You should have current practical experience with the following:

- Operating system shell commands on your Exchange server platform (root permission required)
- The specific version of Exchange software currently deployed at your site

Refer to your Microsoft Exchange Server documentation for additional information.

## **On-Demand Backup**

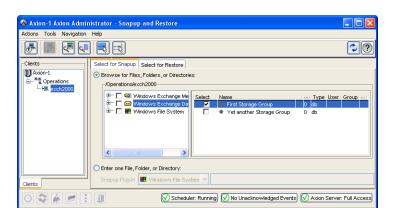
This topic describes how to perform an on-demand backup of an entire Exchange server or one or more Exchange message folders.

## **Backing Up an Entire Exchange Database**

To backup an entire Exchange server, perform the following:

- 1. Start Avamar Administrator.
- 2. Select **Navigation > Backup and Restore** or click the **Backup & Restore** launcher button.

The Backup and Restore window appears.



- 3. Click the Select for Backup tab.
- 4. In the Clients tree, select the Exchange server.

**REMINDER:** You cannot view clients outside your domain. To view all clients, you must be logged into the root domain.

5. Select the Windows Exchange Database plug-in.

**IMPORTANT:** Currently, you can only back up one storage group per backup operation on Exchange 2000 and 2003. Therefore, if your Exchange database comprises multiple storage groups, you must select each storage group individually and perform multiple on-demand backups in order to backup the entire Exchange database.

This limitation does not apply to Exchange 2007.

6. Select the storage group you want to backup.

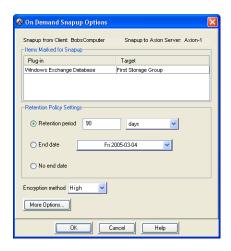


**TIP:** Select **Actions > Preview List...** to view a summary of all directories and files you have just selected for an ondemand backup.



7. Select **Actions > Backup Now...** or click the toolbar icon shown immediately to the left.

The On Demand Backup Options dialog box appears.



8. Review your backup settings.

Clicking **Cancel** returns you to the Backup and Restore window where you can modify your backup selections.

9. If you want to change your backup retention setting, select or type the following:

FIELD/OPTION	DESCRIPTION
Retention period	If you want this backup to be deleted from the Avamar server after a specific number of days, weeks, months or years, select this option and type the number of days, weeks, months or years.
End date	If you want this backup to be deleted from the Avamar server on a specific calendar date, select this option and browse to that date on the calendar.
No end date	If you want to keep this backup for as long as this client remains active in the Avamar server, select this option.

10. Select the encryption method you want to use for client/server data transfer during this backup.

#### Choices are:

Medium Medium strength encryption.

High Strongest available encryption setting for that specific client

platform.

None No encryption.

**NOTE:** The exact encryption technology and bit strength used for any given client/server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your *Avamar Product Security Manual* for additional information.

**TIP:** If you want to include plug-in options with this backup, click **More Options...**, then select or clear the desired options and type new values where applicable.

Refer to Appendix B - Plug-in Options (page 65) for a complete list of supported Exchange plug-in options.

#### 11. Click **OK**.

The On Demand Backup Options dialog box closes and the following status message appears: Backup initiated.

#### 12. Click **OK**.

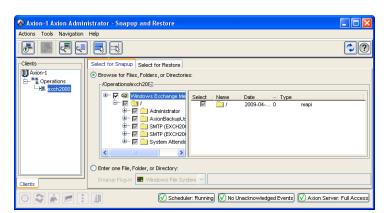
## **Backing Up One or More Message Folders**

**IMPORTANT:** Avamar only supports backup of Exchange message folders, not individual messages.

To backup one or more Exchange message folders, perform the following:

- 1. Start Avamar Administrator.
- 2. Select **Navigation > Backup and Restore** or click the **Backup & Restore** launcher button.

The Backup and Restore window appears.



- 3. Click the Select for Backup tab.
- 4. In the Clients tree, select the Exchange server.

**REMINDER:** You cannot view clients outside your domain. To view all clients, you must be logged into the root domain.

5. Select the Windows Exchange Message plug-in.

**NOTE:** Tree expansion can be expected to take one approximately for every 20-30 entries. This means that a 5000 entry directory can be expected to take approximately 2-3 minutes to fully expand.

6. Select one or more Exchange message folders.

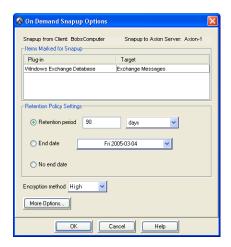
**TIP:** Select **Actions > Preview List...** to view a summary of all directories and files you have just selected for an ondemand backup.





7. Select **Actions > Backup Now...** or click the toolbar icon shown immediately to the left.

The On Demand Backup Options dialog box appears.



8. Review your backup settings.

Clicking **Cancel** returns you to the Backup and Restore window where you can modify your backup selections.

9. If you want to change your backup retention setting, select or type the following:

FIELD/OPTION	DESCRIPTION
Retention period	If you want this backup to be deleted from the Avamar server after a specific number of days, weeks, months or years, select this option and type the number of days, weeks, months or years.
End date	If you want this backup to be deleted from the Avamar server on a specific calendar date, select this option and browse to that date on the calendar.
No end date	If you want to keep this backup for as long as this client remains active in the Avamar server, select this option.

10. Select the encryption method you want to use for client/server data transfer during this backup.

#### Choices are:

Medium Medium strength encryption.

High Strongest available encryption setting for that specific client

platform.

None No encryption.

**NOTE:** The exact encryption technology and bit strength used for any given client/server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your *Avamar Product Security Manual* for additional information.

**TIP:** If you want to include plug-in options with this backup, click **More Options...**, then select or clear the desired options and type new values where applicable.

Refer to Appendix B - Plug-in Options (page 65) for a complete list of supported Exchange plug-in options.

#### 11. Click **OK**.

The On Demand Backup Options dialog box closes and the following status message appears: Backup initiated.

#### 12. Click **OK**.

## **Recovery (Restore)**

**IMPORTANT:** If you are using the Local Continuous Replication (LCR), you must turn off LCR, perform the restore operation, then turn LCR back on. If you leave LCR on during the restore operation, it will fail.

Refer to your Microsoft Exchange Server documentation for additional information about turning LCR on and off.

