Dell EMC Avamar for Lotus Domino

User Guide

19.2

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Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Preface

As part of an effort to improve the product lines, revisions of the software and hardware are periodically released. Therefore, some functions that are described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features.

Contact the technical support professional when a product does not function correctly or does not function as described in this document.

NOTE: This document was accurate at publication time. To find the latest version of this document, go to Online Support (https://www.dell.com/support).

Purpose

This guide describes how to install Avamar in a Lotus Domino environment, and how to back up and restore data.

Audience

This document is intended for use by the following users:

- System administrators, who are responsible for installing software and maintaining servers and clients on a network.
- IBM Lotus Domino administrators, who are responsible for backing up and maintaining Domino servers.

Revision history

The following table presents the revision history of this document.

Table 1. Revision history

Revision	Date	Description
02	June, 2020	Updated "Restoring database files to the original directory" and "Restoring database files to a different directory" section.
01	November 15, 2019	GA release of Avamar 19.2

Related documentation

The following publications provide additional information:

- *Avamar Administration Guide*
- *E-LAB Navigator* at https://elabnavigator.emc.com/eln/elnhome
- *Avamar Operational Best Practices Guide*
- *Avamar Release Notes*

Typographical conventions

These type style conventions are used in this document.

Table 2. Typographical conventions

Bold	Used for names of interface elements, such as names of windows, dialog boxes, buttons, fields, tab names, key names, and menu paths (what the user specifically selects or clicks)
Italic	Used for full titles of publications that are referenced in text
`Monospace`	Used for:

Table 2. Typographical conventions (continued)

	• System code • System output, such as an error message or script • Pathnames, filenames, prompts, and syntax • Commands and options
Monospace italic	Used for variables
`Monospace bold`	Used for user input
[ ]	Square brackets enclose optional values
|	Vertical bar indicates alternate selections - the bar means "or"
{ }	Braces enclose content that the user must specify, such as x or y or z
...	Ellipses indicate nonessential information that is omitted from the example

Where to get help

The Avamar support page provides access to licensing information, product documentation, advisories, and downloads, as well as how-to and troubleshooting information. This information may resolve a product issue before contacting Customer Support.

To access the Avamar support page:

1. Go to https://www.dell.com/support.
2. Type a product name in the **Enter a Service Tag, Serial Number, Service Request, Model, or Keyword** search box.
3. Select the product from the list that appears. When you select a product, the **Product Support** page loads automatically.
4. (Optional) Add the product to the **My Products** list by clicking **Add to My Saved Products** in the upper right corner of the **Product Support** page.

Documentation

The Avamar product documentation provides a comprehensive set of feature overview, operational task, and technical reference information. To supplement the information in product administration and user guides, review the following documents:

- Release notes provide an overview of new features and known limitations for a release.
- Technical notes provide technical details about specific product features, including step-by-step tasks, where necessary.
- White papers provide an in-depth technical perspective of a product or products as applied to critical business issues or requirements.

Knowledgebase

The Knowledgebase contains applicable solutions that you can search for either by solution number (for example, KB000xxxxxx) or by keyword.

To search the Knowledgebase:

1. Go to https://www.dell.com/support.
2. Under the **Support** tab, click **Knowledge Base**.
3. Type either the solution number or keywords in the search box. Optionally, you can limit the search to specific products by typing a product name in the search box and then selecting the product from the list that appears.

Online communities

Go to Community Network at https://www.dell.com/community for peer contacts, conversations, and content on product support and solutions. Interactively engage online with customers, partners, and certified professionals for all products.

Live chat

To engage Customer Support by using live interactive chat, click **Join Live Chat** on the **Service Center** panel of the Avamar support page.

Service Requests

For in-depth help from Customer Support, submit a service request by clicking **Create Service Requests** on the **Service Center** panel of the Avamar support page.

NOTE: To open a service request, you must have a valid support agreement. Contact a sales representative for details about obtaining a valid support agreement or with questions about an account.

To review an open service request, click the **Service Center** link on the **Service Center** panel, and then click **View and manage service requests**.

Enhancing support

It is recommended to enable ConnectEMC and Email Home on all Avamar systems:

- ConnectEMC automatically generates service requests for high priority events.
- Email Home sends configuration, capacity, and general system information to Customer Support.

Comments and suggestions

Comments and suggestions help to continue to improve the accuracy, organization, and overall quality of the user publications. Send comments and suggestions about this document to DPAD.Doc.Feedback@emc.com.

Please include the following information:

- Product name and version
- Document name, part number, and revision (for example, 01)
- Page numbers
- Other details to help address documentation issues

1

Introduction

Topics:

- Architecture
- Backup
- Restore
- Concurrent backups and restores
- DAOS support
- Internationalization (I18N) support
- Multi-streaming

Architecture

The Avamar® Plug-in for Lotus Domino works with the Domino server to back up Domino data to an Avamar server or a Data Domain® system. The Avamar Plug-in for Lotus Domino serves as a backup module and the Avamar server or Data Domain system as a storage device.

The Avamar Plug-in for Lotus Domino supports the Domino server in both stand-alone configurations and clustered configurations. The Avamar Plug-in for Lotus Domino does not support local databases of Notes clients.

IBM Lotus Domino supports the use of DB2 databases as a data repository for Domino databases. The Avamar Plug-in for Lotus Domino, however, does not support this type of configuration.

Data Domain support

The Avamar Plug-in for Lotus Domino supports backups to and restores from Data Domain systems. You can back up Domino data to a Data Domain system by using Avamar Administrator, the AUI, or by using the command line interface. Metadata for the backup is stored on the Avamar server.

Restore backed up data from a Data Domain system the same way you restore data from the Avamar server. Follow the same restore procedure whether the data is on the Avamar server or a Data Domain system.

The *Avamar and Data Domain System Integration Guide* provides more information about configuring Data Domain systems for use with Avamar systems.

Stand-alone configurations

In a stand-alone configuration, one computer runs the Avamar client software and the Domino server software.

In a stand-alone environment, the Domino server host requires the installation of the following software:

- Domino server that is supported by Avamar
- Platform-specific Avamar client software
- Avamar Plug-in for Lotus Domino

The following figure shows a stand-alone configuration in which the Avamar Plug-in for Lotus Domino saves data to an Avamar server.

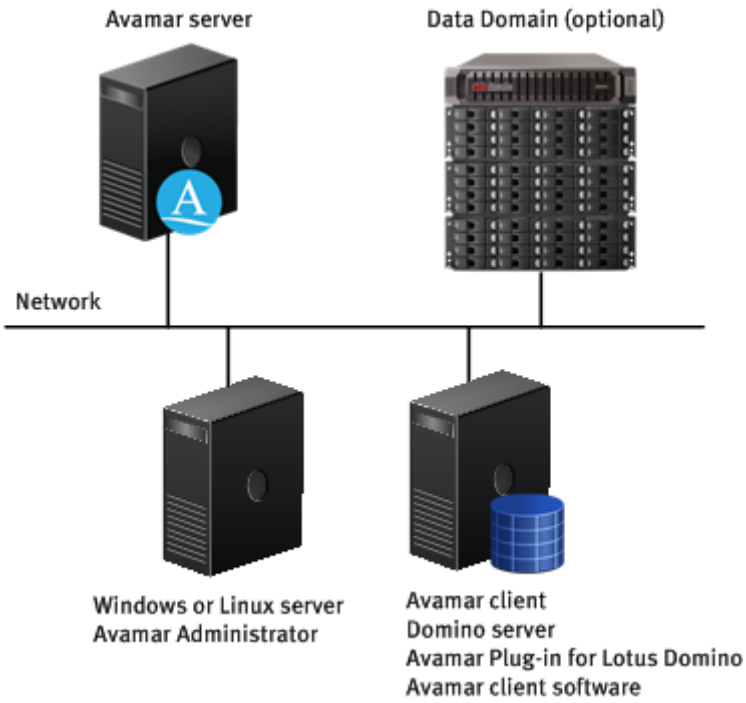

Figure 1. Avamar Plug-in for Lotus Domino stand-alone configuration

Cluster configurations

The Avamar Plug-in for Lotus Domino supports Lotus Domino servers in two-node active/passive or active/active Microsoft Windows cluster configurations.

For a Windows cluster environment, install the following software on each Domino server:

- Avamar Client for Windows
- Avamar Plug-in for Lotus Domino
- Avamar Cluster Client

Install the Avamar Cluster Client only on the active node. Installation and Configuration on page 20 provides more information about installing the software in a Windows cluster.

The following figure shows the Avamar Plug-in for Lotus Domino in an active/passive cluster configuration.

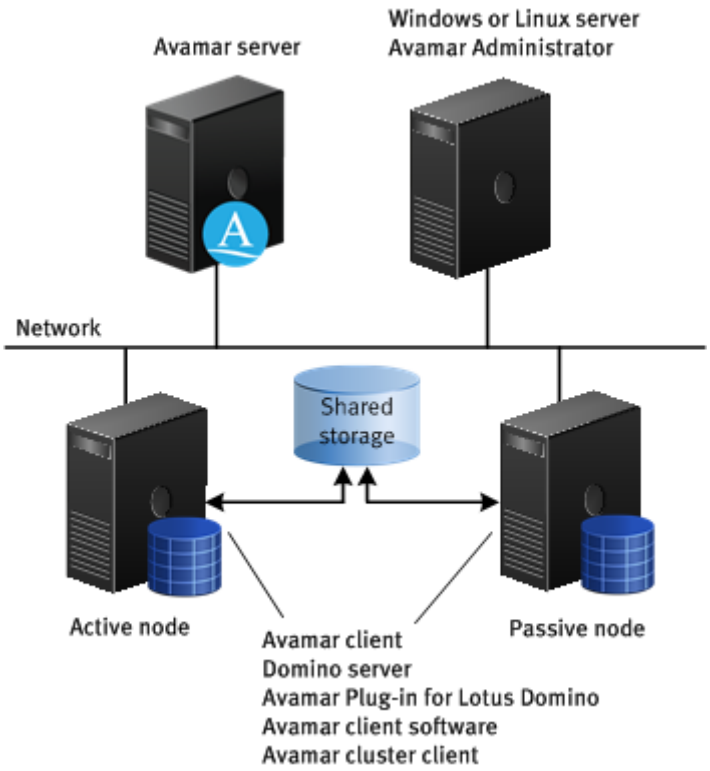

Figure 2. Avamar Plug-in for Lotus Domino cluster configuration

Two-node active/passive cluster deployment

In a two-node active/passive cluster, the active node runs applications while the passive node stands ready to take over if the active node fails.

When a failure occurs on the active node, its applications, such as the Domino server and Avamar client, fail over to the passive node. If scheduled Avamar backups exist for the active node, the passive node runs them while the active node is offline. Once the active node comes back online, the passive node fails back the Domino server and the Avamar client applications to the active node. Then the passive node goes back into standby mode.

Two-node active/active cluster deployment

In a two-node active/active cluster, both nodes are active and run applications.

If an active node (for example, NODE-1) fails, its applications fail over to the second active node (for example, NODE-2). NODE-2 now runs its own applications plus the ones from NODE-1. If, for example, scheduled Avamar backups exist for NODE-1, NODE-2 must run them while NODE-1 (the failed node) is offline. Once NODE-1 comes back online, NODE-2 fails back the applications, such as the Domino server and Avamar client, to NODE-1.

To use Lotus Domino in an active/active Windows cluster requires a Domino partitioned server.

Multiple versions of Domino on a single host

On UNIX, the Avamar Plug-in for Lotus Domino supports multiple installations of the Domino server. The Domino server versions can be the same or different.

On 64-bit AIX, the Avamar Plug-in for Lotus Domino supports the coexistence of both 32-bit and 64-bit versions of the Domino server on the same host. The Avamar Plug-in for Lotus Domino installation package for AIX includes both the 32-bit and 64-bit plug-in software.

NOTE: IBM does not support multiple versions of the Domino server on Windows platforms.

Types of files backed up and restored

The Avamar Plug-in for Lotus Domino backs up and restores database files, non-database files such as ID files, the `notes.ini` file, and transaction logs.

The following table describes the four types of database files that the Avamar Plug-in for Lotus Domino backs up.

Table 3. Types of database files

Database file extensions	Description
`.NSF`	`.NSF` files comprise two types: • Lotus Notes database files, which contain email for users. • Lotus Notes database link files, which contain a link to a Lotus Notes database in a directory other than the `data` directory.
`.NTF`	Template files for creating Notes applications and system databases.
`.box`	Outgoing email messages.
`.dir`	Lotus directory links. These files contain the full pathname to the directory outside of the `data` directory.

Lotus Domino stores all Lotus Notes client files and Domino server files in the data directory in the installation directory:

- On Windows, the default installation directory is `C:\Program Files\IBM\Lotus\Domino\data`.
- On AIX, Linux, or UNIX, the default installation directory is `/local/notesdata`.

You can also store Notes client files and Domino server files in an alternate location by using database and directory links.

Client cache and log files

The Avamar Plug-in for Lotus Domino creates client cache files and log files during backup operations.

The installation of Avamar Plug-in for Lotus Domino creates client cache files in `/install_path/var/clientlogs`.

Backup and restore operations from Avamar Administrator create the `avlotus.log` file in the `/install_path/var/clientlogs` directory.

Backup

The Avamar Plug-in for Lotus Domino enables you to perform backups by using Avamar Administrator or the AUI. You can perform both hot and cold backups. During a hot backup, databases are online and accessible. During a cold backup, databases are offline.

Backup types

The Avamar Plug-in for Lotus Domino supports full, incremental, and subset backups.

The following table describes the backup types.

Table 4. Types of backups

Backup types	Description
Full	Backs up all database files on the Domino server whether they have changed since the last backup. Optionally, you can choose to backup transaction logs if you enable transaction logging and set the logging style to `Archived`. A full backup also archives the transaction logs if you include transaction logs in the backup. Lotus Domino documentation provides more information about transaction logging.
Incremental	Backs up the following items:

Table 4. Types of backups (continued)

Backup types	Description
	• All transaction logs on the Domino server. • All new databases that you created since the last full or incremental backup. • All databases in which the DBIID property changed since the last full or incremental backup. The Avamar Plug-in for Lotus Domino supports incremental backups only when you set transaction logging to `Archived`. You must run a full backup before you run the first incremental backup.
Subset	Backs up all selected database files. A subset backup never backs up the transaction logs. If you select either the **Backup transaction logs with full backup** or the **Archive transaction logs** option in the **Backup Command Line Options** dialog box, the backup ignores the option.

Backups of Domino partitioned servers

The Avamar Plug-in for Lotus Domino supports both manual and scheduled backups of Domino partitions.

Domino partitions share the same Domino program directory. Each partition has its own `data` directory and `notes.ini` file. Back up each partition separately. The backup procedure is similar to the backup procedure for a single Domino server. For each partition, provide the full pathname to the `notes.ini` file and the full pathname to the Domino directory. Backup on page 34 provides more information about backing up the Domino server.

Transaction log backups

The Avamar Plug-in for Lotus Domino supports backups of the transaction logs.

Because Lotus Domino typically stores the transaction logs on a separate disk, the Avamar Plug-in for Lotus Domino can back up the transaction logs in parallel with other data streams during both full and incremental backups. After the Avamar Plug-in for Lotus Domino backs up all data files, the plug-in backs up the remaining transaction logs.

Incremental backups fail if you set transaction logging to circular or linear. The Avamar Plug-in for Lotus Domino supports incremental backup only when you set transaction logging to `Archived` on the Domino server.

Restore

The Avamar Plug-in for Lotus Domino supports restores from the original client to the same target location or to a different target location.

The Avamar Plug-in for Lotus Domino supports restores to the following targets:

- Original client in the original directory
- Original client in a different directory
- Different client

The destination client must run the same operating system and the same or later version of Domino server as the original client.

Redirected restores

The Avamar Plug-in for Lotus Domino supports redirected restores. A redirected restore enables you to restore a database to the destination host, which must be on the same type of a computer as the original host. The Avamar Plug-in for Lotus Domino does not support cross-platform restores.

The destination host can run a different version of the operating system or Domino server than the original host. The Avamar file system client and the Domino server must support the versions of the two operating systems.

To restore Domino database files to a different directory, the target directory must have read and write permissions for the specific Domino user account.

NOTE: The Avamar Plug-in for Lotus Domino uses the user account (by default, "notes") for tasks such as starting and stopping the Domino server. Only UNIX systems use the notes user account.

A restore fails if the target directory does not have read and write permissions for the Domino user account. Restoring database files to a different directory on page 42 provides more information about restoring Domino database files to different directories.

When you restore a database from one Domino server to another on the same host or a different host, you cannot apply the logs. When you restore databases to a new host and a new Domino server, you can move and apply the logs.

After a redirected restore to a new computer, you cannot apply the transaction logs to the database because the logs are not available from the new client computer. An attempt to recover a logged database fails, in which you cannot bring the database online. This limitation applies to redirected restores of Domino to a target computer that is part of a cluster or a target computer that participates as a replication server.

Restore of online database

During a restore, the Avamar Plug-in for Lotus Domino takes a database offline, deletes it, and then restores it with the backup file.

Domino considers each `.nsf` or `.ntf` file a separate database. A Domino server can include hundreds of databases.

Before restoring an online database, ensure that the database is not in use.

Restore and recovery from the Cloud

For Elastic Cloud Storage (ECS), when backups are in the Cloud and absent on Active tier, direct read from ECS for Lotus Domino enables common restore scenarios by using the plugin restore operations with DD 6.1 and later. When the user performs restores of backups in the ECS, Avamar Plug-in for Lotus Domino transparently restores data from ECS without performing a recall operation first.

For other Cloud providers, a two step process is in place for restoring and recovering data:

- Recall data from the Cloud
- Restore and recover data

Refer to *Restore operations for cloud tier* in the *Avamar Data Domain System Integration Guide* for more information.

Year 2038

The Avamar subsystem supports backup retention until February 2106. However, for older releases, the Avamar subsystem does not start after January 2038 due to the signed 32-bit integer time format of UNIX and Linux operating systems, and therefore cannot restore backup data after this date.

Newer Avamar releases offer support for longer retention periods:

- For Avamar 19.1 and later, the Avamar server subsystem uses an unsigned 32-bit integer and continues to start until 2106.
- For Avamar 19.1 and earlier, the Avamar client and plug-ins subsystem uses a signed 32-bit integer and retains data until 2038.
- For Avamar 19.2 and later, the Avamar client and plug-ins subsystem uses an unsigned 32-bit integer and retains data until 2106.
- Backup retention after 2038 is successful when all Avamar subsystems use unsigned 32-bit integers.

Therefore, with both Avamar 19.2 and later, and an Avamar 19.2 or later client, backup retention succeeds after 2038.

Avamar 19.2 and later clients also support restoring backups where the retention time is after 2038, and where the local (server and client) time is after 2038. Earlier client releases do not support this.

For backups of Windows or Linux clients, do not assign a retention period for a date after February 7, 2106.

Concurrent backups and restores

The Avamar Plug-in for Lotus Domino supports a maximum of six concurrent backups, restores, or both types of operations from Avamar Administrator or the AUI.

When six operations are running concurrently and you start a seventh one, the Avamar Plug-in for Lotus Domino adds the seventh operation to a wait queue. After one of the running operations completes, the next one in the wait queue starts.

The Avamar Plug-in for Lotus Domino enables you to run concurrent backup and restore operations for multiple partitions in a partitioned Domino environment or when you install multiple Domino servers on same host.

Concurrent operations require additional system resources such as memory and CPU. Consider the resource impact on the system before running concurrent operations.

Concurrent operations must reference different instances. You cannot run concurrent operations for the same instance.

DAOS support

Lotus Domino 8.5 includes the Domino Attachment and Object Storage (DAOS) feature.

The Avamar Plug-in for Lotus Domino supports the backup and restore of databases on DAOS-enabled servers. Enabling DAOS on a Domino server reduces disk space usage. For example, when you send an attachment to multiple users multiple times, the Domino server stores one copy of the attachment. The Avamar Plug-in for Lotus Domino backs up the attachment once.

NOTE: Avamar doesn't support or cannot determine which NSF files are associated with which NLO files.

Backups of DAOS-enabled servers

To back up a database on a DAOS-enabled server, the Avamar Plug-in for Lotus Domino backs up the database and the DAOS directory.

The Avamar Plug-in for Lotus Domino automatically backs up the DAOS directory for all types of backups: full, incremental, and subset. You do not need to include the DAOS directory in the backup request. The Avamar Plug-in for Lotus Domino backs up the DAOS directory after the backup of the data files and the transaction logs.

Restores to DAOS-enabled servers

During a restore operation of a DAOS-enabled database, the Avamar Plug-in for Lotus Domino checks for missing attachments (NLO files), restores them, and then synchronizes the DAOS catalog by using the `daosmgr` executable.

The Avamar Plug-in for Lotus Domino does not support a redirected restore of a DAOS-enabled database to a different computer. You cannot move a DAOS-enabled database from one computer to another because references to all attachments are to the original server.

An attempt to restore a DAOS-enabled database to a new computer restores the database. The attachments in the NLO files are not accessible. The NLO files are inaccessible regardless of whether you select the **Restore missing NLO files** option from Avamar Administrator.

This limitation applies to redirected restores of Domino to a destination computer that is part of a cluster or a destination computer that is a replication server.

Internationalization (I18N) support

Internationalization (I18N) support enables you to browse, back up, monitor, and restore non-English data from Avamar clients without localizing the software.

The Avamar Plug-in for Lotus Domino can back up and restore Domino databases and files that are named with international characters encoded with UTF-8 (UCS Transformation Format–8-bit) on Linux and UNIX, and UTF-16 on Windows.

NOTE: Do not confuse I18N support with localization (L10N) support. L10N translates the software user interface and operational messages into localized languages. This release of the Avamar Plug-in for Lotus Domino does not provide L10N support.

Multi-streaming

Multiple backup streams enable the Avamar Plug-in for Lotus Domino to back up the Domino files and the transaction logs in parallel streams. The Avamar Plug-in for Lotus Domino supports multiple backup and restore streams.

Multiple backup streams can improve the rate at which the Avamar Plug-in for Lotus Domino writes data to the Avamar server or the Data Domain system. The Avamar Plug-in for Lotus Domino balances the backup data among the available streams which are based on total size or logical volumes.

Data backed up in size-based streams occur in the following order:

1. Data files using multiple parallel streams.
2. Transaction logs using multiple parallel streams.
3. DAOS directory using a single stream.

Multi-stream backups of logical volume-based data use separate streams to back up each volume. Transaction logs that are on a separate volume from the data use a single stream.

