

EMC[®] Avamar[®] 7.2 for Sybase ASE

User Guide

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CONTENTS

Figures	7
Tables	9
Preface	11
Chapter 1	Introduction 15
	Architecture..... 16
	Stand-alone configuration..... 16
	High-availability cluster configurations..... 17
	Data Domain system support..... 18
	Multiple Sybase versions and instances on the same host..... 18
	Backup..... 19
	Complete backup protection..... 19
	Basic backup features..... 19
	Scheduled backups versus on-demand backups..... 20
	Full and incremental backups..... 20
	Truncation backups..... 22
	Backup names..... 22
	Exclusion of temporary databases from backups..... 23
	Restore and recovery..... 23
	Basic restore and recovery features..... 24
	Restore methods..... 24
	Restore to a specified time..... 25
	Concurrent backups and restores..... 26
	Password-protected database backups and restores..... 27
	Database backup and restore verification..... 27
	Database consistency checks..... 28
	Preprocessing and postprocessing scripts..... 28
	Internationalization (I18N)..... 29
	Multi-streaming..... 29
	Client logs and caches..... 30
	Sybase ASE 15.7.x support..... 30
	Sybase ASE network password encryption..... 30
	Software processes..... 30
	Backup processes..... 31
	Restore processes..... 32
Chapter 2	Installation and Configuration 35
	Preparing to install the Avamar Plug-in for Sybase..... 36
	System requirements..... 36
	Sybase server requirements..... 36
	Cluster system requirements..... 36
	User Account Control setting on Microsoft Windows..... 36
	Downloading the software..... 37
	Installing the Avamar file system client..... 38
	Installing, upgrading, and uninstalling the software on HP-UX..... 39

	Installing the Avamar Plug-in for Sybase on HP-UX.....	39
	Upgrading the Avamar Plug-in for Sybase on HP-UX.....	40
	Uninstalling the Avamar Plug-in for Sybase on HP-UX.....	40
	Installing, upgrading, and uninstalling the software on IBM AIX.....	41
	Installing the Avamar Plug-in for Sybase on IBM AIX.....	41
	Upgrading the Avamar Plug-in for Sybase on IBM AIX.....	42
	Uninstalling the Avamar Plug-in for Sybase on IBM AIX.....	43
	Installing, upgrading, and uninstalling the software on Linux.....	44
	Installing the Avamar Plug-in for Sybase on Linux.....	44
	Upgrading the Avamar Plug-in for Sybase on Linux.....	45
	Uninstalling the Avamar Plug-in for Sybase on Linux.....	47
	Installing, upgrading, and uninstalling the software on Solaris.....	47
	Installing the Avamar Plug-in for Sybase on Solaris.....	47
	Upgrading the Avamar Plug-in for Sybase on Solaris.....	48
	Uninstalling the Avamar Plug-in for Sybase on Solaris.....	49
	Installing, upgrading, and uninstalling the software on Windows.....	49
	Installing the Avamar Plug-in for Sybase on Windows.....	49
	Upgrading the Avamar Plug-in for Sybase on Windows.....	50
	Uninstalling the Avamar Plug-in for Sybase on Windows.....	50
	Performing post-installation tasks.....	51
	Excluding Sybase device files from file system backups.....	51
	Configuring internationalization (I18N) support.....	51
Chapter 3	Backup	55
	Backup feature support.....	56
	Performing on-demand backups.....	56
	Scheduling backups.....	62
	Creating a dataset.....	62
	Creating a group.....	68
	Assigning the dataset to the Sybase client.....	70
	Enabling scheduled backups.....	70
	Monitoring backups.....	71
	Canceling backups.....	72
	Reviewing backups.....	72
Chapter 4	Restore and Recovery	75
	Restore and recovery requirements.....	76
	Software requirements for restore and recovery.....	76
	Requirements for recovery to same or alternate destination.....	76
	Requirements for recovery to current time.....	77
	Requirements for point-in-time recovery.....	77
	Performing restore and recovery.....	78
	Monitoring restores.....	84
	Canceling restores.....	84
	Disaster recovery.....	85
	Recovery of the master database.....	85
	Recovery of the Sybase server.....	85
Appendix A	Plug-in Options	87
	How to set plug-in options.....	88
	Plug-in options in Avamar Administrator.....	88
	Browse options in Avamar Administrator.....	88
	Backup options in Avamar Administrator.....	89

	Restore options in Avamar Administrator.....	91
Appendix B	Command Line Interface	93
	Overview of CLI operations.....	94
	Launching the CLI.....	94
	Using an option file.....	94
	Password encoding.....	96
	Help.....	96
	Version information.....	96
	Command options.....	96
	Synopsis.....	97
	Operation option.....	99
	Common options.....	101
	Backup options.....	105
	Restore and recovery options.....	107
	Browse operations with the avsybase command.....	108
	On-demand backups with the avsybase command.....	109
	Full backups with the avsybase command.....	109
	Incremental backups with the avsybase command.....	111
	Truncation backups with the avsybase command.....	113
	Restore and recovery with the avsybase command.....	114
	Restore to same destination with the avsybase command.....	115
	Relocated recovery with the avsybase command.....	116
	Point-in-time recovery with the avsybase command.....	118
	Restoring the database db1 to a point-in-time between t3 and t4... ..	120
	Database restore verification with the avsybase command.....	120
Appendix C	Troubleshooting	121
	Logging information.....	122
	Configuration checklist.....	123
	Determining the Sybase ASE server version.....	123
	Bitness of Avamar Plug-in for Sybase ASE and Sybase.....	124
	Requirements for libsybase_avamar.so and libsybase_avamar.dll.....	124
	Verifying the bitness of the library file.....	125
	Avamar client and Avamar Plug-in for Sybase ASE installation.....	125
	Avamar client and Avamar Plug-in for Sybase registration.....	126
	Disk space for the Avamar var directory.....	127
	Common problems and solutions.....	127
	Backup or restore failure with Sybase ASE15.5.....	127
	"Cannot open file f_cache.dat" error.....	127
	Failure of list-times operation.....	128
	Hidden backups.....	128
	Failure of point-in-time recovery.....	129
	Unable to browse databases with Avamar Administrator.....	130
Glossary		131

FIGURES

1	Avamar Plug-in for Sybase in a stand-alone configuration.....	17
2	Backup workflow.....	31
3	Restore workflow.....	33
4	Activity Monitor.....	72
5	Activity Monitor.....	84

FIGURES

TABLES

1	Revision history.....	11
2	Default result of full backup for different database types.....	21
3	Default result of incremental backup for different database types.....	22
4	Sybase plug-in installation packages.....	37
5	Sybase browse options in Avamar Administrator.....	88
6	Sybase backup options in Avamar Administrator.....	89
7	Sybase restore options in Avamar Administrator.....	91
8	Operations supported with avsybase command.....	100
9	Common options for both backups and restores with avsybase command.....	101
10	Options for backups with avsybase command.....	105
11	Options for restore and recovery with avsybase command.....	107
12	Commands to verify the Avamar client and Sybase plug-in installation.....	125

PREFACE

As part of an effort to improve its product lines, EMC periodically releases revisions of its software and hardware. Therefore, some functions 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 your EMC technical support professional if a product does not function properly or does not function as described in this document.

Note

This document was accurate at publication time. Go to EMC Online Support (<https://support.EMC.com>) to ensure that you are using the latest version of this document.

Purpose

This guide describes how to install Avamar in a Sybase environment, and how to back up and restore Sybase Adaptive Server Enterprise (ASE) databases.

Audience

This document is intended for the following users:

- System administrators who are responsible for installing software and maintaining servers and clients on a network
- Sybase database administrators (DBAs) who are responsible for backing up and maintaining Sybase databases

Readers of this document must be familiar with the following topics:

- Sybase terminology and concepts, especially those related to Sybase database backup and recovery
- Backup and recovery procedures
- Disaster recovery procedures

Revision history

The following table presents the revision history of this document.

Table 1 Revision history

Revision	Date	Description
01	June, 2015	GA release of Avamar 7.2.

Related documentation

The following EMC publications provide additional information:

- *EMC Avamar Compatibility and Interoperability Matrix*
- *EMC Avamar Administration Guide*
- *EMC Avamar and EMC Data Domain System Integration Guide*
- *EMC Avamar Backup Clients User Guide*
- *EMC Avamar for Windows Server User Guide*
- *EMC Avamar Operational Best Practices*

- *EMC Avamar Product Security Guide*
- *EMC Avamar Release Notes*

The following additional documentation may be useful:

- Sybase Adaptive Server Enterprise (ASE) documentation
- Sybase ASE backup and recovery documentation

Special notice conventions used in this document

EMC uses the following conventions for special notices:

NOTICE

Addresses practices not related to personal injury.

Note

Presents information that is important, but not hazard-related.

Typographical conventions

EMC uses the following type style conventions in this document:

Bold	Use 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)
<i>Italic</i>	Use for full titles of publications referenced in text
Monospace	Use for: <ul style="list-style-type: none"> • System code • System output, such as an error message or script • Pathnames, file names, prompts, and syntax • Commands and options
<i>Monospace italic</i>	Use for variables
Monospace bold	Use 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 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 enable you to resolve a product issue before you contact EMC Customer Support.

To access the Avamar support page:

1. Go to <https://support.EMC.com/products>.
2. Type a product name in the **Find a Product** box.
3. Select the product from the list that appears.
4. Click the arrow next to the **Find a Product** box.

5. (Optional) Add the product to the **My Products** list by clicking **Add to my products** in the top right corner of the **Support by Product** page.

Documentation

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

- 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.

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To search the EMC Knowledgebase:

1. Click the **Search** link at the top of the page.
2. Type either the solution number or keywords in the search box.
3. (Optional) Limit the search to specific products by typing a product name in the **Scope by product** box and then selecting the product from the list that appears.
4. Select **Knowledgebase** from the **Scope by resource** list.
5. (Optional) Specify advanced options by clicking **Advanced options** and specifying values in the available fields.
6. Click the search button.

Online communities

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Live chat

To engage EMC 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 EMC 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 your EMC sales representative for details about obtaining a valid support agreement or with questions about your 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**.

Facilitating support

EMC recommends that you enable ConnectEMC and Email Home on all Avamar systems:

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

Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of 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 that will help us address the documentation issue

CHAPTER 1

Introduction

This chapter includes the following topics:

• Architecture	16
• Backup	19
• Restore and recovery	23
• Concurrent backups and restores	26
• Password-protected database backups and restores	27
• Database backup and restore verification	27
• Database consistency checks	28
• Preprocessing and postprocessing scripts	28
• Internationalization (I18N)	29
• Multi-streaming	29
• Client logs and caches	30
• Sybase ASE 15.7.x support	30
• Sybase ASE network password encryption	30
• Software processes	30

Architecture

The EMC® Avamar® Plug-in for Sybase ASE (Sybase plug-in) is software that works with the Avamar server and client software. The Sybase plug-in provides deduplication backup and recovery for Sybase Adaptive Server Enterprise (ASE) data. A Sybase ASE server is the only type of Sybase database server that the Sybase plug-in supports.

You must install the Sybase plug-in on an Avamar client host that is a Sybase ASE server. The Sybase plug-in works with Sybase ASE server software and the components of an Avamar system to back up and restore Sybase databases and transaction logs. The Sybase plug-in serves as a backup module. An Avamar server or (optionally) EMC Data Domain® system serves as a backup storage device.

You must deploy the Sybase plug-in in an Avamar client/server system in a network environment. The Avamar server stores and manages client backups in a deduplicated format. The Sybase server host is an Avamar client that accesses the Avamar server for backup and restore services.

An Avamar server can optionally use a Data Domain system as a storage device for backup and restore operations. [Data Domain system support on page 18](#) provides details.

You can use the Avamar Administrator graphical user interface (GUI) to remotely administer an Avamar system from a supported Windows or Linux computer.

The Glossary provides details about terms used in this guide.

Stand-alone configuration

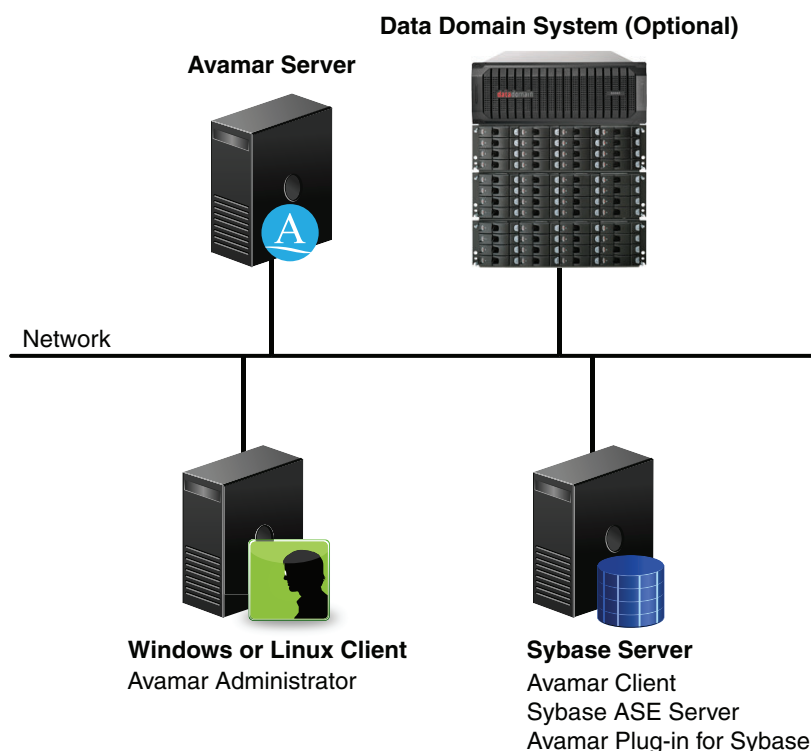
You can deploy the Sybase plug-in in a stand-alone configuration on one of the supported operating systems.

[Preparing to install the Avamar Plug-in for Sybase on page 36](#) provides details on system requirements, including supported operating systems.

You must install the following software on the Sybase server host:

- Platform-specific Avamar client
- Sybase ASE server
- Avamar Plug-in for Sybase

The following figure shows a stand-alone configuration that uses the Sybase plug-in to back up or restore Sybase data to or from an Avamar server or a Data Domain system.

Figure 1 Avamar Plug-in for Sybase in a stand-alone configuration

High-availability cluster configurations

You can also deploy the Sybase plug-in in a high-availability active/passive cluster configuration on a Solaris operating system. This type of cluster comprises multiple hosts (nodes) connected by a SCSI bus attached to a shared storage system. If a failure occurs on the primary node, the cluster software can automatically switch the failed application service to a surviving host in the cluster.

You configure the backup or restore operations for the virtual cluster host. The operations run on the active node in an active/passive cluster environment.

NOTICE

If a backup or restore operation is running during a failover, the operation fails. You must restart a failed backup or restore manually on the new active node.

The *EMC Avamar Compatibility and Interoperability Matrix* provides details about the supported cluster versions.

Solaris Cluster configurations

The Sybase plug-in supports two-node active/passive Solaris Cluster configurations on Solaris.

In an active/passive Solaris Cluster configuration, the resource group is online on the active node until a failover occurs. Then the resource group comes online on the passive node. You can run backups and restores from the active node.

Veritas Cluster Server configurations

The Sybase plug-in supports two-node active/passive Veritas Cluster Server (VCS) configurations on Solaris. In an active/passive VCS configuration, the service group is

online on the active node until a failover occurs. Then the service group comes online on the passive node. You can run backups and restores from the active node.

Data Domain system support

The Sybase plug-in supports backups to and restores from a Data Domain system. The Sybase plug-in stores the backup data on the Data Domain system, and stores backup metadata on the Avamar server. The Avamar server manages the backups.

Before you can store backups on a Data Domain system, you must add the Data Domain system to the Avamar configuration by using Avamar Administrator. Then you select the Data Domain system in the plug-in options when you perform an on-demand backup or when you create a dataset for a scheduled backup. You can also use the command line interface (CLI) to perform backups to a Data Domain system.

If you specify a Data Domain system as the backup destination, then the Sybase plug-in backs up all the Sybase data to that destination. You cannot back up part of the data to a Data Domain system and another part of the data to an Avamar server during a single backup.

You must store the full backup for a client and all subsequent incremental backups on either the Avamar server or a single Data Domain system. The Sybase plug-in does not support the following scenarios:

- Full backup on a Data Domain system and incremental backups on an Avamar server
- Full backup on the Avamar server and incremental backups on a Data Domain system
- Full backup on one Data Domain system and incremental backups on another Data Domain system

If you change the device on which backups for a client are stored, then you must perform a full backup before you perform any further incremental backups.

The steps to restore backups are the same whether you restore from the Avamar server or a Data Domain system. The restore process determines the location of the backup and restores the backup.

The *EMC Avamar and EMC Data Domain System Integration Guide* provides more information about Data Domain systems in an Avamar environment, including detailed steps to add a Data Domain system to the Avamar configuration.

Multiple Sybase versions and instances on the same host

The Sybase plug-in supports the use of other Avamar plug-in software on the same host.

The Sybase plug-in supports multiple Sybase versions on the same Sybase server host. The plug-in also supports multiple Sybase instances as long as the Sybase instances use different names. For example, the Sybase plug-in does not support the following scenario on the same host:

- Sybase ASE 15.5 has an instance named TESTSYBASE1.
- Sybase ASE 15.7 has an instance named TESTSYBASE1.

Note

The Sybase plug-in supports the scenario where both 32-bit and 64-bit versions of Sybase are installed on the same host on 64-bit Linux or 64-bit Windows. You must install the 32-bit Sybase plug-in package on the 64-bit Linux or the 64-bit Sybase plug-in installer on 64-bit Windows.

Backup

The Sybase plug-in supports specific features for Sybase backups:

- [Backup processes on page 31](#) describes the processes in Sybase plug-in backups to an Avamar server.
- The Sybase plug-in also supports backups to a Data Domain system as described in [Data Domain system support on page 18](#).
- [Multi-streaming on page 29](#) describes how to use multiple sessions to improve the backup performance.

Complete backup protection

For the complete protection of a Sybase ASE server system, a viable backup strategy must include regular backups of the Sybase database data, transaction logs, and database configuration files.

You require the backups for the following reasons:

- Without database backups, you cannot restore a database at all.
- Without transaction logs, you can restore a database only to the time of the last consistent backup, but you cannot recover the database to an arbitrary point-in-time after that backup.
- Without the configuration files, you cannot recover the database setup.

To prepare a Sybase server environment for disaster recovery, perform regular scheduled backups of Sybase server instances, databases, and transaction logs.

Perform the following additional tasks to prepare for disaster recovery:

- Keep up-to-date printouts of the Sybase system tables.
- Keep up-to-date printouts of the scripts for disk init and create databases.
- Do not store user databases or any databases other than master, tempdb, model, and sybsystemdb on the master device.
- Back up the master database after performing actions such as initializing database devices, creating or altering databases, or adding a new server login.

The appropriate Sybase documentation provides more details.

Basic backup features

The Sybase plug-in supports online backups, scheduled and on-demand backups, full and incremental backups, and truncation backups.

The details of the supported backup types are as follows:

- Online backups—The Sybase plug-in backs up an online Sybase ASE database without requiring any down time.

NOTICE

The Sybase plug-in does not perform offline backups of Sybase data.

- Scheduled and on-demand backups—The Sybase plug-in supports both scheduled backups that run automatically and on-demand backups that you initiate.
- Full and incremental backups—The Sybase plug-in can back up all the Sybase databases on a server, specific databases, or specific transaction logs, with truncation of the logs.

- Truncation backups—The Sybase plug-in can truncate the logs of one or more Sybase databases. A truncation backup is a tool for ad-hoc database management only.

NOTICE

The Sybase plug-in does not back up any type of temporary Sybase database.

Scheduled backups versus on-demand backups

The Sybase plug-in supports scheduled backups and on-demand (manual) backups.

The Avamar server automatically runs a scheduled backup according to Avamar policy settings that you configure for a group of one or more Avamar clients. [Scheduling backups on page 62](#) provides details.

You can run an on-demand backup by using one of the following methods:

- You can use Avamar Administrator to specify the required backup options and start the backup. [Performing on-demand backups on page 56](#) provides details.
- You can manually run the `avsybase` command with the required command line options on the Sybase server host. [On-demand backups with the avsybase command on page 109](#) provides details.

NOTICE

The Avamar Administrator activity monitor displays on-demand backups started through Avamar Administrator only, not through the `avsybase` command.

[Installation and Configuration on page 35](#) describes the configuration procedures.

[Backup on page 55](#) describes the backup procedures.

Full and incremental backups

The Sybase plug-in performs Sybase full-level backups and incremental-level backups. A single backup process can back up databases or logs on only one Sybase server at a time.

Full backups

A full backup backs up all the data in one or more databases on a Sybase server:

- A full backup can back up all the databases on the Sybase server, including the transaction logs for each database.
- A full backup can back up one or more databases on the Sybase server, including the transaction logs for each database.

With a regular type of Sybase database, the database data and log data are stored in separate Sybase devices.

The Sybase plug-in supports full backups of the following non-regular types of Sybase databases in the same way as full backups of a regular Sybase database:

- In-memory database—A database that only exists in memory and never writes data to a disk.
- Relaxed-durability database—A database that only commits transactions when the database is shut down.
- Mixed log and data database—A database that stores the database data and log data in the same Sybase device.

- Read-only database—A database that can only be read. You cannot commit new data to a read-only database.

Sybase documentation provides details on all the supported types of databases.

By default, the Sybase plug-in truncates the logs of mixed log and data databases after a full backup to prevent the logs from becoming completely full. The Sybase plug-in does not truncate the logs of regular databases after a full backup but truncates the logs after an incremental backup. [Incremental backups on page 21](#) provides details.

Full backups of different types of Sybase databases

The following table shows the default result of a full backup performed through either the CLI or Avamar Administrator for the different types of Sybase databases.

Table 2 Default result of full backup for different database types

Type of Sybase database	Default result of full backup
Regular database (separate data and log files)	Backs up database, does not truncate logs
In-memory database	Backs up database, truncates logs
Relaxed-durability database	Backs up database, truncates logs
Mixed log and data database	Backs up database, truncates logs
Read-only database	Backs up database, does not truncate logs

Incremental backups

During an incremental backup, the Sybase plug-in backs up one or more transaction logs, not the Sybase databases. An incremental backup backs up the transaction log in a single database and, by default, truncates the inactive portion of the log after the backup.

NOTICE

If a full backup of the database has not been performed previously, the Sybase plug-in performs a full backup of the database instead of an incremental backup.

The Sybase plug-in does not support an incremental backup in the following cases:

- A full backup of the database has not been performed previously.
- The database is an in-memory, relaxed-durability, mixed log and data, or read-only database.
- The first page of the database is in the bounds of a data-only disk fragment.
- The truncate log on checkpoint option is selected.
- Unlogged writes have occurred on the database.
- A truncation backup (truncate_only or no_log) was performed on the database.

Sybase documentation provides details on all the supported database types and the cases where an incremental (log) backup is not supported.

NOTICE

If the Sybase plug-in does not support an incremental backup, then the Sybase plug-in promotes the incremental backup to a full backup.

Incremental backups of different types of Sybase databases

The following table shows the default result of an incremental backup performed through either the CLI or Avamar Administrator for the different types of Sybase databases.

Table 3 Default result of incremental backup for different database types

Type of Sybase database	Default result of incremental backup
Regular database (data and log are in separate Sybase devices)	Backs up logs, truncates logs
In-memory database	Backs up database, truncates logs
Relaxed-durability database	Backs up database, truncates logs
Mixed log and data database	Backs up database, truncates logs
Read-only database	Backs up database, does not truncate logs

Truncation backups

The Sybase plug-in can perform a truncation backup to truncate the logs of one or more databases without performing a log backup.

By default, the Sybase plug-in performs a full database backup after a truncation backup because the truncated portion of the logs might not have been backed up. If the truncated database was lost before the next regular backup, those log transactions would not be recoverable. To skip the full backup after a log truncation, you can use the CLI option `--no-backup`.

Note

Do not include a truncation backup as part of a regular on-demand backup or scheduled backup performed through Avamar Administrator or through cron jobs. A truncation backup is a tool for ad-hoc database management only.

The Sybase plug-in supports two types of truncation backups, `truncate_only` and `no_log`:

- A `truncate_only` backup or regular truncation backup truncates the log without performing a log backup. Use a `truncate_only` backup for mixed log and data databases where the data and transaction logs are stored in the same file. You cannot perform transaction log backups on mixed log and data databases. However, the logs of such databases must be truncated before the logs become full.
- A `no_log` backup is similar to a regular truncation backup except the `no_log` backup does not log the truncation. By default, truncation operations are logged. If the log is full, a regular truncation backup or `truncate_only` backup fails. Use a `no_log` backup only as a last resort when the transaction log is full.

Backup names

For a full backup, the Sybase plug-in creates a backup file on the Avamar server with the following naming convention:

Sybase_server_name/db_name/f-0

where:

- *Sybase_server_name* is the Sybase server instance name.

- *db_name* is the name of the backed-up database.

A full backup file name always ends in f-0, where the letter f indicates a full backup and the sequence number 0 indicates the first in a sequence of backups of the database. A backup cycle or sequence consists of a full backup, followed by one or more incremental backups.

For example, the first full backup in a sequence of backups of database db1 on Sybase server server1 creates the following backup file:

```
server1/db1/f-0
```

For an incremental backup, the Sybase plug-in creates a backup file on the Avamar server with the following naming convention:

```
Sybase_server_name/db_name/i-n
```

where i-*n* indicates an incremental backup with the sequence number *n*, starting from 1.

For example, the first incremental backup in a sequence of backups of database db1 on Sybase server server1 creates the following backup file:

```
server1/db1/i-1
```

The sequence number 1 indicates the first incremental backup after a full backup of the database. Subsequent incremental backups of the database create the following backup files:

```
server1/db1/i-2
```

```
server1/db1/i-3
```

When the next full backup of database db1 is performed, the file sequence is reset to f-0. Subsequent incremental backups are then performed against the new full backup.

Exclusion of temporary databases from backups

A Sybase server can have one or more system-defined or user-defined temporary databases. The data in the temporary databases comprises intermediate results and is not necessarily persistent data. There is no need to back up temporary databases.

NOTICE

The Sybase plug-in does not back up or restore any temporary databases. The Sybase plug-in excludes both user-defined temporary databases and system-defined temporary databases during a backup.

During a backup, the Sybase plug-in automatically detects any temporary databases and excludes them from the backup.

Restore and recovery

The Sybase plug-in supports specific features for Sybase restore and recovery.

Data backed up by the Sybase plug-in is always online and available for recovery. You can quickly restore and recover data from Sybase backups by using the Sybase plug-in.

- [Restore processes on page 32](#) describes the processes in Sybase plug-in restores from an Avamar server.
- The Sybase plug-in also supports restores from a Data Domain system as described in [Data Domain system support on page 18](#).
- [Multi-streaming on page 29](#) describes how to use multiple sessions to improve the restore performance.

Basic restore and recovery features

The Sybase plug-in restores data into an existing database. The Sybase plug-in does not create a Sybase server or database that does not already exist.

The Sybase plug-in restores a database only if the database already exists on the destination Sybase server with the same storage layout as the backed-up database. If a database does not exist on the server, you must manually create the database before starting the restore. A database restore completely overwrites the current contents of a database.

In this guide, restore and recovery of a Sybase database have the following meanings:

- Restore is the process of retrieving individual data files from a backup and copying the files to a disk.
- Recovery is the process of applying transaction logs to the restored data to make the data consistent with a given point-in-time.

The Glossary describes terms used in this guide.

The Sybase plug-in supports the following basic restore and recovery features:

- Automatic restore to a specified time—The Sybase plug-in can restore a Sybase database to the latest backup time or to a specified point-in-time.
- Restore to a specified database—The Sybase plug-in can restore a Sybase database to the original database or to an alternate database:
 - A restore to the original database completely overwrites the database contents.
 - If required, a restore can be performed to an alternate database. The data and log allocation for the alternate database must be at least as large as for the original database.
- Granular restore—The Sybase plug-in can restore individual databases on the Sybase server. A single restore operation can restore databases on only one Sybase server at a time. The Sybase plug-in cannot restore more than one Sybase server during a single restore.
- Sybase server restore—The Sybase plug-in can restore an entire Sybase server. The restore of an entire server includes all the databases backed up from the server except the master database.