To recover (restore) an entire Exchange database or one or more Exchange message folders, perform the following:

1. Do one of the following:

IF	DO THIS
You want to recover (restore) an entire Exchange 2007 database.	Perform step 2, then go to step 4.
You want to recover (restore) an entire Exchange 2003/2000 database.	Skip step 2, perform step 3, then go to step 4.
You only want to recover (restore) one or more Exchange message folders.	Skip steps 2 and 3, and go directly to step 4.

Exchange 2007 Database Preparation

- 2. Prepare your Exchange 2007 database for the restore operation by performing the following:
  - (a) Un-mount the database and mark that it is overwritable by a restore operation.
  - (b) Manually delete the contents of the default storage folder.

**NOTE:** The default storage folder name will normally be the same the storage group created. In most cases, the default name is First Storage Group.

(c) If located elsewhere than default storage folder, also manually delete the \*.log files.

Exchange 2003/ 2000 Database Preparation

- 3. Prepare your Exchange 2003 or 2000 database for the restore operation by performing the following:
  - (a) Un-mount the database and mark that it is overwritable by a restore operation.
  - (b) Manually delete the contents of the MDBDATA directory.
  - (c) If located elsewhere than the MDBDATA directory, also manually delete the \*.log files.
- 4. Start Avamar Administrator.



5. Select **Navigation > Backup and Restore** or click the **Backup & Restore** launcher button.

The Backup and Restore window appears.

- 6. Click the Select for Restore tab.
- 7. In the Clients tree, select the Exchange server.

**REMINDER:** You cannot view clients outside your domain. To view all clients, you must be logged into the root domain.

8. Do one of the following:

IF	DO THIS
You want to locate backups stored on the server by calendar date.	Perform step 8, then skip step 9 and go directly to step 10.
You want to locate backups stored on the server by content (the specific directories and files contained within each backup).	Skip step 8 and go directly to step 9.

#### **Selecting by Calendar Date**

- 9. To locate backups stored on the server by calendar date, perform the following:
  - (a) Click the By Date tab.

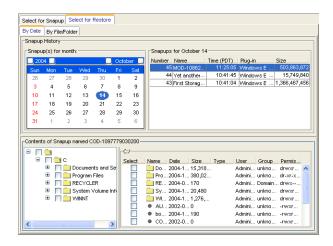
Clicking the By Date tab displays a browsable calendar for locating backups in the Avamar server.

Dates highlighted in yellow indicate that a backup was performed on that date.

Selecting a valid backup date on the calendar populates the backups list immediately to the right of the calendar.



Selecting a backup populates the contents list directly below the Backup History pane.

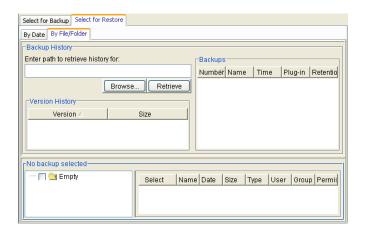


- (b) In the Backup History pane, browse to a valid backup date in the Calendar (highlighted in yellow).
- (c) Select a backup from the backups list directly to the right of the calendar.
- (d) Select one or more directories or files you want to restore.

#### Selecting by File/Folder

- 10. To locate backups stored on the server by content, perform the following:
  - (a) Click the By File/Folder tab.

Clicking the By File/Folder tab displays a Backup History pane that can be used to retrieve all backups that contain a specified client file or folder.



- (b) If you know the full path to the desired client file or folder, type that path in the Enter path to retrieve history for field.
- (c) If you do not know the full path to the desired client file or folder, click **Browse** and locate the desired client file or folder.
- (d) Click Retrieve.

The Version History table lists all versions and sizes for that file or folder that have been backed up for this client.

Selecting a row in the Version History table shows all backups for the selected client that contains the selected version of the file or directory.

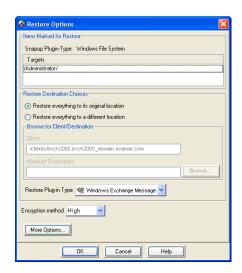
(e) Select the backup you want to restore from.

**TIP:** Select **Actions > Preview List...** to view a summary of all directories and files you have just selected for an ondemand restore.



11. Select **Actions** > **Restore Now...** or click the toolbar icon shown immediately to the left.

The Restore Options dialog box appears.



12. Review your restore settings.

Clicking **Cancel** returns you to the Backup and Restore window where you can modify your restore selections.

13. If you want to change your restore destination choices, select or type the following:

FIELD/OPTION	DESCRIPTION
Restore Everything to its original location	<b>Restore Everything to its original location</b> is the default destination — all files are restored to original client in the original top-level (root) directory.
Restore Everything to a different location	<b>Restore Everything to a different location</b> allows you to specify another client or another directory on the same client.
Browse for Client/ Destination	Click <b>Browse</b> to locate a client or directory for the restore. You can also type this information directly in the Absolute Destination field.
Restore Plug-in Type	Restore Plug-in Type specifies which client plug-in will be used to perform this restore. The default choice is the same plug-in used to take the original backup.

FIELD/OPTION		DESCRIPTION
Encryption Method	Encryption method specifies the encryption method used for client/server data transfer during this restore. Choices are:	
	Medium Medium strength encryption.	
	High	Strongest available encryption setting for that specific client platform.
	None	No encryption.
	strength connection including version. F	the exact encryption technology and bit used for any given client-server in is dependent on a number of factors, the client platform and Avamar server Refer to your Avamar Product Security or additional information.

**TIP:** If you want to include plug-in options with this restore, click **More Options...**, then select or clear the desired options and type new values where applicable.

Refer to Appendix B - Plug-in Options (page 65) for a complete list of supported Exchange plug-in options.

#### 14. Click **OK**.

The Restore Options dialog box closes and the following status message appears: Restore initiated.

#### 15. Click **OK**.

# **Scheduling Exchange Server Backups**

In order to have your Exchange server backups (backups) performed on a regular schedule, you must:

- Create a new dataset expressly for Exchange server backups (backups)
- Create a new group expressly for Exchange server backups (backups)
- Add the Exchange server client to this new group
- Assign the new dataset to this new group
- Assign a schedule to this new group
- Assign a retention policy to this new group
- Enable scheduling for this new group

A thorough discussion of groups, group policy, datasets, schedules and retention policies is beyond the scope of this publication. Refer to your *Avamar System Administration Manual* for additional information.