Data backed up in volume-based streams occur in the following order:

1. Data files using multiple parallel streams.
2. Transaction logs that are on a separate volume from the data using a single stream.
3. DAOS directory using a single stream.

The Avamar Plug-in for Lotus Domino merges all backups from multiple streams into one image at the end of the backup operation.

A restore operation uses the same stream content and number of streams as the corresponding backup. A multi-stream restore process can improve performance because the number of `avtar` processes are reduced in comparison to single-stream restores, which run sequentially.

The maximum number of streams for either a backup or restore is 10 and the default is 1.

2

Installation and Configuration

Topics:

- Preparing to install the Avamar Plug-in for Lotus Domino
- Installing, upgrading, and uninstalling on IBM AIX
- Installing, upgrading, and uninstalling on RHEL
- Installing, upgrading, and uninstalling on SLES
- Installing, upgrading, and uninstalling on Solaris
- Installing, upgrading, and uninstalling on Windows
- Performing post-installation tasks

Preparing to install the Avamar Plug-in for Lotus Domino

Review the system requirements for the Avamar Plug-in for Lotus Domino to ensure that the environment meets these requirements before you perform the installation. Download the Avamar file system client and Avamar Plug-in for Lotus Domino installation packages from the Avamar server.

System requirements

Before you install the Avamar Plug-in for Lotus Domino, ensure that you meet all software and hardware requirements.

The Avamar file system client and the Avamar Plug-in for Lotus Domino that are installed on the host must be the same version number. You can install the Avamar Plug-in for Lotus Domino on 32-bit or 64-bit platforms.

Client compatibility requirements are available in the *E-LAB Navigator* at https://elabnavigator.emc.com/eln/modernHomeDataProtection. The requirements in the matrix include supported operating systems and application versions.

Domino server requirements

The Domino server requirements include setting `ARCHIVE` mode (transaction logging) and setting the `BACKUP_TIMEOUT` parameter.

Changing Domino server configuration settings might require two Domino server restarts or a reboot of the system that runs the Domino server for the configuration changes to take effect. The IBM Lotus Domino technote 1381136 provides more information.

Setting ARCHIVE mode on the Domino server

You must set databases on the Domino server to archive logging to perform incremental backups with the Avamar Plug-in for Lotus Domino.

About this task

Incremental backups fail if you enable circular or linear logging for the database on the Domino server.

Steps

1. Log in to the Domino server.
2. Set transaction logging to `Archived`.

   The Lotus Domino documentation provides additional instructions.

Setting the BACKUP_TIMEOUT parameter in notes.ini

Set a timeout value for the `BACKUP_TIMEOUT` parameter to an adequate value to avoid any possible backup failure.

About this task

You can prevent a backup from timing out by setting the `BACKUP_NO_TIMEOUT` parameter to 1 instead of setting the `BACKUP_TIMEOUT` parameter to 60 minutes. The use of the `BACKUP_NO_TIMEOUT` parameter can result in a backup that runs continuously. Use only one of these parameters in the `notes.ini` file.

Steps

1. Log in to the Domino server.
2. Open the `\path\notes.ini` file in a text editor. Specify the full directory pathname to the `notes.ini` file for *path*.
3. Set the `BACKUP_TIMEOUT` parameter in the `notes.ini` file to 60 minutes:

   `BACKUP_TIMEOUT=60`

   The default value for `BACKUP_TIMEOUT` is 15 minutes even if the parameter does not exist in the `notes.ini` file.
4. Save the changes and close the text editor.
5. Restart the Domino server twice for the configuration change to begin.

Downloading the software

Download the installation packages for the Avamar Plug-in for Lotus Domino from the Avamar server, and then save the package to a temporary directory.

About this task

The Avamar Plug-in for Lotus Domino installation package for a Linux 64-bit system is available from the Linux for x86 (32 bit) platform heading on the **Downloads** web page. Use `AvamarLotus-linux-rhel4-x86-7.2.100-build.rpm` or `AvamarLotus-linux-sles11-x86-7.2.100-build.rpm` to install the Avamar Plug-in for Lotus Domino on a Linux 64-bit system.

Steps

1. Log in to the Domino server host with the necessary privileges to perform an installation.
2. Open a web browser and type the following URL:

   `https://Avamar_server`

   where *Avamar_server* is the DNS name or IP address of the Avamar server.

   The **Avamar Web Restore** page appears.
3. Click **Downloads**.
   The **Downloads** list appears.
4. Click **+** next to the platform heading for the Domino server.
5. Click **+** next to the operating system heading for the Domino server.
6. Click the link for the Avamar Plug-in for Lotus Domino installation package.
7. Save the Avamar Plug-in for Lotus Domino installation package to a temporary directory.

Installing the Avamar file system client

Install the appropriate Avamar file system client before installing the Avamar Plug-in for Lotus Domino.

Steps

- For IBM AIX, RHEL, SLES, and Solaris systems, follow the instructions in the *Avamar Backup Clients User Guide*.
- For Windows systems, follow the instructions in the *Avamar for Windows Server User Guide*.

Installing RHEL6 or RHEL7 64-bit packages

The Avamar Plug-in for Lotus Domino on RHEL6 or RHEL7 64-bit systems requires additional software to enable the browse feature.

About this task

Software packages for RHEL6 and RHEL7 64-bit systems are available in the `Packages` folder from the RHEL 6 or RHEL 7 installation ISO image or DVD.

Steps

- To enable the browse feature for the Avamar Plug-in for Lotus Domino on RHEL6 and RHEL7 64-bit systems, install the following packages:

Table 5. RHEL6 and RHEL7 64-bit packages

RHEL6	RHEL7
○ `libcap-2.16-5.2.el6.i686.rpm` ○ `libxml2-2.7.6-1.el6.i686.rpm` ○ `libacl-2.2.49-4.el6.i686.rpm` ○ `zlib-1.2.3-25.el6.i686.rpm`	○ `libcap-2.22-8.el7.i686.rpm` ○ `libxml2-2.9.1-5.el7.i686.rpm` ○ `libacl-2.2.51-12.el7.i686.rpm` ○ `zlib-1.2.7-13.el7.i686.rpm`

Installing, upgrading, and uninstalling on IBM AIX

You can install, upgrade, and uninstall the Avamar Plug-in for Lotus Domino on IBM AIX.

Installing the Avamar Plug-in for Lotus Domino on IBM AIX

The Avamar Plug-in for Lotus Domino installation package for AIX includes both the 32-bit and 64-bit plug-in software. You can install the Avamar Client for AIX software in either the default installation directory or an alternate directory. Use the `geninstall` command to install the Avamar Plug-in for Lotus Domino in the default `var` directory or use the `installp` command to install the Avamar Plug-in for Lotus Domino in a new location.

About this task

Ensure that you install the Avamar Plug-in for Lotus Domino in the same directory as the Avamar Client for AIX. The installation returns an error if you install the Avamar Plug-in for Lotus Domino in default directory after you install the Avamar Client for AIX in an alternate directory.

Steps

1. Log in to the Domino server as root.
2. Change the directory to the temporary directory by typing the following command:

   `cd /`*`tmp`*

   where *tmp* is the temporary install directory.
3. To install the Avamar Plug-in for Lotus Domino in the default directory, type the following command:

   `geninstall -d /`*`tmp`*`/AvamarLotus-`*`platform-version`*`.bff all`

   where:

   - *platform* is the AIX system type. For example: aix6-ppc or aix6-ppc64.
   - *version* is the Avamar software version.
4. To install the Avamar Plug-in for Lotus Domino in an alternate directory, type the following command:

   `installp -R /`*`install_path`*` -d AvamarLotus-`*`platform-version`*`.bff all`

   where:

   - *install_path* is the directory for the installation files.
   - *platform* is the AIX system type. For example: aix6-ppc or aix6-ppc64.

- *version* is the Avamar software version.

Upgrading the Avamar Plug-in for Lotus Domino on IBM AIX

Upgrade the Avamar Plug-in for Lotus Domino before upgrading the Avamar Client for AIX. The Avamar Client for AIX and Avamar Plug-in for Lotus Domino must be the same version.

Steps

1. Download the Avamar Plug-in for Lotus Domino installation packages. Downloading the software on page 21 provides instructions.
2. Log in to the Domino server as root.
3. Change the directory to the temporary directory by typing the following command:

   cd /*tmp*

   where *tmp* is the temporary install directory.
4. To upgrade the Avamar Plug-in for Lotus Domino in the default installation directory, type the following command:

   geninstall -d AvamarLotus-*platform-version*.bff all

   where *platform-version* is the platform type and Avamar version number.

   NOTE: To upgrade the Avamar Plug-in for Lotus Domino in an alternate installation directory, skip this step and continue to the next step.
5. To upgrade the Avamar Plug-in for Lotus Domino in an alternate installation directory, type the following command:

   installp -R /*install_path* -d AvamarLotus-*platform-version*.bff all

   where:

   - *install_path* is the alternate installation directory.
   - *platform-version* is the platform type and Avamar version number.
6. Download the Avamar Client for AIX. The *Avamar Backup Clients User Guide* provides instructions.
7. To upgrade the Avamar Client for AIX in the default installation directory, type the following command:

   geninstall -d AvamarClient-*platform-version*.bff all

   where *platform-version* is the platform type and Avamar version number.

   NOTE: To upgrade the Avamar Client for AIX in an alternate installation directory, skip this step and continue to the next step.
8. To upgrade the Avamar Client for AIX in an alternate installation directory, type the following command:

   installp -R /*install_path* -d AvamarClient-*platform-version*.bff all

   where:

   - *install_path* is the alternate installation directory.
   - *platform-version* is the platform type and Avamar version number.

Uninstalling the Avamar Plug-in for Lotus Domino on IBM AIX

You can uninstall the Avamar Plug-in for Lotus Domino from an IBM AIX system by using the `geninstall -u` command.

About this task

When you uninstall the Avamar Plug-in for Lotus Domino and the Avamar Client for AIX from the host system, scheduled backups no longer occur for the client. You cannot restore backups to the client after you uninstall the software.

You can retire or delete a client either before or after you uninstall the Avamar Plug-in for Lotus Domino:

- To keep the backups for the client so that you can restore the backups to a different client, retire the client by using Avamar Administrator.
- To delete the backups for the client, delete the client by using Avamar Administrator.

The *Avamar Administration Guide* provides more information.

Steps

1. Open a command shell and log in to the Domino server as root.
2. To list Avamar packages that are installed in the default directory, type the following command:

   `lslpp -la | grep Avamar`

   NOTE: To list Avamar packages that are installed in an alternate installation directory, skip this step and continue to the next step.

3. To list Avamar packages that are installed in an alternate installation directory, type the following command:

   `lslpp -la -R /install_path | grep Avamar`

   where *install_path* is the alternate installation directory.
4. Uninstall the Avamar Plug-in for Lotus Domino by typing the following command:

   `geninstall -u AvamarLotus-platform`

   where *platform* is the AIX system type. For example: aix6-ppc or aix6-ppc64.
5. Uninstall the Avamar Client for AIX by typing the following command:

   `geninstall -u AvamarClient-platform`

   where *platform* is the AIX system type. For example: aix6-ppc or aix6-ppc64

Installing, upgrading, and uninstalling on RHEL

You can install, upgrade, and uninstall the Avamar Plug-in for Lotus Domino on RHEL.

Installing the Avamar Plug-in for Lotus Domino on RHEL

You can install the Avamar Client for Linux software in either the default installation directory or an alternate directory.

About this task

Ensure that you install the Avamar Plug-in for Lotus Domino in the same directory as the Avamar Client for Linux.

Steps

1. Log in to the Domino server as root.
2. Change the directory to the temporary directory by typing the following command:

   `cd /tmp`

   where *tmp* is the temporary install directory.
3. To install the Avamar Plug-in for Lotus Domino in the default directory, type the following command:

   `rpm -ivh AvamarLotus-linux-platform-version.rpm`

   where *platform-version* is the platform type and Avamar version number.

   NOTE: To install the Avamar Plug-in for Lotus Domino in an alternate directory, skip this step and continue to the next step.

4. To change the base directory for the installation, type the following command:

   `rpm --relocate /usr/local/avamar=/new_path -i AvamarLotus-linux-platform-version.rpm`

   where:

   - *new_path* is the new directory.
   - *platform-version* is the platform type and Avamar version number.

   NOTE: To change the base directory and the `var` directory, skip this step and continue to the next step.

5. To change the base directory and `var` directory locations during the installation, type the following command:

   `rpm -ivh --relocate /usr/local/avamar=base_path --relocate /var/avamar=var_path AvamarLotus-linux-platform-version.rpm`

Upgrading the Avamar Plug-in for Lotus Domino on RHEL

Upgrade the Avamar Plug-in for Lotus Domino by using the `rpm -Uvh` command. You can use the `--relocate` option to specify the alternate installation or `var` directory that you specified when you installed the initial version. The versions of the Avamar Client for Linux and Avamar Plug-in for Lotus Domino must be the same.

Steps

1. Upgrade the Avamar Client for Linux by using the instructions in the *Avamar Backup Clients User Guide*.
2. Change the directory to the temporary directory by typing the following command:

   cd /*tmp*
3. To upgrade the software in the default directory, type the following command:

   rpm -Uvh AvamarLotus-linux-*platform-version*.rpm

   where *platform-version* is the platform type and Avamar version number.

   NOTE: To upgrade the software in a nondefault installation directory, skip this step and continue to the next step.
4. To upgrade the software in a nondefault installation directory, type the following command:

   rpm -Uvh --relocate /usr/local/avamar=*install_path* AvamarLotus-linux-*platform-version*.rpm

   where:

   - *install_path* is the installation directory that you specified when you installed the earlier version of the Avamar Plug-in for Lotus Domino software.
   - *platform-version* is the platform type and Avamar version number.

   NOTE: To upgrade the software and use a nondefault `var` directory, skip this step and continue to the next step.
5. To upgrade the software and use a nondefault `var` directory, type the following command:

   rpm -Uvh --relocate /var/avamar=*var_path* AvamarLotus-linux-*platform-version*.rpm

   where:

   - *var_path* is the installation directory that you specified when you installed the earlier version of the Avamar Plug-in for Lotus Domino software.
   - *platform-version* is the platform type and Avamar version number.

   The `rpm -Uvh` command automatically uninstalls the earlier version of the Avamar Plug-in for Lotus Domino, and then installs the new version.

Uninstalling the Avamar Plug-in for Lotus Domino on RHEL

You can uninstall the Avamar Plug-in for Lotus Domino from an RHEL system by using the `rpm -e` command.

About this task

When you uninstall the Avamar Plug-in for Lotus Domino and the Avamar Client for Linux from the host system, scheduled backups no longer occur for the client. You cannot restore backups to the client after you uninstall the software.

You can retire or delete a client either before or after you uninstall the Avamar Plug-in for Lotus Domino:

- To keep the backups for the client so that you can restore the backups to a different client, retire the client by using Avamar Administrator.
- To delete the backups for the client, delete the client by using Avamar Administrator.

The *Avamar Administration Guide* provides more information.

Steps

1. Log in to the Domino server as root.
2. To view the Avamar packages that are installed on the system, type the following command:

   rpm -qa | grep Av

   Output similar to the following appears in the command shell:

`AvamarLotus-version-nnn`
`AvamarClient-version-nnn`

3. Uninstall the Avamar Plug-in for Lotus Domino by typing the following command:

   `rpm -e AvamarLotus-version`

   where *version* is the version of the Avamar Plug-in for Lotus Domino.
4. Uninstall the Avamar Client for Linux by typing the following command:

   `rpm -e AvamarClient-version`

   where *version* is the version of the Avamar Client for Linux.

Installing, upgrading, and uninstalling on SLES

You can install, upgrade, and uninstall the Avamar Plug-in for Lotus Domino on SLES.

Installing the Avamar Plug-in for Lotus Domino on SLES

You can install the Avamar Plug-in for Lotus Domino software in either the default installation directory or an alternate directory. Install the Avamar Plug-in for Lotus Domino in the same directory as the Avamar Client for Linux.

Steps

1. Log in to the Domino server as root.
2. Change the directory to the temporary directory by typing the following command:

   `cd /tmp`

   where *tmp* is the temporary install directory.
3. To install the Avamar Plug-in for Lotus Domino in the default directory, type the following command:

   `rpm -ivh AvamarLotus-linux-platform-version.rpm`

   where *platform-version* is the platform type and Avamar version number.

   NOTE: To change the base directory during the installation, skip this step and continue to the next step.
4. To change the base directory during the installation, type the following command:

   `rpm --relocate /usr/local/avamar=/new_path -i AvamarLotus-linux-platform-version.rpm`

   where:

   - *new_path* is the new directory.
   - *platform-version* is the platform type and Avamar version number.

   NOTE: To change the base directory and `var` directory locations during the installation, skip this step and continue to the next step.
5. To change the base directory and `var` directory locations during the installation, type the following command:

   `rpm -ivh --relocate /usr/local/avamar=new_base_path --relocate /var/avamar=new_var_path AvamarLotus-linux-platform-version.rpm`

   where:

   - *new_base_path* is the new installation directory.
   - *new_var_path* is the new `var` directory.
   - *platform-version* is the platform type and Avamar version number.

Upgrading the Avamar Plug-in for Lotus Domino on SLES

Upgrade the Avamar Plug-in for Lotus Domino to a later release by using the `rpm -Uvh` command. Use the `--relocate` option to specify the alternate installation or `var` directory that you specified when you installed the initial version. The Avamar Client for Linux and Avamar Plug-in for Lotus Domino must be the same version.

Steps

1. Upgrade the Avamar Client for Linux by using the instructions in the *Avamar Backup Clients User Guide*.

2. Change the directory to the temporary directory by typing the following command:

   `cd /tmp`

3. To upgrade the software in the default directory, type the following command:

   `rpm -Uvh AvamarLotus-linux-platform-version.rpm`

   where *platform-version* is the platform type and Avamar version number.

   NOTE: To upgrade the software in a nondefault installation directory, skip this step and continue to the next step.

4. To upgrade the software in a nondefault installation directory, type the following command:

   `rpm -Uvh --relocate /usr/local/avamar=new_base_path AvamarLotus-linux-platform-version.rpm`

   where:

   - *new_base_path* is the installation directory that you specified when you installed the release 7.0.
   - *platform-version* is the platform type and Avamar version number.

   NOTE: To upgrade the software and use a nondefault `var` directory, skip this step and continue to the next step.

5. To upgrade the software and use a nondefault `var` directory, type the following command:

   `rpm -Uvh --relocate /var/avamar=new_var_path AvamarLotus-linux-platform-version.rpm`

   where:

   - *new_var_path* is the installation directory that you specified when you installed release 7.0.
   - *platform-version* is the platform type and Avamar version number.

   The `rpm -Uh` command automatically uninstalls the earlier version of the Avamar Plug-in for Lotus Domino, and then installs the new version.

Uninstalling the Avamar Plug-in for Lotus Domino on SLES

When you uninstall the Avamar Plug-in for Lotus Domino and the Avamar Client for Linux from the host system, scheduled backups no longer occur for the client. You cannot restore backups to the client after you uninstall the software.

About this task

You can retire or delete a client either before or after you uninstall the Avamar Plug-in for Lotus Domino:

- To keep the backups for the client so that you can restore the backups to a different client, retire the client by using Avamar Administrator.
- To delete the backups for the client, delete the client by using Avamar Administrator.

The *Avamar Administration Guide* provides more information.

Steps

1. Log in to the Domino server as root.
2. To view the Avamar packages that are installed on the system, type the following command:

   `rpm -qa | grep Avamar`

   Output similar to the following appears in the command shell:

   ```
   AvamarLotus-version-nnn
   AvamarClient-version-nnn
   ```

3. Uninstall the software by typing the following command:

   `rpm -e AvamarLotus-version AvamarClient-version`

   where *version* is the Avamar software version.

Installing, upgrading, and uninstalling on Solaris

You can install, upgrade, and uninstall the Avamar Plug-in for Lotus Domino on Solaris.

Installing the Avamar Plug-in for Lotus Domino on Solaris

Use the `pkgadd` command to install the Avamar Plug-in for Lotus Domino software.

Steps

1. Log in to the Domino server as root.
2. Change the directory to the temporary directory by typing the following command:

   cd /*tmp*

   where *tmp* is the temporary install directory.
3. Install the Avamar Plug-in for Lotus Domino by typing the following command:

   pkgadd -d AvamarLotus-*OS*-sparc-*version*.pkg

   where:

   - *OS* is the Solaris operating system version. For example: solaris10.
   - *version* is the Avamar software version.

   The following appears in the command shell:

   ```
   The following packages are available:
   1 AVMRlotus Avamar Client Plugin for IBM Lotus Domino
   (sparc) 7.2.100-nnn\par

   Select package(s) you wish to process (or 'all' to process
   all packages). (default: all) [?,??,q]:
   ```
4. Type **1** and press **Enter**.
   The following output appears in the command shell:

   ```
   Processing package instance <AVMRlotus> from
   </AvamarLotus-solaris10-sparc-7.2.100-nnn.pkg>

   Avamar Client Plugin for IBM Lotus Domino(sparc) 7.2.100-nnn
   ## Executing checkinstall script.
   Using as the package base directory.
   ## Processing package information.
   ## Processing system information.
   2 package pathnames are already properly installed.
   ## Verifying package dependencies.
   ## Verifying disk space requirements.
   ## Checking for conflicts with packages already installed.
   ## Checking for setuid/setgid programs.

   This package contains scripts which will be executed with super-user
   permission during the process of installing this package.

   Do you want to continue with the installation of <AVMRlotus> [y,n,?]
   ```
5. Type **y** and press **Enter**.
   The installation runs to completion.

Upgrading the Avamar Plug-in for Lotus Domino on Solaris

About this task

The versions of the Avamar Client for Solaris and Avamar Plug-in for Lotus Domino must be the same.

Steps

1. Uninstall the Avamar Plug-in for Lotus Domino. Uninstalling the Avamar Plug-in for Lotus Domino on Solaris on page 29 provides instructions.
2. Uninstall the Avamar Client for Solaris. The *Avamar Backup Clients User Guide* provides instructions.
3. Download the Avamar Client for Solaris and the Avamar Plug-in for Lotus Domino installation packages. Downloading the software on page 21 provides instructions.
4. Install the new version of the Avamar Client for Solaris. The*Avamar Backup Clients User Guide* provides instructions.
5. Install the new version of the Avamar Plug-in for Lotus Domino. Installing the Avamar Plug-in for Lotus Domino on Solaris on page 28 provides instructions.