For example, a Sybase server has databases A, B, and C. The Sybase plug-in backs up the databases during a full backup of the server. If database D is created on the server after the backup, the subsequent restore of the Sybase server does not restore database D because the database was not included in the backup.

- Disaster recovery—The Sybase plug-in can perform disaster recovery of the entire Sybase server. [Disaster recovery on page 85](#) provides details.

You must restore the Sybase master database separately in Sybase server master-recovery mode.

NOTICE

The Sybase plug-in does not restore any type of temporary Sybase database.

Restore methods

When you perform restore browsing, you search the previously created backups for specific backups to be restored.

You can run a restore as an on-demand restore by using one of the following methods:

- You can use Avamar Administrator to specify the required restore options and restore either one or more Sybase databases or the whole Sybase server. [Performing restore and recovery on page 78](#) provides details.
- You can manually run the `avsybase` command with the required command line options to restore one Sybase database or the whole Sybase server. [Restore and recovery with the avsybase command on page 114](#) provides details.

NOTICE

The Avamar Administrator activity monitor displays restores started through Avamar Administrator only, not through the `avsybase` command.

[Restore and Recovery on page 75](#) describes the restore procedures.

With a regular type of Sybase database, the database data and log data are stored in separate Sybase devices.

The Sybase plug-in supports restores of the following non-regular types of Sybase databases in the same way as restores of a regular Sybase database:

- In-memory database—A database that only exists in memory and never writes data to a disk.
- Relaxed-durability database—A database that only commits transactions when the database is shut down.
- Mixed log and data database—A database that stores the database data and log data in the same Sybase device.
- Read-only database—A database that can only be read. You cannot commit new data to a read-only database.

Sybase documentation provides details on all the supported types of databases.

Restore to a specified time

By default, the Sybase plug-in restores a database to the time of the latest backup by using the most recent database and transaction log backups. You do not need to specify the transaction log backups for the restore because the Sybase plug-in locates and applies the log backups automatically.

After a database restore is complete, the Sybase plug-in brings the database online.

For example, if you performed a database backup and three log backups for the `db1` database on the Sybase server named `server1`, the following backups would exist for the database:

- `server1/db1/i-3`
- `server1/db1/i-2`
- `server1/db1/i-1`
- `server1/db1/f-0`

In this case, when you restore the `db1` database, the Sybase plug-in first restores the database backup, `server1/db1/f-0`, and then restores the log backups in order from the oldest log backup to the most recent log backup:

1. `server1/db1/i-1`
2. `server1/db1/i-2`
3. `server1/db1/i-3`

By default, the Sybase plug-in restores a database to the latest time contained in the last transaction log backup, which might not be the current time. To restore a database to the

current time, perform a transaction log backup of the database (if possible) prior to performing the database restore. The log backup contains the most recent logs, and can be used during the database restore.

NOTICE

If the Sybase plug-in does not support transaction log backups for a specific type of database, such as a mixed log and data database, you can only restore the database to the time of the last backup.

To restore a database to a point-in-time between the last log (incremental) backup of one backup cycle (cycle #1) and the first full backup of the next backup cycle (cycle #2), you must perform a point-in-time recovery by using the first log backup created after the full backup of cycle #2. If such a log backup does not yet exist, you must run the log backup before you can perform the point-in-time recovery. The first log backup of cycle #2 contains all the transaction logs since the last log backup of cycle #1.

Unless you specify a point-in-time recovery when you restore a log backup, the Sybase plug-in automatically applies the log backup to the preceding full backup only.

For example, two consecutive backup cycles of database db1 contain the following sequence of backups:

- Backup cycle #1:
 - Full backup, f-0, performed at time t1
 - Log backup, i-1, performed at time t2
 - Log backup, i-2, performed at time t3
- Backup cycle #2:
 - Full backup, f-0, performed at time t4
 - Log backup, i-1, performed at time t5

You cannot use the Sybase plug-in to automatically restore to a point-in-time between t3 and t4. You must use special procedures. You also cannot restore to the point-in-time unless the backup i-1 of cycle #2 exists. (Create the i-1 backup of cycle #2 if it does not yet exist.)

To restore the database db1 to a point-in-time between times t3 and t4:

1. Restore backups f-0, i-1, and i-2 of cycle #1. Leave the database offline.
2. Perform a point-in-time recovery by using backup i-1 of cycle #2 with the `--postfix` and `--postfix-only` options.

[Restoring the database db1 to a point-in-time between t3 and t4 on page 120](#) provides details.

Concurrent backups and restores

The Sybase plug-in supports a maximum of six concurrent backups or restores. You can start each backup or restore from either Avamar Administrator or the CLI.

The Sybase plug-in supports concurrent backups or restores for the following configurations:

- Multiple Sybase server instances of the same Sybase version on the same Sybase server host

Note

If concurrent backups or restores are launched for databases on the same Sybase server instance, an operation started after the first one might fail because the Sybase plug-in does not support such concurrent database operations.

- Multiple Sybase versions on the same Sybase server host

Each concurrent backup or restore can run multiple data sessions to or from the Avamar server or the Data Domain system.

Note

The recommended maximum number of concurrent data sessions is 10.

[Multi-streaming on page 29](#) provides details about running multiple data sessions.

You can specify multiple database names in the same `avsybase` command for a backup or restore initiated from the CLI as described in [Command options on page 96](#).

Password-protected database backups and restores

The Sybase plug-in supports password-protected Sybase database backups and restores of those backups. You can specify a password that the Sybase server uses with the Sybase `dump` or `load` command option with `passwd=` to implement a password-protected backup or restore the backup.

If you specify a password for a Sybase database backup, then you must specify the same password to restore the backup. If the password does not match the one used for the backup, then the restore fails with an error message.

[Backup on page 55](#) describes how to use Avamar Administrator to specify the password for a password-protected database backup.

[Restore and Recovery on page 75](#) describes how to use Avamar Administrator to specify the password for the restore of a password-protected database backup.

[Command options on page 96](#) describes how to use the `avsybase` command options to specify the password for a password-protected database backup or restore.

Database backup and restore verification

The Sybase plug-in supports database backup and restore verification at the header or a full verification.

You can specify the following types of database backup or restore verification:

- No verification—Specifies to not perform verification during the backup or restore. By default, the Sybase plug-in does not perform verification if you do not specify a verification level.
- No verification—Specifies to use the Sybase `dump` or `load` command option with `verify=full` to verify both the header information and rows structure for full verification of the backup data.
- Header verification—Specifies to use the Sybase `dump` or `load` command option with `verify=header` to verify the page header information only.
- Verifyonly verification—(Restore from the CLI only) Specifies to use the Sybase `load` command option with `verify=verifyonly` to verify minimal header

information without restoring the database as described in [Common options on page 101](#).

[Backup on page 55](#) describes how to use Avamar Administrator to specify the verification level for a backup.

[Restore and Recovery on page 75](#) describes how to use Avamar Administrator to specify the verification level for a restore.

[Command options on page 96](#) describes how to use the `avsybase` command options to specify the verification level for a backup or restore.

Database consistency checks

The Sybase plug-in supports the following types of Sybase database consistency checks for a backup or restore operation:

- `dbcc checkalloc`
- `dbcc checkcatalog`
- `dbcc checkdb`
- `dbcc checkdb skip ncindex`
- `dbcc checkstorage`

The Sybase documentation provides details about database consistency checks.

The Sybase plug-in performs the Sybase database consistency check before starting the backup or after completing the restore. You can specify the type of database consistency check to perform by using either the Avamar Administrator settings or the appropriate option in the `avsybase` command. If you do not specify the type of consistency check, the Sybase plug-in does not perform a database consistency check during a backup or restore.

Note

If the consistency check of a database fails before a backup, the Sybase plug-in does not back up the database.

[Backup on page 55](#) describes how to use Avamar Administrator to specify database consistency checks for a backup.

[Restore and Recovery on page 75](#) describes how to use Avamar Administrator to specify database consistency checks for a restore.

[Command options on page 96](#) describes how to use the `avsybase` command options to specify database consistency checks for a backup or restore.

You can also perform a database consistency check as a separate manual operation outside of a backup or restore by running the `avsybase` command with the appropriate option as described in [Command options on page 96](#).

Preprocessing and postprocessing scripts

The Sybase plug-in supports the following scripts:

- A preprocessing script that is run at the start of a backup or restore.
- A postprocessing script that is run at the end of a backup or restore.

You must store the scripts in a directory named `scripts`, located under the directory specified by the `--sysdir` option. If you do not specify `--sysdir`, you must store scripts in the following default directory:

- On AIX and Linux: `/usr/local/avamar/etc/scripts`
- On HP-UX and Solaris: `/opt/AVMRclnt/etc/scripts`
- On Windows: `C:\Program Files\avs\etc\scripts`

When you run a backup or restore, you can specify either script or both scripts for the operation. The backup or restore does not fail if either script fails.

NOTICE

You cannot specify more than one preprocessing script and one postprocessing script for a single backup or restore operation.

[Backup on page 55](#) describes how to use Avamar Administrator to specify a preprocessing or postprocessing script for a backup.

[Restore and Recovery on page 75](#) describes how to use Avamar Administrator to specify a preprocessing or postprocessing script for a restore.

[Command options on page 96](#) describes how to use the `avsybase` command options to specify a preprocessing or postprocessing script.

Internationalization (I18N)

The Sybase plug-in provides I18N capability to operate in a non-English environment or locale without the Sybase plug-in itself being localized. After you configure the I18N support as described in [Configuring internationalization \(I18N\) support on page 51](#), the Sybase plug-in can process and display in Avamar Administrator the non-ASCII data passed to it from the operating system, Avamar server, and Sybase software.

Multi-streaming

Multi-streaming is a feature that enables a single backup or restore to use multiple sessions (data streams) to the Avamar server or Data Domain system to improve the backup or restore performance.

The multi-streaming setting specifies the maximum number of backup or restore sessions to run concurrently. The default value is 1, and the Sybase plug-in backs up or restores only one database at a time.

You can specify a greater multi-streaming value (for example, with the `--max-streams` option of the `avsybase` command) to back up or restore multiple databases concurrently. The Sybase plug-in enforces a maximum multi-streaming value of 10 for backups and restores only when you specify multi-streaming in Avamar Administrator.

NOTICE

If you set the multi-streaming value too high, the system might not have sufficient resources to perform the backup or restore. The Sybase plug-in always tries to run a backup or restore at the specified multi-streaming value.

The Sybase plug-in starts database backups or restores until the number of running backups or restores equals the specified multi-streaming value. When a database backup or restore completes, the Sybase plug-in starts another operation in its place and

continues performing the maximum number of operations until all the databases on the server are backed up or restored.

If the multi-streaming value is greater than the number of databases on the server:

- A backup of the whole Sybase server backs up all the databases on the server concurrently.
- A restore of the whole Sybase server restores all the databases on the server concurrently, except for the master database.

Despite the multi-streaming option setting during a backup or restore, the Sybase plug-in creates two cache files for each database: a file cache and a hash cache.

[Backup on page 55](#) describes how to specify backup multi-streaming.

[Restore and Recovery on page 75](#) describes how to specify restore multi-streaming.

Client logs and caches

The default location of the client logs and cache files was moved from the `var` directory to the `var/clientlogs` directory in the Avamar 7.0 Sybase plug-in release. The `var/clientlogs` directory provides full access to non-root users.

To use existing caches created by a previous Sybase plug-in release, you must manually move the caches from the `var` directory to the `var/clientlogs` directory. If you do not move the old cache files, the Sybase plug-in creates new cache files in the `var/clientlogs` directory, which might have some performance impact on the initial backups after an upgrade to this Sybase plug-in release. If you do not remove or move the old cache files, the `avagent` process deletes the old cache files in six months.

Sybase ASE 15.7.x support

The Sybase plug-in supports the features of Sybase ASE release 15.7.x, including Sybase database compression, the shrink log feature, and the threaded kernel option. The Sybase documentation describes the Sybase ASE 15.7.x features.

If you enable Sybase database compression or the threaded kernel option with Sybase ASE 15.7.x, you do not need to perform any additional configurations or procedures for the Sybase plug-in backups and restores.

You can have the Sybase plug-in perform a shrink log operation during a Sybase 15.7.x database backup by specifying the `--shrink-log` option of the `avsybase` backup command as described in [Backup options on page 105](#).

Sybase ASE network password encryption

The Sybase plug-in supports proprietary and RSA password encryption for Sybase login passwords on all supported platforms.

Software processes

The Sybase plug-in uses specific processes during the supported backup and restore operations.

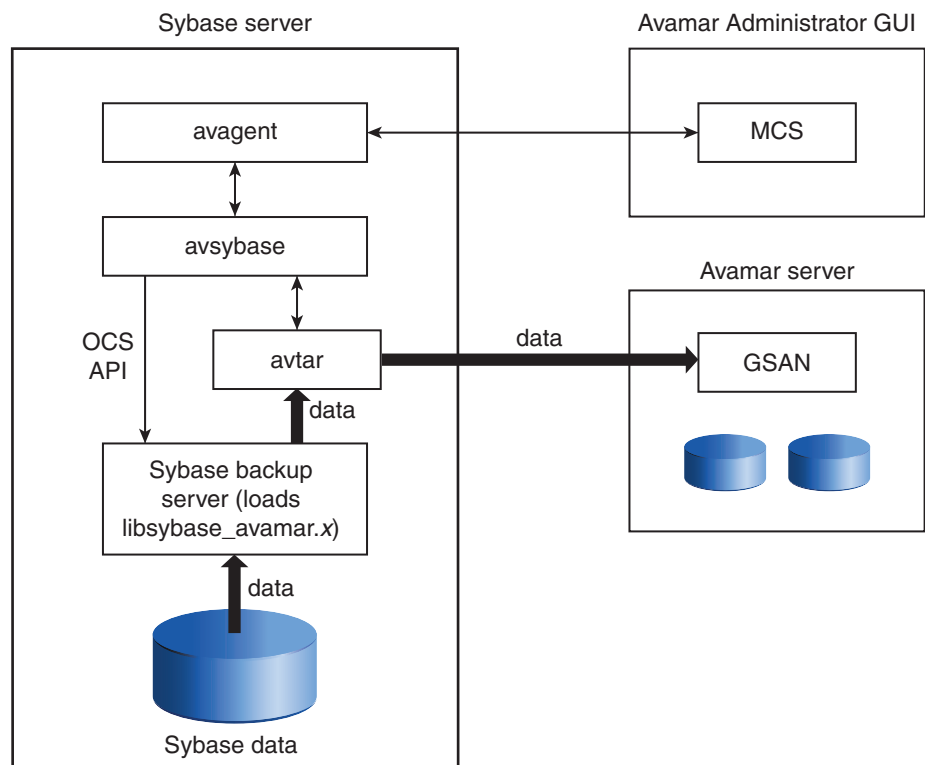
Backup processes

The following figure and steps describe how the Sybase server, Avamar server, and Sybase plug-in processes interact during a scheduled backup or on-demand backup initiated from Avamar Administrator.

NOTICE

When you start an on-demand backup from the CLI with the `avsybase` command, the backup has a similar workflow but does not include the `avagent` process. The CLI backup obtains information from the `avsybase` command options, not from an Avamar Management Console Server (MCS) workorder.

Figure 2 Backup workflow



A scheduled backup or on-demand backup initiated from Avamar Administrator includes specific process interactions.

1. The `avagent` process on the Sybase server (Avamar client) performs the following actions:
 - a. Polls the Avamar Administrator MCS service, which gives `avagent` a backup workorder:
 - The backup workorder is an XML message with details about the backup to perform, including a list of Sybase databases or transaction logs to back up and information required to connect to the Sybase server.

- For an on-demand backup, after you browse and provide the backup options in Avamar Administrator, the MCS creates and queues the workorder for processing.
 - A scheduled backup creates the workorder by using the dataset specified in the backup policy. [Scheduling backups on page 62](#) provides details.
- b. Starts the Sybase plug-in binary, `avsybase`, and passes the workorder to the `avsybase` process.
 2. For each database to be backed up, the `avsybase` process uses the Sybase Open Client/Server (OCS) API to issue a `dump` command to the Sybase server. The number of `dump` commands issued concurrently depends on the multi-streaming configuration. Each `dump` command specifies the database to be backed up.
 3. For each received `dump` command, the Sybase server starts a process to load the `libsybase_avamar.x` library.
 4. For each issued `dump` command, the `avsybase` process starts an `avtar` process.
 5. Each process started by the Sybase server connects to a single `avtar` processes and passes the backup data to the `avtar` process through the `libsybase_avamar.x` library interface.
 6. Depending on the backup destination, the `avtar` process writes the backup data to the Avamar server or a Data Domain system.

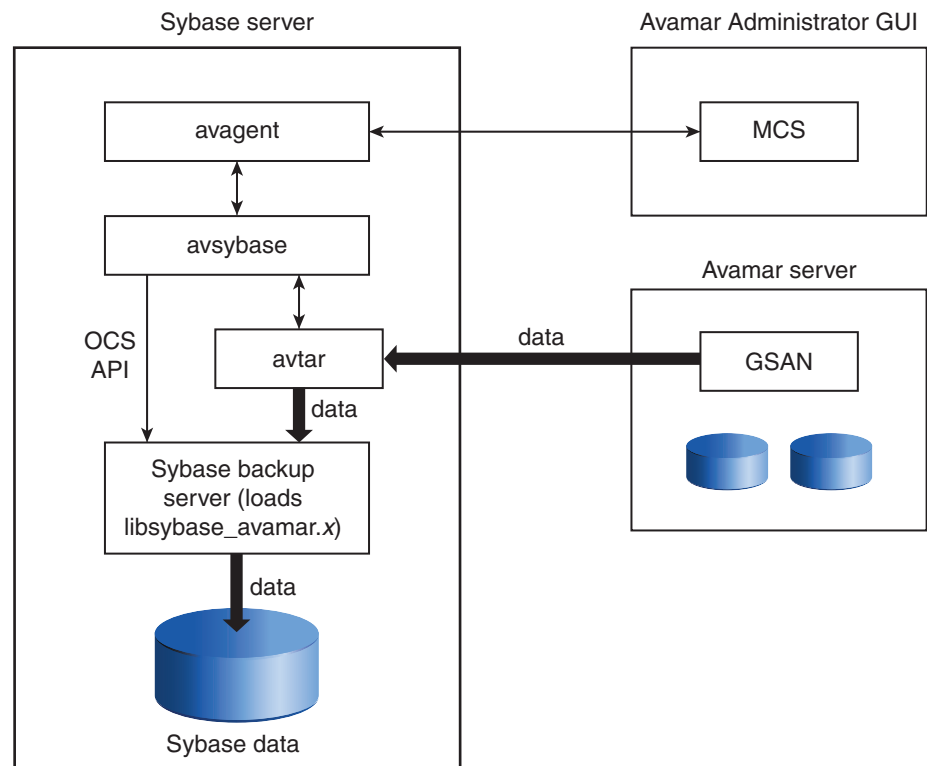
The first backup to the Avamar server or Data Domain system backs up all the specified data, which achieves the least data deduplication. Subsequent backups achieve improved deduplication rates as more and more redundant data blocks are identified.

Restore processes

The following figure and steps describe how the Sybase server, Avamar server, and Sybase plug-in processes interact during a restore initiated from Avamar Administrator.

NOTICE

When you start a restore from the CLI with the `avsybase` command, the restore has a similar workflow but does not include the `avagent` process. The CLI restore obtains information from the `avsybase` command options, not from an MCS workorder.

Figure 3 Restore workflow

A restore initiated from Avamar Administrator includes specific process interactions.

1. The `avagent` process on the Sybase server (Avamar client) performs the following actions:
 - a. Polls the Avamar Administrator MCS service, which gives `avagent` a restore workorder:
 - The restore workorder is an XML message with details about the restore to perform, including a list of Sybase databases to restore and information required to connect to the Sybase server.
 - After you browse and provide the restore options in Avamar Administrator, the MCS creates and queues the workorder for processing.
 - b. Starts the Sybase plug-in binary, `avsybase`, and passes the workorder to the `avsybase` process.
2. For each backup to be restored, the `avsybase` process uses the Sybase OCS API to issue a `load` command to the Sybase server.

The number of `load` commands issued concurrently depends on the multi-streaming configuration. Each `load` command specifies the backup (database and transaction log) to be restored and places the database in offline mode if it is not already offline.

Note

More than one `load` command can be issued per database because each database can have multiple backups (database and transaction log) to be restored.

3. For each received `load` command, the Sybase server starts a process that loads the `libsybase_avamar.x` library.
4. For each issued `load` command, the `avsybase` process starts an `avtar` process.
5. The `avtar` process reads the backup data from the Avamar server or a Data Domain system.
6. Each process started by the Sybase server connects to a single `avtar` process and reads the backup data from the `avtar` process through the `libsybase_avamar.x` library interface.

NOTICE

The Sybase server cannot create a database during a restore. If a database was lost, you must first create the database before you start the database restore. Keep records of all the databases and their sizes on the Sybase system. Sybase documentation describes how to restore lost databases.

CHAPTER 2

Installation and Configuration

This chapter includes the following topics:

- [Preparing to install the Avamar Plug-in for Sybase](#) 36
- [Installing, upgrading, and uninstalling the software on HP-UX](#) 39
- [Installing, upgrading, and uninstalling the software on IBM AIX](#) 41
- [Installing, upgrading, and uninstalling the software on Linux](#) 44
- [Installing, upgrading, and uninstalling the software on Solaris](#) 47
- [Installing, upgrading, and uninstalling the software on Windows](#) 49
- [Performing post-installation tasks](#) 51

Preparing to install the Avamar Plug-in for Sybase

Review the system requirements for the Avamar Plug-in for Sybase ASE, and ensure that the environment meets the requirements before you install the plug-in. You also must download the Avamar file system client and plug-in installation package from the Avamar server, install the file system client, and register the client with the Avamar server.

System requirements

The environment must meet client compatibility requirements before you install Avamar client software.

Client compatibility requirements are available in the *EMC Avamar Compatibility and Interoperability Matrix* on EMC Online Support at <https://support.EMC.com>. The requirements in the matrix include supported operating systems and application versions.

The Avamar file system client and the plug-ins that you install on the host must have the same version number.

Sybase server requirements

Ensure that you meet the following requirements on the Sybase server host:

- You have operating system root privileges on the Sybase server host.
- Sybase server (both database server and backup server) software is installed and functioning correctly.
- All the backup patches required by Sybase are installed.

On a Sybase ASE 15.5 system with Sybase SDK installed, the Sybase SDK 15.5 ESD#11 or later has been installed as required for Sybase SDK bug 589847.

- The Avamar server is operational and present on the same network as the Sybase server. To verify the network connectivity, you can open a command shell and type the following command:

```
ping Avamar_server
```

where *Avamar_server* is the network hostname (as defined in DNS) or IP address of the Avamar server.

Cluster system requirements

In a cluster system on Solaris, ensure that you meet the pre-installation requirements for a Solaris Cluster or Veritas Cluster Server (VCS) as described in the *EMC Avamar Backup Clients User Guide*. Sybase must also be configured for the particular type of cluster.

User Account Control setting on Microsoft Windows

The User Account Control (UAC) feature limits application software to standard user privileges. You must provide administrator privileges for certain tasks, such as installing software. UAC is enabled by default.

If you start an Avamar client or plug-in installer without administrator privileges on a Windows computer with UAC enabled, then the software does not install correctly.

You can disable or bypass UAC. The installation procedures in this chapter provide one method to bypass UAC. The Microsoft documentation provides other methods and additional information.

Downloading the software

In a supported cluster, you must download the Avamar Plug-in for Sybase ASE installation package to each node that requires the software to be installed.

Procedure

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

`http://Avamar_server`

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

The **EMC Avamar Web Restore** page appears.

3. Click **Downloads**.

The **Downloads** list appears.

4. Click **+** next to the platform heading for the Sybase server.
5. Click **+** next to the operating system heading for the Sybase server.
6. Click the link for the Avamar Plug-in for Sybase ASE installation package as listed in the following table.

Table 4 Sybase plug-in installation packages

Operating system	Package name
HP-UX	AvamarSybase-hpux11iv3-itan-version.depot For example: AvamarSybase-hpux11iv3-itan-7.2.100-218.depot
IBM AIX	AvamarSybase-aix6-ppc-version.bff For example: AvamarSybase-aix6-ppc-7.2.100-218.bff
Red Hat Enterprise Linux, SUSE Linux Enterprise Server ¹	AvamarSybase-linux-type-x86-version.rpm (32-bit) or AvamarSybase-linux-type-x86_64-version.rpm (64-bit) where <i>type</i> is rhel4 or sles11 For example: AvamarSybase-linux-rhel4-x86_64-7.2.100-218.rpm
Oracle Solaris	AvamarSybase-solaris10-type-version.pkg where <i>type</i> is sparc or x86_64 For example: AvamarSybase-solaris10-x86_64-7.2.100-218.pkg
Microsoft Windows ²	AvamarSybase-windows-x86-version.msi (32-bit) or AvamarSybase- windows-x86_64-version.msi (64-bit) For example: AvamarSybase-windows-x86_64-7.2.100-218.msi

¹On Linux, the install package bitness must match the bitness of the Sybase server that is supported by Sybase and will be used for backups and restores. Obtain the package from the download link for “Linux for x86 (32 bit)” or “Linux for x86 (64 bit)”. For 32-bit Sybase on 64-bit Linux, obtain the 32-bit package from either download link.

Table 4 Sybase plug-in installation packages (continued)

²On Windows, the install package bitness must match the bitness of the Windows operating system. The 64-bit installer contains 32-bit and 64-bit libraries to match Sybase server installations of either bitness. Obtain the package from the download link for “Windows (32 bit)” or “Windows (64 bit)”. Each only runs on the corresponding bitness of Windows system.

7. Download the correct installation package for a 64-bit operating system:

- To support a 32-bit Sybase backup server on a 64-bit operating system, download and install the 32-bit Avamar Plug-in for Sybase ASE installation package for Linux, and the 64-bit package for Windows.
- To support a 64-bit Sybase backup server on a 64-bit operating system, download and install the 64-bit Avamar Plug-in for Sybase ASE installation package.
- To support the coexistence of 32-bit and 64-bit Sybase backup servers on the same 64-bit Linux or 64-bit Windows system, download and install the 32-bit Avamar Plug-in for Sybase ASE installation package for 64-bit Linux and the 64-bit package for 64-bit Windows.

Note

The 32-bit Avamar Plug-in for Sybase ASE installation package for 64-bit Linux contains both the 32-bit and 64-bit Sybase libraries. The 64-bit Avamar Plug-in for Sybase ASE installation package for 64-bit Windows contains both the 32-bit and 64-bit Sybase libraries.

8. Save the Avamar Plug-in for Sybase ASE installation package to a temporary directory.

Note

On a Solaris VCS cluster node only, download the correct Avamar Cluster Client for Solaris package to the same directory as the Avamar Plug-in for Sybase ASE installation package. Follow the download instructions in the VCS cluster chapter of the *EMC Avamar Backup Clients User Guide*.

Installing the Avamar file system client

Avamar file system clients include the Avamar agent and an Avamar file system plug-in. The Avamar agent is required for backups and restores with the Sybase plug-in. You can use the file system plug-in to back up operating system and application binary files, which are required for disaster recovery.

Install and register the Avamar file system client on each Sybase host computer:

- For HP-UX, IBM AIX, Linux, and Solaris systems, follow the instructions in the *EMC Avamar Backup Clients User Guide*.
- For Windows systems, follow the instructions in the *EMC Avamar for Windows Server User Guide*.
- In a cluster environment, install the client software in the same directory on each node in the cluster, and register each node in the cluster with the Avamar server.

You must install the 64-bit Avamar client package on a 64-bit operating system.

Installing, upgrading, and uninstalling the software on HP-UX

You can install, upgrade, and uninstall the Avamar Plug-in for Sybase on HP-UX.

Installing the Avamar Plug-in for Sybase on HP-UX

You can install the Avamar Client for HP-UX in either the default installation directory or an alternate directory. After you have installed the Avamar Client for HP-UX, you must install the Avamar Plug-in for Sybase in the same directory as the Avamar client.