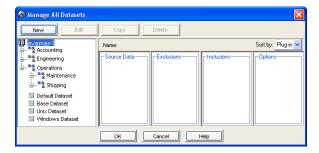
## **Create a New Dataset for Exchange Server Backups**

**REMINDER:** You must be logged into the root domain as an administrative user in order to perform this procedure.

**IMPORTANT:** If your Exchange server is deployed as a cluster, you should add all nodes in the cluster to this dataset.

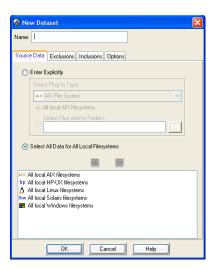
- 1. Start Avamar Administrator.
- 2. Select Tools > Manage Datasets...

The Manage All Datasets window appears.



#### 3. Click **New**.

The New Dataset dialog box appears.



4. Type a name for this new dataset.

**IMPORTANT:** Do not use any of the following characters in your dataset name:  $\sim !@$^\%(){}[]|,`;#\lor:*?<>'"&.$ 

5. Click the Source Data tab.

The Source Data tab is where you define a list of source data plug-ins that contribute data to this dataset.

6. Select or type the following:

FIELD/OPTION	DESCRIPTION
Enter Explicitly	Set this option to define which plug-ins will be used by this particular source data entry.
	To add a plug-in type to this dataset, select it from the drop-down list.
Select Plug-in Type	This list is only available when <b>Enter Explicitly</b> is selected.
	Select a plug-in type from the list and click + to add it to the plug-in list.

FIELD/OPTION	DESCRIPTION
Select Files and/ or Folders	This list is only available when <b>Enter Explicitly</b> is selected.
	If you want this plug-in to point to a specific client subdirectory (somewhere other than the root directory), click and browse to the directory before you click +.
	You can also type the full path to any client directory directly in this field.
	<b>IMPORTANT:</b> Do not use any of the following characters in your entry: ~!@\$^%(){}[] ,`;#\/:*?<>'"&.
Select All Data for All Local File Systems	Set this option to include all data on all client filesystems. This adds all plug-in types to the source data list.

The remaining dialog box tabs are used to set optional parameters such as exclude and include list entries and optional plug-in options.

**IMPORTANT:** Neither the Exchange Database nor the Exchange Message plug-in supports include or exclude lists in datasets.

If you do not need to set these optional parameters in this dataset, skip steps 8 and go directly to step 9.

#### 7. Click the Options tab.

The Options tab is where you set various plug-in options.

Plug-in options can be set two ways: by using the graphical controls or by entering option names and values as free text.

If you want to include plug-in options with future backups, select or clear the desired options and type values where applicable.

**IMPORTANT:** When entering option names and values as free text, it must be understood that no error checking or validation is performed on these free-text entries and that free text entries override settings made using graphical controls.

Refer to Appendix B - Plug-in Options (page 65) for a complete list of supported Exchange plug-in options that can be executed by a dataset.

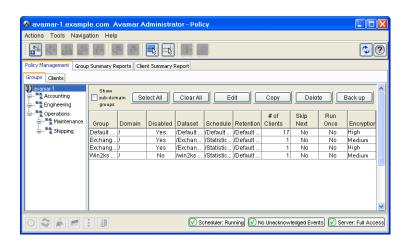
#### 8. Click **OK**.

The New Dataset dialog box closes.

## **Setting Up Scheduled Exchange Server Backups**

**REMINDER:** You must be logged into the root domain as an administrative user in order to perform this procedure.

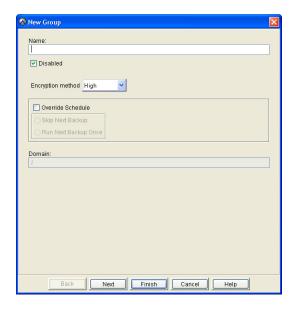
- 1. Start Avamar Administrator.
- 2. Select **Navigation > Policy** or click the **Policy** launcher button. The Policy window appears.





3. Select **Actions > New Group...** or click the toolbar icon shown immediately to the left.

The New Group wizard appears.





#### 4. Select or type the following:

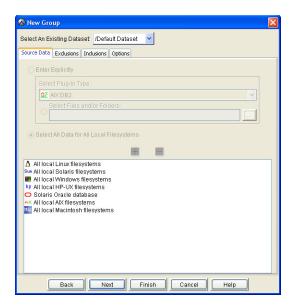
FIELD/OPTION	DESCRIPTION	
Name	Type a name for this new group.  IMPORTANT: Do not use any of the following characters in your group name: ~!@\$^%(){}[] ,`;#\/:*?<>'"&.	
Disabled	This option is selected by default. Unset this option if you want to immediately use this group to take regularly scheduled client backups.	
Encryption Method	This is the group encryption method that will be used by all members of this group for client/server network communications unless it is overridden at the client level. Choices are:	
	Medium Medium strength encryption.	
	High Strongest available encryption setting for that specific client platform.	
	None No encryption.	
	<b>NOTE:</b> The exact encryption technology and bit strength used for any given client-server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your <i>Avamar Product Security Manual</i> for additional information.	
Override Schedule	Set this option if you want to override the assigned schedule for this group.	
	You can also skip the next scheduled backup entirely ( <b>Skip Next Backup</b> ) or perform the next scheduled backup one time only ( <b>Run Next Backup Once</b> ).	
Domain	Location in the Avamar where this group should reside.	

The remaining wizard screens are used to select a dataset, schedule and retention policy, as well as build a client list for this group.

You can click **Finish** at any time. Doing so will cause the new group to be created using system default settings and an empty client list. You can change those settings by editing the group properties.

#### 5. Click **Next**.

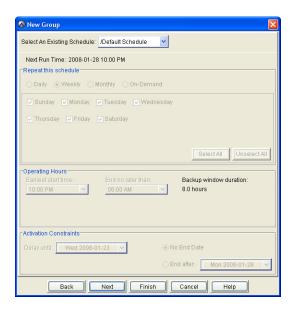
The next New Group wizard screen appears.



This screen is used to select a dataset for use with this group.