Uninstalling the Avamar Plug-in for Lotus Domino on Solaris

When you uninstall the Avamar Plug-in for Lotus Domino and the Avamar Client for Solaris from the host system, scheduled backups no longer occur for the client. You cannot restore backups to the client after you uninstall the software.

About this task

You can retire or delete a client either before or after you uninstall the Avamar Plug-in for Lotus Domino:

- To keep the backups for the client so that you can restore the backups to a different client, retire the client by using Avamar Administrator.
- To delete the backups for the client, delete the client by using Avamar Administrator.

The *Avamar Administration Guide* provides more information.

Steps

1. Log in to the Domino server as root.
2. Display all Avamar packages that are installed on the system by typing the following command:

   `pkginfo | grep AVMR`

   Information similar to the following appears in the command shell:

   ```
   The following packages are currently installed:
   1 AVMRlotus Avamar Client Plugin for IBM Lotus Domino
   (sparc) 7.2.100-nnn
   ```
3. Uninstall the software by typing the following command:

   `pkgrm AVMRlotus`

   The following output appears in the command shell:

   ```
   The following package is currently installed:
   AVMRlotus
   Do you want to remove this package?
   ```
4. Type **`y`** and press **Enter**.
   The following output appears in the command shell:

   ```
   Removal of AVMRlotus was successful.
   ```

Installing, upgrading, and uninstalling on Windows

You can install, upgrade, and uninstall the Avamar Plug-in for Lotus Domino on a stand-alone Windows system or on a Windows cluster.

Installing the Avamar Plug-in for Lotus Domino on Windows

Install the Avamar Plug-in for Lotus Domino on both Windows stand-alone systems and MSCS two-node clusters. In a cluster, install the Avamar Plug-in for Lotus Domino on both nodes and in the same directory on each node.

About this task

If UAC is enabled on the client computer, you must start the setup wizard by using administrator privileges. Otherwise, the software does not install correctly. This procedure provides one method to bypass UAC. The Microsoft documentation provides other methods and additional information.

The Avamar Plug-in for Lotus Domino is automatically installed in the same folder as the Avamar Client for Windows.

Steps

1. Log in to the Domino server as an administrator.
2. Go to the temporary directory that contains the installation package that you downloaded in Downloading the software on page 21.
3. Start the installation by using the correct method:
   - If UAC is disabled, double-click the installation package.
   - If UAC is enabled, right-click the **Command Prompt** icon and select **Run as administrator**. Change to the directory that contains the installation package and type the following command:

     ```
     msiexec /i AvamarLotus-windows-platform-version.msi
     ```

     where *platform-version* is the platform type and Avamar software version number.

   The welcome page appears.
4. Click **Next**.
   The **Ready to install Avamar Backup Plug-in for Lotus Domino** page appears.
5. Click **Install**.
   The **Installing Avamar Backup Plug-in for Lotus Domino** page appears. A status bar shows the installation's progress. After the installation completes, the **Completed the Avamar Backup Plug-in for Lotus Domino Setup Wizard** page appears.
6. Click **Finish**.
7. In a cluster, repeat this installation procedure on each node.

Configuring the cluster client on Windows

The Avamar cluster client enables you to back up and restore Domino data on shared storage in a cluster, regardless of which node is managing the data at the time of the backup or restore.

Prerequisites

Before you run the Cluster Configuration Tool, ensure that the Avamar Client for Windows and the Avamar Plug-in for Lotus Domino are installed on each node in the cluster.

About this task

Use the Cluster Configuration Tool to configure the Avamar cluster client on the active node in an active/passive configuration or on both active nodes in an active/active configuration.

Steps

1. Log in to the active node in the cluster as a domain administrator. The account must be a member of the local Administrators group on each cluster node.
2. Start the Cluster Configuration Tool:
   - On Windows Server 2012, open the **Start** screen and select **Cluster Configuration Tool**.

- On Windows Server 2008, open the **Start** menu and select **Program Files** > **Avamar** > **Cluster Configuration Tool**.

The welcome page appears.

3. Click **Next**.
   The **Plug-Ins** page appears.
4. Select **Lotus Domino** from the **Avamar Backup Plug-ins** list, and then click **Next**.
   The **Cluster Nodes** page appears with a list of nodes and their status.
5. Ensure that the environment meets the following requirements:
   - The status for each Lotus Domino node is Up.
   - The installation status of the Windows client software for each node is Installed.
   - The installation status of the Avamar Plug-in for Lotus Domino software for each node is Installed.
6. Click **Next**.
   The **Operations** page appears.
7. Select **Configure a new cluster client for all nodes**, and then click **Next**.

   NOTE: All cluster nodes must be registered to Avamar Server.

   The **Prerequisites** page appears. A check mark next to a prerequisite indicates that the prerequisite has been met.
8. Ensure that the environment meets all prerequisites on the **Prerequisites** page.
   If a prerequisite is not met, exit the wizard, resolve the issue, and then restart the wizard.
9. Select the Internet Protocol version that the environment uses, and then click **Next**.
   The **Attach to Service** page appears.
10. Select the cluster service to use for the cluster client, and then click **Next**.
    The **Server Settings** page appears.
11. Specify the settings for the Avamar server:
    a. Type either the DNS name of the Avamar server in the **Name** box or the IP address in the **IPv4/IPv6 address** box.

       The IP option that appears on this page depends on the choice you make in step 9.
    b. Type the name of the Avamar domain in the **Avamar client domain for the cluster client** box.

       To specify a domain at the root level, type ***/domain***, where *domain* is the domain name. To specify a subdomain, type ***/domain/subdomain***, where *domain* is the domain name and *subdomain* is the subdomain name.
    c. Type the data port for Avamar client/server communication in the **Port number** box.

       Port 28001 is the default port that the Avamar client uses to communicate with the administrator server.
    d. Click **Next**.

       The **Client settings** page appears.
12. Specify the settings for the client:
    a. Type the name of the shared network directory or volume where the Secure Certificate is located in the **Cluster client's SYSDIR directory** box, or click **Browse** to select the shared network directory or volume.
    b. Type the name of the shared network directory or volume in the **Cluster client's var directory** box, or click **Browse** to select a shared network directory or volume.

       The shared network directory or volume stores the cluster client configuration and log files. All nodes in the cluster must have write access to this directory or volume.
    c. Click **Next**.

       The **Summary** page appears.
13. Review the configuration settings, and then click **Configure**.
    The **Progress** page provides the status of the configuration. When the configuration process is complete, the **Results** page appears.
14. Click **Close**.

Upgrading the Avamar Plug-in for Lotus Domino on Windows

The steps to upgrade the Avamar Plug-in for Lotus Domino on Windows depend on whether the installation is on a stand-alone server or in a cluster.

Upgrading on a stand-alone Windows server

When you upgrade the Avamar Plug-in for Lotus Domino on a stand-alone server, you do not need to uninstall earlier versions before you install a new version. The installation determines that an earlier version is installed, and then prompts you to upgrade to the new version or remove the current version.

Steps

1. Ensure that you meet all system requirements for the new version. Preparing to install the Avamar Plug-in for Lotus Domino on page 20 provides information.
2. Upgrade the Avamar Client for Windows by running the Windows client installation wizard for the new version on the client computer. The *Avamar for Windows Server User Guide* provides instructions.
3. Upgrade the Avamar Plug-in for Lotus Domino by running the plug-in installation wizard for the new version on the Windows server. Installing the Avamar Plug-in for Lotus Domino on Windows on page 30 provides instructions.

Upgrading in a Windows cluster

When you upgrade the Avamar Client for Windows and Avamar Plug-in for Lotus Domino software in a cluster, you must uninstall earlier versions of the Avamar client and plug-in from each node, and then install new versions.

Steps

1. Uninstall the current version of the Avamar Client for Windows and Avamar Plug-in for Lotus Domino:
   a. To uninstall the Avamar cluster client, use the earlier version of the Cluster Configuration Tool. Uninstalling in a cluster client on page 33 provides instructions.
   b. Uninstall the earlier version of the Avamar Plug-in for Lotus Domino on each node in the cluster.
   c. Uninstall the earlier version the Avamar Client for Windows on each node in the cluster.

   The plug-in guide for the earlier version provides instructions for each step.
2. Install the new version of the Avamar Client for Windows and Avamar Plug-in for Lotus Domino:
   a. Install the Avamar Client for Windows in the same directory on each node in the cluster. The *Avamar for Windows Server User Guide* provides instructions.
   b. Install the Avamar Plug-in for Lotus Domino in the same directory on each node in the cluster. Installing the Avamar Plug-in for Lotus Domino on Windows on page 30 provides instructions.
   c. Register each node in the cluster with the Avamar server. The *Avamar for Windows Server User Guide* provides instructions.
   d. Use the Cluster Configuration Tool to install the Avamar Client for Windows on an active node. Configuring the cluster client on Windows on page 30 provides instructions.

Uninstalling the Avamar Plug-in for Lotus Domino on Windows

When you uninstall the Avamar Plug-in for Lotus Domino and the Avamar Client for Windows from the host system, scheduled backups no longer occur for the client. You cannot restore backups to the client after you uninstall the software.

About this task

You can retire or delete a client either before or after you uninstall the Avamar Plug-in for Lotus Domino:

- To keep the backups for the client so that you can restore the backups to a different client, retire the client by using Avamar Administrator.
- To delete the backups for the client, delete the client by using Avamar Administrator.

The *Avamar Administration Guide* provides more information.

The steps to uninstall the Avamar Plug-in for Lotus Domino on Windows depend on whether the installation is on a stand-alone server or in a cluster.

Uninstalling on a stand-alone Windows server

Use the Windows uninstall feature to uninstall the Avamar Client for Windows and Avamar Plug-in for Lotus Domino software.

Steps

1. Uninstall the Avamar Plug-in for Lotus Domino by using **Programs and Features**.
2. Uninstall the Avamar Client for Windows by using **Programs and Features**.

Uninstalling in a cluster client

In a Windows cluster, use the Cluster Configuration Tool to uninstall the Avamar cluster client. Then use the Windows uninstall feature to uninstall the Avamar Client for Windows and Avamar Plug-in for Lotus Domino software from each node.

Steps

1. Log in to the active node in the cluster as a domain administrator. The account must also be a member of the local Administrators group on each cluster node.
2. Start the Cluster Configuration Tool:
   - On Windows Server 2012, open the **Start** screen and select **Cluster Configuration Tool**.
   - On Windows Server 2008, open the **Start** menu and select **Program Files** > **Avamar** > **Cluster Configuration Tool**.

   The welcome page appears.
3. Click **Next**.
   The **Plug-Ins** page appears.
4. Select **Lotus Domino** from the **Avamar Backup Plug-ins** list, and then click **Next**.
   The **Cluster Nodes** page appears with a list of nodes and their status.
5. Ensure that the status of each node is Up, and then click **Next**.
   The **Operations** page appears.
6. Select **Remove the cluster client from all nodes**, and then click **Next**.
   The **Prerequisites** page appears. A check mark next to a prerequisite indicates that the prerequisite has been met.
7. Click **Next**.
   The **Attach to Service** page appears.
8. Select the cluster service that the cluster client uses, and then click **Next**.
   The **Summary** page appears.
9. Review the configuration settings, and then click **Uninstall**.
   The **Progress** page provides the status of the uninstall. When the uninstall is complete, the **Results** page appears.
10. Click **Close**.

Performing post-installation tasks

After a successful installation of the Avamar Plug-in for Lotus Domino completes, perform the post-installation tasks that apply to the system type.

Moving flag files to the /var/clientlogs directory

The Avamar Plug-in for Lotus Domino, release 7.1 or later, uses the `/var/clientlogs` directory for flag files, log files, and client cache files. The `avtar` program from Avamar 7.1 or later creates all logs and cache files in `/var/clientlogs` after you install or upgrade to 7.1 or later.

About this task

After you install or upgrade Avamar Plug-in for Lotus Domino, you must move flag files, such as `avtar.cmd` or `avlotus.cmd`, from the `/var` directory to the `/var/clientlogs` directory.

Before release 7.1, the Avamar Plug-in for Lotus Domino used the `/var` directory for flag files, log files, and client cache file.

3

Backup

Topics:

- Backups
- Scheduling backups
- Restarting backups after cluster failover
- Monitoring backups
- Canceling backups
- Enforcement of backups to Data Domain

Backups

The Avamar Plug-in for Lotus Domino allows you to perform backups from Avamar Administrator or the AUI.

NOTE: The Avamar AUI is only supported in stand-alone Windows and Linux environments only.

Before backing up an online database, the Avamar Plug-in for Lotus Domino sends a request to the Domino server to flush pending I/O to the database file. This task ensures that the backup process backs up the most current version of the database.

You can run an on-demand backup while the Domino server is running or stopped. The Lotus Domino documentation provides more information on stopping and restarting a Domino server.

NOTE: Do not back up an online database during a database compaction. A hot backup of a database can fail during a database compaction.

The Lotus Domino plug-in provides the ability to include and exclude data from the backup dataset. You can include and exclude data when creating or editing a policy, or when creating or editing a dataset in the **Settings** pane. The *Avamar Administration Guide* provides more information.

Specifying the 32bitbinary flag on AIX systems

The `32bitbinary` flag applies only to AIX systems with 32-bit and 64-bit Domino server configurations. To back up data from the 32-bit version of Domino server on AIX systems, you must specify the `32bitbinary` flag. Specify the `32bitbinary` flag from Avamar Administrator or from the CLI.

Performing an on-demand backup

An on-demand backup is a user-initiated backup of Domino data on a client. You can perform an on-demand backup for the first backup of the client immediately after you install the Avamar client software. Perform an on-demand backup before system maintenance, software installations, or software upgrades.

Steps

1. In the AUI navigation pane on the left, click ≫, and then click **Asset Management**.
   The **Asset Management** window is displayed.
2. In the domain tree, select the domain that contains the Domino server.

   A list of Avamar clients is displayed in the pane below the domains list.
3. In the list of clients, select the client that runs the Domino server.

   You can only view clients in the domain for the login account. To view all clients, log in to the root domain.
4. Click **BACKUP**.
   The Backup wizard is displayed. In the **Plugin** pane, a list of plug-ins that are installed on the Domino server is displayed.
5. In the **Plugins** pane, perform the following steps:
   a. Select the *Lotus Domino* plug-in for the platform.

b. Browse to and select one or more databases for the backup.

A backup selection automatically includes the `notes.ini` file. In the event of catastrophic data loss, a disaster recovery requires the `notes.ini` file. Disaster Recovery on page 50 provides more information.

c. Click **NEXT**.

The **Basic Configuration** pane is displayed.

6. In the **Basic Configuration** pane, complete the following fields:

a. Select the backup retention policy settings:

- To automatically delete this backup from the Avamar server after a specific amount of time, select **Retention period**. Specify the number of days, weeks, months, or years for the retention period.
- To automatically delete this backup from the Avamar server on a specific calendar date, select **End date** and browse to that date on the calendar.
- To keep this backup for as long as this client remains active in the Avamar server, select **No end date**.

b. In the **Avamar encryption method** list, select the encryption method to use for data transfer between the client and the Avamar server during the backup.

The encryption technology and bit strength for a client/server connection depends on several factors, including the client operating system and Avamar server version. The *Avamar Product Security Guide* provides additional information.

c. In the **Optionally select a proxy to perform backup** list, select the proxy.

The default setting is **Automatic**, which enables the Avamar server to choose the best proxy for this operation.

d. Click **NEXT**.

The **More Options** window is displayed.

7. In the **More Options** pane, set the plug-in options:

a. To view advanced options, select **Show Advanced Options**.

b. In the **Backup label** field, type a descriptive label for the backup.

c. In the **Backup type** list, select the type of backup:

- To back up all databases and files required for a complete recovery, select **Full**.
- To back up transaction logs and new database files that were created since the last full or incremental backup, select **Incremental**.
- To back up the database and non-database files, select **Subset**.

d. To terminate the backup if an error occurs, select **Terminate backup on error**.

e. In the **Full path of the Domino server's notes.ini file** field, type the full pathname of the `notes.ini` file on the Domino server.

- On Windows, the default directory is `C:\Program Files\IBM\Lotus\Domino\notes.ini`.
- On AIX, Linux, and UNIX, the default directory is `/local/notesdata/notes.ini`.

f. In the **Full path of the Domino directory** field, type the full pathname of the Domino directory.

g. In the **Maximum number of backup streams** list, select the number of backup streams to use. The default is 1. The maximum number of streams is 10.

h. To enable debugging messages, select the checkbox.

i. In the **Encryption method to Data Domain system** list, select the encryption method to use for data transfer between the client and the Data Domain system during the backup.

8. Select a stream allocation option:

- To assign files to streams, select **Balance data among the streams based on total file size**. Each stream receives an equal fraction of the total file size.
- To assign individual streams to each volume, select **Balance data among the streams based on logical volume or file system**.

9. Select or clear **Transaction Logs** options:

- To include transaction logs with the backup, select **Back up transaction logs with full backup**. By default, this option is selected.
- To archive transaction logs after the backup, select **Archive transaction logs**. By default, this option is selected.

Backup options on page 64 provides more information about backup plug-in options.

10. Click **FINISH**.

The following status message is displayed:

```
Backup initiated.
```

Backing up databases on DAOS-enabled servers

About this task

The Avamar Plug-in for Lotus Domino automatically backs up the `DAOS` directory for all types of backups: full, incremental, and subset. You do not need to include the `DAOS` directory in the backup request.

Steps

1. Ensure that transaction logging is enabled. Setting ARCHIVE mode on the Domino server on page 20 provides more information.
2. Complete all steps in Performing an on-demand backup on page 34.

   If you select the **Archive transaction logs** option in the **Backup Command Line Options** dialog box, the Domino server archives the transaction logs after the backup completes.

Scheduling backups

Scheduled backups run automatically to ensure that backups occur on an ongoing basis. You can schedule backups to run daily, weekly, or monthly. The scheduled backup can include multiple clients or a single server.

About this task

You can schedule backups by using the Policy wizard to create a policy for a backup.

Perform the following steps within the **Policy** wizard. The *Avamar Administration Guide* provides more information about groups, group policy, datasets, schedules, and retention settings.

Steps

1. Assign members to the new backup policy.
2. Assign a dataset to the new backup policy.

   To create a dataset, use the Policy wizard or select **Settings** > **Dataset** > **Add**.
3. Assign a schedule to the new backup policy.

   To create a schedule, use the Policy wizard or select **Settings** > **Schedule** > **Add**.
4. Assign a retention policy to the new backup policy.

   To create a retention policy, use the Policy wizard or select **Settings** > **Retention** > **Add**.
5. Enable scheduling for the backup policy.

Creating a dataset

A dataset specifies the data to include in a scheduled backup and the options to use for the backup. Create at least one dataset for scheduled backups of Domino data on a client or on a group of clients. Create multiple datasets to segregate client data.

Steps

1. In the AUI navigation pane on the left, click ≫, and then click **Settings**.
   The **Setting** pane is displayed.
2. Click the **Dataset** tab.
3. Click **ADD**.

   The **Create Dataset** window is displayed.
4. In the **Dataset Name** field, type a name for the dataset.

   The name can include alphanumeric characters (A-Z, a-z, 0–9) and the following special characters: period (.), hyphen (-), and underscore (_), and space. Do not use Unicode characters or the following special characters: ` ~ ! @ # $ % ^ & * ( ) = + [ ] { } | \ / ; : ' " < > , ?
5. From the **Plugins** list, select the Lotus Domino plug-in for the platform.
   The Lotus Domino plug-in options are displayed.
6. Click the **Options** tab.
7. To view advanced options, select **Show Advanced Options**.
8. In the **General** section, perform the following steps:

a. In the **Backup label** field, type a descriptive label for the backup.
b. (Optional) To back up databases and directories pointed to by links, select **Follow links**.
c. In the **Backup type** list, select the type of backup:
   - To back up all databases and files required for a complete recovery, select **Full**.
   - To back up transaction logs and new database files that were created since the last full or incremental backup, select **Incremental**.
   - To back up the database and non-database files, select **Subset**.
d. (Advanced option) Do not select the **Enable debugging message** check box. This option is for troubleshooting backup problems. When you select the **Enable debugging messages** option, the Avamar Plug-in for Oracle creates large log files.
e. To terminate the backup if an error occurs, select **Terminate backup on error**.
f. In the **Full path of the Domino server's notes.ini file** field, type the full pathname of the `notes.ini` file on the Domino server.
   - On Windows, the default directory is `C:\Program Files\IBM\Lotus\Domino\notes.ini`.
   - On AIX, Linux, and UNIX, the default directory is `/local/notesdata/notes.ini`.
g. In the **Full path of the Domino directory** field, type the full pathname of the Domino directory.
h. (UNIX) In the **Domino username** field, type the Domino username.

   This username is the OS user, who has permissions to start and stop the Domino server on the UNIX operating systems. The default username is notes.
i. In the **Maximum number of backup streams** list, select the number of backup streams to use. The default is 1. The maximum number of streams is 10.
j. To store the backup on a Data Domain system instead of the Avamar server, select **Store backup on Data Domain system**, and then select the Data Domain system from the list.
k. In the **Encryption method to Data Domain system** list, select the encryption method to use for data transfer between the client and the Data Domain system during the backup.

9. Select a stream allocation option:
   - To assign files to streams, select **Balance data among the streams based on total file size**. Each stream receives an equal fraction of the total file size.
   - To assign individual streams to each volume, select **Balance data among the streams based on logical volume or file system**.
10. Select or clear **Transaction Logs** options:
    - To include transaction logs with the backup, select **Back up transaction logs with full backup**. By default, this option is selected.
    - To archive transaction logs after the backup, select **Archive transaction logs**. By default, this option is selected.

    Backup options on page 64 provides more information about backup plug-in options.
11. Click the **Source Data** tab and set the following plug-in options:
    - To include all data, select the first option.
    - To limit the dataset to specific items, perform the following steps:

    a. In the **File/Folder Path**, type the file path.
    b. Click **ADD**.
12. Click **SUBMIT**.

Creating a backup policy

A backup policy is a collection of Avamar clients that use the same dataset, schedule, and retention settings to implement scheduled backups.

About this task

Member clients must all be in the same Avamar domain. When you create a backup policy, you define the dataset, schedule, and retention settings that apply for scheduled backups. These settings comprise the backup policy, which controls backup behavior for all members of the backup policy unless you override these settings at the client level.

The *Avamar Administration Guide* provides information about creating and editing backup policies, schedules, or retention settings.

Enabling a scheduled backup for a backup policy

Scheduled backups occur only for enabled backup policies. Backup policies are disabled by default unless you select the **Enabled** check box on the first page of the **New Policy** wizard. If you did not enable the backup policy when you created it, use the menu options in the **Policy** window to enable backups.