You can specify an alternate location for the `var` directory during the Avamar Client for HP-UX installation by using the `-x ask=true` option with the `swinstall` command as described in the *EMC Avamar Backup Clients User Guide*. When you install the Sybase plug-in, the plug-in installation automatically uses the same location for the `var` directory that you specified during the Avamar Client for HP-UX installation.

Procedure

1. Log in to the Sybase server host as root.
2. Type the following command to change to the temporary directory that contains the Avamar Plug-in for Sybase installation package:

```
cd tmp
```

where *tmp* is the pathname of the temporary directory

3. Install the Avamar Plug-in for Sybase in the default directory or an alternate directory:

- To install the Avamar Plug-in for Sybase in the default directory, type the following command:

```
swinstall -s /tmp/AvamarSybase-hpux11iv3-itan-version.depot \*
```

where *version* is the Avamar software version.

- To install the Avamar Plug-in for Sybase in an alternate directory, type the following command:

```
swinstall -s /tmp/AvamarSybase-hpux11iv3-itan-version.depot  
hpuxsybase,2=/alternate_path
```

where:

- *version* is the Avamar software version.
- *alternate_path* is the pathname of the alternate directory where you installed the Avamar Client for HP-UX.

4. Create a symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`, that points to the correct Avamar Plug-in for Sybase library file in the `Avamar_installation_dir/lib` directory:

- For Sybase ASE 15.0.x, points to 32-bit library file `libsybase_avamar32.so`
- For Sybase ASE 15.5 or later, points to 64-bit library file `libsybase_avamar.so`

5. Register the Avamar Plug-in for Sybase:

- a. Type the following command to register the Avamar Plug-in for Sybase installed in the default directory:

```
/usr/local/avamar/bin/avregister
```

The following output appears in the command shell:

```
=== Client Registration and Activation
This script will register and activate the client with the
Administrator server.

Enter the Administrator server address (DNS text name or
numeric IP address, DNS name preferred): server_name

Enter the Avamar server domain [clients]: domain/client
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
avagent Info <0000>: Logging to /usr/local/avamar/var/
avagent.log
avagent.d Info: Client activated successfully.
avagent Info <0000>: Logging to /usr/local/avamar/var/
avagent.log
avagent Info <5417>: daemonized as process id 18347
avagent.d Info: Client Agent started.
Registration Complete.
```

- b. Type the following command to register the Avamar Plug-in for Sybase installed in an alternate directory:

```
alternate_path/bin/avregister
```

where *alternate_path* is the pathname of the alternate directory.

Upgrading the Avamar Plug-in for Sybase on HP-UX

You must complete the required steps to upgrade the Avamar Plug-in for Sybase on HP-UX.

Procedure

1. Uninstall the Sybase plug-in. [Uninstalling the Avamar Plug-in for Sybase on HP-UX on page 40](#) provides instructions.
2. Uninstall the Avamar file system client. The *EMC Avamar Backup Clients User Guide* provides instructions.
3. Download and install the new version of the Avamar file system client. The *EMC Avamar Backup Clients User Guide* provides instructions.

Note

The versions of the Avamar file system client and Sybase plug-in must be the same.

4. Download the Sybase plug-in installation package. [Downloading the software on page 37](#) provides instructions.
5. Install the new version of the Sybase plug-in. [Installing the Avamar Plug-in for Sybase on HP-UX on page 39](#) provides instructions.

Uninstalling the Avamar Plug-in for Sybase on HP-UX

You can uninstall the Avamar Plug-in for Sybase on HP-UX by using the `swremove` command.

Procedure

1. Log in to the Sybase server host as root.
2. Type the following command to uninstall the Avamar Plug-in for Sybase:


```
swremove hpuxsybase
```

3. Delete the symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`.

Installing, upgrading, and uninstalling the software on IBM AIX

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

Installing the Avamar Plug-in for Sybase on IBM AIX

You can install the Avamar Client for AIX in either the default installation directory or an alternate directory. After you have installed the Avamar Client for AIX, you must install the Avamar Plug-in for Sybase in the same directory as the Avamar client.

You can specify an alternate location for the `var` directory during the Avamar Client for AIX installation by setting the `VARDIR` environment variable as described in the *EMC Avamar Backup Clients User Guide*. When you install the Sybase plug-in, the plug-in installation automatically uses the same location for the `var` directory that you specified during the Avamar Client for AIX installation.

Procedure

1. Log in to the Sybase server host as root.
2. Type the following command to change to the temporary directory that contains the Avamar Plug-in for Sybase installation package:

```
cd tmp
```

where *tmp* is the pathname of the temporary directory.

3. Install the Avamar Plug-in for Sybase in the default directory or an alternate directory:

- To install the Avamar Plug-in for Sybase in the default directory, type the following command:

```
installp -d /tmp/AvamarSybase-aix6-ppc-version.bff all
```

where *version* is the Avamar software version.

- To install the Avamar Plug-in for Sybase in an alternate directory, type the following command:

```
installp -R alternate_path -d /tmp/AvamarSybase-aix6-ppc-version.bff all
```

where:

- *alternate_path* is the pathname of the alternate directory where you installed the Avamar Client for AIX.
- *version* is the Avamar software version.

4. Create a symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`, that points to the Avamar Plug-in for Sybase library file, `libsybase_avamar.so`, in the `Avamar_installation_dir/lib` directory.

5. Register the Avamar Plug-in for Sybase:

- Type the following command to register the Avamar Plug-in for Sybase installed in the default directory:

```
/usr/local/avamar/bin/avregister
```

The following output appears in the command shell:

```
=== Client Registration and Activation
This script will register and activate the client with the
Administrator server.

Enter the Administrator server address (DNS text name or
numeric IP address, DNS name preferred): server_name

Enter the Avamar server domain [clients]: domain/client
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
avagent Info <0000>: Logging to /usr/local/avamar/var/
avagent.log
avagent.d Info: Client activated successfully.
avagent Info <0000>: Logging to /usr/local/avamar/var/
avagent.log
avagent Info <5417>: daemonized as process id 18347
avagent.d Info: Client Agent started.
Registration Complete.
```

- Type the following command to register the Avamar Plug-in for Sybase installed in an alternate directory:

```
alternate_path/bin/avregister
```

where *alternate_path* is the pathname of the alternate directory.

Upgrading the Avamar Plug-in for Sybase on IBM AIX

You must complete the required steps to upgrade the Avamar Plug-in for Sybase on IBM AIX.

You must upgrade the Sybase plug-in before you upgrade the Avamar file system client.

Note

The versions of the Avamar file system client and Sybase plug-in must be the same.

Procedure

1. Log in to the Sybase server host as root.
2. Download the Avamar Plug-in for Sybase installation package. [Downloading the software on page 37](#) provides instructions.
3. Type the following command to change to the temporary directory that contains the Avamar Plug-in for Sybase installation package:

```
cd tmp
```

where *tmp* is the pathname of the temporary directory.

4. Upgrade the Avamar Plug-in for Sybase in the default directory or an alternate directory:
 - To upgrade the Avamar Plug-in for Sybase in the default directory, type the following command:

```
installp -d /tmp/AvamarSybase-aix6-ppc-version.bff all
```

where *version* is the Avamar software version.

- To upgrade the Avamar Plug-in for Sybase in an alternate directory, type the following command:

```
installp -R alternate_path -d /tmp/AvamarSybase-aix6-ppc-  
version.bff all
```

where:

- *alternate_path* is the pathname of the alternate directory.
- *version* is the Avamar software version.

5. Download the Avamar file system client. The *EMC Avamar Backup Clients User Guide* provides instructions.
6. Upgrade the Avamar file system client in the default directory or an alternate directory:
 - To upgrade the Avamar file system client in the default directory, type the following command:

```
installp -d /tmp/AvamarClient-platform-version.bff all
```

where:

- *platform* is the AIX system type.
- *version* is the Avamar software version.
- To upgrade the Avamar file system client in an alternate directory, type the following command:

```
installp -R alternate_path -d /tmp/AvamarClient-platform-version.bff all
```

where:

- *alternate_path* is the pathname of the alternate directory.
- *platform* is the AIX system type.
- *version* is the Avamar software version.

7. Create a symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`, that points to the Avamar Plug-in for Sybase library file, `libsybase_avamar.so`, in the `Avamar_installation_dir/lib` directory.
8. Register the Avamar Plug-in for Sybase:
 - Type the following command to register the Avamar Plug-in for Sybase installed in the default directory:


```
/usr/local/avamar/bin/avregister
```
 - Type the following command to register the Avamar Plug-in for Sybase installed in an alternate directory:


```
alternate_path/bin/avregister
```

where *alternate_path* is the pathname of the alternate directory.

Uninstalling the Avamar Plug-in for Sybase on IBM AIX

You can uninstall the Avamar Plug-in for Sybase on IBM AIX by using the `installp` command.

Procedure

1. Log in to the Sybase server host as root.
2. View all the Avamar packages installed on the system.
 - To view the Avamar packages installed in the default directory, type the following command:

```
lsllpp -la | grep Avamar
```

- To view the Avamar packages installed in an alternate directory, type the following command:

```
lsllpp -R alternate_path -la | grep Avamar
```

where *alternate_path* is the pathname of the alternate directory.

3. Uninstall the Avamar Plug-in for Sybase from the default directory or an alternate directory:

- To uninstall the Avamar Plug-in for Sybase from the default directory, type the following command:

```
installp -u AvamarSybase-aix6-ppc
```

- To uninstall the Avamar Plug-in for Sybase from an alternate directory, type the following command:

```
installp -R /alternate_path -u AvamarSybase-aix6-ppc
```

where *alternate_path* is the pathname of the alternate directory.

4. Delete the symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`.

Installing, upgrading, and uninstalling the software on Linux

You can install, upgrade, and uninstall the Avamar Plug-in for Sybase on Linux.

Installing the Avamar Plug-in for Sybase on Linux

You can install the Avamar Client for Linux in either the default installation directory or an alternate directory. After you have installed the Avamar Client for Linux, you must install the Avamar Plug-in for Sybase in the same directory as the Avamar client.

You can specify an alternate location for the `var` directory during the Avamar Client for Linux installation as described in the *EMC Avamar Backup Clients User Guide*. When you install the Sybase plug-in, the plug-in installation automatically uses the same location for the `var` directory that you specified during the Avamar Client for Linux installation.

Procedure

1. Log in to the Sybase server host as root.
2. Type the following command to change to the temporary directory that contains the Avamar Plug-in for Sybase installation package:

```
cd tmp
```

where *tmp* is the pathname of the temporary directory.

3. Install the Avamar Plug-in for Sybase in the default directory or an alternate directory:

- To install the Avamar Plug-in for Sybase in the default directory, type the following command:

```
rpm -ivh AvamarSybase-linux-package-version.rpm
```

where *package-version* is the package type and Avamar software version.

- To install the Avamar Plug-in for Sybase in an alternate directory, type the following command:

```
rpm -ivh --relocate /usr/local/avamar=/alternate_path  
AvamarSybase-linux-package-version.rpm
```

where:

- *alternate_path* is the pathname of the alternate directory where you installed the Avamar Client for Linux.
 - *package-version* is the package type and Avamar software version.
4. Create a symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`, that points to the Avamar Plug-in for Sybase library file, `libsybase_avamar.so`, in the `Avamar_installation_dir/lib` directory.

If both 32-bit and 64-bit Sybase backup servers are running on the same 64-bit Linux system, create separate symbolic links that point to the correct library file in the `Avamar_installation_dir/lib` directory:

- For a 32-bit backup server, create a link that points to the 32-bit library file `libsybase_avamar.so`.
- For a 64-bit backup server, create a link that points to the 64-bit library file `libsybase_avamar64.so`.

5. Register the Avamar Plug-in for Sybase:

- Type the following command to register the Avamar Plug-in for Sybase installed in the default directory:

`/usr/local/avamar/bin/avregister`

The following output appears in the command shell:

```
=== Client Registration and Activation
This script will register and activate the client with the
Administrator server.

Enter the Administrator server address (DNS text name or
numeric IP address, DNS name preferred): server_name

Enter the Avamar server domain [clients]: domain/client
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
avagent Info <0000>: Logging to /usr/local/avamar/var/
avagent.log
avagent.d Info: Client activated successfully.
avagent Info <0000>: Logging to /usr/local/avamar/var/
avagent.log
avagent Info <5417>: daemonized as process id 18347
avagent.d Info: Client Agent started.
Registration Complete.
```

- Type the following command to register the Avamar Plug-in for Sybase installed in an alternate directory:

`alternate_path/bin/avregister`

where *alternate_path* is the pathname of the alternate directory.

Upgrading the Avamar Plug-in for Sybase on Linux

You can upgrade the Avamar Plug-in for Sybase on Linux by using the `rpm-Uvh` command.

Before you begin

The versions of the Avamar file system client and Avamar Plug-in for Sybase must be the same. You cannot relocate the Sybase plug-in or `var` directory to a different directory during the upgrade.

Procedure

1. Log in to the Sybase server host as root.
2. Upgrade the Avamar Client for Linux. The *EMC Avamar Backup Clients User Guide* provides instructions.
3. Type the following command to change to the temporary directory that contains the Avamar Plug-in for Sybase installation package:

```
cd tmp
```

where *tmp* is the pathname of the temporary directory.

4. Type the following command to upgrade the Avamar Plug-in for Sybase in the default directory:

```
rpm -Uvh AvamarSybase-linux-package-version.rpm
```

where *package-version* is the package type and Avamar software version.

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

5. Create a symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`, that points to the Avamar Plug-in for Sybase library file, `libsybase_avamar.so`, in the *Avamar_installation_dir/lib* directory.

If both 32-bit and 64-bit Sybase backup servers are running on the same 64-bit Linux system, create separate symbolic links that point to the correct library file in the *Avamar_installation_dir/lib* directory:

- For a 32-bit backup server, create a link that points to the 32-bit library file `libsybase_avamar.so`.
- For a 64-bit backup server, create a link that points to the 64-bit library file `libsybase_avamar64.so`.

6. Type the following command to register the Avamar Plug-in for Sybase:

```
/usr/local/avamar/bin/avregister
```

The following output appears in the command shell:

```
=== Client Registration and Activation
This script will register and activate the client with the
Administrator server.

Enter the Administrator server address (DNS text name or numeric
IP address, DNS name preferred): server_name

Enter the Avamar server domain [clients]: domain/client
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
avagent Info <0000>: Logging to /usr/local/avamar/var/avagent.log
avagent.d Info: Client activated successfully.
avagent Info <0000>: Logging to /usr/local/avamar/var/avagent.log
avagent Info <5417>: daemonized as process id 18347
avagent.d Info: Client Agent started.
Registration Complete.
```

Uninstalling the Avamar Plug-in for Sybase on Linux

You can uninstall the Avamar Plug-in for Sybase on Linux by using the `rpm -e` command.

Procedure

1. Log in to the Sybase server host as root.
2. Type the following command to view all the Avamar packages installed on the system:

```
rpm -qa | grep Av
```

For example, the following output appears in the command shell:

```
AvamarSybase-version
```

```
AvamarClient-version
```

where *version* is the Avamar software version.

3. Type the following command to uninstall the Avamar Plug-in for Sybase:

```
rpm -e AvamarSybase-version
```

4. Delete the symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`.

Installing upgrading, and uninstalling the software on Solaris

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

Installing the Avamar Plug-in for Sybase on Solaris

You can install the Avamar Client for Solaris in either the default installation directory or an alternate directory. After you have installed the Avamar Client for Solaris, you can install the Avamar Plug-in for Sybase. The Sybase plug-in installation process automatically installs the Avamar Plug-in for Sybase in the same directory as the Avamar Client for Solaris.

You can use the following instructions to install the Avamar Plug-in for Sybase on a stand-alone Solaris system or on each node in a cluster.

Procedure

1. Log in to the Sybase server host as root.
2. Type the following command to change to the temporary directory that contains the Avamar Plug-in for Sybase installation package:

```
cd tmp
```

where *tmp* is the pathname of the temporary directory.

3. Type the following command to install the Avamar Plug-in for Sybase:

```
pkgadd -d AvamarSybase-solarisversion-package-version.pkg
```

where `AvamarSybase-solarisversion-package-version.pkg` is the file name of the Avamar Plug-in for Sybase installation package that you downloaded.

The command displays installation activity.

4. Perform the following additional procedures in a cluster system on Solaris:
 - In a Solaris Cluster system, configure the resource groups on each node according to instructions in the Solaris Cluster chapter of the *EMC Avamar Backup Clients User Guide*.
 - In a VCS system, install the Avamar Cluster Client for Solaris on each node, starting with the active VCS node first, according to instructions in the VCS chapter of the *EMC Avamar Backup Clients User Guide*. Depending on the Solaris operating system, use the correct installation package.
5. Create a symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`, that points to the Avamar Plug-in for Sybase library file, `libsybase_avamar.so`, in the `Avamar_installation_dir/lib` directory.
6. Register the Avamar Plug-in for Sybase:
 - a. Type the following command to register the Avamar Plug-in for Sybase installed in the default directory:

```
/opt/AVMRclnt/bin/avregister
```

The following output appears in the command shell:

```
=== Client Registration and Activation
This script will register and activate the client with the
Administrator server.

Enter the Administrator server address (DNS text name or
numeric IP address, DNS name preferred): server_name

Enter the Avamar server domain [clients]: domain/client
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
avagent Info <0000>: Logging to /opt/AVMRclnt/var/avagent.log
avagent.d Info: Client activated successfully.
avagent Info <0000>: Logging to /opt/AVMRclnt/var/avagent.log
avagent Info <5417>: daemonized as process id 11269
avagent.d Info: Client Agent started.
Registration Complete.
```

- b. Type the following command to register the Avamar Plug-in for Sybase installed in an alternate directory:

```
alternate_path/bin/avregister
```

where *alternate_path* is the pathname of the alternate directory.

Upgrading the Avamar Plug-in for Sybase on Solaris

You must complete the required steps to upgrade the Avamar Plug-in for Sybase on a stand-alone Solaris system or on each node in a cluster.

Procedure

1. Uninstall the Avamar Plug-in for Sybase. [Uninstalling the Avamar Plug-in for Sybase on Solaris on page 49](#) provides instructions.
2. Uninstall the Avamar file system client. The *EMC Avamar Backup Clients User Guide* provides instructions.
3. Download the Avamar file system client and the Avamar Plug-in for Sybase installation packages. [Downloading the software on page 37](#) provides instructions.

Note

The versions of the Avamar file system client and Avamar Plug-in for Sybase must be the same.

4. Install the new version of the Avamar file system client. The *EMC Avamar Backup Clients User Guide* provides instructions.
5. Install the new version of the Avamar Plug-in for Sybase. [Installing the Avamar Plug-in for Sybase on Solaris on page 47](#) provides instructions.

Uninstalling the Avamar Plug-in for Sybase on Solaris

You must complete the required instructions to uninstall the Avamar Plug-in for Sybase on a stand-alone Solaris system or on each node in a cluster.

Procedure

1. Log in to the Sybase server host as root.
2. If you are uninstalling in a cluster configuration, run the correct cluster configuration script:
 - For a Solaris Cluster configuration, run the `suncluster-configure.sh` script to remove the Avamar agent resource from the Solaris Cluster resource group.
 - For a VCS configuration, run the `avclusuninstall` script.

The *EMC Avamar Backup Clients User Guide* provides details.

3. Type the following command to view all the Avamar packages installed on the system:

```
pkginfo | grep AVMR
```

A list of all the Avamar packages installed on the system appears, including the AVMRsybase package that is the Avamar Plug-in for Sybase package.

4. Note the package names.
5. Type the following command to uninstall a software package:

```
pkgrm package_name
```

where *package_name* is one of the Avamar software packages.

6. Type **y** and press **Enter** when prompted to remove the package.
7. Repeat steps as required to remove the Avamar software packages.
8. Delete the symbolic link named `libsybase_avamar.so` in the Sybase ASE library directory, `$SYBASE/$SYBASE_ASE/lib`.
9. In a VCS system, uninstall the Avamar Cluster Client for Solaris according to instructions in the VCS chapter of the *EMC Avamar Backup Clients User Guide*.

Installing, upgrading, and uninstalling the software on Windows

You can install, upgrade, and uninstall the Avamar Plug-in for Sybase on Windows.

Installing the Avamar Plug-in for Sybase on Windows

You can install the Avamar Client for Solaris in either the default installation directory or an alternate directory. After you have installed the Avamar Client for Solaris, you can

install the Avamar Plug-in for Sybase ASE. The Sybase plug-in installation process automatically installs the Avamar Plug-in for Sybase ASE in the same directory as the Avamar client.

You can use the following instructions to install the Avamar Plug-in for Sybase ASE on a stand-alone Windows system or on each node in a cluster.

Procedure

1. Log in to the Sybase server host as an administrator.
2. Go to the temporary directory that contains the Avamar Plug-in for Sybase ASE installation package that you downloaded in [Downloading the software on page 37](#).
3. Start the Avamar Plug-in for Sybase ASE installation by using the correct method:
 - If UAC is disabled, double-click the installation package to open it.
 - If UAC is enabled, open a command prompt as an administrator, change directory to the location of the installation package, and then type the following command:
`msiexec /i AvamarSybase-windows-package-version.msi`
 where *package-version* is the package type and Avamar software version.
 The welcome page appears.
4. Follow the instructions in the wizard to install the Avamar Plug-in for Sybase ASE.
5. Click **Finish** when the installation completes.
6. Copy the Avamar Plug-in for Sybase ASE library file, `libsybase_avamar.dll`, from the `Avamar_installation_dir\bin` directory to the Sybase ASE library directory, `%SYBASE%\%SYBASE_ASE%\lib`.

Upgrading the Avamar Plug-in for Sybase on Windows

You must complete the required steps to upgrade the Avamar Plug-in for Sybase on Windows.

Procedure

1. Ensure that the environment meets all the system requirements for the new version. [Preparing to install the Avamar Plug-in for Sybase on page 36](#) provides details.
2. Upgrade the Avamar Client for Windows by running the Windows client installation wizard for the new version on the client computer. The *EMC Avamar for Windows Server User Guide* provides instructions.

Note

The versions of the Avamar file system client and Avamar Plug-in for Sybase must be the same.

3. Upgrade the Avamar Plug-in for Sybase by running the plug-in installation wizard for the new version on the client computer. [Installing the Avamar Plug-in for Sybase on Windows on page 49](#) provides instructions.

Uninstalling the Avamar Plug-in for Sybase on Windows

You must complete the required steps to uninstall the Avamar Plug-in for Sybase on Windows.

Procedure

1. Uninstall the Avamar Plug-in for Sybase by using **Programs and Features**.

2. Remove the library file `libsybase_avamar.dll` from the Sybase ASE library directory, `%SYBASE%\%SYBASE_ASE%\lib`.
3. Uninstall the Avamar Client for Windows by using **Programs and Features**.

Performing post-installation tasks

You must perform the required post-installation tasks that apply to your particular system after a successful installation of the Avamar Plug-in for Sybase.

Excluding Sybase device files from file system backups

To optimize the performance of file system backups and save storage space on your system, you can exclude the Sybase device files or directories (containing the Sybase database data and logs) from the file system backups.

NOTICE

To ensure that the Sybase database data and logs are adequately protected, set up regular Sybase plug-in backups, as described in the remainder of this guide.

You can determine the files or directories of the Sybase devices by using the `sp_helpdevice` command or Sybase Central GUI.

To exclude the files or directories of the Sybase devices from a file system backup, create a dataset that excludes the required files or directories, and then assign the dataset to the appropriate Avamar client or group. The *EMC Avamar Administration Guide* provides details on how to create and use a dataset in a backup.

Configuring internationalization (I18N) support

I18N support provides the Sybase plug-in capability to process non-ASCII data in a non-English locale.

The extent of the I18N support is dependent on the following support:

- I18N support provided by the operating system on the Sybase host
- I18N support provided by the Avamar client and server software
- I18N support provided by the Sybase server software

For example, if the Avamar software does not support non-ASCII data in a specific parameter, the Sybase plug-in cannot support non-ASCII data in that parameter. The Avamar client and server documentation and Sybase ASE documentation provide more details on I18N support.

NOTICE

On UNIX and Linux, this Sybase plug-in release supports UTF-8 encoding only.

In an I18N environment, the Sybase plug-in supports non-ASCII data in the following parameters for backup, restore, and browse operations:

- Sybase username and password
- Sybase ASE protected password
- Sybase database name

NOTICE

Due to an Avamar limitation, you cannot specify non-ASCII values for these parameters in the `avsybase.cmd` file or option file for either CLI or GUI operations. [Command Line Interface on page 93](#) provides details about the `avsybase.cmd` file and option file. Non-ASCII characters might not be rendered correctly in the Sybase plug-in log files and the standard output from CLI operations.

Requirements for I18N support

Ensure that all the following I18N requirements are met:

- The Sybase host runs a supported internationalized version of the operating system, properly configured to operate in the non-English locale.
- The Sybase ASE server software provides the required I18N support. The Sybase database is configured with the required non-ASCII character set. The Sybase ASE documentation provides more details.
- Supported internationalized Avamar client and server software is installed.

The *EMC Avamar Release Notes* provides details on I18N support limitations of the Avamar client and server software.

Configuring I18N support

Complete the required settings to configure I18N support for backup, restore, and browse operations with the Sybase plug-in:

- You can set both the `LC_ALL` and `LANG` environment variables to the proper locale value for the Sybase Open Client Library (OCL) session and for the file system operating system. The variable value must match a *vendor_locale* value in the `locales.dat` file on the Sybase host:
 - `$SYBASE/locales/locales.dat` on UNIX or Linux
 - `%SYBASE%\locales\locales.dat` on Windows

Each entry in the `locales.dat` file has the following format:

```
locale = vendor_locale, syb_language, syb_charset
```

where *vendor_locale*, *syb_language*, and *sybcharset* are the local, language, and character set values supported by the Sybase ASE server software.

[Example 1 on page 53](#) shows an environment variable setting to configure I18N support in a Japanese locale on Linux.

On UNIX or Linux, you can optionally set the `LC_ALL` and `LANG` environment variables in the `avsybase` script file. On these platforms, if `LC_ALL` and `LANG` are set to a default value of `POSIX` that is invalid for the I18N environment as defined in the Sybase I18N classification, Sybase plug-in operations might fail with an error stating that the language or locale is not supported.

On Windows, the `LC_ALL` and `LANG` environment variables are not set by default. Before you run CLI operations with the `avsybase` command on Windows, you can set the environment variables with the `set` command on the operating system command line:

```
set LANG=value
```

```
set LC_ALL=value
```

Before you run GUI operations with Avamar Administrator on Windows, set the `--syb-language` option instead of the `LC_ALL` and `LANG` environment variables.

- Instead of setting the LC_ALL and LANG environment variables, you can optionally set the `--syb-language` option of the `avsybase` command to specify the proper locale for the Sybase OCL session. Set the `--sybase_language` option to the proper *vendor_locale* value from the `locales.dat` file entry. The Sybase plug-in uses the `--syb-language` option value to set the LC_ALL and LANG variables during its operations.

Setting the `--syb-language` option is especially recommended on Windows, where LC_ALL and LANG are not set when the Sybase plug-in runs. You can set the `--syb-language` option value in the `avsybase.cmd` file, described in [Using an option file on page 94](#) or by using the **More** button in one of the following dialog boxes in Avamar Administrator:

- **Backup Command Line Options**
- **Restore Command Line Options**

[Backup on page 55](#) and [Restore and Recovery on page 75](#) describe how to use the **More** button in the dialog boxes for browse, backup, and restore operations.

[Example 2 on page 53](#) shows the `--syb-language` option setting to configure I18N support in a Japanese locale on Windows.

Example 1 I18N configuration in a Japanese locale on Linux

A Linux system with a Japanese locale includes the following entry in the `$SYBASE/locales/locales.dat` file:

```
[linux]
locale = ja_JP.UTF-8, japanese, utf8
```

To configure the I18N support for Sybase plug-in operations in this Japanese locale, the LC_ALL and LANG environment variables are set to `ja_JP.eucJP` as the proper locale value for the Sybase OCL session.