- 6. Select the dataset you defined during *Create a New Dataset for Exchange Server Backups* (page 52) from the **Select an Existing Dataset** dropdown list.
- 7. Click Next.

The next New Group wizard screen appears.



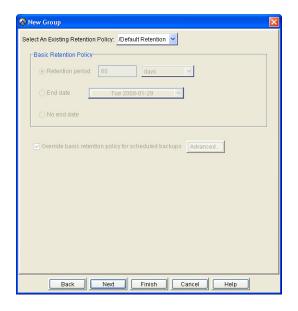
This screen is used to select a schedule for use with this group.

8. Select a schedule from the **Select an Existing Schedule** drop-down list.

**NOTE:** Schedules are not modifiable from this screen. Detailed schedule properties are shown so that you can review them prior to making your selection. Refer to your *Avamar System Administration Manual* for additional information about editing schedule properties.

#### 9. Click Next.

The next New Group wizard screen appears.



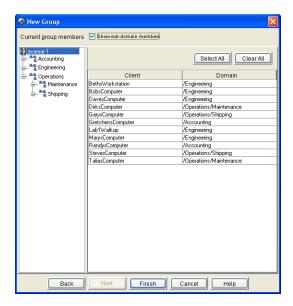
This screen is used to select a retention policy for use with this group.

10. Select a retention policy from the **Select an Existing Retention Policy** drop-down list.

**NOTE:** Retention policies are not modifiable from this screen. Detailed retention policy properties are shown so that you can review them prior to making your selection. Refer to your *Avamar System Administration Manual* for additional information about editing retention policy properties.

#### 11. Click Next.

The final New Group wizard screen appears.



This screen is used to build a list of clients that will be members of this group. In this case, our group will contain only one client — the Exchange server.

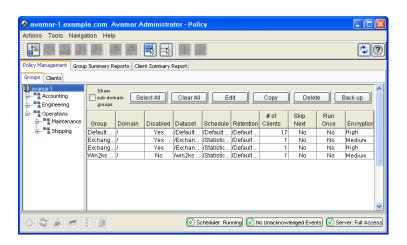
- 12. Select the Exchange server from the client list.
- 13. Click **Finish**.

The New Group wizard closes and the new group appears in the Policy window.

## **Enabling Scheduled Exchange Server Backups**

**REMINDER:** You must be logged into the root domain as an administrative user in order to perform this procedure.

- 1. Start Avamar Administrator.
- Select Navigation > Policy or click the Policy launcher button.The Policy window appears.



- 3. Click the Policy Management tab.
- 4. Click the Groups tab.
- 5. Select the group you created in the previous procedure (the group that now contains only your Exchange server).
- 6. Select **Actions > Group > Disable Group**.

This unsets the **Disable Group** option on the **Actions** > **Group** menu.

A confirmation message appears.

7. Click **Yes** to enable this group.



# APPENDIX A — SPECIALIZED RECOVERY APPLICATIONS

## **Recovering From Tape or Hard Disk**

This topic describes how to recover Exchange databases from Avamar File System (AvFS) files that have been archived to removable tape media.

Although this procedure assumes that the archive media is digital tape, this procedure could easily be adapted for use with hard-disk based archive systems such as EMC Centera.

### **Prerequisites**

The Avamar File System (AvFS) must be installed and configured according to the instructions found in your Avamar System Administration Manual.

The Exchange database that you want to recover must have been previously backed up using the avexchange database plug-in. The recovery procedure presented in this chapter does not in any way support message level backup, nor does it support any backup files that might have created using the Avamar Windows Client filesystem plug-in.

Once the Exchange database has been successfully backed up using the avexchange database plug-in, it is the Avamar File System (AvFS) representation of that Exchange database stream file (and only that file) that can be archived to tape and used for future recoveries.

The same version of avexchange used to backup the Exchange database should be used to recover it. Therefore, is highly desirable to put a copy of avexchange.exe on the tape with the Exchange database stream file.

The active directory controller for the Exchange server must be restored first. Refer to the following Microsoft publications for additional information about restoring Exchange server active directory controllers:

- Disaster Recovery Exchange 2000 Server.pdf
- Exchange 2003 Disaster Recovery Operations.doc

### **Recovery Procedure**

**IMPORTANT:** For Exchange 2007, restoring an entire database from the command line is not supported. Restoring a single storage group from the command line is supported.

- 1. Restore the active directory controller.
- 2. Locate and mount the tape containing the archived Exchange database files.
- 3. Create a temporary directory in a convenient location.
  - C:\TMP is used as an example temporary directory for the remainder of this procedure.
- 4. Using your tape archive and recovery software:
  - (a) Write the Exchange database stream file from the tape to the temporary directory.
  - (b) If avexchange.exe is present, also write it from the tape to the temporary directory.
- 5. Open a DOS prompt or other command shell.
- 6. Change directory to the temporary directory by entering:

C:

cd TMP

7. Ensure that avexchange.exe is present in the temporary directory by entering:

dir av\*

avexchange.exe should be listed.

8. If avexchange.exe is not present, you must obtain a version of avexchange.exe to use for this procedure and copy it to the temporary directory.

Try to obtain the exact version of avexchange.exe that was used to perform the original backup of this Exchange database.

9. Restore the Exchange database by entering the following command on a single command line (no returns or line feeds allowed):

```
avexchange -R --logfile=C:\avexchangedb.log
--attachdb=true --backupfile=C:\TMP\MyDBFile --debug=false
--dothecomplete=true --erase_existing=false
--keeplogs=false --pipe=false --restorelogpath=C:\TMP
--skipmounted=false --start_server=false --wait=true
--instance=storage_group_name
--annotation="Microsoft Information Store"
```

Where MyDBFile is the Exchange stream file that was archived to tape.

**IMPORTANT:** The --annotation option must contain "Microsoft Information Store" as the value. Any other value will cause this recovery operation to fail.

# Restoring a Database to Recovery Storage Group and Recovering a Mailbox

This topic describes how to recover an Exchange database to a Recovery Storage Group, then recover a single mailbox from that Storage Group.

This procedure might be useful if an Exchange mailbox was accidently deleted and message level backups had not been performed.

Refer to Microsoft Document, *Using Exchange Server 2003 Recovery Storage Groups*, for additional information about recovering an Exchange database to a Recovery Storage group.