Steps

1. In the AUI navigation pane on the left, click ≫, and then click **Backup Policy**.
   The **Policy** page is displayed.
2. In the domain tree, select a domain or subdomain for the backup policy.

   To select a subdomain for the backup policy, toggle the **Include Sub-domain** switch to on.
3. Select a backup policy from the list.
4. To enable a backup policy, click **MORE ACTIONS** > **Enable Policy**.
5. To disable a backup policy, click **MORE ACTIONS** > **Disable Policy**.

Restarting backups after cluster failover

Active backups fail during a cluster failover.

Steps

- Manually restart failed backups on the new active node.

Monitoring backups

You can monitor and view status information for backup and restore operations by using the **Activity Monitor**.

About this task

To access the **Activity Monitor**, open the navigation pane, and then click **Activity**. The **Activity Monitor** appears with a list of all activities.

NOTE: The AUI Activity Monitor window has been optimized for at least 1366 pixels-wide screens. Display issues might occur for smaller screens. To properly display the AUI, ensure that your display is at least 1366 pixels wide.

The **Activity Monitor** provides you with options to filter the information that appears:

- Filter activities by duration—By default, the **Activity Monitor** displays the most recent 5,000 client activities. To select a different duration, in the **Filter activities by duration** drop-down list, select **Last 24 hours** or **Last 72 hours**.
- Filter activities by domain—By default, the **Activity Monitor** displays all activities regardless of domain. To display only the activities for a specific domain, in the **Filter activities by domain** drop-down list, select a domain or subdomain.
- Filter activities by status—By default, the **Activity Monitor** displays all activities regardless of status.

  To display only activities with a specific status, at the top of the **Activity Monitor**, select one of the following options:

  - Completed
  - Failed
  - Running
  - Waiting

To filter activities by client, start time, plug-in, or type, click ▼ in their respective column.

The **Activity Monitor** displays the date and time that an activity began, and the total number of bytes examined during an activity.

To view activity details, expand the **Details** pane, by clicking ≪.

Canceling backups

You can cancel a backup at any time before it completes. The cancellation can take five minutes or more. The backup might complete before the cancellation finishes.

Steps

1. In the AUI navigation pane on the left, click ≫, and then click **Activity**.
   The **Activity Monitor** appears with a list of activities.
2. Select the backup from the list.
3. Click **CANCEL**.
   A confirmation dialog box is displayed.
4. Click **YES**.

Enforcement of backups to Data Domain

If the Avamar server is configured to enforce backups to a Data Domain system, the server rejects backups that are not destined for the Data Domain. This enforcement covers backups that you configure through the Avamar Administrator and the AUI, as well as from command-line interfaces and other tools.

These backups must have additional flags that indicate the storage target. The *Avamar and Data Domain System Integration Guide* provides more information about backup enforcement and the related client version requirements. Backup enforcement is disabled by default.

4

Restore and Recovery

Topics:

- DBIID or ReplicaID
- Specifying the 32bitbinary flag on AIX systems
- Restoring database files to the original directory
- Restoring database files to a different directory
- Restoring database files to a different client
- Restoring databases on DAOS-enabled servers
- Restoring shared mail databases
- Restarting restores after cluster failover
- Monitoring restores
- Canceling restores

DBIID or ReplicaID

The **Restore Command Line Options** dialog box includes the two options that enable you to change the DBIID or ReplicaID of a database: **Create new DBIID during recovery** and **Create new DBIID and ReplicaID during recovery**.

You cannot specify the options to change the DBIID or ReplicaID of a database during a recovery when transaction logging is not set to `ARCHIVE` mode for the database.

Specifying the 32bitbinary flag on AIX systems

The `32bitbinary` flag applies only to AIX systems with 32-bit and 64-bit Domino server configurations. To restore data from the 32-bit version of Domino server on AIX systems, you must specify the `32bitbinary` flag. You specify the `32bitbinary` flag from Avamar Administrator or from the CLI.

Restoring database files to the original directory

You can restore the Domino database and files to the original directory on the original client.

Steps

1. In the AUI navigation pane on the left, click ≫, and then click **Asset Management**.
   The **Asset Management** window is displayed.
2. In the domain tree, select the domain that contains the Domino server.

   You cannot view clients outside the domain for the login account. To view all clients, log in to the root domain.

   A list of Avamar clients is displayed in the pane below the domains list.
3. From the list of clients, select the client that runs the Domino server.
4. To locate backups by date:
   a. In the right pane, click **VIEW MORE**.
   b. Click **SEARCH**.
   c. In the **Date** field, select a day or range of days.
   d. Click **RETRIEVE**.
      The list of backups for the selected dates is displayed.
5. Select the desired backup, and then click **Restore**.

   The **Restore** wizard opens on the **Destination Client** pane.

   NOTE: If you click Restore before selecting a backup, the wizard opens on the Backup List pane, where you can then make the backup selection.

6. In the **Destination Client** pane, perform the following steps:
   a. Select **Restore to original client**.
   b. Click **NEXT**.

   The **Backup Content** pane is displayed.
7. In the **Backup Content** pane, perform the following steps:
   a. In the left pane, select the folder from the tree.

      The **Backup Content** pane displays a list of databases within the backup.
   b. Select the databases that you want to restore.
   c. Click **NEXT**.

   The **Destination Location** pane is displayed.
8. In the **Destination Location** pane, perform the following steps:
   a. Select **Restore to the original location**.
   b. Click **NEXT**.

   The **More Options** pane is displayed.
9. In the **More Options** pane, set the plug-in options:
   a. To view advanced options, select **Show Advanced Options**.
   b. To bring all databases online after the restore completes, select **Bring all databases online after restore**. This option is selected by default.
   c. To overwrite existing databases or files with the restored data, select **Overwrite files**.

      Selecting the **Overwrite files** option takes the database offline and deletes it before the restore operation.
   d. (Advanced option) To write maximum information to log files, select **Enable debugging message**. Selecting this option creates very large log files.
   e. To restore system databases, select **Restore system databases**.

      Select this option to restore system databases such as `busytime.nsf`, `ddm.nsf`, `events4.nsf`, `log.nsf`, `mail.box`, `names.nsf`, and `mailjrn.nsf`.

      NOTE: You must stop the Domino server to restore system databases.
   f. If the Lotus Domino configuration has changed or the Domino server has been reinstalled in a new location, select **Specify full paths for the Domino configuration files and directory**.

      If you select **Specify full paths for the Domino configuration files and directory**, type the full pathname for the `notes.ini` file in the **Full path of the Domino server's notes.ini file** field and the full pathname for the Domino directory in the **Full path of the Domino directory** field.
   g. To temporarily disable the replication of the successfully restored databases, select **Pause replication of restored databases**. This option allows you to check or verify the status of the restored databases before the databases are copied or synced to other replicas.

      NOTE: After checking or verification, you should manually re-enable the replication those databases via the Avamar Administrator GUI.
   h. In the **Encryption method from Data Domain system** list, select the encryption method to use for data transfer between the Data Domain system and the client during the restore.
   i. (AIX, Linux, or UNIX) Type the Domino username in the **Domino username** field.

      This username is the OS user, who has permissions to start and stop the Domino server on AIX, Linux, or UNIX systems. The default username is notes.
10. In the **Recover** section, set the following options:
   a. To use transaction logs to recover database files to a specific date and time, leave **Recover the database by using transaction logs** selected. This option is selected by default.

      Clear **Recover the database by using transaction logs** if the database does not use transaction logs.
   b. To recover databases as a group, select **Recover all databases as one group per stream**.

      This option recovers all databases in groups rather than one at a time. If a database encounters a problem during a group recovery, the recovery fails for all databases in the group.

      This option is for advanced users who are familiar with the recovery of Domino databases.
   c. To assign new DBIIDs to recovered databases, select **Create new DBIID during recovery**.

      Because database transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as a new database.

d. To have the Domino server assign new DBIIDs and ReplicaIDs to recovered databases, select **Create new DBIID and ReplicaID during recovery**.

   Because transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as a new database.

11. In the **Recover Time** section, select one of the following options:
    - To restore each database to its original state at the time of the backup, select **Now**. When you select this option, transaction logs are used to recover all data until now. **Now** is the default option.
    - To restore each database to its original state at the time of the backup, select **Other date/time**. When you select this option, transaction logs are used to recover all data up to the date and time that you specify in the **Recover date/time** field.
    - To restore each database to its original state at the time of its backup, select **Backup date/time**.
12. In the **Recover Options** section, set the following options:
    a. In the **Recover date/time** field, select a date and time. Transaction logs are used to recover all data up to the date and time that you selected.
    b. In the **Transaction log pre-fetch value** field, select the number of transaction logs that should be pre-fetched. This operation instructs the Lotus plug-in to fetch more than one transaction log from backups at a time, which improves recovery speed. The default is 5, and the maximum is 100.
13. In the **DAOS Options** section, set the following options:
    a. (DAOS-enabled servers only) To find and restore missing NLO files that the database references, select **Restore missing NLO files**.

       The process of finding missing NLO files can take a long time.
    b. (DAOS-enabled servers only) To synchronize the DAOS catalog file (`DAOSCAT.NSF`), select **Synchronize DAOS catalog files**.

       The resynchronization process can take a long time.
14. In the **DAOS Catalog Resync Options** section, set the following options:
    a. (DAOS-enabled servers only) To resynchronize DAOS catalog files by using the default method, select **Synchronize DAOS catalog files normally**.
    b. (DAOS-enabled servers only) To resynchronize DAOS catalog files by using the `QUICK` option, select **Synchronize DAOS catalog files using QUICK (Domino version 8.5.2 or later)**.
15. Click **NEXT**.
    The **Summary** pane is displayed.
16. Review the provided information, and then click **FINISH**.

Restoring database files to a different directory

You can restore Domino database files to a different target directory on the original client.

Steps

1. In the AUI navigation pane on the left, click ≫, and then click **Asset Management**.
   The **Asset Management** window is displayed.
2. In the domain tree, select the domain that contains the Domino server.

   You cannot view clients outside the domain for the login account. To view all clients, log in to the root domain.

   A list of Avamar clients is displayed in the pane below the domains list.
3. From the list of clients, select the client that runs the Domino server.
4. To locate backups by date:
   a. In the right pane, click **VIEW MORE**.
   b. Click **SEARCH**.
   c. In the **Date** field, select a day or range of days.
   d. Click **RETRIEVE**.
      The list of backups for the selected dates is displayed.
5. Select the desired backup, and then click **Restore**.

   The **Restore** wizard opens on the **Destination Client** pane.

   NOTE: If you click Restore before selecting a backup, the wizard opens on the Backup List pane, where you can then make the backup selection.
6. In the **Destination Client** pane, perform the following steps:
   a. Select **Restore to original client**.

b. Click **NEXT**.

The **Backup Content** pane is displayed.

7. In the **Backup Content** pane, perform the following steps:
   a. In the left pane, select the folder from the tree.

      The **Backup Content** pane displays a list of databases within the backup.

   b. Select the databases that you want to restore.
   c. Click **NEXT**.

   The **Destination Location** pane is displayed.

8. In the **Destination Location** pane, perform the following steps:
   a. Select **Restore to a different folder location**.
   b. In the **Instance Location** field, click **CHOOSE** to browse to the folder available on the destination client.
   c. In the **Alternate database location** field, type an alternate location in the destination client where the database will be restored. For example, `C:\restore`.
   d. Click **NEXT**.

      The **More Options** pane is displayed.

9. In the **More Options** pane, set the plug-in options:
   a. To view advanced options, select **Show Advanced Options**.
   b. To bring all databases online after the restore completes, select **Bring all databases online after restore**. This option is selected by default.
   c. To overwrite existing databases or files with the restored data, select **Overwrite files**.

      Selecting the **Overwrite files** option takes the database offline and deletes it before the restore operation.

   d. (Advanced option) To write maximum information to log files, select **Enable debugging message**. Selecting this option creates very large log files.
   e. To restore system databases, select **Restore system databases**.

      Select this option to restore system databases such as `busytime.nsf`, `ddm.nsf`, `events4.nsf`, `log.nsf`, `mail.box`, `names.nsf`, and `mailjrn.nsf`.

      NOTE: You must stop the Domino server to restore system databases.

   f. If the Lotus Domino configuration has changed or the Domino server has been reinstalled in a new location, select **Specify full paths for the Domino configuration files and directory**.

      If you select **Specify full paths for the Domino configuration files and directory**, type the full pathname for the `notes.ini` file in the **Full path of the Domino server's notes.ini file** field and the full pathname for the Domino directory in the **Full path of the Domino directory** field.

   g. To temporarily disable the replication of the successfully restored databases, select **Pause replication of restored databases**. This option allows you to check or verify the status of the restored databases before the databases are copied or synced to other replicas.

      NOTE: After checking or verification, you should manually re-enable the replication those databases via the Avamar Administrator GUI.

   h. In the **Encryption method from Data Domain system** list, select the encryption method to use for data transfer between the Data Domain system and the client during the restore.
   i. (AIX, Linux, or UNIX) Type the Domino username in the **Domino username** field.

      This username is the OS user, who has permissions to start and stop the Domino server on AIX, Linux, or UNIX systems. The default username is notes.

10. In the **Recover** section, set the following options:
    a. To use transaction logs to recover database files to a specific date and time, leave **Recover the database by using transaction logs** selected. This option is selected by default.

       Clear **Recover the database by using transaction logs** if the database does not use transaction logs.

    b. To recover databases as a group, select **Recover all databases as one group per stream**.

       This option recovers all databases in groups rather than one at a time. If a database encounters a problem during a group recovery, the recovery fails for all databases in the group.

       This option is for advanced users who are familiar with the recovery of Domino databases.

    c. To assign new DBIIDs to recovered databases, select **Create new DBIID during recovery**.

       Because database transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as a new database.

d. To have the Domino server assign new DBIIDs and ReplicaIDs to recovered databases, select **Create new DBIID and ReplicaID during recovery**.

   Because transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as a new database.

11. In the **Recover Time** section, select one of the following options:
    - To restore each database to its original state at the time of the backup, select **Now**. When you select this option, transaction logs are used to recover all data until now. **Now** is the default option.
    - To restore each database to its original state at the time of the backup, select **Other date/time**. When you select this option, transaction logs are used to recover all data up to the date and time that you specify in the **Recover date/time** field.
    - To restore each database to its original state at the time of its backup, select **Backup date/time**.
12. In the **Recover Options** section, set the following options:
    a. In the **Recover date/time** field, select a date and time. Transaction logs are used to recover all data up to the date and time that you selected.
    b. In the **Transaction log pre-fetch value** field, select the number of transaction logs that should be pre-fetched. This operation instructs the Lotus plug-in to fetch more than one transaction log from backups at a time, which improves recovery speed. The default is 5, and the maximum is 100.
13. In the **DAOS Options** section, set the following options:
    a. (DAOS-enabled servers only) To find and restore missing NLO files that the database references, select **Restore missing NLO files**.

       The process of finding missing NLO files can take a long time.
    b. (DAOS-enabled servers only) To synchronize the DAOS catalog file (`DAOSCAT.NSF`), select **Synchronize DAOS catalog files**.

       The resynchronization process can take a long time.
14. In the **DAOS Catalog Resync Options** section, set the following options:
    a. (DAOS-enabled servers only) To resynchronize DAOS catalog files by using the default method, select **Synchronize DAOS catalog files normally**.
    b. (DAOS-enabled servers only) To resynchronize DAOS catalog files by using the `QUICK` option, select **Synchronize DAOS catalog files using QUICK (Domino version 8.5.2 or later)**.
15. Click **NEXT**.
    The **Summary** pane is displayed.
16. Review the provided information, and then click **FINISH**.

Restoring database files to a different client

You can restore Domino database files to a different client.

Prerequisites

Ensure that the environment meets the following requirements before you restore Domino database and files to a different client:

- The client must run the same type of operating system and the same or later version of the Domino server as the original client.
- The Domino server can have the same or different bitness as the original client.
- The operating system version of the new client can be different from the original client. For example, you can restore a database from an AIX 6.1 client to an AIX 7.1 client as long as the Avamar Plug-in for Lotus Domino and Domino server support the two versions of AIX.

The following limitations apply to restoring Domino database files to a different client:

- You cannot apply the transaction logs because the logs are not available on the destination client.

  An attempt to recover a logged database to a different client restores the database, but fails to recover the database. In such a case, you cannot bring the database online.
- You cannot restore a DAOS-enabled database to a different client because the original clients' attachments are only accessible by the original client.

  An attempt to restore a DAOS-enabled database to a different client successfully restores the database. The restore does not enable access to the attachments even if you specify the **Restore missing NLO files** option. In such a case, the attachments stored in the NLO files are restored, but are not accessible because the NLO files still reference the original client, not the new client.

Steps

1. In the AUI navigation pane on the left, click ≫, and then click **Asset Management**.

The **Asset Management** window is displayed.

2. In the domain tree, select the domain that contains the Domino server.

   You cannot view clients outside the domain for the login account. To view all clients, log in to the root domain.

   A list of Avamar clients is displayed in the pane below the domains list.
3. From the list of clients, select the client that runs the Domino server.
4. To locate backups by date:
   a. In the right pane, click **VIEW MORE**.
   b. Click **SEARCH**.
   c. In the **Date** field, select a day or range of days.
   d. Click **RETRIEVE**.
      The list of backups for the selected dates is displayed.
5. Select the desired backup, and then click **Restore**.

   The **Restore** wizard opens on the **Destination Client** pane.

   NOTE: If you click Restore before selecting a backup, the wizard opens on the Backup List pane, where you can then make the backup selection.
6. In the **Destination Client** pane, perform the following steps:
   a. Select **Restore to a different client**.
   b. In the domain tree, select the domain for the client.
   c. In the list of clients, select the destination client.
      The client is displayed in the **Destination Client** field.
   d. Click **NEXT**.

      The **Backup Content** pane is displayed.
7. In the **Destination Location** pane, perform the following steps:
   a. Select **Restore to a different folder location**.
   b. In the **Instance Location** field, click **CHOOSE** to browse to the folder available on the destination client.
   c. In the **Alternate database location** field, type an alternate location in the destination client where the database will be restored. For example, `C:\restore`.
   d. Click **NEXT**.

      The **More Options** pane is displayed.
8. In the **Backup Content** pane, perform the following steps:
   a. In the left pane, select the folder from the tree.

      The **Backup Content** pane displays a list of databases within the backup.
   b. Select the databases that you want to restore.
   c. Click **NEXT**.

   The **Destination Location** pane is displayed.
9. In the **Destination Location** pane, perform the following steps:
   a. Select **Restore to a different folder location**.
   b. In the **Instance Location** field, click **CHOOSE** to browse to the folder available on the destination client.
   c. In the **Alternate database location** field, type an alternate location in the destination client where the database will be restored. For example, `C:\restore`.
   d. Click **NEXT**.

      The **More Options** pane is displayed.
10. In the **More Options** pane, set the plug-in options:
    a. To view advanced options, select **Show Advanced Options**.
    b. To bring all databases online after the restore completes, select **Bring all databases online after restore**. This option is selected by default.
    c. To overwrite existing databases or files with the restored data, select **Overwrite files**.

       Selecting the **Overwrite files** option takes the database offline and deletes it before the restore operation.
    d. (Advanced option) To write maximum information to log files, select **Enable debugging message**. Selecting this option creates very large log files.
    e. To restore system databases, select **Restore system databases**.

       Select this option to restore system databases such as `busytime.nsf`, `ddm.nsf`, `events4.nsf`, `log.nsf`, `mail.box`, `names.nsf`, and `mailjrn.nsf`.

NOTE: You must stop the Domino server to restore system databases.

f. If the Lotus Domino configuration has changed or the Domino server has been reinstalled in a new location, select **Specify full paths for the Domino configuration files and directory**.

   If you select **Specify full paths for the Domino configuration files and directory**, type the full pathname for the `notes.ini` file in the **Full path of the Domino server's notes.ini file** field and the full pathname for the Domino directory in the **Full path of the Domino directory** field.

g. To temporarily disable the replication of the successfully restored databases, select **Pause replication of restored databases**. This option allows you to check or verify the status of the restored databases before the databases are copied or synced to other replicas.

   NOTE: After checking or verification, you should manually re-enable the replication those databases via the Avamar Administrator GUI.

h. In the **Encryption method from Data Domain system** list, select the encryption method to use for data transfer between the Data Domain system and the client during the restore.

i. (AIX, Linux, or UNIX) Type the Domino username in the **Domino username** field.

   This username is the OS user, who has permissions to start and stop the Domino server on AIX, Linux, or UNIX systems. The default username is notes.

11. In the **Recover** section, set the following options:

    a. To use transaction logs to recover database files to a specific date and time, leave **Recover the database by using transaction logs** selected. This option is selected by default.

       Clear **Recover the database by using transaction logs** if the database does not use transaction logs.

    b. To recover databases as a group, select **Recover all databases as one group per stream**.

       This option recovers all databases in groups rather than one at a time. If a database encounters a problem during a group recovery, the recovery fails for all databases in the group.

       This option is for advanced users who are familiar with the recovery of Domino databases.

    c. To assign new DBIIDs to recovered databases, select **Create new DBIID during recovery**.

       Because database transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as a new database.

    d. To have the Domino server assign new DBIIDs and ReplicaIDs to recovered databases, select **Create new DBIID and ReplicaID during recovery**.

       Because transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as a new database.

12. In the **Recover Time** section, select one of the following options:

    - To restore each database to its original state at the time of the backup, select **Now**. When you select this option, transaction logs are used to recover all data until now. **Now** is the default option.
    - To restore each database to its original state at the time of the backup, select **Other date/time**. When you select this option, transaction logs are used to recover all data up to the date and time that you specify in the **Recover date/time** field.
    - To restore each database to its original state at the time of its backup, select **Backup date/time**.

13. In the **Recover Options** section, set the following options:

    a. In the **Recover date/time** field, select a date and time. Transaction logs are used to recover all data up to the date and time that you selected.

    b. In the **Transaction log pre-fetch value** field, select the number of transaction logs that should be pre-fetched. This operation instructs the Lotus plug-in to fetch more than one transaction log from backups at a time, which improves recovery speed. The default is 5, and the maximum is 100.

14. In the **DAOS Options** section, set the following options:

    a. (DAOS-enabled servers only) To find and restore missing NLO files that the database references, select **Restore missing NLO files**.

       The process of finding missing NLO files can take a long time.

    b. (DAOS-enabled servers only) To synchronize the DAOS catalog file (`DAOSCAT.NSF`), select **Synchronize DAOS catalog files**.