Example 2 I18N configuration in a Japanese locale on Windows

A Windows system with a Japanese locale includes the following entry in the `%SYBASE%\locales\locales.dat` file:

```
[NT]
locale = japanese, japanese, sjis
```

To configure the I18N support for Sybase plug-in operations in this Japanese locale, the `syb-language` option of the `avsybase` command is set to `japanese` as the proper locale value for the Sybase OCL session. The following `avsybase` command is used for full backups with the Sybase plug-in:

```
avsybase --operation=backup --brtype=full --syb-language=japanese --
flagfile="C:\Program Files\var\sybflags.txt"
```


CHAPTER 3

Backup

This chapter includes the following topics:

• Backup feature support.....	56
• Performing on-demand backups.....	56
• Scheduling backups.....	62
• Monitoring backups.....	71
• Canceling backups.....	72
• Reviewing backups.....	72

Backup feature support

[Backup on page 19](#) describes the Avamar Plug-in for Sybase (Sybase plug-in) backup features, including the supported types of backups and the backup limitations. You can use the Sybase plug-in to perform online backups of Sybase databases and transaction logs in both stand-alone systems and cluster systems.

You can use Avamar Administrator to perform on-demand backups and configure scheduled backups:

- [Performing on-demand backups on page 56](#)
- [Scheduling backups on page 62](#)

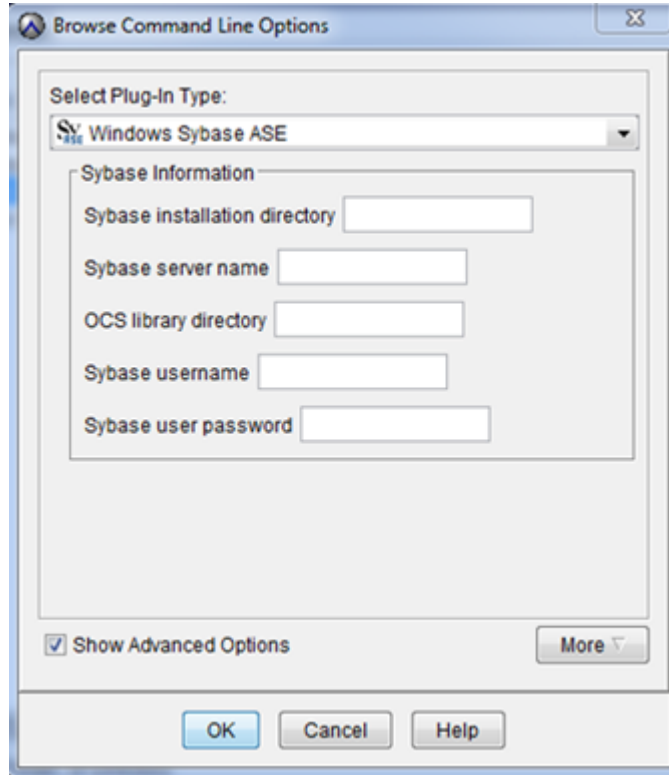
You can also perform on-demand backups from the CLI by using the `avsybase` command as described in [On-demand backups with the avsybase command on page 109](#).

Performing on-demand backups

A Sybase plug-in backup that you initiate by using Avamar Administrator is also known as an on-demand (manual) backup.

Procedure

1. Start Avamar Administrator and log in.
2. In Avamar Administrator, click the **Backup & Restore** launcher button.
The **Backup, Restore and Manage** window appears.
3. Click the **Backup** tab.
The upper-left pane contains a list of domains.
4. Click the domain that contains the Sybase server host.
A list of Avamar clients appears in the pane below the domains list.
5. Select the Sybase server host. If the Sybase server is installed in a cluster, select the virtual server host.
A list of plug-ins installed on the client appears in the left pane of the **Backup** tab.
6. In the left pane of the **Backup** tab, select the Sybase plug-in.
The **Browse Command Line Options** dialog box appears as in the following example.
You need to reset the settings in this dialog box when you want to browse another Sybase server on the same host. To reset the settings, you can close the **Browse Command Line Options** dialog box, then right-click the plug-in, select **Refresh**, and select the plug-in again.



7. Complete the settings in the **Browse Command Line Options** dialog box:

- In the **Sybase installation directory** field, type the full pathname of the Sybase installation directory for the server to be backed up, represented by \$SYBASE on Linux or UNIX and %SYBASE% on Windows.
Do not type the environment variable \$SYBASE or %SYBASE% but type the actual text of the full pathname. For example, type `/sybase` instead of `$SYBASE`.
- In the **Sybase server name** field, type the Sybase server name, which is not the hostname. For example, type `SERVER1`.
- In the **OCS library directory** field, type the full pathname of the Sybase OCS library directory, represented by \$SYBASE/\$SYBASE_OCS/lib on Linux or UNIX and %SYBASE%\%SYBASE_OCS%\dll on Windows.
Do not type any environment variable but type the actual text of the full pathname. For example, type `/sybase/OCS-15_0/lib` instead of `$SYBASE/$SYBASE_OCS/lib`.
- In the **Sybase username** field, type the Sybase username.
- In the **Sybase user password** field, type the Sybase user password.

NOTICE

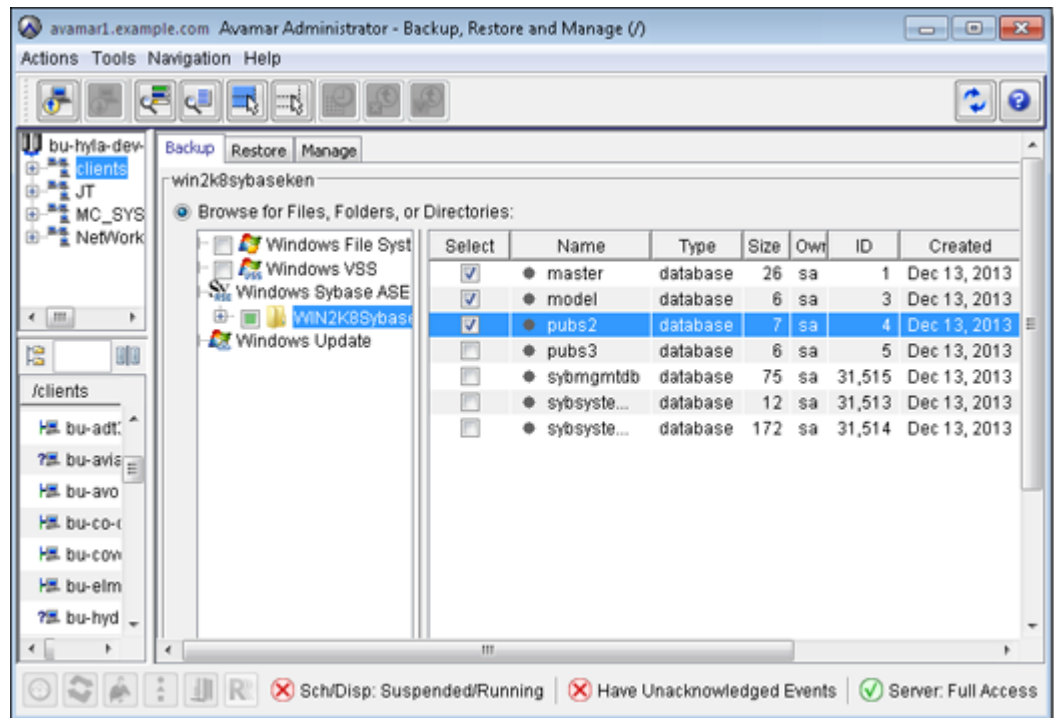
In an I18N environment, you can set the `--syb-language` option value in the `avsybase.cmd` file, described in [Using an option file on page 94](#). [Configuring I18N support on page 52](#) provides more details on the `--syb-language` option.

8. Click **OK**.

The right pane of the **Backup** tab displays a folder with the Sybase server name.

9. Select the databases for backup on the **Backup** tab:

- To back up all the databases on the server or the logs of all the databases, select the checkbox next to the Sybase server name.
- To back up specific databases or the logs of specific databases:
 - a. Double-click the Sybase server name.
All the databases of the Sybase server appear in the right pane.
 - b. Select the checkboxes next to the databases that you want to include in the backup, as shown in the following figure.



10. Select **Actions > Back Up Now**.

The **On Demand Backup Options** dialog box appears as shown in the following figure.

11. Complete the settings in the **On Demand Backup Options** dialog box:

- a. Specify the backup retention policy in the **Retention Policy Settings** group box:
 - To automatically delete this backup from the Avamar server after a specific period of time, select **Retention period** and then 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 retain this backup as long as the client remains active in the Avamar server, select **No end date**.
- b. From 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 depend on several factors, including the client operating system and the Avamar server version. The *EMC Avamar Product Security Guide* provides details.

- c. Click **More Options**.

The **Backup Command Line Options** dialog box appears, as shown in the following figure, which displays the default option values.

12. Complete the settings in the **Backup Command Line Options** dialog box:

- a. To view the advanced options with red labels, select **Show Advanced Options** at the bottom of the dialog box.

NOTICE

Advanced options with red labels are optional and only used for special configurations. All the other options with black labels are mandatory.

- b. Complete the settings in the **Sybase Information** group box:

- In the **Sybase installation directory** field, type the full pathname of the Sybase installation directory for the server to be backed up, represented by \$SYBASE on Linux or UNIX and %SYBASE% on Windows.
Do not type the environment variable \$SYBASE or %SYBASE% but type the actual text of the full pathname. For example, type **/sybase** instead of **\$SYBASE**.
 - In the **OCS library directory** field, type the full pathname of the Sybase OCS library directory, represented by \$SYBASE/\$SYBASE_OCS/lib on Linux or UNIX and %SYBASE%\%SYBASE_OCS%\dll on Windows.
Do not type any environment variable but type the actual text of the full pathname. For example, type **/sybase/OCS-15_0/lib** instead of **\$SYBASE/\$SYBASE_OCS/lib**.
 - In the **Sybase username** field, type the Sybase username.
 - In the **Sybase user password** field, type the Sybase user password.
- c. If required, select **Enable debugging messages** to enable logging of debug messages. [Logging information on page 122](#) provides details about logging.
 - d. If required, select **Store backup on Data Domain system** to store the backup data on a Data Domain system. From the drop-down list, select the Data Domain system, which has been added on the Avamar server. [Data Domain system support on page 18](#) provides details about backups to Data Domain systems.
 - e. From the **Encryption method to Data Domain system** list, select the encryption method for data transfer between the client and the Data Domain system during the backup.
 - f. Select the backup type in the **Backup Type** group box:
 - Select **Full backup** to create a full copy of the selected databases, including both the data and transaction logs.
 - Select **Incremental backup** to back up the transaction logs of the selected databases.
 - Select **Incremental backup with no_truncate** option to run a Sybase `dump transaction` command with the `no_truncate` option, which performs an incremental backup that does not truncate the logs afterwards. Use this option in a disaster recovery situation only. Do not use this option in a regular on-demand backup.
 - Select **Log truncation with truncate_only option followed by full backup** to run a Sybase `dump transaction` command with the `truncate_only` option, which truncates the logs. After the logs are truncated, the Sybase plug-in also performs a full backup of the database. Do not use this option in a regular on-demand backup.
 - Select **Log truncation with no_log option followed by full backup** to run a Sybase `dump transaction` command with the `no_log` option, which truncates the logs without logging the truncation. After the logs are truncated, the Sybase plug-in also performs a full backup of the database. Use this option in a disaster recovery situation only. Do not use this option in a regular on-demand backup.
 - g. Complete the settings in the **General Backup Options** group box:
 - From the **Maximum number of streams** menu, select the backup multi-streaming value as the maximum number of databases to back up

simultaneously. The default multi-streaming value is 1. [Multi-streaming on page 29](#) provides details.

Note

A maximum multi-streaming value of 10 is enforced for GUI on-demand backups.

- From the **Backup data verification** menu, select the type of data verification to use:
 - Select **No verification** (default value) to disable verification during the backup.
 - Select **Full verification** to use the Sybase `dump` command option with `verify=full` to verify both the header information and rows structure, for full verification of the backup.
 - Select **Header verification** to use the Sybase `dump` command option with `verify=header` to verify the page header information only.
- [Database backup and restore verification on page 27](#) provides details.
- If required, in the **Protected backup password** field, type the password that the Sybase server uses with the Sybase `dump` command option with `passwd=` to implement a password-protected database backup. [Password-protected database backups and restores on page 27](#) provides details.
- h. If required, select one or more choices in the **Perform consistency checks before backup group** box. You can select one or more types of database consistency checks to perform before the backup. [Database consistency checks on page 28](#) provides more information about the database consistency checks.
- i. If required, complete the settings in the **Pre and Postprocessing Options** group box:
- In the **Preprocessing script** field, type the name of a preprocessing script to be run immediately before the backup.
 - In the **Postprocessing script** field, type the name of a postprocessing script to be run immediately after the backup.
- j. If required, click **More** to set additional options. The **Enter Attribute** and **Enter Attribute Value** fields appear.

For each additional option, type `[avsybase]option_name` (for example, `[avsybase]syb-language`) in the **Enter Attribute** field, and type the option value in the **Enter Attribute Value** field. Click **+** to add the option, and click **-** to remove the option from the list.

[Command Line Interface on page 93](#) provides details on the `avsybase` command options that the Sybase plug-in supports.

NOTICE

The Avamar software does not validate the option information you type in the **Enter Attribute** and **Enter Attribute Value** fields. In addition, the values in these fields override settings that you specify for the options with GUI controls (text boxes, checkboxes, radio buttons, and so forth) in Avamar Administrator. In an I18N environment, you can set the `--syb-language` option value by using the **More** button. [Configuring I18N support on page 52](#) provides details on the option.

13. Click **OK** to close the **Backup Command Line Options** dialog box.
14. Click **OK** to close the **On Demand Backup Options** dialog box and start the backup.

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.

Procedure

1. Create a dataset for scheduled backups. [Creating a dataset on page 62](#) provides instructions.
2. Create a group for the backups. [Creating a group on page 68](#) provides instructions. During the group creation process, you perform the following tasks:
 - a. Assign the new dataset to the new group if you wish. Alternatively, assign the new dataset to the Sybase client in the group, as described in [step 3 on page 62](#).
 - b. Assign a schedule to the new group.
 - c. Assign a retention policy to the new group.
 - d. Add the Sybase client to the new group.

NOTICE

After you create the group for backups, you can perform an on-demand group backup by selecting the group in the **Policy** window and clicking the **Back Up Group Now** button.

3. Instead of assigning the new dataset to the group, you can assign the new dataset to the Sybase client if you wish. [Assigning the dataset to the Sybase client on page 70](#) provides instructions.
4. Enable scheduling for the group. [Enabling scheduled backups on page 70](#) provides instructions.

After you finish

The *EMC Avamar Administration Guide* provides details about backup groups, group policies, datasets, schedules, and retention policies.

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 on a client or group of clients. Create multiple datasets to segregate client data.

Procedure

1. In Avamar Administrator, select **Tools > Manage Datasets**.
The **Manage All Datasets** window appears.
2. Click **New**.
The **New Dataset** dialog box appears.
3. In the **New Dataset** dialog box:
 - a. In the **Name** box, 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 (-), underscore (_). Do not use Unicode characters or any of the following characters:

~ ! @ # \$ % ^ & * () = + [] { } | \ / ; : ' " < > , ?

- b. Click the **Source Data** tab.
- c. Select **Enter Explicitly**.
- d. Delete all the default datasets listed in the box below the + and - buttons by selecting each dataset in turn and clicking the - button to delete the dataset.
- e. Select the Sybase ASE plug-in from the **Select Plug-in Type** list.

NOTICE

All Avamar plug-ins are listed in the **Select Plug-in Type** list, but only plug-ins installed on the client are available to add to the dataset.

- f. Click the ... button (**Browse for files and/or folders**) next to the **Select Files and/or Folders** text box.

The **Select Files and/or Folders** dialog box appears.

4. In the **Select Files and/or Folders** dialog box:

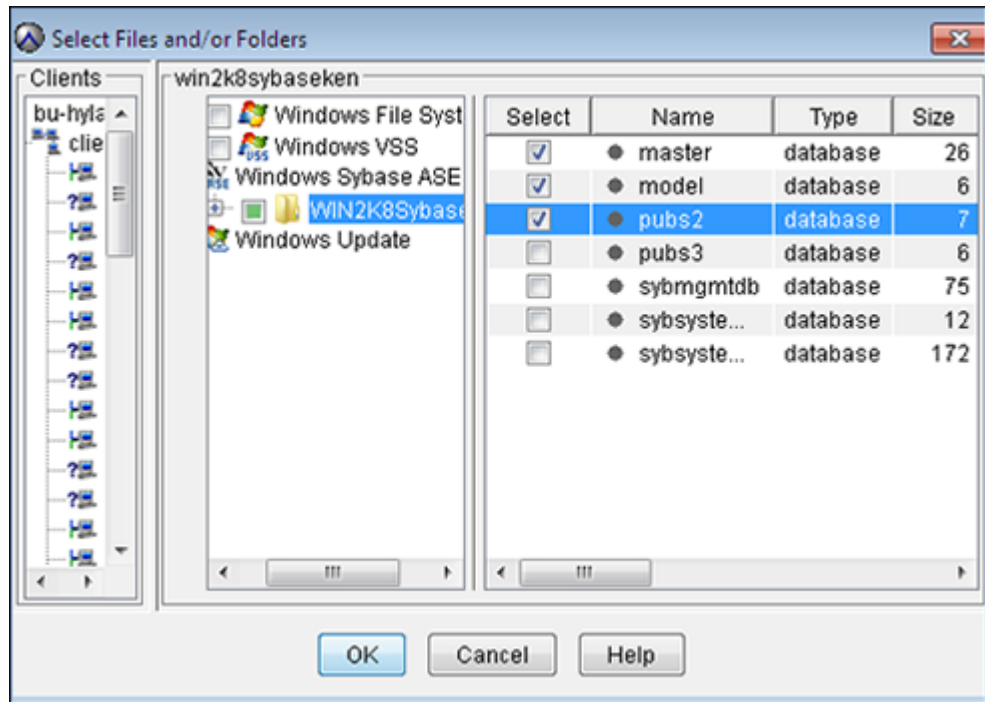
- a. Select the Sybase server host from the **Clients** tree in the left pane. If the Sybase server is installed in a cluster, select the virtual server host.
- b. Select the Sybase plug-in in the middle pane.

The **Browse Command Line Options** dialog box appears.

- c. Complete the settings in the **Browse Command Line Options** dialog box, and then click **OK**:
 - In the **Sybase installation directory** field, type the full pathname of the Sybase installation directory for the server to be backed up, represented by \$SYBASE on Linux or UNIX and %SYBASE% on Windows.
Do not type the environment variable \$SYBASE or %SYBASE% but type the actual text of the full pathname. For example, type **/sybase** instead of **\$SYBASE**.
 - In the **Sybase server name** field, type the Sybase server name, which is not the hostname. For example, type **SERVER1**.
 - In the **OCS library directory** field, type the full pathname of the Sybase OCS library directory, represented by \$SYBASE/\$SYBASE_OCS/lib on Linux or UNIX and %SYBASE%\%SYBASE_OCS%\dll on Windows.
Do not type any environment variable but type the actual text of the full pathname. For example, type **/sybase/OCS-15_0/lib** instead of **\$SYBASE/\$SYBASE_OCS/lib**.
 - In the **Sybase username** field, type the Sybase username.
 - In the **Sybase user password** field, type the Sybase user password.

- d. In the **Select Files and/or Folders** dialog box, select the items to be backed up:
 - To back up all the databases on the server or the logs of all the databases, select the checkbox next to the Sybase server name.

- To back up specific databases or the logs of specific databases:
 - a. Double-click the Sybase server name.
All the databases of the Sybase server appear in the right pane.
 - b. Select the checkboxes next to the databases that you want to include in the backup, as shown in the following figure.



NOTICE

A dataset must include only one Sybase server. If more than one server is selected for a dataset, the scheduled or on-demand group fails. A dataset must not include more than one backup of a particular database.

- e. Click **OK**.

The **Select Files and/or Folders** dialog box closes.

Note

Do not use the **Exclusions** tab or **Inclusions** tab in the **New Dataset** dialog box to exclude or include Sybase databases in a scheduled backup.

5. Click the **Options** tab in the **New Dataset** dialog box.
6. Complete the settings on the **Options** tab:
 - a. Select the Sybase plug-in from the **Select Plug-In Type** list.
The Sybase plug-in options appear on the **Options** tab.
 - b. To view the advanced options with red labels, select **Show Advanced Options** at the bottom of the **Options** tab.

NOTICE

Advanced options with red labels are optional and only used for special configurations. All the other options with black labels are mandatory.

- c. Complete the settings in the **Sybase Information** group box:
 - In the **Sybase installation directory** field, type the full pathname of the Sybase installation directory for the server to be backed up, represented by \$SYBASE on Linux or UNIX and %SYBASE% on Windows.
Do not type the environment variable \$SYBASE or %SYBASE% but type the actual text of the full pathname. For example, type **/sybase** instead of **\$SYBASE**.
 - In the **OCS library directory** field, type the full pathname of the Sybase OCS library directory, represented by \$SYBASE/\$SYBASE_OCS/lib on Linux or UNIX and %SYBASE%\%SYBASE_OCS%\dll on Windows.
Do not type any environment variable but type the actual text of the full pathname. For example, type **/sybase/OCS-15_0/lib** instead of **\$SYBASE/\$SYBASE_OCS/lib**.
 - In the **Sybase username** field, type the Sybase username.
 - In the **Sybase user password** field, type the Sybase user password.
- d. If required, select **Enable debugging messages** to enable logging of debug messages. [Logging information on page 122](#) provides details on logging.
- e. If required, select **Store backup on Data Domain system** to store the backup data on an attached Data Domain system. From the drop-down list, select the Data Domain system, which has been added on the Avamar server. [Data Domain system support on page 18](#) provides details on backups to Data Domain systems.
- f. From the **Encryption method to Data Domain system** list, select the encryption method for data transfer between the client and the Data Domain system during the backup.
- g. Select the backup type in the **Backup Type** group box:
 - Select **Full backup** to create a full copy of the selected databases, including both the data and transaction logs
 - Select **Incremental backup** to back up the transaction logs of the selected databases.
 - Select **Incremental backup with no_truncate option** to run a Sybase `dump transaction` command with the `no_truncate` option, which performs an incremental backup that does not truncate the logs afterwards. Use this option in a disaster recovery situation only. Do not use this option in a regularly scheduled backup.
 - Select **Log truncation with truncate_only option followed by full backup** to run a Sybase `dump transaction` command with the `truncate_only` option, which truncates the logs. After the logs are truncated, the Sybase plug-in also performs a full backup of the database. Do not use this option in a regularly scheduled backup.
 - Select **Log truncation with no_log option followed by full backup** to run a Sybase `dump transaction` command with the `no_log` option, which truncates the logs without logging the truncation. After the logs are truncated, the Sybase plug-in also performs a full backup of the database. Use this option

in a disaster recovery situation only. Do not use this option in a regularly scheduled backup.

h. Complete the settings in the **General Backup Options** group box:

- From the **Maximum number of streams** menu, select the backup multi-streaming value as the maximum number of databases to back up simultaneously. The default multi-streaming value is 1. [Multi-streaming on page 29](#) provides details.

NOTICE

A maximum multi-streaming value of 10 is enforced for scheduled backups.

- From the **Backup data verification** menu, select the type of data verification to use:
 - Select **No verification** (default value) to disable verification during the backup.
 - Select **Full verification** to use the Sybase `dump` command option with `verify=full` to verify both the header information and rows structure, for full verification of the backup.
 - Select **Header verification** to use the Sybase `dump` command option with `verify=header` to verify the page header information only.[Database backup and restore verification on page 27](#) provides details.
- If required, in the **Protected backup password** field, type the password that the Sybase server uses with the Sybase `dump` command option with `passwd=` to implement a password-protected database backup. [Password-protected database backups and restores on page 27](#) provides details.

i. If required, select one or more choices in the **Perform consistency checks before backup** group box. You can select one or more types of database consistency checks to perform before the backup. [Database consistency checks on page 28](#) provides more information about the database consistency checks.

j. If required, complete the settings in the **Pre and Postprocessing Options** group box:

- In the **Preprocessing script** field, type the name of a preprocessing script to be run immediately before the backup.
- In the **Postprocessing script** field, type the name of a postprocessing script to be run immediately after the backup.

k. If required, click **More** to set additional options. The **Enter Attribute** and **Enter Attribute Value** fields appear.

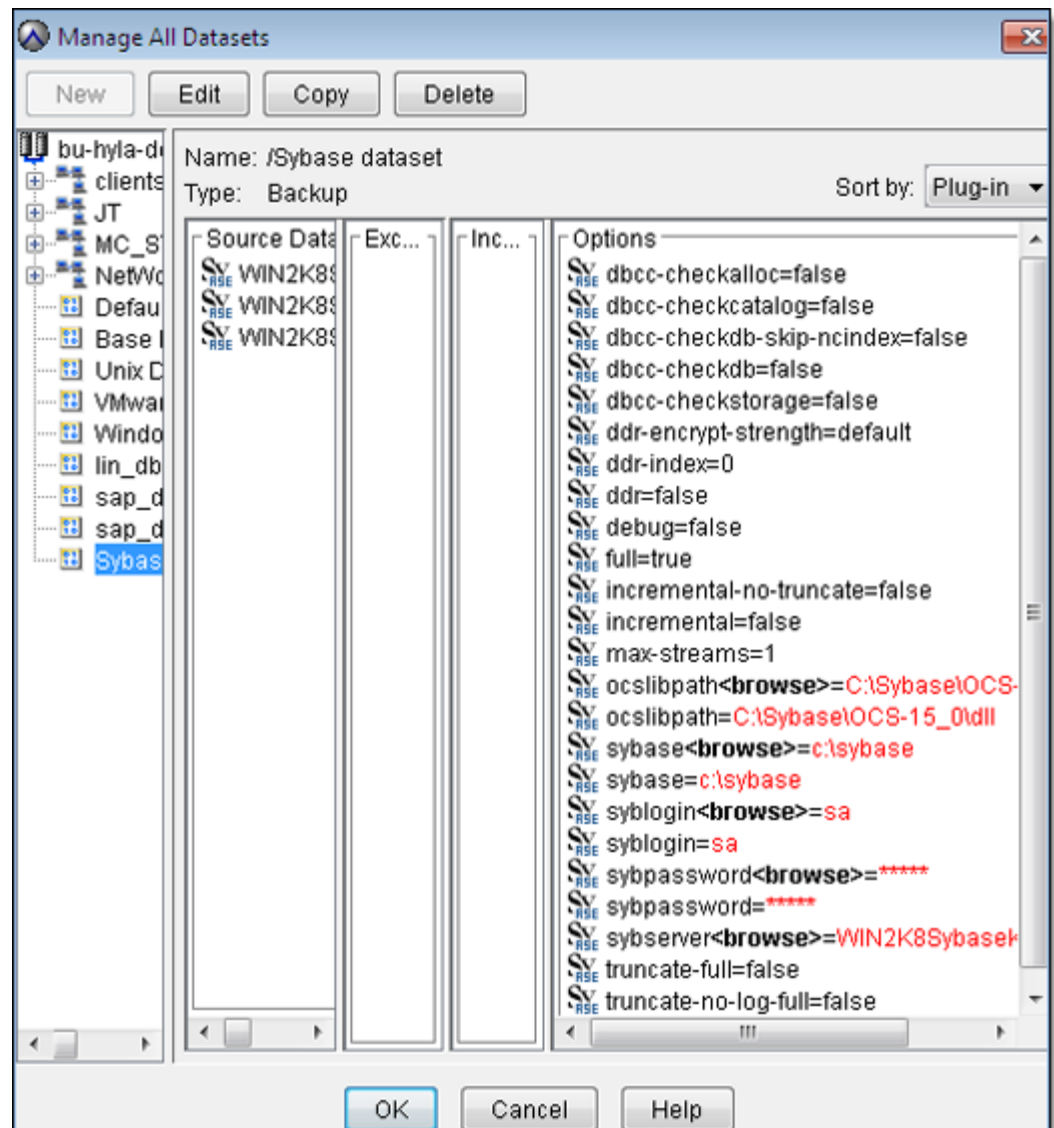
For each additional option, type `[avsybase] option_name` (for example, `[avsybase] syb-language`) in the **Enter Attribute** box, and type the option value in the **Enter Attribute Value** box. Click **+** to add the option, and click **-** to remove the option from the list.