1. From Exchange 2003 System Manager or Exchange 2007 Exchange Management Console:

**TIP:** On Exchange 2007, you can also use equivalent Exchange Power Shell commands to perform these actions.

- (a) Add Recovery Storage Group to Exchange server.
- (b) Add database to Recovery Storage Group.
- (c) Verify that **Database can be overwritten by restore** option is selected.
- (d) Verify database is not mounted.
- (e) Verify that there are no files in the Recovery Storage Group location. Move or delete any existing files.
- (f) Verify there are no files in C:\Tmp.Move or delete any existing files.

- 2. From Avamar Administrator:
  - (a) Locate the database backup you want to restore by performing steps 1 thru 7 basic recovery (restore) procedure (page 46).
  - (b) Select the exchstream file.
  - (c) If restoring to a different server, browse to the server and select Windows Exchange Database.
  - (d) In the Absolute Destination field, type C:\Tmp.
  - (e) In Advanced Options, type RSG in the Storage Group Name field.
  - (f) Restore database.
- 3. After the restore completes, launch Exchange System Manager, select the Recovery Storage Group and select **Actions** > **Refresh**.

#### Restoring to Recovery Storage Group on an Alternate Server

If an Exchange server does not have enough available drive space for an additional copy of the database, then a Recovery Storage Group can be created on an alternative server that has adequate free space. This recovery server should be part of the same Domain (AD forest) and be added to the existing Exchange organization when installing Exchange.

**IMPORTANT:** In this configuration, always restore to a Recovery Storage Group; never restore to a production Storage Group. Severe disruption of production Exchange functions could result if a database is restored to any storage group other than the Recovery Storage Group.

# APPENDIX B — PLUG-IN OPTIONS

Plugin options provide additional control of backups and restores. These options are context-sensitive to both the operation being performed and the specific plugin selected for that operation.

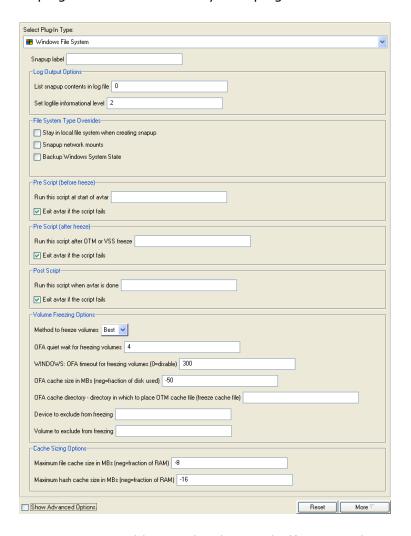
These options can be specified during on-demand backup and restore options, or persistently set within datasets for all future scheduled backups

Plugin options can be set two ways:

- By using the graphical controls (page 66)
- By entering option names and values as free text (page 67)

# **Setting Plugin Options Using Graphical Controls**

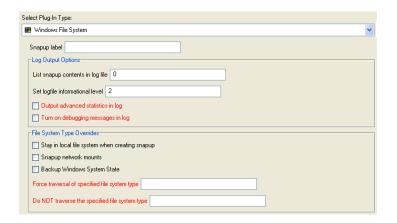
Clicking the Options tab and selecting a plugin displays all current plugin options for that specific plugin. The Windows filesystem plugin is shown in this example.



These settings are represented by graphical controls (for example, options, radio buttons, drop-down lists, and so forth).

The advantage to setting plugin options using graphical controls is that you cannot enter an option name or value incorrectly — only valid states are shown.

Setting **Show Advanced Options** expands this list even further by displaying options that are normally only of interest to persons debugging an Avamar system. These advanced options are shown in red. A partial list of advanced Windows filesystem plugin options is shown as an example (below).



# **Entering Option Names and Values as Free Text**

You can also set plugin options by entering option names and values as free text.

Clicking **More** expands the dialog box to include Enter Attribute and Attribute Value fields.

The Enter Attribute and Attribute Value fields are used to input plugin options and values as free text.

However, it must be understood that no error checking or validation is performed on these free text entries and that free text entries override settings made by way of the graphical controls.



# **Common Plugin Options**

This topic lists plugin options that are common to nearly all plugins. These options can be specified during on-demand backups and restores, or persistently set within datasets for all future scheduled backups.

## **Backup Options**

FIELD/OPTION		DESCRIPTION	
Backup label		Assign this descriptive label to backup.	
	List backup contents	Specify how much information about backup contents should be included in the log files. One of the following:	
		No file listing	
		List file names	
		List files and dates	
	Informational message level		ormational messages should files. One of the following:
		No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.
LOGGING		Some informationals	Some informational messages are included in the log files.
P		Many informationals	Additional status information is included in the log files.
		All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
	Report advanced statistics	If selected, advanced timing and deduplication statistics are written to log files.	
	Enable debugging messages	If selected, maximum information is written to log files.  IMPORTANT: If selected, very large log files are created.	

FIELD/OPTION		DESCRIPTION	
RSAL	Do not traverse any mounts	If selected, no mount points are traversed during this backup.	
	Traverse fixed- disk mounts	If selected, only fixed-disk filesystem mount points are traversed during this backup.	
M TRAVERSAL	Traverse fixed- disk and remote network mounts	If selected, both fixed-disk and NFS network mount points are traversed during this backup.	
FILESYSTEM	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.	
Ē	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.	
PRE-SCRIPT	Run user-defined script at beginning of backup	Runs user-defined script at beginning of backup session.  Script must be located in:     /usr/local/avamar/etc/scripts on AIX and Linux     /opt/AVMRcInt/etc/scripts on HP-UX and Solaris     C:\Program Files\avs\etc\scripts on Windows On Windows clients, script must have a .bat, .js or .vbs extension. There are no limitations on other client platforms.	
	Abort backup if script fails	If selected, stop backup if script returns a non-zero status code.	
POST-SCRIPT	Run user-defined script at end of backup	Runs user-defined script at end of backup session.  Script must be located in:     /usr/local/avamar/etc/scripts on AIX and Linux     /opt/AVMRcInt/etc/scripts on HP-UX and Solaris     C:\Program Files\avs\etc\scripts on Windows On Windows clients, script must have a .bat, .js or .vbs extension. There are no limitations on other client platforms.	
	Exit process with script failure exitcode	If selected, avtar exits with the exit code of the script instead of a standard avtar exit code.	