       The resynchronization process can take a long time.

15. In the **DAOS Catalog Resync Options** section, set the following options:

    a. (DAOS-enabled servers only) To resynchronize DAOS catalog files by using the default method, select **Synchronize DAOS catalog files normally**.

    b. (DAOS-enabled servers only) To resynchronize DAOS catalog files by using the `QUICK` option, select **Synchronize DAOS catalog files using QUICK (Domino version 8.5.2 or later)**.

16. Click **NEXT**.
    The **Summary** pane is displayed.
17. Review the provided information, and then click **FINISH**.

Restoring databases on DAOS-enabled servers

You restore databases on DAOS-enabled servers by using Avamar Administrator. You set specific options for DAOS-enabled servers in the **Restore Command Line Options** dialog box.

Steps

1. In Avamar Administrator, click the **Backup & Restore** launcher link.

   The **Backup, Restore and Manage** window appears.
2. Click the **Restore** tab.
   The top-left pane contains a list of domains.
3. Select the domain that contains the Domino server.

   You cannot view clients outside the domain for the login account. To view all clients, log in to the root domain.

   A list of Avamar clients appears in the pane under the domains list.
4. Select the client that runs the Domino server.
5. Click the **By Date** tab.
6. Select the backup date from the calendar. Valid backups occurred on dates with a yellow highlight.
   A list of backups that were performed on that date appears in the **Backups** table next to the calendar.
7. Select a backup from the **Backups** table.
   The backup contents appear under the **Contents of Backup** pane.
8. Expand the folders in the **Contents of Backup** pane to display the database files.
9. Select one or more folders from the **Contents of Backup** pane.
10. Select **Actions** > **Restore Now**.
    The **Restore Options** dialog box appears.
11. From the **Avamar encryption method** list, select an encryption method to use for client/server data transfer during this restore.

    The encryption technology and big strength for a client/server connection depend on several factors, including the client platform and Avamar server version. The *Avamar Product Security Guide* provides more information.
12. Select **Restore everything to its original location**.
13. Click **More Options**.
    The **Restore Command Line Options** dialog box appears.
14. In the **Restore Command Line Options** dialog box, select **Show Advanced Options** to display all plug-in options.
15. (Advanced option) To write maximum information to log files, select **Enable debugging message**. Selecting this option creates very large log files.
16. Select **Restore system databases** to restore system databases such as `busytime.nsf`, `ddm.nsf`, `events4.nsf`, `log.nsf`, `mail.box`, `names.nsf`, and `mailjrn.nsf`.

    You must stop the Domino server to restore system databases.
17. If the Lotus Domino configuration has changed or the Domino server has been reinstalled in a new location, select **Specify full paths for the Domino configuration files and directory**, and then complete the following steps:
    a. Type the full pathname for the `notes.ini` file in the **Full path of the Domino server's notes.ini file** field.
    b. Type the full pathname for the Domino directory in the **Full path of the Domino directory** field.
18. If appropriate, select **Pause replication of restored databases** to temporarily disable the replication of the successfully restored databases. This option allows you to check or verify the status of the restored databases before the databases are copied or synced to other replicas.

    NOTE: After checking or verification, you should manually re-enable the replication those databases via the Avamar Administrator GUI.
19. From the **Encryption method from Data Domain system** list, select the encryption method to use for data transfer between the Data Domain system and the client during the restore.
20. Specify **Recover** options:
    a. To use transaction logs to recover database files to a specific date and time, leave **Recover the database by using transaction logs** selected. This option is selected by default.
    b. To recover databases as a group, select **Recover all databases as one group per stream**.

This option recovers all databases in groups rather than one at a time. If a database encounters a problem during a group recovery, the recovery fails for all databases in the group.

This option is intended for advanced users who are familiar with the recovery of Domino databases.

c. To assign new DBIIDs to recovered databases, select **Create new DBIID during recovery**.

Because database transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as an entirely new database.

d. To have the Domino server assign new DBIIDs and ReplicaIDs to recovered databases, select **Create new DBIID and ReplicaID during recovery**.

Because transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as an entirely new database.

21. Specify a **Recover Time** option:
    - Select **Now** to restore each database to its original state at the time of the backup. Then, transaction logs are used to recover all data until now. **Now** is the default option.
    - Select **Other date/time** to restore each database to its original state at the time of the backup. Then, transaction logs are used to recover all data up to the date and time you specify in the **Recover date/time (yyyy-mm-dd hh:mm:ss)** field.
    - Select **Backup date/time** to restore each database to its original state at the time of its backup.
22. Specify **DAOS Options**:
    a. Select **Restore missing NLO files** to restore missing NLO files.
    b. Select **Synchronize DAOS catalog files** to synchronize the DAOS catalog (`DAOSCAT.NSF`).
23. Specify **DAOS Catalog Resync Options**:
    - Select **Synchronize DAOS catalog files normally** to resynchronize DAOS catalog files by using the default method.
    - Select **Synchronize DAOS catalog files using QUICK (Domino version 8.5.2 or later)** to resynchronize DAOS catalog files by using the `QUICK` option.
24. Click **OK** to close the **Restore Command Line Options** dialog box.
25. Click **OK** to close the **Restore Options** dialog box.
    The following status message appears:

    ```
    Restore initiated.
    ```
26. Click **OK**.

Restoring shared mail databases

Before you restore shared mail databases, you must take the Domino server offline and delete the shared mail database.

About this task

You cannot take a shared mail database offline. An on-demand restore of a shared mail database file fails and returns a message similar to the following:

```
5098 -> The database is in use and cannot be taken off-line
```

You must first delete the shared mail database, and then restore it.

Steps

1. Log in to the Domino server as a Domino administrator.
2. Take the Domino server offline.
3. Use Avamar Administrator to restore the shared mail database:
   a. Restore the shared mail database to a directory other than the original directory. Restoring database files to a different directory on page 42 provides instructions.
   Copy the restored shared mail database to the original location.
4. After the restore completes, bring the Domino server back online.

Restarting restores after cluster failover

Active restores fail during a cluster failover.

Steps

- Manually restart failed restores on the new active node.

Monitoring restores

You can monitor and view status information for backup and restore operations in the **Activity Monitor**.

About this task

To access the **Activity Monitor**, open the navigation pane, and then click **Activity**. The **Activity Monitor** appears with a list of all activities.

NOTE: The AUI Activity Monitor window has been optimized for at least 1366 pixels-wide screens. Display issues might occur for smaller screens. To properly display the AUI, ensure that your display is at least 1366 pixels wide.

The **Activity Monitor** provides you with options to filter the information that appears:

- Filter activities by duration—By default, the **Activity Monitor** displays the most recent 5,000 client activities. To select a different duration, in the **Filter activities by duration** drop-down list, select **Last 24 hours** or **Last 72 hours**.
- Filter activities by domain—By default, the **Activity Monitor** displays all activities regardless of domain. To display only the activities for a specific domain, in the **Filter activities by domain** drop-down list, select a domain or subdomain.
- Filter activities by status—By default, the **Activity Monitor** displays all activities regardless of status.

  To display only activities with a specific status, at the top of the **Activity Monitor**, select one of the following options:

  - Completed
  - Failed
  - Running
  - Waiting

To filter activities by client, start time, plug-in, or type, click in their respective column.

The **Activity Monitor** displays the date and time that an activity began, and the total number of bytes examined during an activity.

To view activity details, expand the **Details** pane, by clicking .

Canceling restores

You can cancel a restore any time before it completes. The cancellation can take five minutes or more. The restore might complete before the cancellation finishes.

Steps

1. In the AUI navigation pane on the left, click , and then click **Activity**.
   The **Activity Monitor** appears with a list of activities.
2. Select the restore from the list.
3. Click **CANCEL**.
   A confirmation dialog box is displayed.
4. Click **YES**.

5

Disaster Recovery

Topics:

- Preparing for disaster recovery
- Performing a disaster recovery

Preparing for disaster recovery

Loss of data can result from accidental loss of active Logger files, a disk failure, or a server crash. For protection against disaster, ensure that you take regular backups that include database file as well as other key files, such as the `notes.ini` file.

Disaster recovery of the Domino server requires the following files:

- The `notes.ini` file from the Domino server.
- Backups for the lost databases.
- For DAOS-enabled servers, backups of all DAOS files associated with the databases.

  NOTE: Attachments are not recovered if any `.NLO` files are missing in the backup.
- Archived log extents (if transaction logging is enabled).

NOTE: The disaster recovery process changes the DBIID. Perform a full backup of the Domino server and its databases after the disaster recovery procedure. A full backup ensures that the databases are correctly associated with specific entries in the transaction log.

Performing a disaster recovery

Steps

1. Replace the hardware and install the software. Installing Avamar and Domino software on page 50 provides instructions.
2. Restore the `notes.ini` file. Restoring the notes.ini file on page 51 provides instructions.
3. Configure the `notes.ini` file. Configuring the notes.ini file on page 53 provides instructions.
4. Restore the last transaction log file. Restoring the last transaction log file on page 53 provides instructions.
5. Restore and recover the data. Restoring and recovering data to the new Avamar client on page 54 provides instructions.
6. Copy the files that you restore to the appropriate directory. Copying restored files to the appropriate directory on page 56 provides instructions.
7. Perform a full backup of the Domino server and databases. Performing a full backup of the Domino server and databases on page 56 provides instructions.

Installing Avamar and Domino software

Steps

1. Replace hardware, if required
2. Install the Avamar file system client and the Avamar Plug-in for Lotus Domino. Chapter 2, "Installation and Configuration," provides instructions.
3. Register and activate the client with the Avamar server.
   The *Avamar Administration Guide* provides instructions for registering and activating clients.
4. Stop all Domino server-related services.
5. Delete the Domino installation directory and data directories.
6. Reboot the operating system on the Domino server host.
7. Reinstall the Domino server software with the same directory structure as the previous installation.

Restoring the notes.ini file

To restore the `notes.ini` file, you must create a user for the Avamar client, retrieve the label number for the backup, and retrieve the pathname to the `notes.ini` file.

Creating a user for the Avamar client

Steps

1. In Avamar Administrator, click the **Administration** launcher link.
   The **Administration** window appears.
2. Click **Account Management**.
   The top-left pane contains a list of domains.
3. Select the domain that contains the Domino server.
   A list of Avamar clients appears in the pane under the domains list.
4. Select the client that runs the Domino server.
5. Select **Actions** > **Account Management** > **New User(s)**.
   The **New User(s)** dialog box appears.
6. Select an authentication system from the **Authentication System** list.
7. Select **Everyone** to designate roles for all users on this client.

   NOTE: Internal Avamar authentication systems do not use this field.

8. Select **User Name** and type the new username.

   If you are using an external authentication system, this must be the username you use to log in to that system. Usernames cannot be longer than 31 characters.
9. Select a role for this user from the **Role** list.
10. Type the password in the **Password** field.

    For the internal authentication system, Avamar passwords are case-sensitive and must adhere to the following requirements:

    - Contain 6–12 characters
    - Contain only alphanumeric, hyphen, period, or underscore characters
    - Contain at least one alphanumeric character

    NOTE: External authentication systems do not use this field.

11. In the **Confirm** field, retype the password to confirm that you typed it correctly in the **Password** field.

    NOTE: External authentication systems do not use this field.

12. Click **OK**.
    A confirmation dialog box appears.
13. Click **OK** to close the confirmation message dialog box.
    The new user appears in the client's list of users.

Retrieving the label number for the backup

Steps

1. In Avamar Administrator, click the **Backup & Restore** launcher link.

   The **Backup, Restore and Manage** window appears.
2. Click the **Restore** tab.
   The top-left pane contains a list of domains.
3. Select the domain that contains the Domino server.

   You cannot view clients outside the domain for the login account. To view all clients, log in to the root domain.

   A list of Avamar clients appears in the pane under the domains list.
4. Select the client that runs the Domino server.
5. Click the **By Date** tab.
6. Select a backup from the calendar.

Details for the backup appear in the table to the right of the calendar.

The numbers in the **Number** column represent label numbers. The `avtar.exe` (Windows) or `avtar` (AIX, Linux, or UNIX) commands use these numbers.

Retrieving the pathname to the notes.ini file

To retrieve the pathname to the notes.ini file, use `avtar.exe` for Windows systems or `avtar` for AIX, Linux, or UNIX systems.

Steps

1. Open a **Command Prompt** window on Windows or a command shell on AIX, Linux, or UNIX.
2. Change to the installation directory:
   - On Windows, the default installation directory is `C:\Program Files\avs\bin`.
   - On AIX or Linux, the default installation directory is `/usr/local/avamar/bin`.
   - On Solaris, the default installation directory is `/opt/AVMRclnt/bin`.
3. Change the user to Domino user account.
4. Type the following command specific to the platform:
   - On Windows, type the following command:

     avtar.exe --list --id=*user*@*auth*/clients/*client-name* --password=*password* --labelnum=*num*
   - On AIX, Linux, or UNIX, type the following command:

     avtar --list --id=*user*@*auth*/clients/*client-name* --password=*password* --labelnum=*num*

   where:

   - *user* is the Avamar username.
   - *auth* is the authentication system.

     The internal authentication system for the Avamar server is “avamar.” For example: **--id=user@avamar/clients/client-name**.
   - *client-name* is the full name of the client.
   - *password* is the password for the **--id=*user*@*auth*** account.
   - *num* is the label number from Retrieving the label number for the backup on page 51.

   The output from the `avtar.exe` or `avtar` command contains the pathname to the `notes.ini` file. The following output from a Windows platform shows the `notes.ini` file in the `C:\Program Files\IBM\Lotus\Domino` folder:

   ```
   ...
   C:\Program Files\IBM\Lotus\Domino\data\webadmin.ntf
   C:\Program Files\IBM\Lotus\Domino\data\wpdic.dic
   C:\Program Files\IBM\Lotus\Domino\notes.ini
   ```
5. From the Avamar backup server, restore the `notes.ini` file to a temporary directory:
   - On Windows, type the following command:

     avtar.exe -x *path*\notes.ini" --id=*user*@*auth*/clients/*client-name* --password=*password* --target=C:\tmp --labelnum=*num*
   - On AIX, Linux, or UNIX type the following command:

     avtar -x *path*/notes.ini" --id=*user*@*auth*/clients/*client-name* --password=*password* --target=/tmp --labelnum=*num*

   where:

   - *path* is the full pathname to the `notes.ini` file.
   - *user* is the Avamar username.
   - *auth* is the authentication system.

     The internal authentication system for the Avamar server is “avamar.” For example: **--id=user@avamar/clients/client-name**.
   - *client-name* is the full name of the client.
   - *password* is the password for the **--id=*user*@*auth*** account.
   - *num* is the label number from Retrieving the label number for the backup on page 51.

NOTE: Do not use the Avamar Plug-in for Lotus Domino to restore the `notes.ini` file.

Configuring the notes.ini file

Steps

1. Replace the `notes.ini` file with the restored `notes.ini` file.
2. (Optional) To recover the Domino server and databases to an AIX, Linux, or UNIX system, change the ownership of the restored `notes.ini` file to the Domino user account.

   NOTE: The default account is notes. The Domino server uses this user account for tasks such as starting and stopping the Domino server.

3. Edit the `notes.ini` file to set the following parameter:

   `TRANSLOG_Recreate_Logctrl=1`
4. Save the `notes.ini` file.

Restoring the last transaction log file

Steps

1. To list all files in the backup, use the `avtar.exe` command for a Windows platform or the `avtar` command for an AIX, Linux, or UNIX system:
   - On Windows, type the following command:

     `avtar.exe --list --internal --id=`*`user`*`@`*`auth`*`/clients/`*`client-name`*` --password=`*`password`*` --labelnum=`*`num`*
   - On AIX, Linux, or UNIX, type the following command:

     `avtar --list --internal --id=`*`user`*`@`*`auth`*`/clients/`*`client-name`*` --password=`*`password`*` --labelnum=`*`num`*

     where:

     - *user* is the Avamar username.
     - *auth* is the authentication system.

       The internal authentication system for the Avamar server is “avamar.” For example: **`--id=`*`user`*`@avamar/clients/`*`client-name`***
     - *client-name* is the full name of the client.
     - *password* is the password for the **`--id=`*`user`*`@`*`auth`*** account.
     - *num* is the label number from Retrieving the label number for the backup on page 51.

   The `avatar.exe` or `avtar` command displays screen output similar to the following:

   ```
   ...
   $MetaTxnLogdrive$:\7ce091d8c289e5850022528e65257583S0000049.TXN
   $MetaTxnLogdrive$:\7ce091d8c289e5850022528e65257583S0000050.TXN
   $MetaTxnLogdrive$:\7ce091d8c289e5850022528e65257583S0000051.TXN
   $MetaTxnLogdrive$:\avlotus_metainfo.metafile
   ...
   ```
2. Determine the last transaction log file from the screen output in step 1.

   In the sample screen output, the last transaction log file is:

   ```
   /\$MetaTxnLogdrive\$:/7ce091d8c289e5850022528e65257583S0000051.TXN
   ```

   The last transaction log file has the largest sequence number (`...S0000051`, for example).

   NOTE: In rare cases when the restore process depletes sequence numbers, sequence numbering restarts at 1. In this case, find a gap in the sequence and use the largest sequence number after the gap.

3. To restore the transaction log file to a different folder, use the `avtar.exe` command for a Windows platform or the `avtar` command for an AIX, Linux, or UNIX system:
   - On Windows, type the following command:

     avtar.exe -x "$MetaTxnLogdrive$:\7ce091d8c289e5850022528e65257583S0000051.TXN" --id=*user*@*auth*/clients/*client-name* --password=*password* --target=c:\tmp --labelnum=*num* --internal
   - On AIX, Linux, or UNIX, type the following command:

     avtar -x "/\$MetaTxnLogdrive\$:/7ce091d8c289e5850022528e65257583S0000051.TXN" --id=*user*@*auth*/clients/*client-name* --password=*password* --target=c:\tmp --labelnum=*num* --internal

   where:

   - *user* is the Avamar username.
   - *auth* is the authentication system.

     The internal authentication system for the Avamar server is "avamar." For example: **--id=*user*@avamar/clients/*client-name***.
   - *path* is the full pathname to the `TXN` file.

     Replace the sequence number that follows *path* with the sequence number from the transaction log file.
   - *client-name* is the full name of the client.
   - *password* is the password for the **--id=*user*@*auth*** account.
   - *num* is the label number from Retrieving the label number for the backup on page 51.
4. Rename the transaction log files to their original names.

   NOTE: The Avamar Plug-in for Lotus Domino changes the names of the transaction log files when they are backed up. The original names comprise the last 12 characters of the backup name. In the example in this procedure, the original name of the transaction log file is `S0000051.TXN`.
5. Create a folder for the restored transaction log files. Use the original pathname and folder name.

   Use the `Translog_Path` variable in the `notes.ini` file to determine the original pathname and folder name.
6. Copy the restored transaction log files to the folder you created in step 5.
7. If you use shared mail, restore shared mail databases. Restoring shared mail databases on page 48 provides instructions.
8. (Optional) Change the ownership of the transaction log files to the Domino user account.
   The Domino server uses this user account (by default, notes) for tasks such as starting and stopping the Domino server.

Restoring and recovering data to the new Avamar client

Steps

1. In Avamar Administrator, click the **Backup & Restore** launcher link.

   The **Backup, Restore and Manage** window appears.
2. Click the **Restore** tab.
   The top-left pane contains a list of domains.
3. Select the domain that contains the Domino server.

   You cannot view clients outside the domain for the login account. To view all clients, log in to the root domain.

   A list of Avamar clients appears in the pane under the domains list.
4. Select the client that runs the Domino server.
5. Click the **By Date** tab.
6. Select the backup date from the calendar. Valid backups occurred on dates with a yellow highlight.
   A list of backups that were performed on that date appears in the **Backups** table next to the calendar.
7. Select a backup from the **Backups** table.
   The backup contents appear under the **Contents of Backup** pane.
8. Expand the folders in the **Contents of Backup** pane to display the database files.
9. Select one or more folders from the **Contents of Backup** pane.
10. Select **Actions** > **Restore Now**.
    The **Restore Options** dialog box appears.

11. Set options in the **Restore Options** dialog box:
    a. From the **Avamar encryption method** list, select an encryption method to use for client/server data transfer during this restore.

       The encryption technology and big strength for the client and server connection depend on several factors, including the client platform and Avamar server version. The *Avamar Product Security Guide* provides more information.
    b. Select **Restore everything to a different location**.

       This option activates the Items **Marked for Restore** table and options.

       NOTE: Do not restore database files to a client other than the original client.
    c. Click **Set Destination**.
       The **Set Destination** dialog box appears.
    d. Click **Browse**.
       The **Browse for File, Folder, or Directory** dialog box appears.
    e. Select the target destination for the restore, and then click **OK**.
       The target appears in the **Destination** field.
    f. Click **OK** to close the **Set Destination** dialog box.
       In the **Restore Options** dialog box, the **Destination** column in the **Items Marked for Restore** table contains the target destination.
    g. Click **More Options**.
       The **Restore Command Line Options** dialog box appears.
12. Set the plug-in options:
    a. Select **Show Advanced Options** to display all plug-in options.
    b. Select **Overwrite database files**.
    c. (AIX, Linux, or UNIX) Type the Domino username in the **Domino username** field.

       This username is the OS user, who has permissions to start and stop the Domino server on AIX, Linux, or UNIX systems. The default username is notes.
    d. Do not select the **Enable debugging messages** option. This option is for troubleshooting restore problems.

       When the **Enable debugging messages** option is selected, the Avamar Plug-in for Lotus Domino creates large log files.
    e. Select **Restore system databases**.
    f. Select **Specify full paths for the Domino configuration files and directory** if you changed the Lotus Domino configuration or if you reinstalled the Domino server in a new location. Then type the full pathname for the `notes.ini` file in the **Full path of the Domino server's notes.ini file** field and the full pathname for the Domino directory in the **Full path of the Domino directory** field.
    g. If appropriate, select **Pause replication of restored databases** to temporarily disable the replication of the successfully restored databases. This option allows you to check or verify the status of the restored databases before the databases are copied or synced to other replicas.

       NOTE: After checking or verification, you should manually re-enable the replication those databases via the Avamar Administrator GUI.
    h. Specify **Recover** options. The Restore options on page 65 provide more information about the **Recover** options.
    i. Specify a **Recover Time** option. The Restore options on page 65 provide more information about the **Recover Time** options.
    j. Select **Restore missing NLO files** to find and restore missing NLO files that the database references.