[Command Line Interface on page 93](#) provides details on the `avsybase` command options that the Sybase plug-in supports.

NOTICE

The Avamar software does not validate the option information you type in the **Enter Attribute** and **Enter Attribute Value** fields. In addition, the values in these fields override settings that you specify for the options with GUI controls (text boxes, checkboxes, radio buttons, and so forth) in Avamar Administrator. In an I18N environment, you can set the `--syb-language` option value by using the **More** button. [Configuring I18N support on page 52](#) provides details on the option.

7. Click **OK** to close the **New Dataset** dialog box.
- The new dataset appears in the list of datasets.



The `<browse>` flags that appear under **Options** in the **Manage All Datasets** dialog box also appear in the output of the corresponding `mccli dataset show --domain --name` command as shown in the following example.

For example:

```
mccli dataset show --domain=/clients --name=sybase_dataset1
```

0,23000,CLI command completed successfully.

Attribute	Value
Name	sybase_dataset1
ID	1352320101937
Domain	/clients
Built-in	false
ALLDATA	false
Num Targets	2
Linux Sybase ASE Target	BUT157/master
Linux Sybase ASE Target ID	1029
Linux Sybase ASE Target	BUT157/model
Linux Sybase ASE Target ID	1029
LNum Includes	0
Num Excludes	0
Num Flags	23
Linux Sybase ASE Flag	type=checkbox:name=dbcc-checkalloc:value=false
Linux Sybase ASE Flag	type=checkbox:name=dbcc-checkcatalog:value=false
Linux Sybase ASE Flag	type=checkbox:name=dbcc-checkdb:value=false
Linux Sybase ASE Flag	type=checkbox:name=dbcc-checkdb-skip-ncindex:value=false
Linux Sybase ASE Flag	type=checkbox:name=dbcc-checkstorage:value=false
Linux Sybase ASE Flag	type=checkbox:name=ddr:value=false
Linux Sybase ASE Flag	type=pull-down:name=ddr-index:value=0
Linux Sybase ASE Flag	type=checkbox:name=debug:value=false
Linux Sybase ASE Flag	type=checkbox:name=full:value=true
Linux Sybase ASE Flag	type=checkbox:name=incremental:value=false
Linux Sybase ASE Flag	type=checkbox:name=incremental-no-truncate:value=false
Linux Sybase ASE Flag	type=pull-down:name=max-streams:value=1
Linux Sybase ASE Flag	type=string:name<browse>=ocslibpath:value=/opt/syb157/OCS-15_0/lib
Linux Sybase ASE Flag	type=string:name=ocslibpath:value=/opt/syb1572/OCS-15_0/lib
Linux Sybase ASE Flag	type=string:name<browse>=sybase:value=/opt/syb157
Linux Sybase ASE Flag	type=string:name=sybase:value=/opt/syb1572
Linux Sybase ASE Flag	type=string:name<browse>=syblogin:value=sa
Linux Sybase ASE Flag	type=string:name=syblogin:value=sa
Linux Sybase ASE Flag	type=password:name<browse>=sybpassword:value=*****
Linux Sybase ASE Flag	type=password:name=sybpassword:value=*****
Linux Sybase ASE Flag	type=string:name<browse>=sybserver:value=BUT157
Linux Sybase ASE Flag	type=checkbox:name=truncate-full:value=false
Linux Sybase ASE Flag	type=checkbox:name=truncate-no-log-full:value=false
Is Link	false

Creating a group

When you create a group, you define the dataset, schedule, and retention policy, which together comprise the group policy for scheduled backups of all members of the group. The group must contain at least one Avamar client. If the group contains two or more clients, then the clients must belong to the same Avamar domain. You can override group policy settings at the client level.

The *EMC Avamar Administration Guide* provides information about editing schedule properties or retention policies.

Procedure

1. In Avamar Administrator, click the **Policy** launcher button.

The **Policy** window appears.

2. Click the **Policy Management** tab.
3. Click the **Groups** tab.
4. In the left pane of the **Groups** tab, select the Avamar domain to which the group should belong.

5. Select **Actions > Group > New > Backup Group**.

The **New Group** wizard appears.

6. In the **Name** box, type a name for the new group.

The name can include alphanumeric characters (A-Z, a-z, 0-9) and the following special characters: period (.), hyphen (-), underscore (_). Do not use Unicode characters or any of the following characters:

~ ! @ # \$ % ^ & * () = + [] { } | \ / ; : ' " < > , ?

7. Clear the **Disabled** checkbox to use this group to perform scheduled client backups.

Selecting the checkbox disables backups for the group.

8. From the **Avamar encryption method** list, select the encryption method for data transfer between the client and the Avamar server during the group backups. This is the method that all clients in the group use unless the method is overridden at the client level.

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

9. Choose whether to use the assigned schedule for the group or override the assigned schedule:

- To use the assigned schedule, leave the **Override Schedule** checkbox clear.

- To override the schedule:

a. Select **Override Schedule**.

Selecting **Override Schedule** enables the **Skip Next Backup** and **Run Next Backup Once** options.

- b. Choose whether to skip the next scheduled backup entirely or to perform the next scheduled backup one time only by selecting either **Skip Next Backup** or **Run Next Backup Once**.

10. Click **Next**.

The next **New Group** wizard page appears with dataset information.

11. From the **Select An Existing Dataset** list, select the dataset that you created, and then click **Next**.

The next **New Group** wizard page appears with schedule information.

12. Select a schedule from the **Select An Existing Schedule** list, and click **Next**.

The next **New Group** wizard page appears with retention policy information.

13. Select a retention policy for the group from the **Select An Existing Retention Policy** list, and click **Next**.

The final **New Group** wizard screen appears with a tree of domains and clients.

14. Select the Sybase server host from the client list. If the Sybase server is installed in a cluster, select the virtual server host.

15. Click **Finish**.

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

Assigning the dataset to the Sybase client

Procedure

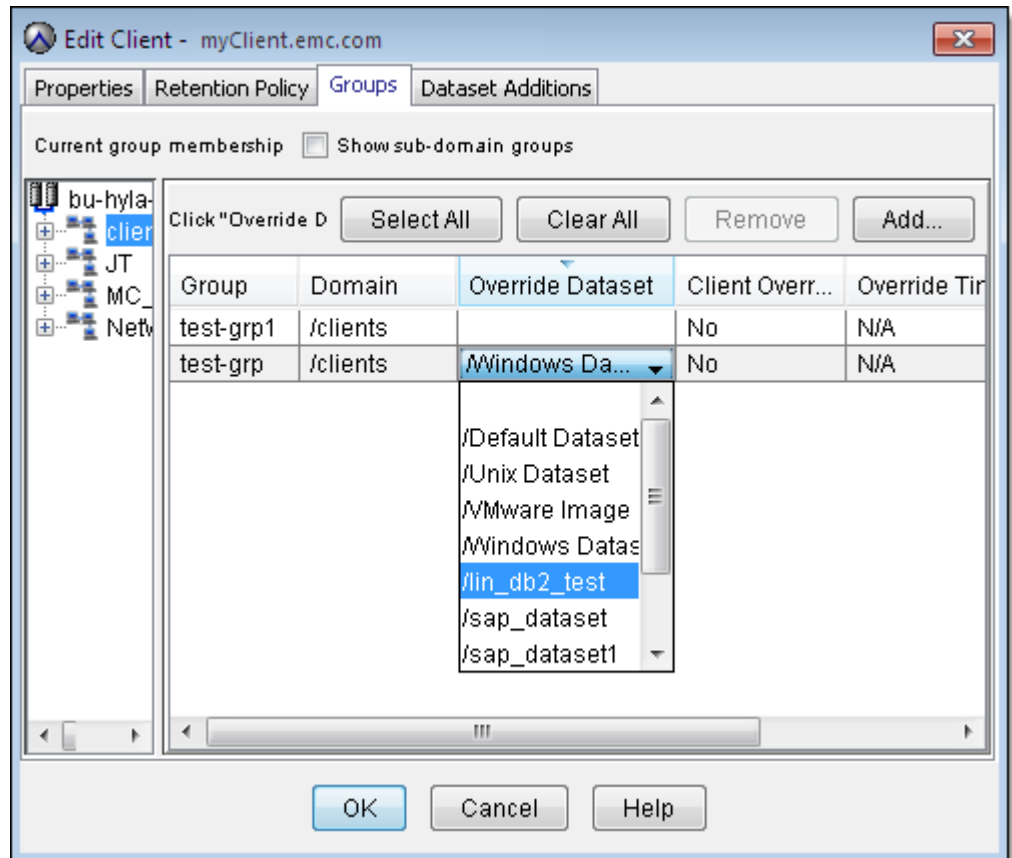
1. In Avamar Administrator, click the **Policy** launcher button.

The **Policy** window appears.

2. Click the **Policy Management** tab.
3. Click the **Clients** tab.
4. In the right pane, select the Sybase client to which to assign the Sybase dataset.
5. Select **Actions > Client > Edit Client**.

The **Edit Client** dialog box appears.

6. Select the **Groups** tab.
7. Select the appropriate group in the right pane.
8. From the menu in the **Override Dataset** column, select the dataset that you created in [Creating a dataset on page 62](#), as shown in the following figure.



9. Click **OK**.

Enabling scheduled backups

Scheduled backups occur only for enabled groups. Groups are disabled by default unless you select the **Enabled** checkbox on the first page of the **New Group** wizard. If you did not

enable the group when you created it, use the menu options in the **Policy** window to enable backups.

Procedure

1. In Avamar Administrator, click the **Policy** launcher button.

The **Policy** window appears.

2. Click the **Policy Management** tab.
3. Click the **Groups** tab.
4. Select the group that you created.
5. Enable the group by selecting **Actions > Group > Disable Group**.

Perform this step only if a check mark appears next to the **Disable Group** menu option.

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

Monitoring backups

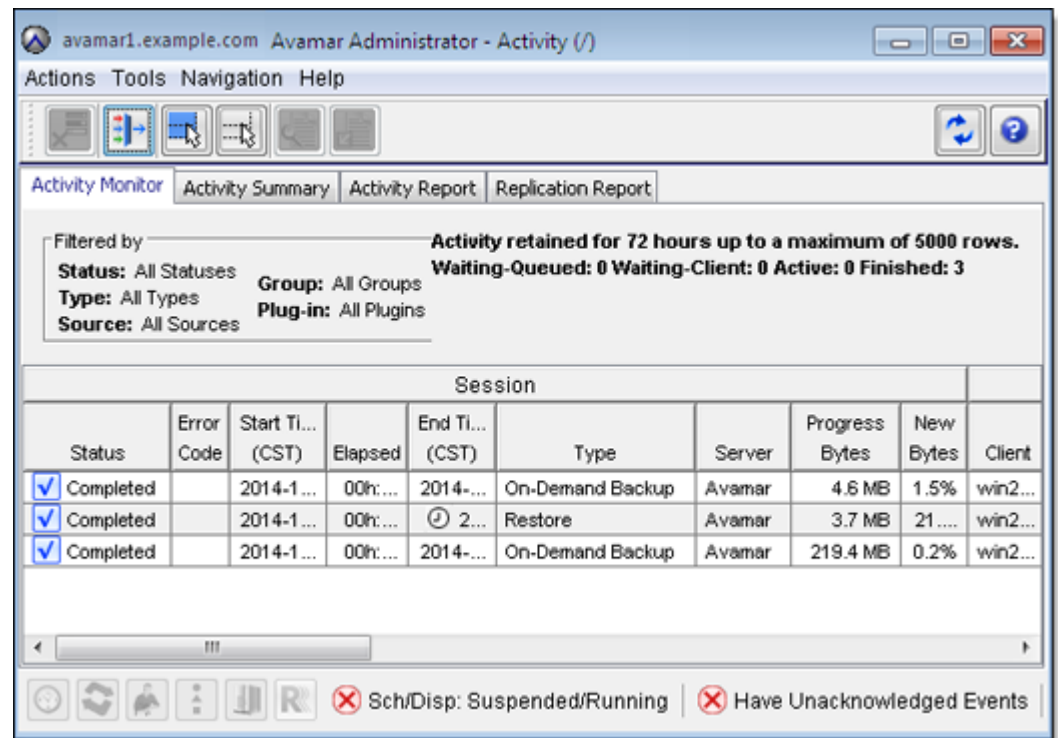
Avamar Administrator or the CLI where you start an on-demand Sybase backup displays operational messages about the status of the backup.

The **Activity Monitor** tab in Avamar Administrator displays status information for a backup started from Avamar Administrator, but not for a backup started from the CLI. The following figure shows an example display on the **Activity Monitor** tab.

Note

In a supported non-English environment, the session log information in the Activity Monitor might contain extra escape characters. You can view the correct information without escape characters in the backup log files, described in [Logging information on page 122](#).

Figure 4 Activity Monitor



Canceling backups

Procedure

- To cancel a CLI backup, press **CTRL-C**.
- To cancel a GUI backup, right-click the backup entry on the **Activity Monitor** tab in Avamar Administrator and select **Cancel Activity** from the menu.

Reviewing backups

Sybase backups are named according to their sequence, as described in [Backup names on page 22](#).

At the end of each database backup, the Sybase plug-in software groups together the current backup with any previous backups required to restore the current database backup, creating a consolidated backup.

The consolidated backup always contains all of the backups required to restore a database to the time of the last backup.

In Avamar Administrator, you can view the backups of a client from the **Restore** tab in the **Backup, Restore Manage** window. The *EMC Avamar Administration Guide* provides more information.

You can use the `avtar --backups` command with the appropriate options to view all the backups of a client. The following example command displays all the backups:

```
# avtar --backups --server=Avamar_server_name --id=Avamar_server_username
--password=Avamar_server_password --account=Avamar_domain
```


Date	Time	Seq	Label	Size	Plugin	Working directory	Targets
2014-10-21	11:51:02	65	MOD-1243672#0	1087K	Sybase	/var/avamar	
2014-10-19	11:32:43	62	MOD-1259643#0	1057K	Sybase	/var/avamar	
2014-10-19	11:32:04	60	MOD-1219815#0	1033K	Sybase	/var/avamar	

where the columns are as follows:

- **Date**—Date of the backup.
- **Time**—Time of the backup.
- **Seq**—Sequence number of the backup, which is an integer assigned by the Avamar server that uniquely identifies the backup.
- **Label**—Optional string that describes the backup.
- **Size**—Amount of data that was backed up.
- **Plugin**—Type of Avamar plug-in that created the backup.
- **Working directory**—Current working directory of the `avtar` process that created the backup.
- **Targets**—Backup path, which is not set for Sybase plug-in backups.

You can also use the `avtar --list` command with the appropriate options to view the contents of a client backup. By default, the command displays the contents of the most recent backup.

The following example `avtar --list` command displays details on the databases included in the most recent full backup of a Sybase server named `SERVER1`. (Lines have been omitted for clarity.) Each set of lines that starts with `<dir type="database"` and ends with `</dir>` provides the details on a separate database in the backup, including the database name, size, ID, old time, and new time values:

```
# avtar --list --server=Avamar_server_name --id=Avamar_server_username
--password=Avamar_server_password --account=Avamar_domain

avtar Info <8745>: Backup from Linux host "/clients/SERVER1" (SERVER1) with plugin 1029 -
Linux Sybase
avtar Info <5538>: Backup #37 label "#0" timestamp 2014-01-17 11:18:27 EST, 0 files, 278.9 MB
avtar Info <12604>: Displaying alternate view
<browse_contents pid="Sybase" ack="false" msgver="5" pidnum="1029" maxelems="1"
incomplete="0" path="" mid="7005/7005/67" inprogress="false" wid="Browse">
:
<dir type="instance" name="SERVER1" selectable="true">
:
<dir type="database" newtime="2014-01-17 11:31:11 (1326817871)" oldtime="1969-12-31 19:00:00
(0)" dbid="1" name="master" size="26" selectable="true">
:
<file type="database" newtime="2014-01-17 11:31:11 (1326817871)" oldtime="1969-12-31
19:00:00 (0)" dbid="1" name="f-0" size="26" selectable="true" />
</dir>

<dir type="database" newtime="2014-01-17 11:31:21 (1326817881)" oldtime="1969-12-31 19:00:00
(0)" dbid="3" name="model" size="6" selectable="true">
:
<file type="database" newtime="2014-01-17 11:31:21 (1326817881)" oldtime="1969-12-31
19:00:00 (0)" dbid="3" name="f-0" size="6" selectable="true" />
</dir>

<dir type="database" newtime="2014-01-17 11:31:31 (1326817891)" oldtime="1969-12-31 19:00:00
(0)" dbid="31513" name="sybssystemdb" size="12" selectable="true">
:
<file type="database" newtime="2014-01-17 11:31:31 (1326817891)" oldtime="1969-12-31
19:00:00 (0)" dbid="31513" name="f-0" size="12" selectable="true" />
```

```

</dir>
<dir type="database" newtime="2014-01-17 11:31:39 (1326817899)" oldtime="1969-12-31 19:00:00
(0)" dbid="31514" name="sybsystemprocs" size="152" selectable="true">
:
<file type="database" newtime="2014-01-17 11:31:39 (1326817899)" oldtime="1969-12-31
19:00:00 (0)" dbid="31514" name="f-0" size="152" selectable="true" />
</dir>
<dir type="database" newtime="2014-01-17 11:31:51 (1326817911)" oldtime="1969-12-31 19:00:00
(0)" dbid="31515" name="sybmgmtadb" size="75" selectable="true">
:
<file type="database" newtime="2014-01-17 11:31:51 (1326817911)" oldtime="1969-12-31
19:00:00 (0)" dbid="31515" name="f-0" size="75" selectable="true" />
</dir>
<dir type="database" newtime="2014-01-17 11:32:00 (1326817920)" oldtime="1969-12-31 19:00:00
(0)" dbid="4" name="db1" size="400" selectable="true">
:
<file type="database" newtime="2014-01-17 11:32:00 (1326817920)" oldtime="1969-12-31
19:00:00 (0)" dbid="4" name="f-0" size="400" selectable="true" />
</dir>
<dir type="database" newtime="2014-01-17 11:32:16 (1326817936)" oldtime="1969-12-31 19:00:00
(0)" dbid="5" name="db2" size="400" selectable="true">
:
<file type="database" newtime="2014-01-17 11:32:16 (1326817936)" oldtime="1969-12-31
19:00:00 (0)" dbid="5" name="f-0" size="400" selectable="true" />
</dir>
<dir type="database" newtime="2014-01-17 11:32:29 (1326817949)" oldtime="1969-12-31 19:00:00
(0)" dbid="6" name="db3" size="6" selectable="true">
:
<file type="database" newtime="2014-01-17 11:32:29 (1326817949)" oldtime="1969-12-31
19:00:00 (0)" dbid="6" name="f-0" size="6" selectable="true" />
</dir>

```

CHAPTER 4

Restore and Recovery

This chapter includes the following topics:

• Restore and recovery requirements	76
• Performing restore and recovery	78
• Monitoring restores	84
• Canceling restores	84
• Disaster recovery	85

Restore and recovery requirements

You can use the Avamar Plug-in for Sybase to perform restore and recovery of Sybase databases and transaction logs on both stand-alone systems and cluster systems.

The “destination” is the location to which the Avamar Plug-in for Sybase (Sybase plug-in) restores and recovers the Sybase data.

A backed-up (source) database is restored and recovered to a destination database, located on the destination Sybase server and destination host. The source database was backed up from the source Sybase server on the source host.

Any of the following objects can have the same or different names:

- Source and destination databases
- Source and destination servers
- Source and destination hosts

The restore operation restores the specified data from either an Avamar server or a Data Domain system. The Sybase plug-in automatically detects whether the backup is stored on the Avamar server or Data Domain system.

Review the following sections to ensure that you meet all the requirements before you perform a restore and recovery with the Sybase plug-in.

Software requirements for restore and recovery

To restore an instance or database to a Sybase server with the Sybase plug-in, the following software must be installed and running on the destination Sybase system:

- Sybase ASE server
- Avamar Client
- Avamar Plug-in for Sybase

If the destination host is different from the source host, then the destination host must be registered with the same Avamar server as the source host.

Requirements for recovery to same or alternate destination

The Sybase plug-in can restore a database only if it already exists on the destination Sybase server with the same storage layout as the source database. The Sybase plug-in can restore a Sybase server instance only if the instance already exists on the destination host.

For example, if a destination database does not yet exist on the destination server, you must manually create the database before starting the restore. Otherwise, the restore operation does not restore the database.

NOTICE

A database recovery with the Sybase plug-in completely overwrites all the data in the destination database, whether or not the destination database is the same as the source database. Before you start a recovery, ensure that none of the data in the destination database is needed.

In a recovery to the same destination, all of the following conditions are true:

- The source and destination databases have the same names.

- The source and destination servers are the same.
- The source and destination hosts are the same.

In a relocated recovery to an alternate destination, any of the following conditions can be true:

- The source database is restored to a destination database with a different name.
- The destination server is a different server than the source server.
- The destination host is a different host than the source host where the backup occurred.

For example, you can perform a relocated recovery to recover a database to a different-named destination database on a different Sybase server on a different host. The destination database must already exist on the destination server and must have the same storage layout as the source database.

When you plan for a relocated recovery to an alternate destination, choose the host and database destinations that will be required for the recovery:

- For the host destination choice, determine if the source and destination hosts will be the same or different.
- For the database destination choice:
 - Determine if the source and destination databases will have the same or different names.
 - Determine if the source and destination servers will be the same or different.

Requirements for recovery to current time

To recover a database, the Sybase plug-in restores the last database backup and then restores the transaction log backups of that database, from the oldest to the newest log backup.

The Sybase plug-in software recovers a database to the time of the most recent transaction log backup.

NOTICE

If you want to recover a database to the current time, you must first perform a transaction log backup of the database before you start the database recovery operation.

Requirements for point-in-time recovery

You can perform a point-in-time recovery for a single database or all the databases on a Sybase server.

To recover the data to a specific point-in-time, you must specify the following items:

- Timestamp in Avamar format, `yyyy-mm-dd hh:mm:ss` (enclosed in quotes when specified with the `--pointintime` option), as the date and time to which the data will be recovered
- Label number of the backup to use for the recovery (required only for a CLI recovery with the `avsybase` command, not for a GUI recovery)

[Point-in-time recovery with the avsybase command on page 118](#) describes how you can determine the label number of a backup to use for a point-in-time recovery with the `avsybase` command.

Performing restore and recovery

You can configure and perform a Sybase plug-in restore by using Avamar Administrator.

[Restore and recovery with the avsybase command on page 114](#) describes how to perform restore and recovery with the `avsybase` command.

NOTICE

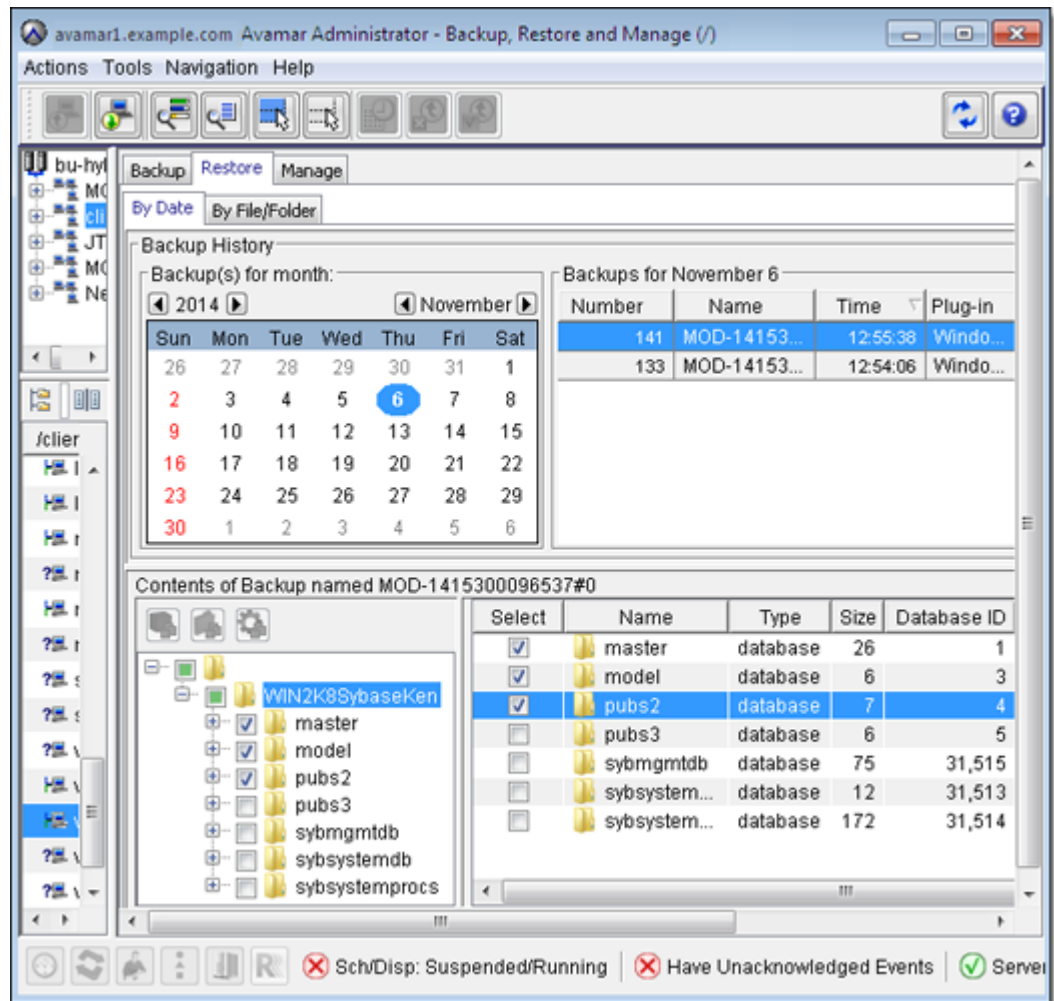
No error checking or validation is performed on free text entries in Avamar Administrator. In addition, free text entries override settings made by using the GUI controls (text boxes, checkboxes, radio buttons, and so forth).

Procedure

1. Start Avamar Administrator and log in.
2. In Avamar Administrator, click the **Backup & Restore** launcher button.
The **Backup, Restore and Manage** window appears.
3. Click the **Restore** tab.
The upper-left pane contains a list of domains.
4. Click the domain that contains the Sybase server host.
A list of Avamar clients appears in the pane below the domains list.
5. Select the Sybase server host. If the Sybase server is installed in a cluster, select the virtual server host.
6. Click the **Restore** tab.
7. Click the **By Date** tab.
8. Select a backup from the calendar:
 - a. Use the year and month navigational arrows to browse to a backup.
Dates highlighted by yellow indicate a valid backup was performed on that date.
 - b. Click a date highlighted by yellow.
A list of backups that were performed on that date appears in the **Backups** table next to the calendar.
9. Select the backup for restore from the **Backups** table.
10. Select the Sybase server or databases to restore in the **Contents of Backup** panes at the bottom of the window:
 - To restore all the databases backed up for the Sybase server, select the checkbox next to the Sybase server name in the folder tree in the bottom left pane.
 - To restore specific databases and their logs:
 - a. Double-click the Sybase server name in the folder tree in the bottom left pane.
All the databases in the backup appear in the bottom panes.
 - b. Select the checkboxes next to the databases that you want to restore, as shown in the following figure.

NOTICE

The master database must be the sole target of a restore operation. If you specify multiple databases for restore and one of the databases is the master database, the restore of the master database is skipped. [Recovery of the master database on page 85](#) provides more information about the recovery of the master database.



11. Select Actions > Restore Now.

The **Restore Options** dialog box appears.

Note

If you selected all the checkboxes in the bottom left pane under **Contents of Backup** in the previous window, the **Restore Options** dialog box displays *Entire contents of backup* under **Items Marked for Restore**.