	FIELD/OPTION	DESCRIPTION
AIR	Check client-side caches and report inconsistencies	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
CHECK/REPAIR	Check and repair client-side caches	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
CLIENT CACHE CH	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
CLIENT	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).
OPTIONS	Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
_	Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
ADVANCED	Directly connect to all server nodes	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.

# **Restore Options**

FIELD/OPTION	DESCRIPTION
Overwrite existing files	Controls behavior when file to be restored already exists. One of the following:
	Never
	Always
	Generate New Name
	If Modified
	If Newer

	FIELD/OPTION	DESCRIPTION	
	List backup contents	Specify how much information about backup contents should be included in the log files. One of the following:	
		No file listing	
		List file names	
		List files and dates	
	Informational message level	Specify how many informational messages should be included in the log files. One of the following:	
LOGGING		No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.
		Some informationals	Some informational messages are included in the log files.
7		Many informationals	Additional status information is included in the log files.
		All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
	Report advanced If selected, advanced times statistics statistics are written to lo		
	Enable debugging messages	If selected, maximum information is written to log files.  IMPORTANT: If selected, very large log files are created.	
	<b>3</b>		
	Run user-defined script at beginning	Runs user-defined script at beginning of restore session. Script must be located in:	
	of restore		
F	/usr/local/avamar/etc/scrints on ATX		· •
CRIE			•
PRE-SCRIPT		C:\Program Files\avs\etc\scripts on Windows On Windows clients, script must have a .bat, .js or .vbs extension. There are no limitations on other client platforms.	
	Abort restore if script fails	If selected, stop restor status code.	re if script returns a non-zero

FIELD/OPTION		DESCRIPTION	
POST-SCRIPT	Run user-defined script at end of restore	Runs user-defined script at end of restore session.  Script must be located in:     /usr/local/avamar/etc/scripts on AIX and Linux     /opt/AVMRcInt/etc/scripts on HP-UX and Solaris     C:\Program Files\avs\etc\scripts on Windows  On Windows clients, script must have a .bat, .js or .vbs extension. There are no limitations on other client platforms.	
	Exit process with script failure exitcode	If selected, avtar exits with the exit code of the script instead of a standard avtar exit code.	
CLIENT CACHE CHECK/REPAIR	Check client-side caches and report inconsistencies	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.	
	Check and repair client-side caches	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.	
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).	
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).	
ADVANCED OPTIONS	Do not descend into subdirectories	If selected, restore only the specified top-level directory; do not restore any subdirectories.	
	Recreate original path beneath target directory	If selected, recreate the original path to files and directories beneath the specified target directory. For example, if restoring F:\Temp\MyFile.txt to C:\Temp and you selected this option, the full path to the restored file will be C:\Temp\F\Temp\MyFile.txt.	
	Directly connect to all server nodes	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.	

# **Windows Exchange Database Plugin Options**

In addition to the *Common Plugin Options* (page 8) discussed previously, the following additional plugin options are also available for use with the Avamar Windows Exchange Database plugin.

## **Backup Options**

FIELD/OPTION	DESCRIPTION	
Set when backup	Choices are:	
occurs on clustered systems	Always	Backs up all nodes in the cluster. This is the default setting.
	Active node only	Only the active node in the cluster is backed up.
	Passive node only	Only passive nodes in the cluster are backed up.
	and Reference	vamar Backup Clients Installation Guide Manual for additional information about t for Microsoft Windows Clusters.
Delete log files after backup	<b>IMPORTANT:</b> Do not select this option if you are performing concurrent incremental backups.	
Enhanced Data De-duplication	Enables or disables enhanced data de-duplication. During backups, enhanced data de-duplication typically reduces the amount of client data that must be sent to the server but requires additional client CPU resources. Choices are:	
	Default	Use the global enhanced data deduplication setting already set on the server. This is the default setting.
	Disabled	Do not use enhanced data deduplication for backups.
	Enabled	Use enhanced data de-duplication for backups.

	FIELD/OPTION	DESCRIPTION	
	Server Name	This field can normally be left blank because the Exchange server name is automatically stored when the target client is browsed during on-demand backups or when a dataset is applied to a member of a group during a scheduled backup.	
	Annotation (Microsoft		the portion of (Extensible Storage ackup to perform. Choices are:
Store  SHOOT ADVANCED OPTIONS  Storage Name  Local	Information Store)	Microsoft Information Store	This is the default setting.
		Microsoft Site Replication Service	Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.
		Microsoft Key Management Service	
	Storage Group Name	This field can normally be left blank because the Exchange storage group name is automatically stored when the target client is browsed during on-demand backups or when a dataset is applied to a member of a group during a scheduled backup.	
	Local Backup File Name	If Pipe input/output to avtar is cleared, this field defines the filename used to send/receive data.	
	Pipe input/ output to avtar	If selected, backups and restores are performed directly by the Avamar backup process (avtar).  If cleared, an intermediate local backup file can be used.	

## **Restore Options**

	FIELD/OPTION	DESCRIPTION
	Perform Database Recovery after restore making Exchange consistent	
03	Keep logs after Restore	
GE 2000/2003	Wait for Database Recovery to Complete	
EXCHANGE	Mount the database(s) after successful restore	
	Restore logs path	Specifies alternative location for restore log files. Specify this alternative location C:\TMP drive is low on disk space.
	Skip Mounted Databases on Restore	

	FIELD/OPTION	DESCRIPTION	
	Server Name	This field can normally be left blank because the Exchange server name is automatically stored when the target client is browsed during restore operations. However, this field can be used to enter another server hostname when performing directed restores to another network host.	
	Annotation (Microsoft Information Store)	This field names the portion of (Extensible Storage Engine (ESE) backup to perform. Choices are:	
ADVANCED OPTIONS		Microsoft This is the default setting. Information Store	
		Microsoft Site Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.	
		Microsoft Key Management Service	
ADV	Storage Group Name	This field can normally be left blank because the Exchange storage group name is automatically stored when the target client is browsed during restore operations.	
	Local Backup File Name	If Pipe input/output to avtar is cleared, this field defines the filename used to send/receive data.	
		This can be used to restore the exchstream file in one step to a local file, then perform a Exchange restore using that file.	
	Pipe input/ output to avtar	If selected, backups and restores are performed directly by the Avamar backup process (avtar).	
		If cleared, an intermediate local backup file can be used.	