       NOTE: The process of finding missing NLO files can take a long time.
    k. Select **Synchronize DAOS catalog files** to synchronize the DAOS catalog file (`DAOSCAT.NSF`).

       NOTE: The resynchronization process can take a long time.
    l. Select **Synchronize DAOS catalog files normally** to resynchronize DAOS catalog files by using the default method.
    m. Select **Synchronize DAOS catalog files using QUICK (Above Domino version 8.5.2)** to resynchronize DAOS catalog files by using the `QUICK` option.
    n. Click **OK** to close the **Restore Command Line Options** dialog box.
13. Click **OK** to close the **Restore Options** dialog box.
    The following status message appears:

    ```
    Restore initiated.
    ```
14. Click **OK**.

Copying restored files to the appropriate directory

Steps

1. Copy the restored files to the same directory structure as the original directory structure.

   For example, if the directory, `D:\restoredfiles\c\Program Files\IBM\Lotus\domino\data`, contains the restored files and the original directory structure is `C:\Program Files\IBM\Lotus\domino\data`, copy `D:\restoredfiles\c\Program Files\IBM\Lotus\domino\data` to `C:\Program Files\IBM\Lotus\domino\data`.

   Overwrite the files in the destination directory.
2. (Domino DAOS-enabled servers only) Restore the DAOS directory:
   a. Create a folder for the restored DAOS (`.NLO`) files.

      To determine the original pathname and directory, see the `DAOSBasePath` variable in the `notes.ini` file. If the DAOS directory was created in the `data` directory, the pathname is relative to the `data` directory.
   b. Restore only the `.NLO` files from the backup to the DAOS directory.
3. Start the Domino server.

   Lotus Domino documentation provides more information about stopping and restarting a Domino server.

Performing a full backup of the Domino server and databases

After completing a successful disaster recovery, perform a full backup of the Domino server and databases to ensure that the DBIIDs of the databases are in sync with the transaction log file entries.

Steps

- Complete the steps in Performing an on-demand backup on page 34.

6

Backup Performance Optimization

Topics:

- Use of separate disks in the Domino environment
- RAID levels appropriate for content
- Analyzing the Domino server disk or partition
- Compacting Domino databases
- Update indexes
- Clustered server replication
- Minimizing log activity
- Use of multiple streams for backups

Use of separate disks in the Domino environment

Use separate RAID arrays with their own controllers for the operating system, the data, DAOS directory, and the transaction logs.

To operate at peak performance, the Domino server requires fast access to its components, especially the databases, and transaction logs. The following table provides an example configuration.

Table 6. RAID configuration

RAID configuration	Contents
C: O/S Installation	`C:\WINNT`
D: Lotus Domino Server binary installation	`D:\Lotus\Domino`
E: Lotus Domino application data installation	`E:\Lotus\Domino\Data`
F: Transaction log directory	`F:\TransLog`

Using a separate RAID array device and controller for Domino data:

- Maximizes throughput to the databases.
- Reduces disk contention when Avamar is reading the Domino databases for backup.

RAID levels appropriate for content

You can assign different RAID levels to best meet the storage requirements. For example, use a RAID 1 (mirroring) device for the transaction logs. RAID 1 arrays provide data protection, fast restores, and fast writes. A RAID 1 array device enables fast access to the transaction logs, which enables a fast and accurate recovery of files and data.

RAID 01 (striping and mirroring)

System administrators commonly use RAID 01 (striping and mirroring) for the operating system, the Domino program files, and the transaction logs. You can also use RAID 01 for data.

The advantages of RAID 01 are its speed and its maximum redundancy. The disadvantage of RAID 01 is its mirroring capability doubles the storage capacity requirements.

Storage capacity requirements are not an issue for the operating system and the program files in comparison to the transaction logs. The operating system and program files do not change or require more space.

RAID 1 (striping) or unprotected disks

Some Domino installations use striping or unprotected disks for the operating system and program files. In case of a disk failure, you can restore the operating system and program files from a backup. The disadvantages of RAID1 are its inability to restore a mirror image or automatically rebuild the drive.

RAID 5

Both RAID 5 and RAID 01 are used for data. RAID 5 is the most common RAID level for storing data. The advantage of RAID 5 is that its storage capacity requirements are less than those of RAID 01. The disadvantage of RAID 5 is that it is not as fast as RAID 01. Each RAID 5 write requires three additional writes per operation.

Analyzing the Domino server disk or partition

Domino writes files and deletes files to and from the disk. Over time, this ongoing process of writing and deleting files causes disk fragmentation. Eventually, files that are written to the disk are no longer stored contiguously, but as multiple parts or extents.

About this task

Once a drive becomes fragmented, access to Domino database files becomes slower because of increased disk head movement. Disk speed and disk contention can also degrade backup performance. To ensure the best possible backup performance by Avamar, perform regular disk analysis to determine the level of fragmentation. To analyze the disk for fragmentation, use the Microsoft **Disk Defragmenter** tool.

NOTE: The Lotus Notes and Domino wiki website provide more information about disk fragmentation specific to Lotus Domino Server. Search for "disk fragmentation."

Steps

1. Log in to the Domino server.
2. From the **Start** menu, select **All Programs** > **Accessories** > **System Tools** > **Disk Defragmenter**.
   The **Disk Defragmenter** dialog box appears.
3. Select the partition or disk that contains the Domino database files and click **Analyze disk**.
   When the disk analysis finishes, a status dialog box appears.
4. Click **View Report**.
   The **Analysis Report** appears.
5. Review the report:
   - Monitor the hard disk performance if the report contains files with more than 600 fragments.
   - Run maintenance on the partition or disk if the report contains files with 2,000 or more fragments.
6. Defragment the disk if the report recommends disk defragmentation.

Results

The speed of disk reads increase after you defragment the disk, which improves backup performance.

Compacting Domino databases

The Domino Compact task compacts each database to free unused space. Compacting a database reduces or reuses database space. The backup window for database backups is shorter after you compact the database.

About this task

The following table lists compacting options for the Domino server.

Table 7. Domino server compacting options

Type	Command-line option
In-place compacting with space recovery (recommended)	`-b`
In-place compacting with space recovery and reduction in file size	`-B`

Table 7. Domino server compacting options (continued)

Type	Command-line option
Copy-style	`-c`
Copy-style: Allow access while compacting	`-L`
Copy-style: Ignore errors and proceed	`-i`

The copy-style compaction (`-c`) option creates a database with a new DBIID. Run a full backup on this database. If you run an incremental backup after you use copy-style compaction on a database, the backup will be a full backup. Avamar requires a full backup before you can run an incremental backup.

The Lotus Domino documentation provides more information about compacting Domino databases.

To help maintain optimal backup performance perform the following tasks:

Steps

1. Regularly compact the database by running In-place compacting with space recovery only (`-b` option).
2. Defragment the disk after compacting the database.
3. Ensure that the compaction schedule and the backup schedule do not overlap.

Update indexes

The Domino Update task updates and rebuilds the database views indexes and the full-text indexes. The Update task runs in the background and is intended to improve database response time when a user opens a database view.

Unnecessary activity from the Update task can impact the Domino server's response time and overall performance. Ensure that the Update schedule and the backup schedule do not overlap.

The Lotus Domino documentation provides more information about the Domino Update task.

Clustered server replication

Use a separate network port for cluster replication on clustered servers. The extensive use of Domino replication is one of Domino's most powerful features. Replication can negatively affect backup performance by overloading a clustered server's communication channels.

The Lotus Domino documentation provides more information about the Domino replication.

Minimizing log activity

Domino logging activities can impact performance. Take the appropriate actions to minimize logging activity on the Domino server.

Steps

1. Limit the amount of information that is logged to the `log.nsf` file and the console log.
2. Set the lowest level of verbosity for `mail logging`, `log_replication`, `log_update`, and so forth.

   The `Server` document stores logging options.

   NOTE: Reducing the amount of log output can lower CPU usage.

3. Disable Log files and `DOMLOG.NSF` in the **Enable logging section** on the HTTP server.
   Web performance improves when you disable HTTP server logging.
4. After troubleshooting a problem, disable all parameters that start with "debug."
   Debug parameters can add CPU overhead and generate a large amount of log output.

Use of multiple streams for backups

To improve backup performance, you can specify multiple backup streams.

The Avamar Plug-in for Lotus Domino provides two methods for performing backups that use multiple streams. The following table describes these two methods.

Table 8. Multiple streams methods

Method	Description
Non-volume based	The equivalent option in the **Backup Command Line Options** dialog box is **Balance data among the streams based on total file** size option.
Volume based	The equivalent option in the **Backup Command Line Options** dialog box is **Balance data among the streams based logical volume of file system** option.

Non-volume based backups

The Avamar Plug-in for Lotus Domino uses two methods for backing up data with the non-volume based approach: sized-based backups and queue-based backups.

The Avamar Plug-in for Lotus Domino performs size-based and queue-based backups when you specify an Avamar server as the target storage device. For backups that use a Data Domain system as the target storage device, the Avamar Plug-in for Lotus Domino uses a single queue.

Size-based backups

For size-based backups, the Avamar Plug-in for Lotus Domino divides data into streams that are based on the size of the data.

The following figure shows the process flow for size-based backup streams.

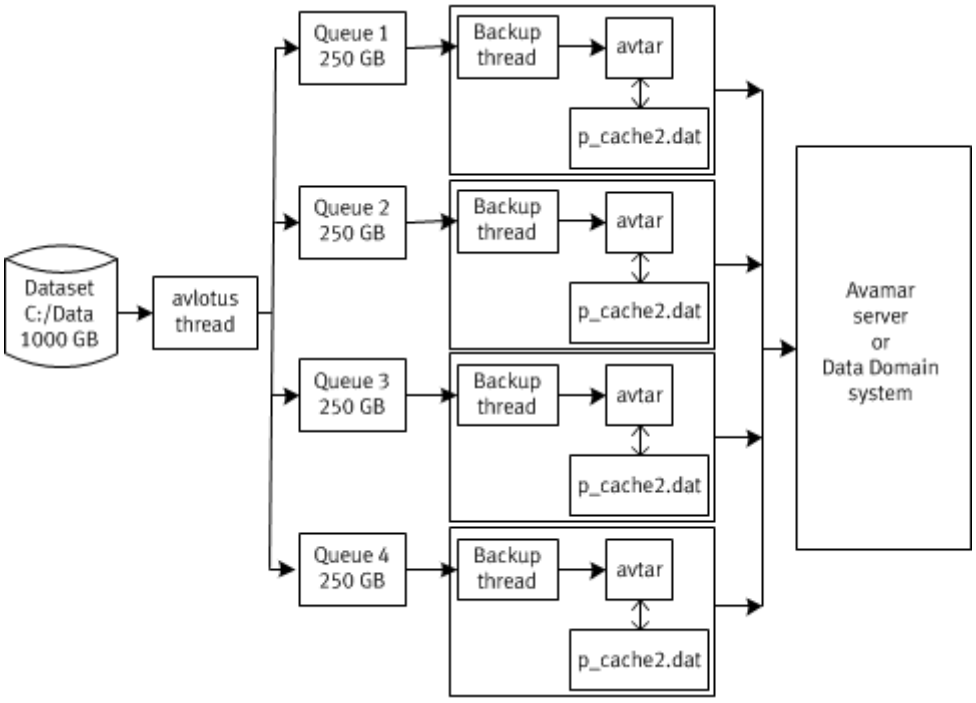

Figure 3. Size-based backup streams

The backup process flow for size-based backup streams proceeds as follows:

1. The Avamar Plug-in for Lotus Domino determines the size of the data.
2. The Avamar Plug-in for Lotus Domino evenly divides the data into the number of streams you specify. For example in Figure 3. Size-based backup streams on page 60, the Avamar Plug-in for Lotus Domino divides 1000 GB of data into four 250 GB backup streams.
3. The Avamar Plug-in for Lotus Domino starts the first backup stream when the backup adds the first file to the backup queue.
4. Subsequent backup streams start backing up data when the backup adds files to the backup queue. The Avamar Plug-in for Lotus Domino issues a warning if you add or delete files after a backup stream starts processing the backup queue.

Queue-based backups

For queue-based backups, the Avamar Plug-in for Lotus Domino uses a single queue instead of multiple queues.

The following figure shows the process flow for a queue-based backup streams.

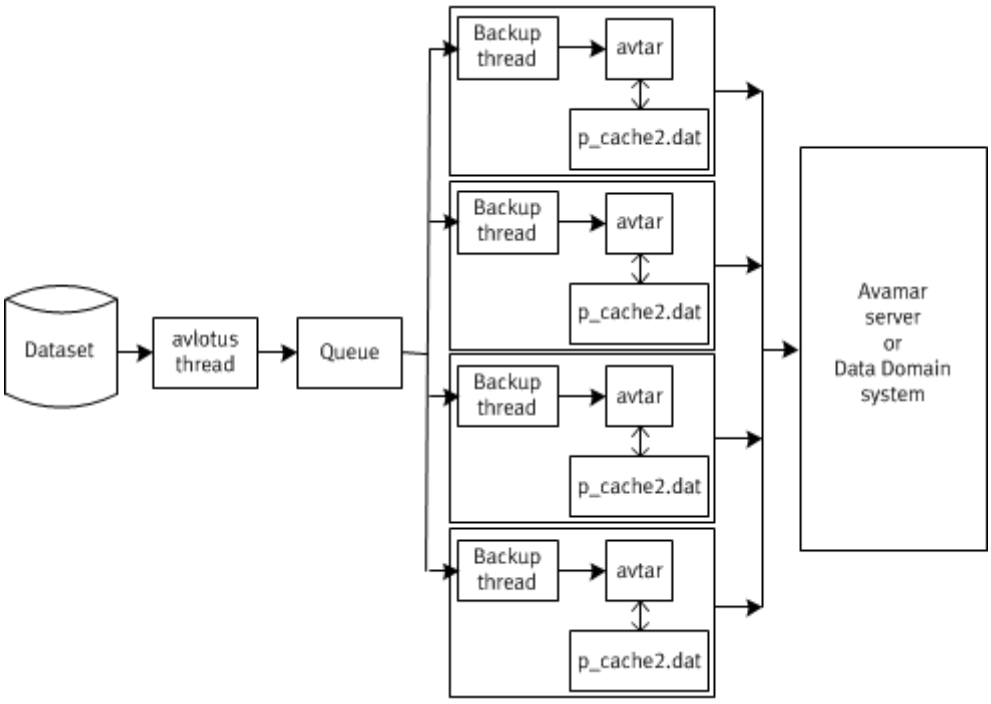

Figure 4. Queue-based backup streams

The backup process flow for queue-based backups proceeds as follows:

1. The Avamar Plug-in for Lotus Domino spawns a directory-walker process that accesses the dataset and determines what files to add to the queue.
2. The Avamar Plug-in for Lotus Domino starts backup threads which are based on the number of backup streams you specify.
3. The backup threads remove files from the queue, and then back up the files to the Avamar server or Data Domain system.

Volume-based backups

For volume-based backups, the Avamar Plug-in for Lotus Domino uses a separate backup stream for each volume. Backup speed depends on whether you configure each volume on a separate disk or whether you configure multiple volumes on a single disk.

Backups of multiple volumes on multiple disks provide faster backup speeds than multiple volumes on a single disk. The following figure shows a configuration in which each file system resides on a single disk.

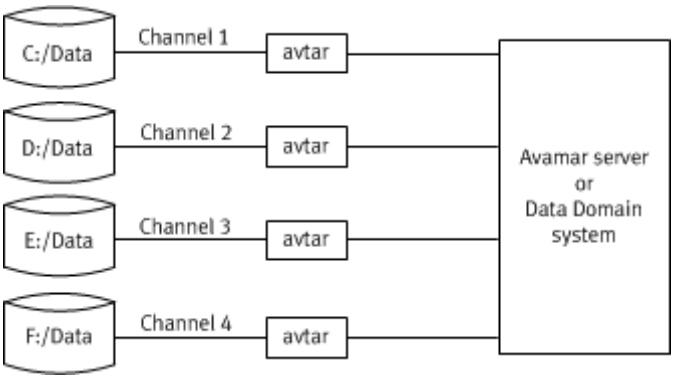

Figure 5. Multiple volumes and multiple backup streams

Excessive seek times can negatively impact the backup speed of multiple volumes on a single disk.

The following figure shows a single disk that contains two volumes.

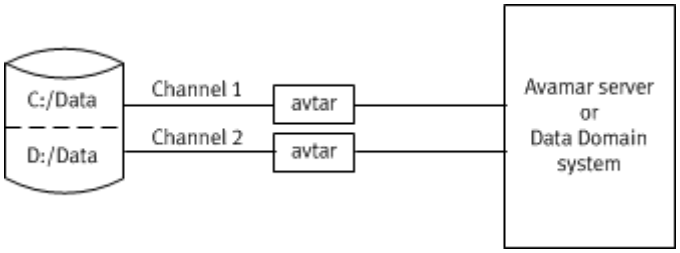

Figure 6. Single volume and multiple backup streams

The following scenarios show how backup performance varies depending on the configuration.

Backup scenario 1

The following backup scenario refers to the configuration details in Figure 5. Multiple volumes and multiple backup streams on page 61.

1. The user selects `C:/Data` for the backup.
2. The `C:/Data` directory contains three links to `C:/Data1`, `D:/Data`, and `E:/Data`.

   NOTE: `C:/Data1`, `D:/Data`, and `E:/Data` comprise a dataset.
3. The Avamar Plug-in for Lotus Domino uses three parallel backup streams for this dataset. One for each for logical volume (C, D, and E).
4. The user selects the number of streams for the backup:
   - One stream—The Avamar Plug-in for Lotus Domino runs one stream. Three separate `avtar` processes start sequentially to back up data on volumes C, D, and E. Each volume uses a separate `p_cache2.dat` file.
   - Two streams—The Avamar Plug-in for Lotus Domino runs two streams in parallel: one stream for volume C and one stream for volume D. After a stream finishes, a new stream for E starts. The Avamar Plug-in for Lotus Domino uses a maximum of two streams at any point during the backup.
   - Three streams—The Avamar Plug-in for Lotus Domino runs three steams in parallel: one stream for each volume (C, D, and E).
   - Four or more streams—The Avamar Plug-in for Lotus Domino runs three streams in parallel: one stream for each volume (C, D, and E).

The Avamar Plug-in for Lotus Domino uses one stream for each volume. When the number of streams you select exceeds the number of volumes in the backup, the Avamar Plug-in for Lotus Domino automatically adjusts the number of streams to equal the number of volumes in the backup.

Backup scenario 2

The following backup scenario refers to the configuration details in Figure 6. Single volume and multiple backup streams on page 62.

1. The user selects `C:/Data` for the backup.
2. The `C:/Data` directory does not contain directory or database links. The `C:/Data` directory is the only directory for the backup.
3. Because `C:/Data` is configured on a single volume, the Avamar Plug-in for Lotus Domino uses one backup stream regardless of whether you specify more than one backup stream.

Transaction log backups

The Avamar Plug-in for Lotus Domino can use multiple backup streams to back up transaction logs. The Avamar Plug-in for Lotus Domino backs up transaction logs along with database files or when you select an incremental backup.

The following figure shows the process flow of transaction log backups that use multiple backup streams.

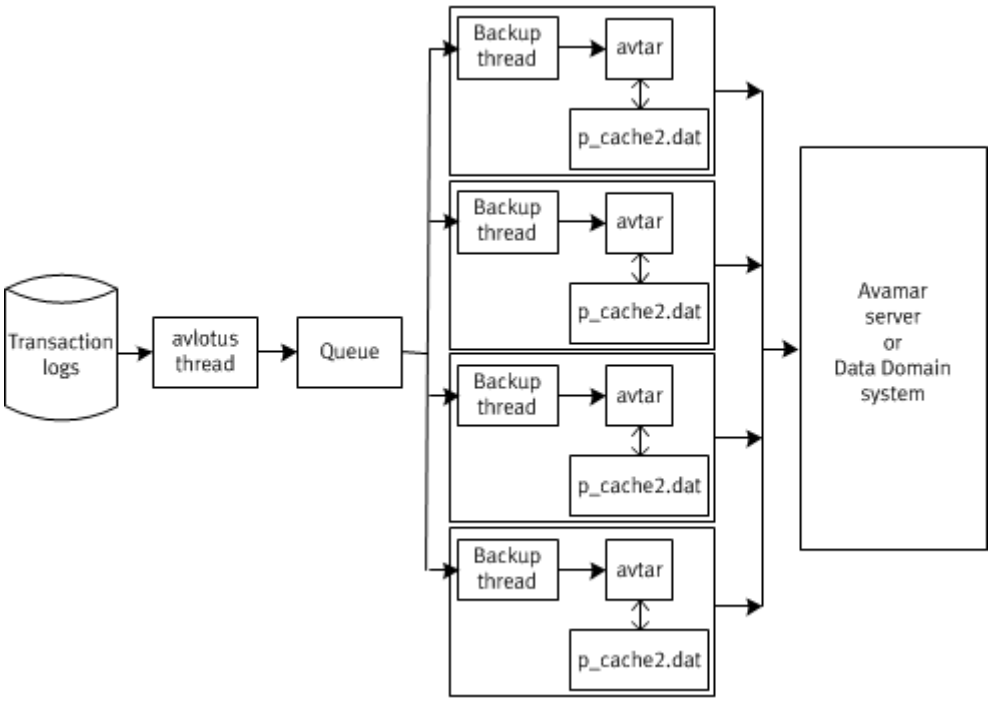

Figure 7. Backup streams for transaction log backups

In Figure 7. Backup streams for transaction log backups on page 63, the Avamar Plug-in for Lotus Domino uses four backup threads to back up the transaction logs:

1. An Avamar Plug-in for Lotus Domino thread writes the transaction logs paths to a queue.
2. Each backup thread removes a transaction log path from the queue, and then backs up the transactions logs to the Avamar server or Data Domain system.

A

Plug-in Options

Topics:

- How to set plug-in options
- Backup options
- Restore options

How to set plug-in options

Plug-in options enable you to control specific actions for on-demand backups, restores, and scheduled backups. The plug-in options that are available depend on the operation type and client plug-in type.

Specify plug-in options in the Avamar Administrator or the AUI for on-demand backup or restore operations, or when you create a dataset for a scheduled backup.

NOTE: No error checking or validation is performed on free text entries in the Avamar Administrator or the AUI. In addition, free text entries override settings that are made by using the GUI controls (text boxes, check boxes, and radio buttons).

Detailed instructions on how to access and set plug-in options during a backup or restore are available in Backup on page 34 and Restore and Recovery on page 40.