12. Complete the settings in the **Restore Options** dialog box:

- If you want to perform a relocated recovery to a different Sybase host, click **Browse** next to the **Restore Destination Client** box and select the destination host in the **Browse for Restore Client** dialog box.
- From the **Restore Plug-in** menu, select the correct plug-in.

- c. From the **Avamar encryption method** list, select the encryption method for data transfer between the client and the Avamar server during the restore.

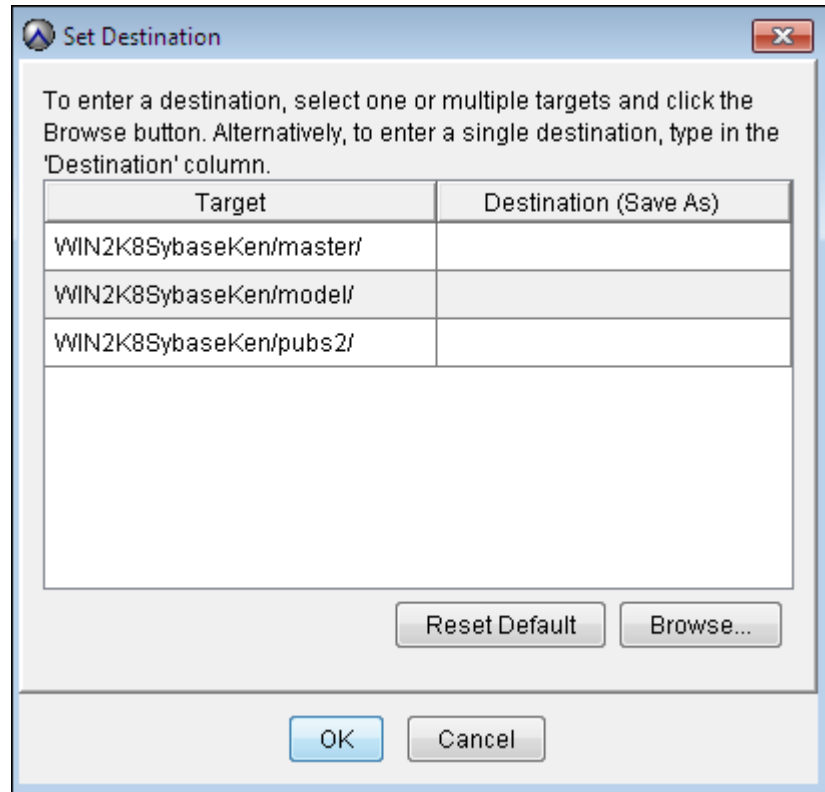
The encryption technology and bit strength used depend on several factors, including the client operating system and Avamar server version. The *EMC Avamar Product Security Guide* provides details.

- d. Select the proper choice in the **Restore Destination Choices** group box:
 - Select **Restore databases to original destinations (same server and database)** to restore databases to the same server and database names used in the source databases.
 - Select **Restore databases to different destinations (different server and database)** to perform a relocated restore of databases to different server or database names than used for the source databases. All the databases must be restored to the same destination server, either the source server or a different-named server.

For example, if you have a host that runs a Sybase production server with several production databases and you have backed up all the databases, you must select the proper restore destination choice based on the type of restore to be performed:

- To restore to the original production database on the same production server on the same production host, select **Restore databases to original destinations (same server and database)**.
 - To perform any of the following restores of the production database backup, select **Restore databases to different destinations (different server and database)**:
 - Restore to a testing database on the same production server on the same production host.
 - Restore to a testing database on a testing server on the same production host.
 - Restore to a testing database on a testing server on a testing host. In this case, you must also select the testing host through the **Restore Destination Client** box as described in step a.
- e. If you selected **Restore databases to different destinations (different server and database)**, specify the destinations in the **Items Marked for Restore** list:
 - a. Click **Set Destination**.

The **Set Destination** dialog box appears as shown in the following figure.



- b. Select each item in the **Target** column and perform either of the following actions:
- Type the destination as *server_name* or *server_name/database_name* in the **Destination (Save As)** column.
 - Click **Browse** to locate and select the destination, which then appears in the **Destination (Save As)** column.

When the **Browse Command Line Options** dialog box appears, type the required information for the destination Sybase server in the fields:

- In the **Sybase installation directory** field, type the full pathname of the Sybase installation directory for the destination server, represented by \$SYBASE on Linux or UNIX and %SYBASE% on Windows.
Do not type the environment variable \$SYBASE or %SYBASE% but type the actual text of the full pathname. For example, type **/sybase** instead of \$SYBASE.
- In the **Sybase server name** field, type the name of the destination Sybase server, which is not the hostname. For example, type **SERVER1**.
- In the **OCS library directory** field, type the full pathname of the Sybase OCS library directory, represented by \$SYBASE/\$SYBASE_OCS/lib on Linux or UNIX and %SYBASE%\%SYBASE_OCS%\dll on Windows.
Do not type any environment variable but type the actual text of the full pathname. For example, type **/sybase/OCS-15_0/lib** instead of \$SYBASE/\$SYBASE_OCS/lib.
- In the **Sybase username** field, type the Sybase username.
- In the **Sybase user password** field, type the Sybase user password.

You must restore all databases to the same destination server, either the source server or a different-named server.

You must specify all the required destination values or the subsequent restore operation fails.

- c. Click **OK** to close the **Set Destination** dialog box.

- f. Click **More Options** in the **Restore Options** dialog box.

The **Restore Command Line Options** dialog box appears.

13. Complete the settings in the **Restore Command Line Options** dialog box:

- a. To view the advanced options with red labels, select **Show Advanced Options** at the bottom of the dialog box.

NOTICE

Advanced options with red labels are optional and only used for special configurations. All the other options with black labels are mandatory.

- b. From the **Select Plug-in Type** menu, select the Sybase ASE plug-in.
- c. Complete the settings for the destination Sybase server in the **Sybase Information** group box:
 - In the **Sybase installation directory** field, type the full pathname of the Sybase installation directory for the destination server, represented by \$SYBASE on Linux or UNIX and %SYBASE% on Windows.
Do not type the environment variable \$SYBASE or %SYBASE% but type the actual text of the full pathname. For example, type **/sybase** instead of **\$SYBASE**.
 - In the **OCS library directory** field, type the full pathname of the Sybase OCS library directory, represented by \$SYBASE/\$SYBASE_OCS/lib on Linux or UNIX and %SYBASE%\%SYBASE_OCS%\dll on Windows.
Do not type any environment variable but type the actual text of the full pathname. For example, type **/sybase/OCS-15_0/lib** instead of **\$SYBASE/\$SYBASE_OCS/lib**.
 - In the **Sybase username** field, type the Sybase username.
 - In the **Sybase user password** field, type the Sybase user password.
- d. If required, select **Enable debugging messages** to enable logging of debug messages. [Logging information on page 122](#) provides details about logging.
- e. From the **Encryption method from Data Domain system** list, select the encryption method for data transfer between the client and the Data Domain system during the restore.
- f. Complete the settings in the **General Restore Options** group box:
 - From the **Maximum number of streams** menu, select the restore multi-streaming value, as the maximum number of databases to restore simultaneously. The default multi-streaming value is 1. [Multi-streaming on page 29](#) provides details.

NOTICE

A maximum multi-streaming value of 10 is enforced for GUI restores.

- From the **Restore data verification** menu, select the type of data verification to use:
 - Select **No verification** (default value) to not perform verification during the restore.
 - Select **Full verification** to use the Sybase `load` command option with `verify=full` to verify both the header information and rows structure, for full verification of the restore.
 - Select **Header verification** to use the Sybase `load` command option with `verify=header` to verify the page header information only.

[Database backup and restore verification on page 27](#) provides details.
- In the **Protected backup password** field, type the same password that was used for a password-protected backup, which the Sybase server uses with the Sybase `load` command option with `passwd=` to restore the backup. [Password-protected database backups and restores on page 27](#) provides details.
- g. For a point-in-time recovery, type the timestamp in the **Point-in-time recovery timestamp** field as described in [Requirements for point-in-time recovery on page 77](#).
- h. If required, select one or more choices in the **Perform consistency checks after restore group** box. You can select one or more types of database consistency checks to perform after the restore. [Database consistency checks on page 28](#) provides more information about the database consistency checks.
- i. If required, complete the settings in the **Pre and Postprocessing Options** group box:
 - In the **Preprocessing script** field, type the name of a preprocessing script to be run immediately before the restore.
 - In the **Postprocessing script** field, type the name of a postprocessing script to be run immediately after the restore.
- j. If required, click **More** to set additional options. The **Enter Attribute** and **Enter Attribute Value** fields appear.

For each additional option, type `[avsybase] option_name` (for example, `[avsybase] syb-language`) in the **Enter Attribute** field, and type the option value in the **Enter Attribute Value** field. Click **+** to add the option, and click **-** to remove the option from the list.

[Command Line Interface on page 93](#) provides details about the `avsybase` command options that the Sybase plug-in supports.

NOTICE

The Avamar software does not validate the option information you type in the **Enter Attribute** and **Enter Attribute Value** fields. In addition, the values in these fields override settings that you specify for the options with GUI controls (text boxes, checkboxes, radio buttons, and so forth) in Avamar Administrator.

In an I18N environment, you can set the `--syb-language` option value by using the **More** button. [Configuring I18N support on page 52](#) provides details about the option.

For example, to perform a point-in-time recovery to a time between a full backup and the preceding log (incremental) backup, you can use the **More** button and set

the options `--leave-offline`, `--postfix`, and `--postfix-only` in the **Enter Attribute** and **Enter Attribute Value** fields. [Point-in-time recovery with the avsybase command on page 118](#) provides more details about this type of point-in-time recovery.

14. Click **OK** to close the **Restore Command Line Options** dialog box.

15. Click **OK** to close the **Restore Options** dialog box and start the recovery.

Monitoring restores

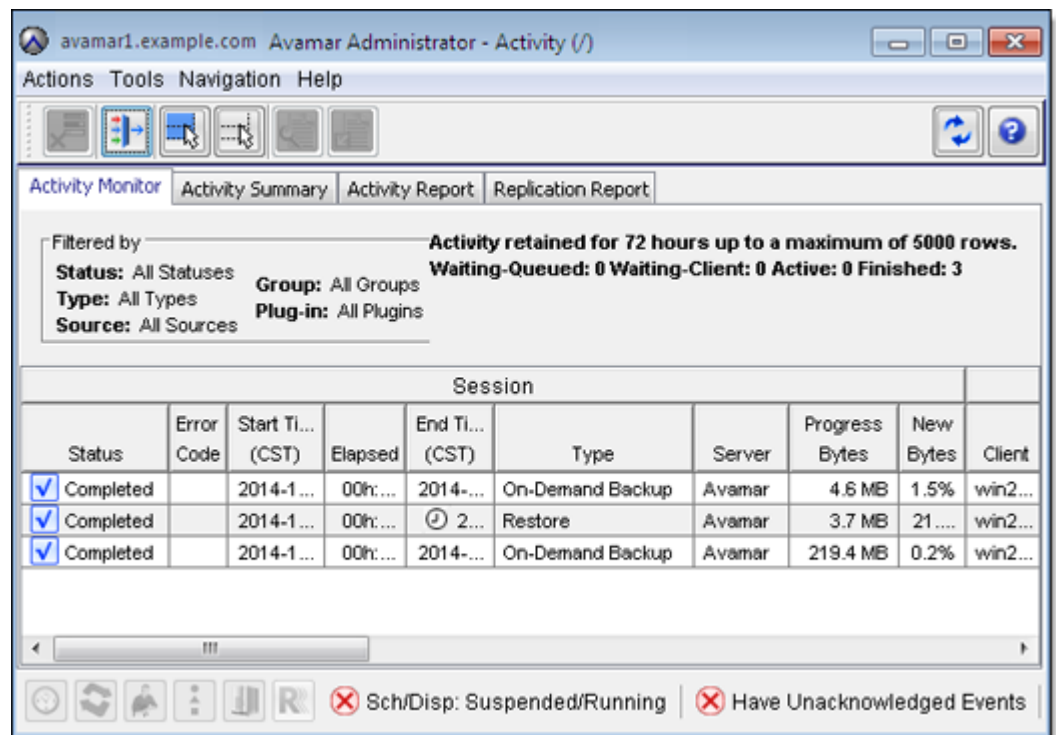
Avamar Administrator or the CLI where you start a Sybase restore displays operational messages about the status of the restore.

The Activity Monitor in Avamar Administrator displays status information for a restore started in the GUI, but not for a restore started with the CLI. The following figure shows an example display on the **Activity Monitor** tab.

Note

In a supported non-English environment, the session log information in the Activity Monitor might contain extra escape characters. You can view the correct information without escape characters in the restore log files as described in [Logging information on page 122](#).

Figure 5 Activity Monitor



Canceling restores

Procedure

- To cancel a CLI restore, press **CTRL-C**.

- To cancel a GUI restore, right-click the restore entry on the **Activity Monitor** tab in Avamar Administrator and select **Cancel Activity** from the menu.

Disaster recovery

Disaster recovery involves the recovery of the entire Sybase server to the original host or an alternate host.

[Complete backup protection on page 19](#) provides information on how to prepare a Sybase server environment for disaster recovery.

Each Sybase server has a master database that stores the system schema for the server. During a disaster recovery, you must ensure that the Sybase server is in master-recover mode and then you must restore the master database before all other databases. After you restore the master database, you must restart the Sybase server and then re-create and restore all the other databases on the Sybase server system.

Recovery of the master database

The master database might be lost or corrupted in the event of a disaster. The master database controls the operation of the Sybase server and stores information about all user databases and their associated database devices.

You must perform the following steps to recover only the Sybase master database when it is corrupted and cannot be repaired.

Procedure

1. Start the Sybase server in master-recover mode. The Sybase documentation provides details.
2. Perform a recovery of the master database by using the Sybase plug-in as you would for a regular database restore.

After the master database is brought online during the recovery, errors from CT-LIBRARY are reported because the Sybase server is shut down automatically. However, the Sybase plug-in command `avsybase` should return the exit code 0, which indicates the success of the recovery.

Example 3 Master database recovery

The following example shows the output displayed during the master database recovery:

```
2012-01-05 21:48:57 avsybase Info <0000>: Database 'master' is now online.
2012-01-05 21:48:57 avsybase Info <0000>: Error in layer name: 'CT-LIBRARY'.
2012-01-05 21:48:57 avsybase Info <14423>: ct_results(): network packet layer: internal net
library error: Net-Library operation terminated due to disconnect
2012-01-05 21:48:57 avsybase Info <0000>: Error in layer name: 'CT-LIBRARY'.
2012-01-05 21:48:57 avsybase Info <14423>: ct_cmd_drop(): user api layer: external error:
The connection has been marked dead.
2012-01-05 21:48:57 avsybase Warning <0000>: Sybase OCS function call 'ct_cmd_drop()' failed.
2012-01-05 21:48:59 avsybase Info <0000>: Leaving the 'master' database offline.
2012-01-05 21:49:00 avsybase Info <0000>: Final summary: number of subworks - 1, number of
cancelled/aborted subworks - 0, number of entries in the snapview - 0, exit code - 0.
2012-01-05 21:49:06 avsybase Info <0000>: Command 'avsybase' returned the exit code 0.
```

Recovery of the Sybase server

You must perform the following steps to recover the Sybase server after a disaster in which the whole Sybase system is completely lost.

Procedure

1. Reinstall the same operating system on the same host or a different host.
2. Reinstall the same Sybase ASE software into the same directory.
3. Re-create the Sybase ASE database server by using the same configuration (Sybase database server name and full path for all system database devices) and Sybase backup server.
4. Reinstall the same Avamar client and Avamar Plug-in for Sybase software.
5. Re-register with the same Avamar server and configure the Avamar Plug-in for Sybase software.
6. Use the Sybase plug-in to recover the Sybase master database, according to [Recovery of the master database on page 85](#).
7. Restart the Sybase database server in the normal way. Ignore errors for user databases that have not been recovered.
8. Use the printout of database device allocations to re-create the user databases. The Sybase documentation provides details on the information that should be tracked for disaster recovery.
9. Use the Sybase plug-in to recover all of the other Sybase system and user databases, according to the information in the preceding sections of this chapter.

APPENDIX A

Plug-in Options

This appendix includes the following topics:

- [How to set plug-in options](#).....88
- [Plug-in options in Avamar Administrator](#).....88

How to set plug-in options

You can specify plug-in options to control specific actions of a Sybase on-demand backup, scheduled backup, or restore with Avamar Administrator.

Use either of the following methods to specify the plug-in options in Avamar Administrator:

- Set the options with the GUI controls (text boxes, checkboxes, radio buttons, and so on) in different dialog boxes.
- Click **More** in the **Backup Command Line Options** or **Restore Command Line Options** dialog box, then type `[avsybase] option_name` in the **Enter Attribute** field and type the option value in the **Enter Attribute Value** field.

Use the **More** button to set only additional options that you cannot specify with the GUI controls. For example, if you specify the backup type as a full backup in the **Backup Command Line Options** dialog box, do not also click **More** and type `[avsybase] brtype` in the **Enter Attribute** field and do not type `full` in the **Enter Attribute Value** field.

[Command Line Interface on page 93](#) describes all the supported command line options for the `avsybase` command.

NOTICE

The Avamar software does not validate the option information you type in the **Enter Attribute** and **Enter Attribute Value** fields. In addition, the values in these fields override settings that you specify with the GUI controls for the options.

Plug-in options in Avamar Administrator

You can set plug-in options in Avamar Administrator for browse, backup, and restore operations with the Avamar Plug-in for Sybase (Sybase plug-in).

Browse options in Avamar Administrator

The following table describes the plug-in options that you can set in the **Browse Command Line Options** dialog box in Avamar Administrator, as required to prepare for Sybase plug-in backups and restores.

Table 5 Sybase browse options in Avamar Administrator

Browse option	How to set the option value
OCS library directory	Type the full pathname of the Sybase OCS library directory, represented by <code>\$SYBASE/\$SYBASE_OCS/lib</code> on Linux or UNIX and <code>%SYBASE%\%SYBASE_OCS%\dll</code> on Windows. Do not type any environment variable but type the actual text of the full pathname. For example, type <code>/sybase/OCS-15_0/lib</code> instead of <code>/sybase/OCS-15_0/lib</code> .
Sybase installation directory	Type the full pathname of the Sybase installation directory for the server to be backed up or the destination server, represented by <code>\$SYBASE</code> on Linux or UNIX and <code>%SYBASE%</code> on Windows. Do not type the environment variable <code>\$SYBASE</code> or <code>%SYBASE%</code> but type the actual text of the full pathname. For example, type <code>/sybase</code> instead of <code>\$SYBASE</code> .

Table 5 Sybase browse options in Avamar Administrator (continued)

Browse option	How to set the option value
Sybase server name	Type the Sybase server name, which is not the hostname. For example, type SERVER1.
Sybase username	Type the Sybase username.
Sybase user password	Type the Sybase user password.

Backup options in Avamar Administrator

The following table describes the plug-in options that you can set in either the **Backup Command Line Options** dialog box or the **New Dataset** dialog box in Avamar Administrator for the Sybase plug-in backups.

Note

You can view an option marked “(Advanced option)” in the following table only by selecting the **Show Advanced Options** checkbox in the **Backup Command Line Options** dialog box or the **Options** tab of the **New Dataset** dialog box.

Table 6 Sybase backup options in Avamar Administrator

Backup option	How to set the option value
Backup data verification	Select the type of backup data verification from the menu: <ul style="list-style-type: none"> No verification—(Default value) Do not perform verification during the backup. Full verification—Use the Sybase <code>dump</code> command option with <code>verify=full</code> to verify both the header information and rows structure, for full verification of the backup. Header verification—Use the Sybase <code>dump</code> command option with <code>verify=header</code> to verify the page header information only.
dbcc checalloc	(Advanced option) Select the checkbox to perform the dbcc checalloc database consistency check before the backup.
dbcc checkcatalog	(Advanced option) Select the checkbox to perform the dbcc checkcatalog database consistency check before the backup.
dbcc checkdb	(Advanced option) Select the checkbox to perform the dbcc checkdb database consistency check before the backup.
dbcc checkdb skip ncindex	(Advanced option) Select the checkbox to perform the dbcc checkdb skip ncindex database consistency check before the backup.
dbcc checkstorage	(Advanced option) Select the checkbox to perform the dbcc checkstorage database consistency check before the backup.
Enable debugging messages	(Advanced option) Select the checkbox to enable the logging of debug messages.
Encryption method to Data Domain system	If you store the backup on a Data Domain system, select the encryption method for data transfer between the client and the Data Domain system during the backup.
Full backup	Select this option to create a full copy of the selected databases, including both the data and transaction logs.
Incremental backup	Select this option to back up the transaction logs of the selected databases.

Table 6 Sybase backup options in Avamar Administrator (continued)

Backup option	How to set the option value
Incremental backup with no_truncate option	<p>(Advanced option) Select this option to run a Sybase <code>dump transaction</code> command with the <code>no_truncate</code> option, which performs an incremental backup that does not truncate the logs afterwards.</p> <p>NOTICE</p> <p>Use this option in a disaster recovery situation only. Do not use this option in a regular on-demand or scheduled backup.</p>
Log truncation with no_log option followed by full backup	<p>(Advanced option) Select this option to run a Sybase <code>dump transaction</code> command with the <code>no_log</code> option, which truncates the logs without logging the truncation. After the logs are truncated, the Sybase plug-in also performs a full backup of the database.</p> <p>NOTICE</p> <p>Use this option in a disaster recovery situation only. Do not use this option in a regular on-demand or scheduled backup.</p>
Log truncation with truncate_only option followed by full backup	<p>(Advanced option) Select this option to run a Sybase <code>dump transaction</code> command with the <code>truncate_only</code> option, which truncates the logs. After the logs are truncated, the Sybase plug-in also performs a full backup of the database.</p> <p>NOTICE</p> <p>Do not use this option in a regular on-demand or scheduled backup.</p>
Maximum number of streams	<p>Select the backup multi-streaming value from the menu, as the maximum number of databases to back up simultaneously.</p> <p>NOTICE</p> <p>A maximum multi-streaming value of 10 is enforced for GUI on-demand backups and scheduled backups.</p>
OCS library directory	<p>Type the full pathname of the Sybase OCS library directory, represented by <code>\$SYBASE/\$SYBASE_OCS/lib</code> on Linux or UNIX and <code>%SYBASE%\%SYBASE_OCS%\dll</code> on Windows.</p> <p>Do not type any environment variable but type the actual text of the full pathname. For example, type <code>/sybase/OCS-15_0/lib</code> instead of <code>\$SYBASE/\$SYBASE_OCS/lib</code>.</p>
Postprocessing script	<p>(Advanced option) Type the name of a postprocessing script to be run immediately after the backup.</p>
Preprocessing script	<p>(Advanced option) Type the name of a preprocessing script to be run immediately before the backup.</p>
Protected backup password	<p>(Advanced option) Type the password that the Sybase server uses with the Sybase <code>dump</code> command option with <code>passwd=</code> to implement a password-protected database backup.</p>
Store backup on Data Domain system	<p>Select the checkbox, and from the drop-down list, select the Data Domain system to use for backup through the DD Boost library.</p> <p>NOTICE</p> <p>This option is disabled if the Data Domain system has not been added on the Avamar server.</p>

Table 6 Sybase backup options in Avamar Administrator (continued)

Backup option	How to set the option value
Sybase installation directory	Type the full pathname of the Sybase installation directory for the server to be backed up, represented by \$SYBASE on Linux or UNIX and %SYBASE% on Windows. Do not type the environment variable \$SYBASE or %SYBASE% but type the actual text of the full pathname. For example, type /sybase instead of \$SYBASE .
Sybase username	Type the Sybase username.
Sybase user password	Type the Sybase user password.

Restore options in Avamar Administrator

The following table describes the plug-in options that you can set in the **Restore Command Line Options** dialog box in Avamar Administrator for Sybase plug-in restore and recovery operations.

Note

You can view an option marked “(Advanced option)” in the following table only by selecting the **Show Advanced Options** checkbox in the **Restore Command Line Options** dialog box.

Table 7 Sybase restore options in Avamar Administrator

Restore option	How to set the option value
dbcc checkalloc	(Advanced option) Select the checkbox to perform the dbcc checkalloc database consistency check after the restore.
dbcc checkcatalog	(Advanced option) Select the checkbox to perform the dbcc checkcatalog database consistency check after the restore.
dbcc checkdb	(Advanced option) Select the checkbox to perform the dbcc checkdb database consistency check after the restore.
dbcc checkdb skip ncindex	(Advanced option) Select the checkbox to perform the dbcc checkdb skip ncindex database consistency check after the restore.
dbcc checkstorage	(Advanced option) Select the checkbox to perform the dbcc checkstorage database consistency check after the restore.
Enable debugging messages	(Advanced option) Select the checkbox to enable the logging of debug messages.
Encryption method from Data Domain system	Select the encryption method for data transfer between the Data Domain system and the client during the restore.
Maximum number of streams	Select the restore multi-streaming value from the menu, as the maximum number of databases to restore simultaneously. NOTICE A maximum multi-streaming value of 10 is enforced for GUI restores.

Table 7 Sybase restore options in Avamar Administrator (continued)

Restore option	How to set the option value
OCS library directory	Type the full pathname of the Sybase OCS library directory, represented by <code>\$SYBASE/\$SYBASE_OCS/lib</code> on Linux or UNIX and <code>%SYBASE%\%SYBASE_OCS%\dll</code> on Windows. Do not type any environment variable but type the actual text of the full pathname. For example, type <code>/sybase/OCS-15_0/lib</code> instead of <code>\$SYBASE/\$SYBASE_OCS/lib</code> .
Point-in-time recovery timestamp	(Advanced option) For a point-in-time recovery, type the timestamp as described in Requirements for point-in-time recovery on page 77 .
Postprocessing script	(Advanced option) Type the name of a postprocessing script to be run immediately after the restore.
Preprocessing script	(Advanced option) Type the name of a preprocessing script to be run immediately before the restore.
Protected backup password	(Advanced option) Type the same password that was used for a password-protected backup, which the Sybase server uses with the Sybase <code>load</code> command option with <code>passwd=</code> to restore the backup.
Restore data verification	Select the type of restore data verification from the menu: <ul style="list-style-type: none"> No verification-(Default value) Do not perform verification during the restore. Full verification-Use the Sybase <code>load</code> command option with <code>verify=full</code> to verify both the header information and rows structure for full verification of the backup data. Header verification-Use the Sybase <code>load</code> command option with <code>verify=header</code> to verify the page header information only.
Sybase installation directory	Type the full pathname of the Sybase installation directory for the destination server, represented by <code>\$SYBASE</code> on Linux or UNIX and <code>%SYBASE%</code> on Windows. Do not type the environment variable <code>\$SYBASE</code> or <code>%SYBASE%</code> but type the actual text of the full pathname. For example, type <code>/sybase</code> instead of <code>\$SYBASE</code> .
Sybase username	Type the Sybase username.
Sybase user password	Type the Sybase user password.

APPENDIX B

Command Line Interface

This appendix includes the following topics:

- [Overview of CLI operations](#) 94
- [Command options](#) 96
- [Browse operations with the avsybase command](#) 108
- [On-demand backups with the avsybase command](#) 109
- [Restore and recovery with the avsybase command](#) 114

Overview of CLI operations

You can use the Avamar Plug-in for Sybase (Sybase plug-in) command, `avsybase`, and its options to perform the supported command line interface (CLI) operations.

NOTICE

On Microsoft windows, use the command name `avsybase.exe`.

If the value of an `avsybase` command option contains any spaces, enclose the value in double quotation marks, for example, `--flagfile="C:\Program Files\var\sybflags.txt"`. Otherwise, the operation might fail.

You can browse for Sybase data to back up and perform backup and restore operations with the Sybase plug-in software by using the `avsybase` command with the `--operation` option and other supported options. [Operation option on page 99](#) provides details on the command options to use for each supported operation.

You can specify the `avsybase` command options for a backup or restore by typing the options after the `avsybase` command. Alternatively, you can list the command options in an option file, as described in [Using an option file on page 94](#).