# **Windows Exchange Database 2007 Plugin Options**

In addition to the *Common Plugin Options* (page 8) discussed previously, the following additional plugin options are also available for use with the Avamar Windows Exchange Database 2007 plugin.

## **Backup Options**

FIELD/OPTION	DESCRIPTION	
Set when backup	Choices are:	
occurs on clustered systems	Always	Backs up all nodes in the cluster. This is the default setting.
	Active node only	Only the active node in the cluster is backed up.
	Passive node only	Only passive nodes in the cluster are backed up.
	Refer to your <i>Avamar Backup Clients Installation Guide</i> and <i>Reference Manual</i> for additional information about Avamar support for Microsoft Windows Clusters.	
Delete log files after backup	<b>IMPORTANT:</b> Do not select this option if you are performing concurrent incremental backups.	
Enhanced Commonality Factoring	Enables or disables enhanced data de-duplication. During backups, enhanced data de-duplication typically reduces the amount of client data that must be sent to the server but requires additional client CPU resources. Choices are	
	Default	Use the global enhanced data deduplication setting already set on the server. This is the default setting.
	Disabled	Do not use enhanced data de- duplication for Exchange database backups.
	Enabled	Use enhanced data de-duplication for Exchange database backups.

	FIELD/OPTION	DESCRIPTION	
	Server Name	This field can normally be left blank because the Exchange server name is automatically stored when the target client is browsed during on-demand backups or when a dataset is applied to a member of a group during a scheduled backup.	
Annotation (Microsoft Information Store)  Storage Group Name	(Microsoft	This field names the portion of (Extensible Storage Engine (ESE) backup to perform. Choices are:	
		Microsoft Information Store	This is the default setting.
		Microsoft Site Replication Service	Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.
		Microsoft Key Management Service	
		This field can normally be left blank because the Exchange storage group name is automatically stored when the target client is browsed during on-demand backups or when a dataset is applied to a member of a group during a scheduled backup.	
	Pipe input/ output to avtar	If selected, backups and restores are performed directly by the Avamar backup process (avtar).  If cleared, an intermediate local backup file can be used.	

## **Restore Options**

	FIELD/OPTION	DESCRIPTION
	Perform Database Recovery after restore making Exchange consistent	
03	Keep logs after Restore	
GE 2000/2003	Wait for Database Recovery to Complete	
EXCHANGE	Mount the database(s) after successful restore	
	Restore logs path	Specifies alternative location for restore log files. Specify this alternative location C:\TMP drive is low on disk space.
	Skip Mounted Databases on Restore	

	FIELD/OPTION	DESCRIPTION	
	Server Name	This field can normally be left blank because the Exchange server name is automatically stored when the target client is browsed during restore operations.  However, this field can be used to enter another server host name when performing directed restores to another network host.	
	Annotation (Microsoft Information Store)	This field names the portion of (Extensible Storage Engine (ESE) backup to perform. Choices are:	
ADVANCED OPTIONS		Microsoft This is the default setting. Information Store	
		Microsoft Site Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.	
		Microsoft Key Management Service	
	Storage Group Name	This field can normally be left blank because the Exchange storage group name is automatically stored when the target client is browsed during restore operations.	
	Local Backup File Name	If Pipe input/output to avtar is cleared, this field defines the filename used to send/receive data.	
		This can be used to restore the exchstream file in one step to a local file, then perform a Exchange restore using that file.	
	Pipe input/ output to avtar	If selected, backups and restores are performed directly by the Avamar backup process (avtar).	
		If cleared, an intermediate local backup file can be used.	

# **Windows Exchange Message Plugin Options**

In addition to the *Common Plugin Options* (page 8) discussed previously, the following additional plugin options are also available for use with the Avamar Windows Exchange Message plugin.

### **Backup Options**

The only backup option available for use with the Avamar Windows Exchange Message plugin is **Enable debugging messages**. Refer to *Common Plugin Options* (page 8) for additional information.

### **Restore Options**

FIELD/OPTION	DESCRIPTION
Overwrite existing messages	Controls behavior when message to be restored already exists. One of the following:
	Never
	Always
	If Modified
	If Newer

# APPENDIX C — ADVANCED TECHNICAL INFORMATION

Thee Avamar Exchange Client supports backup of an entire Exchange database or specific messages within an Exchange database. This is implemented using two separate plug-ins:

- Exchange Database
- Exchange Messages

All Backups Are Initiated Using Avamar Administrator, Not The Client. EMC expects that most customers will simply schedule regular Exchange database backups (backups) using Avamar Administrator and not perform very many on-demand backups. Furthermore, when on-demand backups are required, it is expected that customers will only initiate them from Avamar Administrator, not from the client.

## **Exchange - Database Plug-In**

avexchange is the program (executable) that creates the Avamar Exchange Database plug-in.

```
avexchange {-B | -R | --browse | --help | --version}

[--annotation=NAME] [--backupfile=FILE]
[--compress={Disabled | Default | Enabled}] [--ddnstobackup=LIST]
[--erase_existing] [--fdosoftrecovery] [--ftruncatelogs]
[--instance=NAME] [--logfile=FILE] [--pipe] [--pluginflag="OPTION"]
[--restorelogpath=PATH] [--server=NAME] [--skipmounted]
[--start_server] [--timing] [--usage] [--verbose | -v]
```

**NOTE:** Boolean options (for example, --erase\_existing, --pipe, and so forth) are true if supplied and false if not supplied. Boolean options can also be supplied with the true or false value explicitly set (for example, --pipe=true, --pipe=false)

#### Commands

Performs a backup. -в

-R Performs a restore.

Browses backups stored on the Avamar --browse

server.

Shows help for this utility, then exits. --help

Displays avexchange build version then exits. --version

### **Options**

This can also be set to Site Replication Service or --annotation=NAME

> Key Management Service to backup those facilities, although this will require integration with the administrator server. All three services use the ESE

compatible APIs for backup.

Default is Microsoft Information Store.

**NOTE:** Formal support for mixed-case option --Annotation was discontinued in version 2.1. However, while not the preferred syntax, it will still

work.