Backup options

The following table describes the plug-in options that you can set in either the Avamar Administrator or the AUI.

Table 9. Backup options

Setting	Description
Backup label	Assigns a descriptive label to the backup.
Follow links	Backs up databases and directories pointed to by links.
Backup type	Specifies the type of backup: • **Full**—Back up all databases and files that are required for a complete recovery. • **Incremental**—Back up transaction logs and new database files that are created since the last full or incremental backup. The Avamar Plug-in for Lotus Domino supports incremental backups only when you set transaction logging to `Archived` on the Domino server. • **Subset**—Back up selected database files.
Enable debugging messages	Writes maximum information to log files. This option can create large log files.
Full path of the Domino server's notes.ini file	Specifies the full pathname of the `notes.ini` file on the Domino server. • On Windows, the default folder is `C:\Program Files\IBM\Lotus\Domino`. • On AIX, Linux, or UNIX, the default directory is `/data/notesdata/`.
Full path of the Domino directory	Specifies the full pathname of the Domino directory.
Domino username	Specifies the Domino username. This username is the OS user, who has permissions to start and stop the Domino server on an AIX, Linux, or UNIX system. The default username is notes.

Table 9. Backup options (continued)

Setting	Description
	NOTE: This field is specific to the AIX, Linux, and UNIX operating systems.
Maximum number of backup streams	Specifies the number of backup streams to use. The maximum number is 10. The default is 1.
Balance data among the streams which are based on logical volume or file system	Assigns individual volumes or file systems to streams.
Balance data among the streams which are based on total file size	Assigns files to streams. Each stream receives an equal fraction of the total file size.
Back up transaction logs with full backup	Includes transaction logs with the backup. This option is selected by default.
Archive transaction logs	Archives transaction logs after the backup completes. This option is selected by default.
Terminate backup on error	Terminates the backup if an error occurs.
Store backup on Data Domain system	Stores the backup on a Data Domain system instead of the Avamar server.
Encryption method to Data Domain system	Specifies the encryption method for data transfer between the client and the Data Domain system during the backup.

Restore options

The following table describes the plug-in options that you can set in the Avamar Administrator or the AUI for Lotus Domino plug-in restore and recovery operations.

Table 10. Restore options

Setting	Description
Bring all databases online after restore	Automatically brings all databases online following a successful restore. This option is selected by default.
Overwrite database files	Overwrites existing databases or files with the restored data. Clear this option to prevent the restore operation from overwriting existing database or files. The log entries include databases that were not restored. By default, this option is not set.
Domino username	Specifies the Domino username. This username is the OS user, who has permissions to start and stop the Domino server on an AIX, Linux, or UNIX system. The default username is notes. **NOTE: This field is specific to the AIX, Linux, and UNIX operating systems.**
Enable debugging messages	Do not set this option unless instructed to do so by Avamar Customer Support personnel. This option writes maximum information to log files, which can create large log files.
Restore system databases	Restores the system databases. Stop the Domino server to restore system databases. System databases include `busytime.nsf`, `ddm.nsf`, `events4.nsf`, `log.nsf`, `mail.box`, `names.nsf`, and `mailjrn.nsf`.
Specifies full paths for the Domino configuration file and directory	Enables the restore operation to use the pathnames that are specified by the **Full path of the Domino server's notes.ini file** and **Full path of the Domino directory** fields. This option is necessary only if the Lotus Domino configuration has changed or the Domino server has been reinstalled in a new location. In these instances, you must provide the current pathnames to restore database files. **NOTE: A restore operation by default uses the same pathnames for the `notes.ini` file and Domino directory as the ones that the backup uses.**
Full path of the Domino server's notes.ini file	Specifies the full pathname to the `notes.ini` file on the Domino server.

Table 10. Restore options (continued)

Setting	Description
	• On Windows, the default folder is `C:\Program Files\IBM\Lotus\Domino`. • On AIX, Linux, or UNIX, the default directory is `/data/notesdata/`.
Full path of the Domino directory	Specifies the full pathname to the Domino configuration file and directory: • On Windows, the default folder is `C:\Program Files\IBM\Lotus\Domino\`. • On AIX, the default directory pathname is `/opt/ibm/lotus/notes/80010/ibmpow/`. • On Linux, the default directory pathname is `/opt/ibm/lotus/notes/85020/linux/`.
Pause replication of restored databases	Temporarily disable the replication of the successfully restored databases. This option allows you to check or verify the status of the restored databases before the databases are copied or synced to other replicas. By default, this option is not set. **NOTE: After checking or verification, you should manually re-enable the replication those databases via the Avamar Administrator GUI.**
Encryption method from Data Domain system	Specifies the encryption method for data transfer between the Data Domain system and the client during the restore.
Recover the databases by using transaction logs	Enables the restore operation to use transaction logs to recover database files to a specific date and time. This option is selected by default.
Recover all databases as one group per stream	Recovers all databases in groups rather than one at a time. If a database encounters a problem during a group recovery, the recovery fails for all databases in that group. This option is intended for advanced users who are familiar with the recovery of Domino databases.
Create DBIID during recovery	Enables the Domino server to assign new DBIIDs to databases that are recovered. This option is not selected by default. Because database transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as an entirely new database.
Create DBIID and ReplicaID during recovery	Enables the Domino server to assign new DBIIDs and ReplicaIDs to databases that are recovered. This option is not selected by default. Because transactions are specific to the DBIID, you cannot apply transaction logs before the recovery. Avamar recognizes a database with a new DBIID as an entirely new database.
Now	Restores each database to its original state at the time of the backup. Then, transaction logs are used to recover all data until now. This option is selected by default.
Other date/time	Restores each database to its original state at the time of the backup. Then, transaction logs are used to recover all data up to the date and time you specify in the **Recover date/time (yyyy-mm-dd hh:mm:ss)** field.
Backup date/time	Restores each database to its original state at the time of its backup. **NOTE: When backing up multiple databases in a single backup, the backup time differs for each database.**
Recover date/time (yyyy-mm-dd hh:mm:ss)	Specifies the calendar date to which the data is recovered when you select the **Other date/time** option. The entry must be in the following format: *yyyy-mm-dd hh:mm:ss:mmm* where: • *yyyy* is a four-digit year. • *mm* is a two-digit month of the year. • *dd* is a two-digit day of the month. • *hh* is a two-digit hour of the day.

Table 10. Restore options (continued)

Setting	Description
	• *mm* is the two-digit number of minutes past the hour. • *ss* is the two-digit number of seconds past the minute. Dashes (-) must separate year, month, and day. Colons (:) must separate hours, minutes, and seconds. You can truncate the time entry. For example, you can omit minutes and seconds.
Restore missing NLO files	Restores missing NLO files that are referenced by the databases that are successfully restored. This option is selected by default. The process of finding NLO files might take a long time.
Synchronize DAOS catalog files	Synchronizes the DAOS catalog file. The process of synchronizing the DAOS catalog file might take a long time.
Synchronize DAOS catalog files normally	Synchronizes the DAOS catalog file. Selecting this option performs the following tasks: • Builds the DAOS ID Table (DIT) and the DAOS Object Index (DOI). • Scans all databases for NLO file references. If no references are found for an NLO file, the NLO file is marked for deletion.
Synchronize DAOS catalog files using QUICK (Domino version 8.5.2 or later)	Creates a DIT and DOI in the DAOS catalog. This option does not synchronize the DAOS catalog files. To synchronize the DAOS catalog files, select the **Synchronize DAOS catalog files normally** option.
Transaction log pre-fetch value	Denotes the number of transaction logs that should be pre-fetched during recovery operation, which improves recovery speed. The default is 5, and the maximum is 100.

B

Troubleshooting

Topics:

- Troubleshooting backup problems
- Troubleshooting restore problems
- Troubleshooting configuration problems

Troubleshooting backup problems

You can resolve some backup problems with the troubleshooting information in this appendix.

Lotus Domino backups fail with avlotus error "Unable to initialize Notes API session"

Lotus Domino backups might fail with the following `avlotus` error when the data segment size for the notes user is larger than the data segment size for the root user.

```
Error <15396>: Error: Unable to initialize Notes API session. Error: 433
```

To work around this issue, set the data segment size to unlimited for the root user by performing the following:

1. Stop the `avagent` daemon.
2. In a command shell, type `ulimit -d unlimited`.
3. Navigate to `installdir/etc` and restart `avagent` by typing `./avagent.d --start`.

   NOTE: Ensure that you start `avagent` from the same shell used for the `ulimit` change performed in step 2.

Backing up Lotus Domino temporary files fails

The Domino server creates temporary files (`*.TMP` and `*.sh`) in the `data` directory.

When the files are no longer needed, the Domino server deletes the temporary files. An Avamar Plug-in for Lotus Domino backup returns an error if the Domino server deletes temporary files while the backup is processing the temporary files directory:

```
Path does not exist
```

You can ignore this error.

To prevent backups from returning this error, set up an exclusion list to exclude the Domino server's temporary files from the backup. The *Avamar Administration Guide* provides more information about exclusion lists.

Backup terminated due to timeout

A backup can fail when the backup time exceeds the value you specify for the `BACKUP_TIMEOUT` parameter in the `notes.ini` file.

A backup of a Domino database fails and returns the following error:

```
<DATABASE-NAME>Backup terminated due to timeout
```

This problem occurs when the backup time exceeds the value you specify for the `BACKUP_TIMEOUT` parameter in the `notes.ini` file. The default value for `BACKUP_TIMEOUT` is set to 15 minutes even if you do not include this parameter in the `notes.ini` file.

To resolve this problem, increase the `BACKUP_TIMEOUT` setting to 60 minutes:

1. Log in to the Domino server.
2. Open the `\path\notes.ini` file in a text editor.

   where *path* is the full directory pathname to the `notes.ini` file.

3. Set the `BACKUP_TIMEOUT` parameter to 60 minutes:

   `BACKUP_TIMEOUT=60`
4. Save the changes, and then close the text editor.
5. Restart the Domino server twice for the configuration changes to take effect.

NOTE: You can prevent a backup from timing out by setting the `BACKUP_NO_TIMEOUT` parameter to 1. A value of 1 can cause a backup to run continuously. Use only one of these parameters (`BACKUP_TIMEOUT` or `BACKUP_NO_TIMEOUT`) in the `notes.ini` file.

The Lotus Domino documentation provides more information about the `BACKUP_TIMEOUT` and `BACKUP_NO_TIMEOUT` parameters.

Database compaction fails during backup

Do not back up an online database during a database compaction. Database compaction can fail during an online backup.

Path does not exist

An Avamar Plug-in for Lotus Domino backup can fail if you delete temporary files before they are backed up.

A backup of the Domino `data` directory returns the error:

```
Path does not exist
```

The backup returns this error if an Avamar Plug-in for Lotus Domino backup processes a directory with temporary files that are deleted before they are backed up. The Domino server creates temporary files (`*.TMP` and `*.sh`) in the `data` directory and later deletes these files.

You can ignore this error. To prevent backups from returning this error, set up an exclusion list that specifies the Domino server's temporary files. The *Avamar Administration Guide* provides more information about setting up exclusion lists.

Troubleshooting restore problems

You can resolve some restore problems with the troubleshooting information in this appendix.

Access to database denied

The Avamar Plug-in for Lotus Domino returns an access denied error when you restore `ExBadDoc.ntf`.

The installation of EmailXtender® on a Domino server creates a read-only database file named `ExBadDoc.ntf`. If you restore `ExBadDoc.ntf`, the Avamar Plug-in for Lotus Domino returns an error:

```
Access to database denied
```

To restore `ExBadDoc.ntf`, you must first delete it, and then restore it by using the Avamar Plug-in for Lotus Domino. Restore and Recovery on page 40 provides more information about restoring database files.

Backup was later than recovery point in time

If you specify a time for the **Recover date/time** option that is after the original backup time, the recover fails.

When you set the **Recover date/time** option to a time before the original backup time, a restore fails with the following error:

```
Recovery Failed reason:Recovery Manager: Backup was later than recovery point in time.
```

To resolve this problem, specify a time for the **Recover date/time** option that is after the original backup time. Restore and Recovery on page 40 provides more information about restoring Domino database files, and Plug-in Options on page 64 provides more information about the **Recover date/time** option.

Could not create directory

Restoring database files to a different (target) directory other than the original directory fails if the target directory does not have read and write permissions for the Domino user account.

The error message that the restore operation returns is similar to the following error:

```
2012-01-18 21:25:22 avtar Error <6745>: Could not create directory "/dir1" for restore (code 13: Permission denied)
```

Ensure that the target directory has read and write permission for the Domino user account. The Domino server uses this user account (by default, "notes") for tasks such as starting and stopping the Domino server.

Database is in use and cannot be taken offline

You cannot restore an online shared mail database.

When a shared mail database is online, a restore of a shared mail database file fails and returns a message similar to the following error message:

```
5098 -> The database is in use and cannot be taken off-line
A shared mail database cannot be taken offline.
```

To restore a shared mail database file, use the instructions in Restoring shared mail databases on page 48.

Domino server not reachable or not running

The Avamar Plug-in for Lotus Domino cannot synchronize the DAOS catalog file when the server is not reachable.

When the server is not reachable during a DAOS synchronization process, the following error can appear in the log file:

```
Unable to find path to server.
```

The DAOS synchronization process requires the Domino server to be online.

Check network connectivity from the Avamar server to the Domino server. If the network connection is working, use the Lotus Domino trace option to further diagnose the problem:

- On a Notes client, select **File** > **Preferences** > **User Preferences** > **Ports** > **Trace**.
- On the Domino server, use the `Trace` command.

Restoration of missing NLO files not supported

A restore operation that specifies the **Restore of Missing NLO files** advanced option fails to restore NLO files if the **Bring all databases online after restore** advanced option is not selected.

When this failure occurs, the Avamar log file contains the following error:

```
Restoration of missing NLO files not supported for the databases which are selected to be brought offline after restore/recover
```

The database must be online to restore the NLO files.

To restore NLO files, select the **Bring all databases online after restore** and **Restore of Missing NLO files** options.

Restoring databases on DAOS-enabled servers on page 47 provides more information about restoring NLO files.

Recovery Manager: Database is not latest copy

A database restore operation fails if the database is not set to `ARCHIVE` mode and if you specified the **Recover the database by using transaction logs** options.

When a database recovery fails, the following error message appears in the log file:

```
<8163>: Recovery Failed reason: Recovery Manager: Database is not latest copy.
```

The restore operation reports this error message if the following conditions are true:

- You attempted to restore a backup of a database that does not have transaction logging which is set to `ARCHIVE` mode.

- You specified the **Recover the database by using transaction logs** option in the **Restore Command Line Options** dialog box.

NOTE: The Recovery the database by using transaction logs option is enabled by default.

To resolve this issue, restore the database without using transaction logs:

1. In the **Restore Options** dialog box, click **More Options**.
2. Select **Show Advanced Options** to display the advanced plug-in options.
3. Clear **Recover the database by using transaction logs**.
4. Click **OK** to close the **Restore Options** dialog box. The following status message appears:

   ```
   Restore initiated.
   ```
5. Click **OK** to start the restore.

Recovery Manager: Recovery only supported for backup files

A recovery of a deleted database fails with the following error:

```
avlotus Error <19258>: /local/notesdata/notes.nsf Recovery Failed reason: Recovery Manager:
Recovery only supported for Backup Files.. Try to recover this file after some time
```

This problem occurs when you delete a database by using the `rm` command on a Linux or UNIX system while the Domino server is running, and then perform a recovery of the deleted database. The error message uses the `notes.nsf` database as an example.

There are two workarounds for this issue. Workaround 1 requires you to restart the Domino server. Workaround 2 does not require you to restart the Domino server.

Workaround 1

1. Restart the Domino server.
2. Perform a recovery of the deleted database.
3. Restart the Domino server.

Workaround 2

1. From the Domino Console, run the `dbcache flush` command.
2. Perform a recovery of the deleted database.

IBM documentation for Domino provides more information about the Domino Console and `dbcache flush` command.

Troubleshooting configuration problems

You can resolve some configuration problems with the troubleshooting information in this appendix.

Backup or restore requires I18n Domino server

You must install the Domino server on a system that supports UTF-8 encoding.

To ensure that the system supports UTF-8 encoding, check the following items:

- The locale settings for the Domino server on Windows platforms.
- The `LANG` variable in the `.bash_profile` file for AIX, Linux, and UNIX systems.

If required, add the `LANG` variable to the `.bash_profile` file for the Domino notes user.

Fatal signal 11 in pid 1543 error on AIX 64-bit client

On a 64-bit AIX 6.1 system, an Avamar Plug-in for Lotus Domino backup or restore can fail with a `Fatal signal 11` error.

The `avlotus` log file contains additional errors similar to the following output:

```
2014-05-15 03:54:22 avlotus Info <5241>: Logging to
/usr/local/avamar/var/MOD-1283153278629-5014-lotus.log
2014-05-15 03:54:22 avlotus Info <6636>: CTL listening on port 32796
2014-05-15 03:54:22 avlotus Info <0000>: Setting ctl message version to 2 (from 1)
2014-05-15 03:54:23 avlotus Info <9209>: Exclude list file is
2014-05-15 03:54:23 avlotus Info <9211>: Include list file is
2014-05-15 03:54:23 avlotus Info <8038>: Avlotus Incremental Backup request
2014-05-15 03:54:23 avlotus Info <6649>: Process 442484
(/usr/local/avamar/bin/avtar) for workorder MOD-1283153278629 started
2014-05-15 03:54:23 avlotus Info <8047>: Notes.ini Path =
/home/notes/notesdata/notes.ini
2014-05-15 03:54:23 avlotus Info <9230>: Lotus Domino executable
directory full path = /opt/ibm/lotus/notes/85000/ibmpow/
2014-05-15 03:54:23 avlotus Info <8175>: Loading the Notes/Domino
library /opt/ibm/lotus/notes/85000/ibmpow/libnotes_r.a
2014-05-15 03:54:23 avlotus FATAL <5889>: Fatal signal 11 in pid 1543
2010/08/30-08:54:23.55983 [AvLotusBackupMgr] FATAL ERROR: <0001>
Fatal signal 11
2010/08/30-08:54:23.56015 [AvLotusBackupMgr] ERROR: <0316>
handlefatal exiting thread
pid=1543, sig=11
2014-05-15 03:54:23 avlotus Error <5891>: handlefatal: exiting thread
pid=1543, sig=11
2014-05-15 03:54:24 avlotus Info <0000>: Setting ctl message version
o 2 (from 1)
```

The following procedure resolves this issue:

1. Shut down the Domino server.
2. Reboot the AIX system.
3. Log in to the AIX system as root.
4. Stop `avagent` by typing the following command:

   `/usr/local/avamar/etc/avagent.d --stop`
5. Change the value of `maxDATA` in `avagent.bin` to 0x00000000 by typing the following command on one line:

   `/usr/ccs/bin/ldedit -bmaxdata:0x00000000/usr/local/avamar/bin/avagent.bin`

   Output similar to the following appears in the command shell:

   ```
   /usr/ccs/bin/ldedit: File AvamarInstallDir/bin/avagent.bin updated.
   ```
6. Verify that the value for `maxDATA` is 0x00000000 by typing the following command:

   `dump -o /usr/local/avamar/bin/avagent.bin`

   The following output appears in the command shell:

   ```
   maxDATA
   0x00000000
   ```
7. Start `avagent` by typing the following command:

   `/usr/local/avamar/etc/avagent.d --start`

Two Domino restarts after configuration changes

You might have to restart the Domino server twice after you change its configuration settings. In addition, you might have to reboot the hardware that runs the Domino server. The IBM Lotus Domino technote 1381136 provides more information.

Unable to initiate Lotus API

When a Domino server is configured with a secured (password-protected) console, the Avamar Plug-in for Lotus Domino cannot back up or restore the Lotus databases.

Backups and restores fail and report the following error:

`Unable to initiate lotus API`

To back up and restore a Domino server with the Avamar Plug-in for Lotus Domino, remove the password protection for the Domino server console by using the Domino Administrator program or the `Set Secure` command. The Domino Administrator online help provides instructions on removing password protection.

C

Command-Line Interface

Topics:

- Overview of the CLI for Avamar Plug-in for Lotus Domino
- Command reference
- Specifying command line options
- CLI example commands

Overview of the CLI for Avamar Plug-in for Lotus Domino

The Avamar Plug-in for Lotus Domino provides a command-line interface from which you can back up or restore Lotus Domino database files by using the `avlotus` command. You can use the CLI from all operating systems that the Avamar Plug-in for Lotus Domino supports.

The `avlotus` command, which is available as a binary or executable, is located in the installation directory:

- For AIX or Linux systems, the `avlotus` binary is located in `/usr/local/avamar/bin`.
- For a Solaris system, the `avlotus` binary is located in `/opt/AVMRclnt/bin`.
- For a Windows system, the `avlotus` executable is located in `C:\Program Files\avs\bin`.

You run the `avlotus` command from the system prompt on AIX, Linux, or UNIX systems, or from the **Command Prompt** window on a Windows system.

Backup and restore limitation

Do not run a backup or restore operation from the CLI at the same time a backup or restore operation is running from Avamar Administrator. Doing so might cause a race condition between the two processes.

Canceling a backup or restore from the CLI

When you start a backup or restore from the CLI, do not cancel the process by using `SIGINT` (**Ctrl+c**, **Ctrl+d**, or **Ctrl+z**). The Domino server can crash if you send a `SIGINT` signal or close a session while a backup is running from the CLI.

About this task

To cancel a CLI backup or restore operation, stop the `avtar` process by using the appropriate method:

Steps

- On AIX, Linux, or UNIX, use the `kill` command to stop the `avtar` process.
- On Windows, stop the `avtar.exe` process from the **Processes** tab in the **Windows Task Manager**.

Command reference

The `avlotus` command backs up or restores Lotus Domino database files.

Synopsis

```
avlotus --operation={backup | restore} [options]
```

Operations

The `avlotus` command works with two operation functions: backup and restore. Specify an operation with the `avlotus` command by using the `--operation` option.

NOTE: The `avlotus` command does not include a browse operation. To view files for backup or restore, use the operating system shell for AIX, Linux, or UNIX and the Windows Explorer for Windows.

The following table lists the operations that you can specify with the `avlotus` command by using the `--operation` option.

Table 11. Operations for the `avlotus` command

Command	Description
`backup`	Performs an on-demand backup of Lotus Domino data to the Avamar server.
`restore`	Restores the Lotus Domino data to the original location or to a different location (redirected restore).

Options

The options that you specify with the `avlotus` command control backup and restore operations. The Avamar Plug-in for Lotus Domino supports five types of options: common, account, logging, backup, and restore. The Avamar Plug-in for Lotus Domino does not support browse options.