Launching the CLI

The `avsybase` binary is located in the `bin` subdirectory in the Avamar client installation directory.

Procedure

1. Open a command prompt.
2. Change to the appropriate directory to run the `avsybase` command.

The default directory locations of the `avsybase` binary on the supported operating systems are as follows:

- On AIX and Linux: `/usr/local/avamar/bin`
- On HP-UX and Solaris: `/opt/AVMRclnt/bin`
- On Windows: `C:\Program Files\avs\bin`

[Command options on page 96](#) includes a complete list of all the `avsybase` command options.

Using an option file

As an alternative to typing the command options after the `avsybase` command, you can set the command options in one of the following option files:

- The `avsybase.cmd` file that must be located in either of the following directories:
 - The Avamar `var` directory under the Avamar client installation directory. The default `var` directories are as follows:
 - On AIX and Linux: `/usr/local/avamar/var`
 - On HP-UX and Solaris: `/opt/AVMRclnt/var`

– On Windows: C:\Program Files\avs\var

- The directory specified with the `--vardir` option.

NOTICE

Use the `avsybase.cmd` file with caution. An option set in the `avsybase.cmd` file is applied to every `avsybase` process that runs on the system, including all the browse, backup, and restore processes started through the CLI or Avamar Administrator.

- An option file that you create as a text file. Specify the option file pathname with the `--flagfile` option.

Perform the following actions for security reasons:

- Encode the passwords that you specify with the `--password` and `--sybpassword` options. [Password encoding on page 96](#) provides details.
- Set the credential-related options `--id`, `--password`, `--syblogin`, and `--sybpassword` in an option file that is accessible only to the Sybase operating system user that performs the operation.

You must list each option on a separate line in the option file as shown in the following example:

```
--debug
```

```
--logfile=/sybase/logs/sybase.log
```

NOTICE

Due to an Avamar limitation, you cannot specify non-ASCII values for any options in the `avsybase.cmd` file or option file.

You can use the same option file for both backup and restore options, as required. You can also specify the command options after the `avsybase` command on the operating system command line, instead of listing the options in an option file.

If you set options in an option file, do not type the options after the `avsybase` command used for backups or restores. [Command options on page 96](#) provides details about any command options that you should and should not set in an option file.

For example, you can include all the following mandatory options for a backup or restore in the option file specified by `--flagfile=option_file_path` instead of specifying the options with the `avsybase` command:

```
--account=domain/client
--bindir=Avamar_binary_dir
--id=Avamar_server_username
--ocslibpath=OCS_libraries_path
--password=Avamar_server_password
--server=Avamar_server_name_or_IP_address
--sybase=Sybase_install_dir_path
--syblogin=Sybase_username
--sybpassword=Sybase_user_password
[--sybserver=]Sybase_server_name
```

Password encoding

You can use `avtar` to encode passwords that are entered through the command line or stored in script files, and then use the encoded string with the `--password` or `--sybpassword` option.

You must perform the required steps to encode passwords.

Procedure

1. Type the following command on the command line on the Avamar client (Sybase host):

```
avtar --encodepassword=password
```

where *password* is the password to encode.

The command returns an encoded string on the command line.

NOTICE

Each time you run the `avtar --encodepassword=password` command, the command returns a different encoded string. For example, running the same command twice yields different encoded strings, and you can use either string as a valid encoded password for a backup or restore.

2. Use the encoded string on the `avsybase` command line as the password with the `--password` or `--sybpassword` option.

Help

The `--help` option enables you to view the descriptive version of command line help.

Use the `--help` option to display a complete list of supported options with a description of each option:

```
avsybase --help
```

Use the `--usage` option to view a basic list of available options without a description of each option:

```
avsybase --usage
```

Version information

Use the `--version` option to view the build version information for the Sybase plug-in:

```
avsybase --version
```

Command options

The Sybase plug-in supports specific options with the `avsybase` command for Sybase backup and restore operations.

For operations performed with Avamar Administrator, you can optionally specify the `avsybase` command options in Avamar Administrator:

Procedure

1. Click **More** in the **Backup Command Line Options** dialog box for an on-demand backup, in the **Restore Command Line Options** dialog box for a restore, or on the **Options** tab when you create a dataset for a scheduled backup.
2. For each option, type `[avsybase] option_name` in the **Enter Attribute** field and the option value in the **Enter Attribute Value** field. Click **+** to add the option, and click **-** to remove the option from the list.

Specific options, such as `--ddr` or `--debug`, do not include an equal sign when you specify the options on the command line. When you specify one of these options in Avamar Administrator, set the option value to **True** in the **Enter Attribute Value** field. Use the **More** button to set only additional options that you cannot specify with the GUI controls.

NOTICE

The Avamar software does not validate the option information you type in the **Enter Attribute** and **Enter Attribute Value** fields. In addition, the values in these fields override settings that you specify for the options with GUI controls (text boxes, checkboxes, radio buttons, and so forth) in Avamar Administrator.

Synopsis

Consider the following guidelines when you type the `avsybase` command and the command options:

- Replace a variable value in italicized font with an actual valid value.
- Required options are not enclosed in any brackets.
- Optional options are enclosed in square brackets `[]`.
- Either/or choices are enclosed in curly brackets `{}`.
- If an option value contains any spaces, then enclose the value in double quotation marks, for example, `--flagfile="C:\Program Files\var\sybflags.txt"`.
- Specify the Sybase server name either as a separate item on the command line (without the `--sybserver` option) or as the `--sybserver` option value.
- Specify a database name either as a separate item on the command line (without the `--sybdb` option) or as the `--sybdb` option value. A database name specified as a separate item must also include the Sybase server name, for example, `Sybase_server_name/database_name`.
- Specify only one Sybase server name with the `--sybserver` option and only one database name with the `--sybdb` option.
- You can specify multiple database names as separate items (without the `--sybdb` option) in the `avsybase` command for a backup, restore, or print-headers operation.
- You can specify only one database name in the `avsybase` command for a check-db or list-times operation.

Note

When possible, specify the Sybase server name and any database names as separate items on the command line, without the `--sybserver` and `--sybdb` options. The `--sybserver` and `--sybdb` options will be deprecated in a future release. All the database names specified in the same `avsybase` command must include the same Sybase server name.

Perform the following actions for security reasons:

- Encode the passwords that you specify with the `--password` and `--sybpassword` options. [Password encoding on page 96](#) provides details.
- Set the credential-related options `--id`, `--password`, `--syblogin`, and `--sybpassword` in an option file that is accessible only to the Sybase operating system user that performs the operation.

The following synopsis describes the `avsybase` commands and options used for browse, backup, restore and recovery, and other miscellaneous operations with the Sybase plug-in.

```
avsybase --operation=browse
--account=domain/client --bindir=Avamar_binary_dir
--flagfile=option_file_path --id=Avamar_server_username
--ocslibpath=OCS_libraries_path --password=Avamar_server_password
--sybase=Sybase_install_dir_path --syblogin=Sybase_username
--sybpassword=Sybase_user_password [--sybserver=Sybase_server_name
| Sybase_server_name]
```

All the listed options are mandatory for a browse operation.

```
avsybase [--operation=backup]
--account=domain/client [--ase-password=backup_password]
[--ase-verify=verification_level] [--brtype=backup_type]
--bindir=Avamar_binary_dir [--dbcc-checkalloc | --dbcc-checkcatalog
| --dbcc-checkdb | --dbcc-checkdb-skip-ncindex | --dbcc-checkstorage]
[--ddr [--ddr-index=index_number]] [--debug]
[--expires=number_of_days_or_timestamp] --flagfile=option_file_path
--id=Avamar_server_username [--logfile=log_file_path]
[--max-streams=multi-streaming_value] [--no-backup] [--no-log]
[--no-truncate] [--no-truncate-mixed]
--ocslibpath=OCS_libraries_path --password=Avamar_server_password
[--retention-type=type] [--run-at-end=script_path]
[--run-at-start=script_path]
--server=Avamar_server_name_or_IP_address [--shrink-log]
--sybase=Sybase_install_dir_path
[Sybase_server_name[/database_name1]
[Sybase_server_name[/database_name2] ...]]
[--sybdb=Sybase_database_name] [--sybdebug=syblogs_debug_level]
[--syblanguage=vendor_locale] --syblogin=Sybase_username
[--syblogs=syblogs_dir_path] --sybpassword=Sybase_user_password
{--sybserver=Sybase_server_name | Sybase_server_name}
[--truncate-all] [--var-dir=var_dir_path]
```

The default value of the `--operation` option is `backup`.

```
avsybase --operation=restore
--account=domain/client [--ase-password=backup_password]
[--ase-verify=verification_level] --bindir=Avamar_binary_dir
[--dbcc-checkalloc | --dbcc-checkcatalog | --dbcc-checkdb |
--dbcc-checkdb-skip-ncindex | --dbcc-checkstorage] [--debug]
--flagfile=option_file_path --id=Avamar_server_username
[--labelnum=label_number] [--leave-offline]
[--logfile=log_file_path] [--max-streams=multi-streaming_value]
```

```
--ocslibpath=OCS_libraries_path --password=Avamar_server_password
[--pointintime=date_and_time] [--postfix=backup_name
[--postfix_only]] [--restore-destination=restore_type]
[--run-at-end=script_path] [--run-at-start=script_path]
--server=Avamar_server_name_or_IP_address
--sybase=Sybase_install_dir_path
[Sybase_server_name[/database_name1]
[Sybase_server_name[/database_name2] ...]]
[--sybdb=Sybase_database_name] [--sybdebug=syblogs_debug_level]
[--syblanguage=vendor_locale] --syblogin=Sybase_username
[--syblogs=syblogs_dir_path] --sybpassword=Sybase_user_password
{--sybserver=Sybase_server_name | Sybase_server_name}
[--target=destination_Sybase_server_name[/database_name]]
[--vardir=var_dir_path]
```

```
avsybase --operation=check-db
--account=domain/client --bindir=Avamar_binary_dir
[--dbcc-checkalloc | --dbcc-checkcatalog | --dbcc-checkdb |
--dbcc-checkdb-skip-ncindex | --dbcc-checkstorage]
--flagfile=option_file_path --id=Avamar_server_username
--ocslibpath=OCS_libraries_path --password=Avamar_server_password
--server=Avamar_server_name_or_IP_address
--sybase=Sybase_install_dir_path
[Sybase_server_name[/database_name]] [--sybdb=Sybase_database_name]
--syblogin=Sybase_username --sybpassword=Sybase_user_password
{--sybserver=Sybase_server_name | Sybase_server_name}
```

```
avsybase --operation=list-times
--account=domain/client --bindir=Avamar_binary_dir
--flagfile=option_file_path --id=Avamar_server_username
[--labelnum=label_number] --password=Avamar_server_password
[--pointintime=date_and_time]
--server=Avamar_server_name_or_IP_address
[--sybdb=Sybase_database_name | Sybase_server_name/database_name]
{--sybserver=Sybase_server_name | Sybase_server_name}
```

```
avsybase --operation=print-headers
--account=domain/client --bindir=Avamar_binary_dir
--flagfile=option_file_path --id=Avamar_server_username
[--labelnum=label_number] --ocslibpath=OCS_libraries_path
--password=Avamar_server_password
--server=Avamar_server_name_or_IP_address
--sybase=Sybase_install_dir_path
[Sybase_server_name[/database_name1]
[Sybase_server_name[/database_name2] ...]]
--syblogin=Sybase_username --sybpassword=Sybase_user_password
{--sybserver=Sybase_server_name | Sybase_server_name}
```

Operation option

Except for a backup operation, you must always use the `--operation` option with the `avsybase` command to specify one of the supported operations listed in the following table.

Note

If you use the `--operation` option without specifying an operation, a backup is performed without error.

Table 8 Operations supported with avsybase command

Operation option	Description
--operation=browse	Returns information on all the databases on the Sybase server that are available for backup. With this option, use only certain other options, as described in Synopsis on page 97 .
--operation=backup	<p>Default value of the --operation option. Performs an on-demand backup of the specified Sybase database or server.</p> <p>With this option, use any of the options described in Common options on page 101 on and Backup options on page 105.</p>
--operation=check-db	<p>Performs a database consistency check as a manual operation, separate from any backup or restore operation. With this option, use only certain other options, as described in Synopsis on page 97.</p> <p>You can optionally include any of the following options to specify the type of consistency checks to perform:</p> <ul style="list-style-type: none"> • --dbcc-checkalloc—Specifies to perform a Sybase checkalloc check. • --dbcc-checkcatalog—Specifies to perform a Sybase checkcatalog check. • --dbcc-checkdb—Specifies to perform a Sybase checkdb check. • --dbcc-checkdb-skip-ncindex—Specifies to perform a Sybase checkdb check with the skip_ncindex option. • --dbcc-checkstorage—Specifies to perform a Sybase checkstorage check. <p>If you do not include any of these five options, then the database consistency check performs a Sybase checkdb check by default. The Sybase documentation provides more details about database consistency checks.</p> <p>You can optionally specify a particular database for the consistency check. If you do not specify a database, then the consistency check occurs on every database of the Sybase server.</p>
--operation=list-times	<p>Performs an operation to list the label numbers and the “old time” and “new time” values of a backup as used to verify the backup and provide details about the backup available for restore. The “old time” and “new time” values are obtained by doing a partial restore of the backup data. The list time values are based on when the backup was performed and might vary slightly from the actual times.</p> <p>Point-in-time recovery with the avsybase command on page 118 describes how to use this option.</p> <div style="border: 1px solid black; padding: 2px; margin: 10px 0;">NOTICE</div> <p>You must specify the Sybase server name in the avsybase command for the list-times operation. If you do not specify the server name, the list-times operation fails.</p>
--operation=print-headers	<p>Performs an operation to restore the header information of a backup and print this information, which includes (in Sybase native format) the sequence dates covered by a transaction log backup. The following example shows the header information:</p> <pre style="background-color: #f0f0f0; padding: 10px;">avsybase Info <0000>: Log begins on page 76804; checkpoint RID=Rid pageid = 0x14f65; row num = 0x2d; previous BEGIN XACT RID=(Rid pageid = 0x12c04; row num = 0x1); sequence dates: (old=Mar 9 2013 8:10:50:963AM, new=Mar 9 2013 8:16:45:650AM); truncation page=85861; 10 pages deallocated; requires database with 102400 pages.</pre>

Table 8 Operations supported with avsybase command (continued)

Operation option	Description
	<p>The highlighted “old” and “new” sequence dates indicate the exact time range covered by a transaction log backup and enable you to determine which log backup to use for a point-in-time recovery.</p> <p>Use this operation only if the list-times operation fails to provide an exact enough time range for a point-in-time recovery.</p>
<code>--operation=restore</code>	Performs a restore or recovery of the specified Sybase database or server. With this option, use any of the options described in Common options on page 101 and Restore and recovery options on page 107 .

Common options

Common options are used for multiple operations with avsybase command . You can use specific options for backup, restore, browse, check-db, list-times, and print-headers operations as described in [Synopsis on page 97](#).

The following common options are available for the avsybase command.

Table 9 Common options for both backups and restores with avsybase command

Common option	Description
<code>--account=domain/client</code>	<p>Mandatory for backups and restores. Specifies the Avamar client to back up or restore from, with the following format:</p> <p><i>domain/client</i></p> <p>where <i>domain</i> is the Avamar domain to which the client belongs and <i>client</i> is the client computer name registered on the Avamar server.</p>
<code>--ase-password=backup_password</code>	Optional. Specifies the password that the Sybase server uses with the Sybase dump or load command option with <code>passwd=</code> to implement a password-protected backup or restore. The same password used during a password-protected backup must be specified for the restore of the backup.
<code>--ase-verify=verification_level</code>	<p>Optional. Specifies the level of backup data verification. The <i>verification_level</i> value can be one of the following values:</p> <ul style="list-style-type: none"> <code>full</code>—Specifies to use the Sybase dump or load command option with <code>verify=full</code> to verify both the header information and rows structure for full verification of the backup data. <code>header</code>—Specifies to use the Sybase dump or load command option with <code>verify=header</code> option to verify the page header information only. <code>verifyonly</code>—(CLI restore only) Specifies to use the Sybase load command option with <code>verify=verifyonly</code> to verify minimal header information without restoring the database.
<code>--bindir=Avamar_binary_dir</code>	Mandatory for backups and restores. Specifies the full pathname of the directory location of the Avamar binaries.

Table 9 Common options for both backups and restores with avsybase command (continued)

Common option	Description
--dbcc-checkalloc --dbcc-checkcatalog --dbcc-checkdb --dbcc-checkdb-skip-ncindex --dbcc-checkstorage	<p>Optional. Specifies the type of database consistency check to perform before the start of a backup or after the end of a restore:</p> <ul style="list-style-type: none"> dbcc-checkalloc—Specifies to perform a Sybase checkalloc check. dbcc-checkcatalog—Specifies to perform a Sybase checkcatalog check. -dbcc-checkdb—Specifies to perform a Sybase checkdb check. dbcc-checkdb-skip-ncindex—Specifies to perform a Sybase checkdb check with the skip_ncindex option. dbcc-checkstorage—Specifies to perform a Sybase checkstorage check. <p>If you do not include any of these five options, then the Sybase plug-in does not perform a database consistency check during the backup or restore. The Sybase documentation provides more details about database consistency checks.</p>
--debug	Optional. Enables debugging messages to be printed for a browse, backup, or restore operation.
--flagfile= <i>option_file_path</i>	<p>Recommended for backups and restores. Specifies the full pathname of an option file on the Avamar client that contains avsybase command options. You can optionally include any of the avsybase command options in the file. Each option must appear on a separate line.</p> <p>Perform the following actions for security reasons:</p> <ol style="list-style-type: none"> 1. Encode the passwords that you specify with the --password and --sybpassword options. Password encoding on page 96 provides details. 2. Set the credential-related options --id, --password, --syblogin, and --sybpassword in an option file that is accessible only to the Sybase operating system user that performs the operation.
--id= <i>Avamar_server_username</i>	<p>Mandatory for backups and restores. Specifies the Avamar server username for authentication.</p> <p>You can specify the values for the --id and --account options at the same time by specifying --id=<i>user@domain/client</i>.</p> <div style="background-color: #005596; color: white; padding: 2px; text-align: center;">NOTICE</div> <p>For security reasons, set this option in an option file specified with the --flagfile option and accessible only to the Sybase operating system user that performs the operation.</p>
--logfile= <i>log_file_path</i>	<p>Optional. Specifies the full pathname of the alternative log file to contain all messages that the Sybase plug-in and its spawned processes print to stdout and stderr:</p> <ul style="list-style-type: none"> If the log file does not already exist, the log file is created. If the log file already exists, logging information is appended to the file.

Table 9 Common options for both backups and restores with avsybase command (continued)

Common option	Description
	<ul style="list-style-type: none"> If this option is not specified, CLI operations do not create a log file and logging is disabled. <p>Logging information on page 122 provides details about log files created for operations performed with Avamar Administrator.</p> <hr/> <p>Note</p> <p>To enable debugging messages, you must also specify the <code>--debug</code> option. Debugging is not enabled by default.</p> <hr/>
<code>--max-streams=multi_streaming_value</code>	Optional. Specifies the multi-streaming value, as the maximum number of databases that can be backed up or restored at the same time. The default value is 1. There is no enforced maximum value for CLI operations with the <code>avsybase</code> command. Software processes on page 30 provides details.
<code>--ocslibpath=OCS_libraries_path</code>	Mandatory for backups and restores. Specifies the full pathname of the directory location of the OCS libraries on the Sybase server.
<code>--password=Avamar_server_password</code>	<p>Mandatory for backups and restores. Specifies the password of the Avamar server account, which can be a password that was encoded with the <code>avtar --encodepassword</code> command.</p> <p>Perform the following actions for security reasons:</p> <ol style="list-style-type: none"> 1. Encode the password that you specify with this option according to Password encoding on page 96. 2. Set this option in an option file specified with the <code>--flagfile</code> option and accessible only to the Sybase operating system user that performs the operation.
<code>--run-at-end=script_path</code>	Optional. Specifies the name of a postprocessing script to be run immediately after a backup or restore.
<code>--run-at-start=script_path</code>	Optional. Specifies the name of a preprocessing script to be run immediately before a backup or restore.
<code>--server=Avamar_server_name_or_IP_address</code>	Mandatory for backup, restore, list-times, and print-headers operations. Specifies the DNS hostname or IP address of the Avamar server.
<code>--sybase=Sybase_install_dir_path</code>	Mandatory for backups and restores. Specifies the full pathname of the Sybase installation root directory.
<code>Sybase_server_name[/database_name1]</code> <code>[Sybase_server_name[/database_name2]...]</code>	<p>Mandatory for all operations with the <code>avsybase</code> command if you do not use the <code>--sybserver</code> option. Specifies the Sybase instance name of the Sybase server, which is not the Sybase hostname, and (except for a list-times operation) optionally a database name. If the Sybase server is in a cluster, specify the virtual server name.</p> <p>Instead of or in addition to using the <code>--sybserver</code> option, you can specify the Sybase server name separately (without the <code>--sybserver</code> option) in the command. For a backup or restore, you can optionally include a database name instead of using the <code>--sybdb</code> option, for example,</p>

Table 9 Common options for both backups and restores with avsybase command (continued)

Common option	Description
	<p><i>Sybase_server_name/database_name</i>. You can specify one or more database names in this format in the same backup or restore command.</p> <hr/> <p>Note</p> <p>When possible, specify the Sybase server name and any database names separately in the command instead of using the <code>--sybserver</code> and <code>--sybdb</code> options. You must separate multiple names with a space.</p> <hr/>
<code>--sybdb=<i>Sybase_database_name</i></code>	<p>Optional. Specifies a Sybase database name for the backup or restore. If you do not specify a database name, the whole Sybase server instance is backed up or restored. You can specify only one database name with the <code>--sybdb</code> option.</p> <p>Instead of or in addition to using the <code>--sybdb</code> option, you can specify one or more database names separately (without the <code>--sybdb</code> option) in the same backup or restore command. You must include the Sybase server name with each database name, for example, <i>Sybase_server_name/database_name</i>.</p>
<code>--sybdebug=<i>syblogs_debug_level</i></code>	<p>Optional. Specifies the debug level for the <code>libsybase_avamar.x</code> logs, which takes effect only if <code>--syblogs</code> is specified. The level can be either of the following levels:</p> <ul style="list-style-type: none"> 0—Default value. Specifies that entry and exit messages of read and write functions are not printed. Positive number—Specifies that entry and exit messages of read and write functions are printed.
<code>--syb-language=<i>vendor_locale</i></code>	<p>Optional. Specifies the locale for the Sybase OCL session in an I18N environment. The locale must be a proper <i>vendor_locale</i> value from the <code>locales.dat</code> file entry, as described in Configuring I18N support on page 52.</p>
<code>--syblogin=<i>Sybase_username</i></code>	<p>Mandatory for backups and restores. Specifies the Sybase username of the Sybase server account.</p> <p>Store this option in an option file.</p>
<code>--syblogs=<i>syblogs_dir_path</i></code>	<p>Optional. Specifies the full pathname of a directory for the <code>libsybase_avamar.x</code> logs. If you do not specify this option, the <code>libsybase_avamar.x</code> logs are not written.</p>
<code>--sybpassword=<i>Sybase_user_password</i></code>	<p>Mandatory for backups and restores. Specifies the Sybase user password of the Sybase server account, which can be a password that was encoded with the <code>avtar --encodepassword</code> command.</p> <p>Perform the following actions for security reasons:</p> <ol style="list-style-type: none"> 1. Encode the password that you specify with this option according to Password encoding on page 96. 2. Set this option in an option file specified with the <code>--flagfile</code> option and accessible only to the Sybase operating system user that performs the operation.

Table 9 Common options for both backups and restores with avsybase command (continued)

Common option	Description
<code>--sybserver=Sybase_server_name</code>	<p>Mandatory for all operations with the <code>avsybase</code> command unless you specify the Sybase server name separately (without the <code>--sybserver</code> option) in the command. Specifies the Sybase instance name of the Sybase server, which is not the Sybase hostname. If the Sybase server is in a cluster, specify the virtual server name.</p> <p>Instead of using the <code>--sybserver</code> option, you can specify the Sybase server name separately in the command and optionally include a database name, for example, <code>Sybase_server_name[/database_name]</code>.</p>
<code>--vardir=var_dir_path</code>	<p>Optional. Specifies the full pathname of the Avamar <code>var</code> directory. If this option is not set, the default location is the Avamar data directory in the home directory of the user that runs the <code>avsybase</code> command.</p> <hr/> <p>Note</p> <p>You cannot specify this option in the <code>avsybase.cmd</code> file, which must be stored in the directory specified by the <code>--vardir</code> option.</p>

Backup options

Backup options for the `avsybase` command enable you to control the backup operations. Many of these options are the same as the plug-in options that you specify in Avamar Administrator when you perform an on-demand backup or create a dataset for scheduled backups.

The following `avsybase` options are available for backup operations. With these backup options, use the `--operation=backup` option from [Operation option on page 99](#) and any additional common options from [Common options on page 101](#).

Table 10 Options for backups with avsybase command

Backup option	Description
<code>--brtype=backup_type</code>	<p>Optional. Specifies the type of backup to perform. The <code>backup_type</code> value must be one of the following values:</p> <ul style="list-style-type: none"> <code>full</code>—Default value. Backs up the entire database, including the transaction log in the database. <code>incremental</code>—Backs up only the transaction logs. <code>truncate</code>—Performs a truncation backup as described in Monitoring backups on page 71. <hr/> <p>NOTICE</p> <p>You can create only a full backup for a database that does not support incremental (transaction log) backups, such as the master database with its data and log on the same device. If you try to perform an incremental backup of such a database, a full backup is performed instead.</p>

Table 10 Options for backups with avsybase command (continued)

Backup option	Description
--ddr	Optional. Specifies that the backup is performed by using the DD Boost library to save the data directly on a Data Domain system instead of an Avamar server.
--ddr-index= <i>index_number</i>	Optional. Specifies the index number (1, 2, 3, or so on) of the Data Domain system on which the backup is stored. An index number is assigned to the Data Domain system when the system is added to the Avamar server configuration. If you do not use this option or you specify --ddr-index=0, then the Avamar server assigns a Data Domain system for the backup.
--expires= <i>number_of_days_or_timestamp</i>	Optional. Specifies the backup expiration as a number of days from today or as an absolute timestamp.
--label= <i>name</i>	Specifies a label name for the backup.
--no-backup	Optional. Specifies to disable a database backup after a log truncation operation.
--no-log	Optional. Specifies to disable logging of a log truncation operation. NOTICE Use this option in a disaster recovery situation only.
--no-truncate	Optional. Specifies to disable log truncation after an incremental (log) backup. NOTICE Use this option in a disaster recovery situation only as described in Monitoring backups on page 71 .
--no truncate-mixed	Optional. Specifies to disable log truncation after a full backup for all database types. Log truncation after full backup on page 111 provides details.
--retention-type= <i>type</i>	Optional. Specifies the type of advanced retention to assign to the backup. The <i>type</i> value is a quoted string that can be either (a) one of the following values or (b) a combination of any of the final four values as follows: <ul style="list-style-type: none"> • none—Do not explicitly assign any retention type to the backup. Treat the backup as a normal on-demand backup. • daily—Designate the backup as a daily backup. • weekly—Designate the backup as a weekly backup. • monthly—Designate the backup as a monthly backup. • yearly—Designate the backup as a yearly backup. For example, specify <code>daily, yearly</code> as the value for the type of advanced retention.
--shrink-log	Optional for a Sybase 15.7.x database backup only. Specifies to perform a shrink log operation during a database backup, which removes any hole that exists at the end of the database. Such a hole is created when the Sybase

Table 10 Options for backups with avsybase command (continued)

Backup option	Description
	15.7.x parameter <code>log off</code> is used to remove portions of a database log. The <code>--shrink-log</code> option is ignored for backups with Sybase 15.5 or earlier.
<code>--truncate-all</code>	Optional. Specifies to enable log truncation after a full backup for all database types except read-only databases. Log truncation after full backup on page 111 provides details.

Restore and recovery options

Restore and recovery options for the `avsybase` command enable you to control restore operations. Many of these options are the same as the plug-in options that you specify in Avamar Administrator when you perform a restore.