Used with --pipe to specify backup FILE. --backupfile=FILE

> **NOTE:** Formal support for mixed-case option --BackupFile was discontinued in version 2.1. However, while not the preferred syntax, it will still

work.

--compress={Disabled | Default | Enabled} Enables or disables enhanced data deduplication. During backups, enhanced data deduplication typically reduces the amount of client data that must be sent to the server but requires additional client CPU resources. Default is the default setting (use the global enhanced data deduplication setting

already set on the server).

--ddnstobackup=LIST LIST of databases to backup/restore. Currently left

empty to indicate all databases.

**NOTE:** Formal support for mixed-case option --DDNsToBackup was discontinued in version 2.1. However, while not the preferred syntax, it will still

work.

#### --fdosoftrecovery

Performs soft recovery (performs a consistency check and prepares to put the database online) after database is restored. Can be done manually with ESEUTIL. Default is true.

This option is only supported on Exchange 2000/2003.

**NOTE:** Formal support for mixed-case option --fDoSoftRecovery was discontinued in version 2.1. However, while not the preferred syntax, it will still work.

#### --ftruncatelogs

Forces truncation of Exchange backup logs. A full backup is supposed to truncate the logs once a backup of the database and logs is successful. Default is true.

**NOTE:** Formal support for mixed-case option --fTruncateLogs was discontinued in version 2.1. However, while not the preferred syntax, it will still work.

#### --logfile=FILE

Specifies alternative log file for backup and restore operations.

#### --pipe

Pipe all input/output from/to avtar. Default is true.

This can be set to false to output the backup of avexchange to a file which is specified with the --BackupFile option. This is useful for debugging.

#### --pluginflag="OPTION"

Specifies an option which will be passed directly to the EMC Exchange database plug-in (avexchange) and not avtar.

OPTION must be enclosed in double-quotes and any values that contain spaces must also be enclosed in single quotes. For example:

"--pluginflag="--instance='Recovery Storage Group'"

### --restorelogpath=PATH

For Exchange 2000/2003, this option specifies where restored logs are written to. This location is separate from the log files of the running database.

This option might be necessary if there is insufficient space available on C:. Default is C:\TMP.

**NOTE:** Formal support for mixed-case option --RestoreLogPath was discontinued in version 2.1. However, while not the preferred syntax, it will still work.

#### --server=NAME

It is possible to backup/restore a remote server with avexchange though the communication is done by way of unsecured RPC calls. This might be useful in the future if we get feedback that customers are overly sensitive about the load we put on an Exchange server for backups.

If NAME is left empty, server name is localhost.

NOTE: Formal support for mixed-case option

--Server was discontinued in version 2.1.

However, while not the preferred syntax, it will still work.

Will skip mounted databases on restore without flagging an error. It should be noted that if all the databases are mounted, a restore will do nothing and not return an error. This is used as the way to selectively restore only those databases which are currently unmounted, so that a user can restore selected databases within a storage group on an Exchange Server.

This option added in version 3.0.1.

--timing Shows millisecond timing information.

--usage Shows a list of available options.

--verbose | -V Supplying either --

Supplying either --verbose or -v turns on verbose information including showing the transfer rate each second and creating more detailed logs.

--skipmounted

## **Exchange - Message Plug-In**

The actual mechanism used to accomplish Exchange backups involves several specialized avtar options, which enable avtar (on the client) to communicate with an Exchange database by way of Messaging Application Programming Interface (MAPI) protocol. Using these MAPI options, avtar traverses an Exchange server as it would any other filesystem.

For database backup, the plug-in mechanism relies on a executable (avexchange), which must also be installed on the client (Exchange server).

All items in exchange are stored as messages. This includes but is not limited to messages, tasks, notes, calendar items and contacts.

avtar considers all messages as files during its message based backup.

## **Message Identifiers**

Messages are identified using the display name. The display name varies according to the message type as follows:

MESSAGE TYPE	DISPLAY NAME
Email	Subject line
Tasks	Title line
Calendar	Subject line
Contact	Contact name
Notes	Title line

The storage hierarchy is the same hierarchy shown in Outlook.

### **MAPI Storage Path Syntax**

The path name conventions for the Exchange hierarchy are:

"" All mailboxes.

\@public All public mailboxes.

\MAILBOX-NAME Private MAILBOX-NAME.

Contacts for each mailbox are also backed up.

### avtar MAPI Options

mapi	Uses MAPI protocol to communicate with an Exchange server.
mapiprofile=PROFILE	Communicates with Exchange server defined in this MAPI PROFILE.
mapipassword=PASSWORD	PASSWORD formapiprofile=PROFILE. A password might not be required in all circumstances.

### **Example avtar Command Lines**

Although these command line examples continue (wrap) to more than one line, all commands and options must be entered on a single command line (no line feeds or returns allowed).

1. This example avtar command line backs up an Exchange server (exchange1) to the Avamar server (avamar-1):

```
avtar --hfsaddr=avamar-1 --id=root@avamar
--ap=AVAMAR-ROOT-PASSWORD --path=/clients/exchange1
--mapi --mapiprofile="AvamarBackupProfile" -cv ""
```

If a list of mailboxes is not supplied (for example, -cv ""), the backup will be taken at the default mailbox defined in the MAPI profile (MS Exchange Settings) and will include all mailboxes and messages below it.

To backup one or more individual mailboxes (and all mailboxes and messages below them), include one of the MAPI storage path statements (page 86).

The --mapipassword=PASSWORD option might be required in cases where the MAPI profile (MS Exchange Settings) requires password authentication.

2. These example avtar command lines show two ways to list Exchange server (exchange1) backups stored on the Avamar server (avamar-1):

```
avtar --backups --hfsaddr=avamar-1 --id=root@avamar --ap=AVAMAR-ROOT-PASSWORD --path=/clients/exchange1
avtar -tv --hfsaddr=avamar-1 --id=root@avamar --ap=AVAMAR-ROOT-PASSWORD --path=/clients/exchange1
```

3. This example avtar command line restores an Exchange server (exchange1):

```
avtar --hfsaddr=avamar-1 --id=root@avamar
--ap=AVAMAR-ROOT-PASSWORD --path=/clients/exchange1 --mapi
--mapiprofile="MS Exchange Settings" -xv -target restore
```

restore is the destination folder for the restore. It will overwrite if the target is not specified.