Common options

Common options are general options that are available for multiple operations.

The following table lists common options for the `avlotus` command.

Table 12. Common options for the `avlotus` command

Option	Description
`--exclude-pluginid-list=`*list*	Excludes backups that are originally taken with one or more plug-in types, where *list* is a comma-separated list of one or more integer plug-in IDs.
`--pluginid-list=`*list*	Includes backups that are originally taken with one or more plug-in types, where *list* is a comma-separated list of one or more integer plug-in IDs.
`--version`	Displays the build version.
`--domino-user=`*username*	Specifies the Domino username. This username is the OS user, who has permissions to start and stop the Domino server on an AIX, Linux, or UNIX system.
`--exec-dir-path=`*filepath*	Specify the full path for the Domino configuration file and directory: • On Windows, the default folder is `C:\Program Files\IBM\Lotus\Domino\`. • On AIX, the default directory path is `/opt/ibm/lotus/notes/80010/ibmpow/`. • On Linux, the default directory path is `/opt/ibm/lotus/notes/85020/linux/`.
`--flagfile=`*filepath*	Specifies an option file, where `filepath` is the full path and the file name of the option file.
`--notesini-path=`*filepath*	Specifies the full path to the `notes.ini` file on the Domino server: • On Windows, the default folder is `C:\Program Files\IBM\Lotus\Domino\data\`. • On AIX, Linux, or UNIX, the default directory is `/local/data/notesdata/`.

Account options

Account options enable you to specify credentials to connect to the Avamar server for backups and restores that you perform with the `avlotus` command.

The following table lists account options for the `avlotus` command.

Table 13. Account options for the `avlotus` command

Option	Description
`--account=`*location* | `--path=`*location* | `--acnt=`*location*	Specifies a hierarchical *location* on the Avamar server. This option is relative to the current home location, unless you use a slash (`/`) as a prefix to the path designation, in which case an absolute path is assumed.
`--id=`*user@domain/homeacnt*	Specifies the client username for authentication where: • *user* is the username of the registered client. • *domain* is the Avamar domain. • *homeacnt* is the hostname of the Avamar Plug-in for Lotus Domino host.
`--password=`*password* | `--ap=`*password* | `--pswd=`*password*	Specifies the password for `--id=`*user@domain/homeacnt*.
`--server=`*Avamar_server* `--hfsaddr=`*Avamar_server*	Specifies the Avamar server IP address or fully qualified hostname (as defined in DNS).

Logging options

Logging options enable you to specify the directory path for log files and to control the output that the `avlotus` command writes to standard output or to log files.

The following table lists logging options for the `avlotus` command.

Table 14. Logging options for the `avlotus` command

Option	Description
`--informationals`	Sets the information level for status messages.
`--logfile=`*file* | `--log`	Creates log files in the directory that you specify.
`--noinformationals`	Disables informational messages.
`--nostdout`	Disables output to standard output (`stdout`).
`--nowarnings`	Disables warning messages.
`--quiet`	Disables both warnings and status messages.
`--verbose` | `--verbose=`*n* | `-v`	Enables all status and warning messages. Use `--verbose=`*n* to specify a verbosity level, where *n* is a number from 1 to 6 with 6 being the highest level of verbosity.

Backup options

Backup options for the `avlotus` command enable you to control specific behavior of a backup, such as specifying a backup level or excluding certain files from a backup.

The following table lists backup options for the `avlotus` command.

Table 15. Backup options for the `avlotus` command

Option	Description
`--32bitbinary`	To back up data from the 32-bit version of Domino server on AIX systems, you must specify the `32bitbinary` flag.
`--expires={`*days*|*timestamp*`}`	Specifies the backup expiration date as a number of days from the day of the backup (*days*) or an absolute timestamp (*timestamp*). Specify *timestamp* by using 24-hour local time zone values conforming to the following syntax: *yyyy-mm-dd hh:mm:ss*

Table 15. Backup options for the `avlotus` command (continued)

Option	Description
	You can specify partial date strings. For example, 2014-02 is equivalent to 2014-02-01 00:00:00.
`--group-by-size`	Assigns files to streams. Each stream receives an equal fraction of the total file size.
`--group-by-volume`	Assigns individual streams to each volume.
`--label=`*name*	Specifies a label name for the backup.
`--retention-type=`*type*	Specifies one of the following retention types: `none`, `daily`, `weekly`, or `monthly`.
`--archive-txn-logs`	Backs up the archive transaction logs. Specify `true` or `false`. The default value is `true`. To perform a full backup without the archive logs, specify `--archive-txn-logs=false` with the `avlotus` command. **NOTE: Do not use the `--archive-txn-logs` option with an incremental backup.**
`--backup-txn-logs`	Backs up transaction logs. Specify `true` or `false`. The default value is `true`.
`--backup-type=`*type*	Specifies the type of backup: • `0` (full)—Backs up all databases and files that are required for a complete recovery. Default backup type. • `1` (incremental)—Backs up transaction logs and new database files that are created since the last full or incremental backup. • `2` (subset)—Backs up a subset of database files.
`--exclude=`*pattern*	Excludes files that match a specific pattern from the backup. Use *pattern* to specify a string, which can include wildcard characters such as the asterisk (`*`) and question mark (`?`).
`--exclude-from=`*file*	Specifies a *file* that lists patterns to use to exclude files from the backup. When a file matches a pattern, the backup excludes the file. A pattern can include wildcard characters such as the asterisk (`*`) and question mark (`?`).
`--follow-links`	Following links to back up databases and directories. Specify `true` or `false`. The default value is `true`.
`--include=`*pattern*	Includes files that match a specific pattern in the backup. Use *pattern* to specify a string, which can include wildcard characters such as the asterisk (`*`) and question mark (`?`).
`--include-from=`*file*	Specifies a *file* that lists patterns to use to include files in the backup. When a file matches a pattern, the backup includes the file.
`--terminate-on-error`	Skips the file if the backup returns an error. Specify `true` or `false`. The default value is `false`.

Restore options

Restore options for the `avlotus` command enable you to control specific behavior of a restore, such as synchronizing DAOS catalog file or overwriting existing databases or files.

The following table lists restore options for the `avlotus` command.

Table 16. Restore options for the `avlotus` command

Option	Description
`--label=`*name*	Specifies the label name for the backup.
`--labelnum=`*name*	Specifies the label number of the backup to restore.
`--bring-online`	Automatically brings all databases online following a successful restore. Specify `true` or `false`. The default value is `true`.
`--enable-recovery`	Recovers the databases after the restore operation completes. Specify `true` or `false`. The default value is `true`.

Table 16. Restore options for the `avlotus` command (continued)

Option	Description
`--normal-sync-daos`	Synchronize the DAOS catalog file: • Builds the DAOS ID Table (DIT) and the DAOS Object Index (DOI). • Scans all databases for NLO file references. The restore marks an NLO file for deletion if the restore does not find references for an NLO file. Specify `true` or `false`. The default value is `true`.
`--overwrite-files`	Overwrites existing databases or files with the restored data. Specify `true` or `false`. The default value is `false`.
`-- pausereplica`	Temporarily disable the replication of the successfully restored databases. Specify `true` or `false`. The default value is `false`.
`--quick-sync-daos`	Synchronizes the DAOS catalog files by using the `QUICK` option. Specify `true` or `false`. The default value is `false`. **NOTE: The `--quick-sync-daos` option applies only to Domino version 8.5.2 and later.**
`--recover-backuptime`	Restores each database to its original state at the time of its backup. Specify `true` or `false`. The default value is `false`.
`--recover-datetime=`*yyyy-mm-dd hh:mm:ss*	Specifies the calendar date for the recover. Use the following format to specify the date and time: *yyyy-mm-dd hh:mm:ss:mmm* where: • *yyyy* is a four-digit year. • *mm* is a two-digit month of the year. • *dd* is a two-digit day of the month. • *hh* is a two-digit hour of the day. • *mm* is the two-digit number of minutes past the hour. • *ss* is the two-digit number of seconds past the minute. Dashes (-) must separate year, month, and day. Colons (:) must separate hours, minutes, and seconds. You can truncate the time entry. For example, you can omit minutes and seconds.
`--recover-in-batch`	Recovers the databases in batch. Specify `true` or `false`. The default value is `false`.
`--recover-now`	Restores each database to its original state at the time of the backup. Then, the restore uses transaction logs to recover all data until now. Specify `true` or `false`. The default value is `true`.
`--recover-othertime`	Restores each database to its original state at the time of the backup. Then, the restore uses transaction logs to recover all data up to the date and time that you specify by the `--recover-datetime` option. Specify `true` or `false`. The default value is `false`.
`--refresh-dbiid`	Assigns new DBIIDs to databases that you recover. Specify `true` or `false`. The default value is `false`.
`--refresh-replicaid`	Assigns new ReplicaIDs to databases that you recover. Specify `true` or `false`. The default value is `false`.
`--restore-missing-nlo`	Restores missing NLO files from the Domino server. Specify `true` or `false`. The default value is `true`.
`--restore-system-dbs`	Restore system databases. Specify `true` or `false`. The default value is `false`.
`--sync-daos-catalog`	Synchronizes the DAOS catalog files after restoring Domino files. Specify `true` or `false`. The default value is `false`.
`--target=`*path*	Restores the database to a different directory on the original client. The *path* is the destination directory.

Table 16. Restore options for the `avlotus` command (continued)

Option	Description
`--translogprefetch=n`	Instructs the plug-in to fetch more than one transaction log at a time. The number of logs fetched at one time is set by *n*; a maximum of 100 is allowed.

Help option

The `--help` option displays a list of available operations and options for the `avlotus` command.

To view a complete list of operations and options with a description for each one, use the `--help` option with the `avlotus` command:

```
avlotus --help
```

To view only the options for a specific operation, use the `--help` and `--operation=`*operation* options together. The following command provides a list of options for the backup operation:

```
avlotus --help --operation=backup
```

When you include the `--debug` option in the `avlotus.cmd` file, the `avlotus --help` command displays debug messages. To prevent debug messages from appearing in online help content use the following command:

```
avlotus --help --debug=false
```

Specifying command line options

You can specify options for `avlotus` to control backup or restore behavior. You can specify options for `avlotus` on the command line or in a file that affects both GUI and CLI usage. The default name for this file is `avlotus.cmd`.

The `avlotus.cmd` file is located in the following directory:

- For AIX or Linux, in `/usr/local/avamar/var/clientlogs`
- For a Solaris system, in `/opt/AVMRclnt/var/clientlogs`
- For Windows, in `C:\Program Files\avs\var\clientlogs`

List each option on its own line, as shown in the following example:

```
--verbose=5
--x14=65535
```

Create the `avlotus.cmd` file as a text file. If you want to give it a different name, or place it somewhere else, you can specify the option file on the command line using the `--flagfile=<filepath>` option. In this case *<filepath>* is the full path of the option file.

CLI example commands

The `avlotus` command uses the default value for an option unless you specify otherwise. For example, the `--backup-txn-logs` option is `true` by default. The `avlotus` command uses this option without you having to include it. You need only include the `--backup-txn-logs` option in the command line to specify `false`.

The following examples show how to use the `avlotus` command to back up data to the Avamar server and to restore data back to the client.

NOTE: The `avlotus` command requires the `--domino-user` option only for AIX, Linux, or Solaris.

Example backup commands

These commands illustrate how to use the `avlotus` command to back up Domino files to the Avamar server.

Backing up all Domino files and the transaction logs

The following command uses the `--backup-type=0` option to perform a full backup that includes transaction logs:

```
avlotus --operation=backup --backup-type=0 --id=user@domain/homeacnt
--password=password --server=address --logfile=file
--notesini-path=/local/notesdata/notes.ini
```

```
--exec-dir-path=/opt/ibm/lotus/notes/85020/linux/
--domino-user=notes /local/notesdata
```

NOTE: Because the default value for the `--backup-txn-logs` and `--archive-txn-logs` options is `true`, the `avlotus` command does require you to include them.

Backup types on page 15 provides more information about full backups.

Backing up all Domino files without transaction logs

The following command uses the `--backup-type=0` and `--backup-txn-logs=false` options to perform a full backup that does not include the transaction logs:

```
avlotus --operation=backup --backup-type=0 --id=user@domain/homeacnt
--password=password --server=address --logfile=file
--notesini-path=/local/notesdata/notes.ini
--exec-dir-path=/opt/ibm/lotus/notes/85020/linux/
--domino-user=notes --backup-txn-logs=false /local/notesdata
```

Backing up only Domino files that have changed

The following command uses the `--backup-type=1` option to perform an incremental backup:

```
avlotus --operation=backup --backup-type=1 --id=user@domain/homeacnt
--password=password --server=address --logfile=file
--notesini-path=/local/notesdata/notes.ini
--exec-dir-path=/opt/ibm/lotus/notes/85020/linux/
--domino-user=notes --archive-txn-logs=false /local/notesdata
```

NOTE: You cannot back up archive logs with an incremental backup. You must specify the `--archive-txn-logs=false` option.

Backup types on page 15 provides more information about incremental backups.

Subset backup

The following command uses the `--backup-type=2` to perform a subset backup:

```
avlotus --operation=backup --backup-type=2 --id=user@domain/homeacnt
--password=password --server=address --logfile=file
--notesini-path=/local/notesdata/notes.ini
--exec-dir-path=/opt/ibm/lotus/notes/85020/linux/
--domino-user=notes /local/notesdata/mail/test.nsf
```

Backup types on page 15 provides more information about subset backups.

Example restore commands

The following examples show how to use the `avlotus` command to restore Domino files from the Avamar server.

Restoring Domino files with transaction logs

The following command uses the `--enable-recovery` and `--recover-now` options to recover all data until now.

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata
```

NOTE: Because the default value for the `--enable-recovery` and `--recover-now` options is `true`, the `avlotus` command does not require you to include them.

Restoring a backup to its original state

The following command uses the `--recover-backuptime` option to recover the database to its original state:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata --recover-backuptime
```

Restoring a backup and recovering the database to a point in time

The following command uses the `--recover-datetime` option to recover the database to its original state:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata/mail
--recover-datetime="yyyy-mm-dd hh:mm:ss"
```

Restoring a backup with transaction logs and restoring system databases

The following command uses the `--enable-recovery` and `--recover-now` options to recover all data until now, and uses the `--restore-system-dbs` option to restore system databases:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35
--overwrite-files /local/notesdata --restore-system-dbs
```

Restoring a database without recovering it

The following command uses the `--enable-recovery=false` option to prevent a recovery operation:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata --enable-recovery=false
```

Synchronizing the DAOS catalog after restoring the database

The following command uses the `--normal-sync-daos` option to synchronize the DAOS catalog after restoring Domino files:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata --normal-sync-daos
```

Recover the databases using log pre-fetch

The following command uses flag the `--translogprefetch` option to restore using log pre-fetch options:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata --translogprefetch=10
```

Recover the databases in batch mode

The following command uses flag the `--recover-in-batch` option to restore all databases in a single batch:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata --recover-in-batch=true
```

Restoring 100 databases in a single batch

The following command uses the `--restore-dbs-single-batch=100` option to restore 100 databases in a single batch:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata --restore-dbs-single-batch=100
```

Restoring all databases in single batch

The following command uses the `--all-dbs-single-batch` option to restore all databases in a single batch:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata --all-dbs-single-batch
```

Restoring Domino files without restoring the missing NLO files

The following command restores Domino files without bringing the database back online by using the `--bring-online=false` option and without restoring missing NLO files by using the `--restore-missing-nlo=false` option:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata --bring-online=false
--restore-missing-nlo=false
```

Restoring Domino files to a different directory on the original client

The following command uses the `--target=`*path* option to restore Domino files to a different directory on the original client:

```
avlotus --operation=restore --id=user@domain/homeacnt
--password=password --server=address --labelnum=35 --logfile=file
--overwrite-files /local/notesdata --enable-recovery=false
--target=path
```

To perform a redirected restore, the `avlotus` command must include the `--enable-recovery=false` option.

Glossary

activation
The process of passing the client ID (CID) back to the client, where it is stored in an encrypted file on the client file system.
administrator
Person who normally installs, configures, and maintains software on network computers, and who adds users and defines user privileges.
avagent
The name of the *client agent* process.
Avamar Administrator
A graphical management console software application that is used to remotely administer an Avamar system from a supported Windows or Linux client computer.
Avamar client
A computer or workstation that runs Avamar software and accesses the Avamar server over a network connection. Avamar client software comprises a *client agent* and one or more *plug-ins*.
Avamar server
The server component of the Avamar client/server system. Avamar server is a fault-tolerant, high-availability system that efficiently stores the backups from all protected clients. It also provides essential processes and services required for data restores, client access, and remote system administration. Avamar server runs as a distributed application across multiple networked storage nodes.
avtar
The Avamar process that performs backups and restores.
backup
A point-in-time copy of client data that can be restored as individual files, selected data, or as an entire backup.
browse
The process of viewing data that is available for backup on a client computer or restore from the Avamar server.
client activation
The process of passing the client ID (CID) back to the client, where it is stored in an encrypted file on the client file system.
client agent
A platform-specific software process that runs on the client and communicates with the Management Console Server (MCS) and with any plug-ins installed on that client.
client registration
The process of establishing an identity with the Avamar server. When Avamar recognizes the client, it assigns a unique client ID (CID), which it passes back to the client during *client activation*.
cold backup
A backup performed while the database is offline.
DAOS directory
A directory that contains NLO files. Domino stores NLO files in subdirectories under the DAOS directory. The naming convention for the subdirectories is 0001, 0002, and so forth.
database
A collection of data arranged for ease and speed of update, search, and retrieval by computer software.
dataset
A policy that defines a set of files, directories, and file systems for each supported platform that are included or excluded in backups across a group of clients. A dataset is a persistent and reusable Avamar policy that can be named and attached to multiple groups.
DBIID
The database instance ID property of a database. This value is located in the database header and associates the database with specific entries in the transaction log.
disaster recovery
Recovery from any disruptive situation, such as hardware failure or software corruption, in which ordinary data recovery procedures are not sufficient to restore a system and its data to normal day-to-day operations. A disaster recovery can be a *bare metal recovery*.
DNS
Domain Name Server. A dynamic and distributed directory service for assigning domain names to specific IP addresses.
domain
A feature in Avamar Administrator that is used to organize large numbers of clients into named areas of control and management.
Domino Attachment and Object Service
An attachment consolidation feature available in Lotus Domino 8.5. DAOS substantially reduces disk space by storing only one copy of an email attachment from an email message that you send to multiple users. With DAOS enabled, the Domino server no longer saves a separate copy of every attachment in the user's email file (NSF). Instead, the Domino server stores a reference to the file attachment (also referred to as a ticket) in the object header of the document, and stores a single copy of the file attachment in an NLO file in the attachment repository on the server.
Domino partitioned server
A feature that enables you to run multiple instances of the Domino server on a single computer.
Domino server

A computer that runs the Domino Server program and stores Notes databases.

file system

Software interface used to save, retrieve, and manage files on storage media by providing directory structures, data transfer methods, and file association.

full backup

A backup that makes copies of the `data` directory on the Domino server.

group

A level of organization in Avamar Administrator for one or more Avamar clients. All clients in an Avamar group use the same group policies, which include the *dataset*, *schedule*, and *retention policy*.

group policy

In Avamar Administration, a group policy is defined as a *dataset*, *schedule*, and *retention policy* for all clients in an Avamar group.

hot backup

A backup that you run while users are online and have access to the data that is being backed up.

hot restore

A restore that runs while the Domino server is running.

incremental backup

A backup that makes copies of the transaction log files, all database files that have been created since the last full or incremental backup, and all database files for which the DBIID has changed since the last full or incremental backup.

LAN

Local Area Network.

MCS

Management console server. The server subsystem that provides centralized administration (scheduling, monitoring, and management) for the Avamar server. The MCS also runs the server-side processes used by *Avamar Administrator*.

metadata

Data about the backup, including information about the original database files, the backup types, the date and time of the backup, and other information necessary for restore.

NLO files

Files that store attachment content for email messages (NSF files). An NSF file contains a reference or ticket to an NLO file. DAOS creates one NLO file for each attachment. The DAOS directory stores all NLO files. The DAOS configuration creates the DAOS directory. You can back up the NLO files in the DAOS repository while the Domino server is down or when it is up and running. The Avamar Plug-in for Lotus Domino backs up the entire DAOS directory automatically as part of a backup request.

Notes client

Client software that enables users to access Lotus Notes applications on a Domino server, send mail, and browse the Web.

plug-in

Avamar client software that recognizes a particular kind of data resident on that client.

plug-in options

Options that you specify during backup or restore to control backup or restore functionality.

policy

A set of rules for client backups that can be named and applied to multiple groups. Groups have dataset, schedule, and retention policies.

recover

To restore data from a backup to a client disk and apply transaction logs to the data to make it consistent with a specific point in time.

redirected restore

The process of restoring a backup to a different location than the original location where the backup occurred.

registration

The process of establishing an identity with the Avamar server. When Avamar recognizes the client, it assigns a unique client ID (CID), which it passes back to the client during *client activation*.

restore

An operation that retrieves one or more file systems, directories, files, or data objects from a backup and writes the data to a designated location.

retention

The time setting to automatically delete backups on an Avamar server. Retention can be set to permanent for backups that should not be deleted from an Avamar server. Retention is a persistent and reusable Avamar policy that can be named and attached to multiple groups.

schedule

The ability to control the frequency and the start and end time each day for backups of clients in a group. A schedule is a persistent and reusable Avamar policy that can be named and attached to multiple groups.

subset backup

A backup that makes copies of selected databases and files. A subset backup includes only a few databases that require a backup. For example, a subset backup is appropriate if a user wants to back up a few databases several times a day to ensure that if an accidental loss of a mailbox occurs, the user has a current backup of the database.

transaction logging

A process that captures all changes made to a database and writes them to log files. The Domino server supports three types of transaction logging:

- Circular logging—Reuses the log files and overwrites old transactions. Circular logging is the default.
- Archive logging—Reuses the log files after they are archived. Archive logging is the recommended type of transaction logging.

- Linear logging—Reuses the log files and overwrites old transactions for log sizes greater than 4 GB.

transaction logs
Log files used by the Domino server to store all changes made to Lotus databases that you enable for transaction logging.

User Account Control
A Windows feature available in Windows Server 2008 R2 and Windows Vista. UAC helps prevent unauthorized changes to your computer. When functions that could potentially affect a computer's operation are made, UAC prompts the user for permission or for an administrator's password before continuing with the task.