The following `avsybase` options are available for the restore operation. With these restore and recovery options, use the `--operation=restore` option from "Operation option" and any additional common options from "Common options."

Table 11 Options for restore and recovery with avsybase command

Restore and recovery option	Description
<code>--label=name</code>	Specifies a label name for the backup to restore.
<code>--labelnum=label_number</code>	Mandatory for a point-in-time recovery only. Specifies the label number of the backup to restore for the point-in-time recovery.
<code>--leave-offline</code>	Optional. Specifies to not bring databases online after a restore.
<code>--pointintime=date_and_time</code>	<p>Mandatory for a point-in-time recovery only. Specifies a date and time for a point-in-time recovery. The recovery process stops at the first date and time that is exactly at or after the specified date and time.</p> <p>Specify the date and time as a quoted string in the format "<i>yyyy-mm-dd hh:mm:ss</i>". For example, specify "2013-02-25 14:15:45" for the date February 25, 2013 and time 2:15:45 p.m.</p>
<code>--postfix=backup_name</code>	<p>Optional. Specifies the quoted name of the backup for recovery, such as "f-0" or "i-2":</p> <ul style="list-style-type: none"> If used with the <code>--postfix-only</code> option, then only the named backup is restored. If used without the <code>--postfix-only</code> option, then all the backups in a sequence are stored, ending with the named backup, for example, ending with the i-2 backup. <div style="border: 1px solid black; background-color: #005596; color: white; padding: 2px; text-align: center; margin: 10px 0;">NOTICE</div> <p>Use the <code>--postfix</code> option only in special cases, such as when the regular point-in-time recovery fails or you need to restore a particular backup individually.</p>

Table 11 Options for restore and recovery with avsybase command (continued)

Restore and recovery option	Description
<code>--postfix-only</code>	Optional. Specifies to restore only the backup specified by the <code>--postfix</code> option.
<code>--target=<i>destination_Sybase_server_name</i> [/<i>database_name</i>]</code>	Optional. Specifies the Sybase instance and (optionally) database on the destination host to which the data is restored in a relocated recovery, where <i>destination_Sybase_server_name</i> is the name of the destination instance and, if specified, <i>database_name</i> is the name of the destination database. If the <code>--target</code> option is not specified, the backup is restored to the original source instance.

Browse operations with the avsybase command

You can perform an on-demand browse operation by running the `avsybase` command (or `avsybase.exe` on Microsoft Windows) with the `--operation= browse` option and other supported options on the operating system command line.

[Overview of CLI operations on page 94](#) provides details on the `avsybase` command options and how to launch a browse operation with the `avsybase` command.

The browse operation returns a list of data on the Sybase host client that is available for backup. The command results appear as standard output in the command window. The following information appears for each entry:

- Name
- Date
- Size
- Type
- User

The data is sorted alphabetically by name.

Use the following browse command to return a list of all the databases on the Sybase host:

```
avsybase --operation=browse --flagfile=option_file_path
```

In this example, the option file specified by `--flagfile=option_file_path` contains all the mandatory options, which are not included with the `avsybase` command.

Perform the following actions for security reasons:

- Encode the passwords that you specify with the `--password` and `--sybpassword` options. [Password encoding on page 96](#) provides details.
- Set the credential-related options `--id`, `--password`, `--syblogin`, and `--sybpassword` in an option file that is accessible only to the Sybase operating system user that performs the operation.

If the other mandatory options are included with the `avsybase` command line, the browse command becomes as follows:

```
avsybase --operation=browse --flagfile=option_file_path
--account=domain/client --bindir=Avamar_binary_dir
--ocslibpath=OCS_libraries_path --sybase=Sybase_install_dir_path
Sybase_server_name
```

On-demand backups with the avsybase command

You can initiate an on-demand backup of Sybase data by running the `avsybase` command (or `avsybase.exe` on Microsoft Windows) with the `--operation=backup` option and other supported options on the operating system command line.

[Overview of CLI operations on page 94](#) provides details on the `avsybase` command options for Sybase backups and how to launch an on-demand backup with the `avsybase` command.

Instead of setting command options on the `avsybase` command line, you can use an option file to set the options as described in [Using an option file on page 94](#).

Perform the following actions for security reasons:

- Encode the passwords that you specify with the `--password` and `--sybpassword` options. [Password encoding on page 96](#) provides details.
- Set the credential-related options `--id`, `--password`, `--syblogin`, and `--sybpassword` in an option file that is accessible only to the Sybase operating system user that performs the operation

A backup with the `avsybase` command can back up one or more specified databases or all the databases on a Sybase server.

A backup with Avamar Administrator can also back up one or more databases on a Sybase server. The following sections describe how to use Avamar Administrator to perform a backup:

- [Performing on-demand backups on page 56](#)
- [Scheduling backups on page 62](#)

Full backups with the avsybase command

A full backup backs up all the data in one or all of the databases on a Sybase server.

[Full backups on page 20](#) provides more information on Sybase full backups.

Full backup of Sybase server

You can perform a full backup with the `avsybase` command to back up all the databases on the Sybase server, including the transaction logs of each database.

The following example `avsybase` command performs a full backup of the whole Sybase server:

```
avsybase [--operation=backup] [--brtype=full]
--flagfile=option_file_path
```

The options `--operation` and `--brtype` are optional for a full backup. In this example, the option file specified by `--flagfile=option_file_path` contains all the mandatory options, which are not included with the `avsybase` command.

Perform the following actions for security reasons:

- Encode the passwords that you specify with the `--password` and `--sybpassword` options. [Password encoding on page 96](#) provides details.
- Set the credential-related options `--id`, `--password`, `--syblogin`, and `--sybpassword` in an option file that is accessible only to the Sybase operating system user that performs the operation.

If the other mandatory options are included with the `avsybase` command, the command for the full backup becomes as follows:

```
avsybase [--operation=backup] [--brtype=full]
--flagfile=option_file_path --account=domain/client
--bindir=Avamar_binary_dir --ocslibpath=OCS_libraries_path
--server=Avamar_server_name_or_IP_address
--sybase=Sybase_install_dir_path Sybase_server_name
```

For example, the following command performs a full backup of all the Sybase databases on the Sybase server named SYBASE_SERVER1 in the sybase domain and stores the backup on the Avamar server with the hostname avamar-1.example.com:

```
avsybase --operation=backup --brtype=full
--flagfile=/secure/options.txt --account=/sybase/host1
--bindir=/usr/local/avamar/bin --ocslibpath=/sybase/OCS-15_0/lib
--server=avamar-1.example.com --sybase=/sybase SYBASE_SERVER1
```

For example, the following command performs a full backup of all the Sybase databases on the Sybase server named SYBASE_SERVER1 in the sybase domain and stores the backup on the first Data Domain system that was added to the Avamar configuration. Use the `--ddr` option and (optional) `--ddr-index` option to specify a backup to a Data Domain system:

```
avsybase --operation=backup --brtype=full
--flagfile=/secure/options.txt --account=/sybase/host1
--bindir=/usr/local/avamar/bin --ocslibpath=/sybase/OCS-15_0/lib
--server=avamar-1.example.com --sybase=/sybase SYBASE_SERVER1 --ddr
--ddr-index=1
```

Full backup of specified databases

You can perform a full backup with the `avsybase` command to back up one or more specified databases on the Sybase server, including the transaction logs of the databases.

Note

You can specify only one database name with the `--sybdb` option. You can use only one `--sybdb` option per `avsybase` command. However, you can specify multiple database names separately in the command without using the `--sybdb` option.

The following example `avsybase` command performs a full backup of two specified databases:

```
avsybase [--operation=backup] [--brtype=full]
--flagfile=option_file_path Sybase_server_name/database_name1
Sybase_server_name/database_name2
```

In this example, the option file specified by `--flagfile=option_file_path` contains all the mandatory options, which are not included with the `avsybase` command.

The options `--operation` and `--brtype` are optional for a full backup.

For example, the following command performs a full backup of the Sybase databases `db1`, `db2`, and `db3` on the Sybase server `SYBASE_SERVER1` in the `sybase` domain. The command stores the backup on the first Data Domain system that was added to the Avamar configuration:

```
avsybase --operation=backup --brtype=full
--flagfile=/secure/options.txt --account=/sybase/host1
--bindir=/usr/local/avamar/bin --ocslibpath=/sybase/OCS-15_0/lib
--server=avamar-1.example.com --sybase=/sybase SYBASE_SERVER1/db1
SYBASE_SERVER1/db2 SYBASE_SERVER1/db3 --ddr --ddr-index=1
```

Log truncation after full backup

By default, the Sybase plug-in does not truncate the logs of regular databases (with database and log data stored in separate Sybase devices) after a full backup with the `avsybase` command. However, the software truncates the logs of non-regular databases (except read-only databases) after a full backup with the `avsybase` command to prevent the logs from becoming completely full.

The `avsybase` command options `--no-truncate-mixed` and `--truncate-all` are supported for full backups only, not for incremental backups:

- `--no-truncate-mixed`—Disables log truncation after a full backup for all database types.
- `--truncate-all`—Enables log truncation after a full backup for all database types except read-only databases.

These command options affect whether the logs are truncated after a full backup with the `avsybase` command:

- After a full backup of a regular database, the Sybase plug-in truncates the logs only if you use the `--truncate-all` option.
- After a full backup of an in-memory database, mixed log and data database, or relaxed-durability database, the Sybase plug-in always truncates the logs unless you use the `--no-truncate-mixed` option.
- After a full backup of a read-only database, the Sybase plug-in never truncates the logs, even if you use the `--truncate-all` option.

Incremental backups with the `avsybase` command

An incremental backup backs up the transaction logs of one or more databases on a Sybase server, not the whole databases.

[Incremental backups on page 21](#) provides more information about Sybase incremental backups.

The Sybase plug-in automatically promotes an incremental (log) backup to a full (database) backup in the following cases:

- A full backup of a Sybase database has not been performed previously.
- An incremental backup is not supported for a particular type of database.

- The Sybase plug-in cannot determine the type of database, for example, if the database is offline.

Incremental backup of Sybase server

You can perform an incremental backup with the `avsybase` command to back up the transaction logs of all the databases on the Sybase server.

The following example `avsybase` command performs an incremental backup of the entire Sybase server:

```
avsybase [--operation=backup] --brtype=incremental  
--flagfile=option_file_path
```

The `--operation` option is optional for an incremental backup.

In this example, the option file specified by `--flagfile=option_file_path` contains all the mandatory options, which are not included with the `avsybase` command.

Perform the following actions for security reasons:

- Encode the passwords that you specify with the `--password` and `--sybpassword` options. [Password encoding on page 96](#) provides details.
- Set the credential-related options `--id`, `--password`, `--syblogin`, and `--sybpassword` in an option file that is accessible only to the Sybase operating system user that performs the operation.

If the other mandatory options are included with the `avsybase` command, the command for the incremental backup becomes as follows:

```
avsybase [--operation=backup] --brtype=incremental  
--flagfile=option_file_path --account=domain/client  
--bindir=Avamar_binary_dir --ocslibpath=OCS_libraries_path  
--server=Avamar_server_name_or_IP_address  
--sybase=Sybase_install_dir_path Sybase_server_name
```

For example, the following command performs an incremental backup of the Sybase server named SYBASE_SERVER1 in the sybase domain by backing up the transaction logs of all the databases. The command stores the backup on the Avamar server with the hostname `avamar-1.example.com`:

```
avsybase --operation=backup --brtype=incremental  
--flagfile=/secure/options.txt --account=/sybase/host1  
--bindir=/usr/local/avamar/bin --ocslibpath=/sybase/OCS-15_0/lib  
--server=avamar-1.example.com --sybase=/sybase SYBASE_SERVER1
```

Incremental backup of specified databases

You can perform an incremental backup with the `avsybase` command to back up the transaction logs of one or more specified databases on the Sybase server.

Note

You can specify only one database name with the `--sybdb` option. You can use only one `--sybdb` option per `avsybase` command. However, to back up the logs of more than one database at a time, you can specify multiple database names separately in the command without using the `--sybdb` option.

The following example `avsybase` command performs an incremental backup of two specified databases:


```
avsybase [--operation=backup] --brtype=incremental
--flagfile=option_file_path Sybase_server_name/database_name1
Sybase_server_name/database_name2
```

In this example, the option file specified by `--flagfile=option_file_path` contains all the mandatory options, which are not included with the `avsybase` command.

The `--operation` option is optional for an incremental backup.

For example, the following command performs an incremental backup of the databases `db1` and `db2` on the Sybase server `SYBASE_SERVER1` in the `sybase` domain and stores the backup on the first Data Domain system that was added to the Avamar configuration:

```
avsybase --operation=backup --brtype=incremental
--flagfile=/secure/options.txt --account=/sybase/host1
--bindir=/usr/local/avamar/bin --ocslibpath=/sybase/OCS-15_0/lib
--server=avamar-1.example.com --sybase=/sybase SYBASE_SERVER1/db1
SYBASE_SERVER1/db2 --ddr --ddr-index=1
```

Log truncation after incremental backup

By default, the Sybase plug-in software truncates the logs of regular databases (with database and log data stored in separate Sybase devices) after an incremental backup with the `avsybase` command.

The `avsybase` command option `--no-truncate` is supported for incremental backups only, not for full backups. When you specify the `--no-truncate` option, the Sybase `dump transaction` command uses the `no_truncate` option. The transaction logs are backed up, but they are not truncated.

NOTICE

Use the `--no-truncate` option only in a disaster recovery situation, not for a regular incremental backup. If the Sybase data device has been lost, you can use the `--no-truncate` option with a regular database to back up the transaction logs without truncating them. Then you can proceed to restore the lost data.

The Sybase plug-in software supports the `--no-truncate` option for regular Sybase databases only. Non-regular databases do not support transaction log backups.

Truncation backups with the `avsybase` command

A truncation backup truncates the logs of one or more databases on a Sybase server without performing a log backup.

[Truncation backups on page 22](#) provides more information about truncation backups.

`truncate_only` truncation backup

You can perform a `truncate_only` truncation backup or regular truncation backup with the `avsybase` command to truncate the log of a database without performing a log backup.

Use a `truncate_only` backup for a mixed log and data database where the data and transaction log are stored in the same file. You cannot perform log backups on this type of database but you must still truncate the log before the log becomes full.

The following example `avsybase` command performs a `truncate_only` backup for the specified database and then performs a full database backup by default:

```
avsybase [--operation=backup] --brtype=truncate
--flagfile=option_file_path Sybase_server_name/database_name
```

The `--operation` option is optional for a truncation backup. In this example, the option file specified by `--flagfile=option_file_path` contains all the mandatory options that are not included with the `avsybase` command.

[Log truncation with truncate_only option followed by full backup on page 89](#) describes the equivalent backup option for a `truncate_only` backup with Avamar Administrator.

The following example `avsybase` command performs a `truncate_only` backup for the specified database without performing a full database backup afterwards:

```
avsybase [--operation=backup] --brtype=truncate --no-backup
--flagfile=option_file_path Sybase_server_name/database_name
```

no_log truncation backup

You can perform a `no_log` truncation backup with the `avsybase` command to truncate the log of a database without performing a log backup and without logging the truncation. Use a `no_log` backup only as a last resort when the transaction log is full.

The following example `avsybase` command performs a `no_log` backup for the specified database and then performs a full database backup by default:

```
avsybase [--operation=backup] --brtype=truncate --no-log
--flagfile=option_file_path Sybase_server_name/database_name
```

The `--operation` option is optional for a truncation backup. In this example, the option file specified by `--flagfile=option_file_path` contains all the mandatory options that are not included with the `avsybase` command.

[Log truncation with no_log option followed by full backup on page 89](#) describes the equivalent backup option for a `no_log` backup with Avamar Administrator.

The following example `avsybase` command performs a `no_log` backup for the specified database without performing a full database backup afterwards:

```
avsybase [--operation=backup] --brtype=truncate --no-log --no-backup
--flagfile=option_file_path Sybase_server_name/database_name
```

Restore and recovery with the avsybase command

You can initiate a restore of Sybase data by running the `avsybase` command (or `avsybase.exe` on Microsoft Windows) with the `--operation= restore` option and other supported options on the operating system command line.

[Overview of CLI operations on page 94](#) provides details about the `avsybase` command options for restores and how to launch a restore with the `avsybase` command.

Instead of setting command options on the `avsybase` command line, you can use an option file to set the options as described in [Using an option file on page 94](#).

Perform the following actions for security reasons:

- Encode the passwords that you specify with the `--password` and `--sybpassword` options. [Password encoding on page 96](#) provides details.
- Set the credential-related options `--id`, `--password`, `--syblogin`, and `--sybpassword` in an option file that is accessible only to the Sybase operating system user that performs the operation.

A restore with the `avsybase` command can restore one or more specified databases or all the databases on a Sybase server.

A restore with Avamar Administrator can also restore one or more databases on a Sybase server. [Performing restore and recovery on page 78](#) describes how to use Avamar Administrator to perform a restore.

Restore to same destination with the `avsybase` command

You can use the `avsybase` command to restore either of the following types of data to the same destination:

- One or more source databases to the same-named destination databases on the source Sybase server and host.
- A source Sybase server to the source host.

Restore of specified databases to same destination

You can use the `avsybase` command to restore one or more specified databases to the source Sybase server.

Note

You can specify only one database name with the `--sybdb` option. You can use only one `--sybdb` option per `avsybase` command. However, to restore more than one database at a time, you can specify multiple database names separately in the command without using the `--sybdb` option.

The following example `avsybase` command restores two specified databases:

```
avsybase --operation=restore --flagfile=option_file_path  
Sybase_server_name/database_name1 Sybase_server_name/database_name2
```

In this example, the option file specified by `--flagfile=option_file_path` contains all the mandatory options, which are not included with the `avsybase` command.

Perform the following actions for security reasons:

- Encode the passwords that you specify with the `--password` and `--sybpassword` options. [Password encoding on page 96](#) provides details.
- Set the credential-related options `--id`, `--password`, `--syblogin`, and `--sybpassword` in an option file that is accessible only to the Sybase operating system user that performs the operation.

If the other mandatory options are included with the `avsybase` command line, the command to restore the databases becomes as follows:

```
avsybase --operation=restore --flagfile=option_file_path  
--account=domain/client --bindir=Avamar_binary_dir  
--ocslibpath=OCS_libraries_path  
--server=Avamar_server_name_or_IP_address  
--sybase=Sybase_install_dir_path Sybase_server_name/database_name1  
Sybase_server_name/database_name2
```

For example, the following command restores the databases `db1`, `db2`, and `db3` on the Sybase server `SYBASE_SERVER1` in the `sybase` domain by connecting to the Avamar server with the hostname `avamar-1.example.com`:

```
avsybase --operation=restore --flagfile=/secure/options.txt  
--account=/sybase/host1 --bindir=/usr/local/avamar/bin
```

```
--ocslibpath=/sybase/OCS-15_0/lib --server=avamar-1.example.com
--sybase=/sybase SYBASE_SERVER1/db1 SYBASE_SERVER1/db2
SYBASE_SERVER1/db3
```

Restore of server instance to same destination

You can use the `avsybase` command to restore a source Sybase server to the source host.

The following example `avsybase` command restores the whole Sybase server:

```
avsybase --operation=restore --flagfile=option_file_path
```

To restore the whole Sybase server, you must not specify any databases in the command.

In this example, the option file specified by `--flagfile=option_file_path` contains all the mandatory options, which are not included with the `avsybase` command.

For example, the following command restores the Sybase server instance, SYBASE_SERVER1, in the sybase domain. The Avamar server that stores the backup data (or just the metadata) has the hostname avamar-1.example.com:

```
avsybase --operation=restore --flagfile=/secure/options.txt
--account=/sybase/host1 --bindir=/usr/local/avamar/bin
--ocslibpath=/sybase/OCS-15_0/lib --server=avamar-1.example.com
--sybase=/sybase SYBASE_SERVER1
```

Relocated recovery with the avsybase command

You can use the `avsybase` command to perform a relocated recovery.

Any of the following conditions can be true when you use the `avsybase` command to perform a relocated recovery:

- The source database is restored to a destination database with a different name.
- The destination server is different than the source server.
- The destination host is different than the source host where the backup occurred.

Before you start a relocated recovery, ensure that the destination database and server already exist and the destination database has the same storage layout as the source database.

For a relocated recovery to a different Sybase host, you must run the recovery on the destination host.

The command options must specify the proper values for the relocated recovery:

- The `--account` option must specify the source host.
- The `--sybdb` option or separate database name in the command must specify the source database for a database restore.
- The `--syblogin` and `--sybpassword` options must specify the Sybase username and password of the destination server.
- The `--sybserver` option or separate server name in the command must specify the source server.
- The `--target` option must specify the destination server and (if required) destination database. The `--target` option must have a single value only.

For a relocated recovery of multiple databases, you can only specify a single destination server name (not multiple database names) with the `--target` option.

For a relocated recovery of a single database, you can specify the destination server name and destination database name with the `--target` option, for example, `--target=destination_server_name/destination_database_name`.

NOTICE

Perform the following actions for security reasons:

- Encode the password that you specify with the `--sybpassword` option according to [Password encoding on page 96](#).
- Set the `--syblogin` and `--sybpassword` options in an option file that is accessible only to the Sybase operating system user that performs the operation.

Note

If the destination server is on a different host, you must run the `avsybase` command on the destination host, but you do not need to add any command options to specify the destination host.

For example, the following command restores the Sybase database named `db1` to the original Sybase server instance, `SYBASE_SERVER1`, but with a new database name, `db2`:

```
avsybase --operation=restore --flagfile=/secure/options.txt
--account=/sybase/host1 --bindir=/usr/local/avamar/bin
--ocslibpath=/sybase/OCS-15_0/lib --server=avamar-1.example.com
--sybase=/sybase SYBASE_SERVER1/db1 --target=SYBASE_SERVER1/db2
```

For example, the following command restores the Sybase database named `db1` from the source Sybase server, `SYBASE_SERVER1`, to the same-named database on the destination Sybase server, `SYBASE_SERVER2`. Both servers are on the same host, `host1`:

```
avsybase --operation=restore --flagfile=/secure/options.txt
--account=/sybase/host1 --bindir=/usr/local/avamar/bin
--ocslibpath=/sybase/OCS-15_0/lib --server=avamar-1.example.com
--sybase=/sybase SYBASE_SERVER1/db1 --target=SYBASE_SERVER2/db1
```

To perform a relocated recovery of a whole Sybase server instance, omit all the source and destination database names from the `avsybase` command. For example, the following command restores the whole server, `SYBASE_SERVER1`, to a different-named server, `SYBASE_SERVER2`:

```
avsybase --operation=restore --flagfile=/secure/options.txt
--account=/sybase/host1 --bindir=/usr/local/avamar/bin
--ocslibpath=/sybase/OCS-15_0/lib --server=avamar-1.example.com
--sybase=/sybase SYBASE_SERVER1 --target=SYBASE_SERVER2
```

To perform a relocated recovery of multiple databases, you can specify only a server name with the `--target` option. For example, the following command restores the databases `db1` and `db2` from the Sybase server `SYBASE_SERVER1` to the same-named databases on the destination Sybase server, `SYBASE_SERVER2`:

```
avsybase --operation=restore --flagfile=/secure/options.txt
--account=/sybase/host1 --bindir=/usr/local/avamar/bin
--ocslibpath=/sybase/OCS-15_0/lib --server=avamar-1.example.com
--sybase=/sybase SYBASE_SERVER1/db1 SYBASE_SERVER1/db2
--target=SYBASE_SERVER2
```

Point-in-time recovery with the avsybase command

You can run a point-in-time recovery with the `avsybase` command for one or more databases on a Sybase server.

To recover Sybase data to a specific point-in-time, use the `--labelnum` and `--pointintime` options with the `avsybase --operation=restore` command:

- Use the option `--labelnum=label_number` to specify the label number of the backup to use for the point-in-time recovery.
- Use the option `--label=name` to specify the backup label to use for the recovery.
- Use the option `--pointintime=date_and_time` to specify a timestamp in Avamar format, `yyyy-mm-dd hh:mm:ss`, enclosed in quotes, as the date and time to which the data will be recovered.

[Command options on page 96](#) provides details about the `avsybase` command options.

Determine the label number of the backup to use for the point-in-time recovery

To determine the label number of the backup to use for the point-in-time recovery, you can use the `avsybase --operation=list-times` command:

```
avsybase --operation=list-times
--account=domain/client --bindir=Avamar_binary_dir
--flagfile=option_file_path --id=Avamar_server_username
[--labelnum=label_number] --password=Avamar_server_password
[--pointintime=date_and_time]
--server=Avamar_server_name_or_IP_address
[--sybdb=Sybase_database_name | Sybase_server_name/database_name]
{--sybserver=Sybase_server_name | Sybase_server_name}
```

Note

The `list-times` operation creates a temporary file named `avsybase-tmp-time-pid` in the `var` directory, for example, `avsybase-tmp-1350320641-2134`. The file contains avtar login information, such as `hfsadd`, `hfsport`, `id`, and other sensitive data. If the `list-times` operation does not automatically remove the file, delete the file manually after the operation is complete.

The `avsybase --operation=list-times` command produces the following type of output:

```
avsybase Info <0000>: Labelnum: 208
avsybase Info <0000>: Server: BUWINISK
avsybase Info <0000>: Database: master
avsybase Info <0000>: f-0 old time: 1969-12-31 19:00:00 (0) new time: 2015-02-15 07:44:34
(1297773874)
avsybase Info <0000>: Database: model
avsybase Info <0000>: f-0 old time: 1969-12-31 19:00:00 (0) new time: 2015-02-15 07:44:50
(1297773890)
avsybase Info <0000>: Database: sybssystemdb
avsybase Info <0000>: f-0 old time: 1969-12-31 19:00:00 (0) new time: 2015-02-15 07:45:02
(1297773902)
avsybase Info <0000>: Database: sybssystemprocs
avsybase Info <0000>: f-0 old time: 1969-12-31 19:00:00 (0) new time: 2015-02-15 07:49:48
(1297774188)
avsybase Info <0000>: Database: sybmgmtbdb
avsybase Info <0000>: f-0 old time: 1969-12-31 19:00:00 (0) new time: 2015-02-15 07:50:52
```

```
(1297774252)
avsybase Info <0000>: Database: owensk
avsybase Info <0000>: i-1 old time: 2013-02-15 07:50:53 (1297774253) new time: 2015-02-15
07:51:00 (1297774260)
avsybase Info <0000>: Labelnum: 201
avsybase Info <0000>: Server: BUWINISK
avsybase Info <0000>: Database: master
avsybase Info <0000>: f-0 old time: 1969-12-31 19:00:00 (0) new time: 2015-02-15 07:36:31
(1297773391)
```

You can use the *Sybase_server_name/database_name* option with the command to obtain the old time and new time values for a specific database backup. Alternatively, you can use the `--labelnum=label_number` option with the command to obtain the old time and new time values for a specific backup label. You can also use the `--pointintime` option to obtain the old time and new time values for only the backups since a specific time, rather than for all the backups that exist on the Avamar server.

From the `avsybase --operation=list-times` command output, you can determine the backup label number that includes backups that contain the required point-in-time. For an incremental backup to qualify as a suitable backup for the point-in-time recovery, the old time listed for the incremental backup must not be later than the point-in-time for recovery and the point-in-time for recovery must be earlier than the new time for the incremental backup.

For example, the following command restores a database backup labeled 582 to its original location and a point-in-time of March 15, 2013 at 2:15:45 p.m.:

```
avsybase --operation=restore --flagfile=/secure/options.txt
--account=/sybase/host1 --bindir=/usr/local/avamar/bin
--labelnum=582 --ocslibpath=/sybase/OCS-15_0/lib
--pointintime="2013-03-15 14:15:45" --server=avamar-1.example.com
--sybase=/sybase SYBASE_SERVER1
```

To restore a database to a point-in-time between the last log (incremental) backup of one backup cycle (cycle #1) and the first full backup of the next backup cycle (cycle #2), you must perform a point-in-time recovery by using the first log backup created after the full backup of cycle #2. If such a log backup does not yet exist, you must run the log backup before you can perform the point-in-time recovery. The first log backup of cycle #2 contains all the transaction logs since the last log backup of cycle #1.

Unless you specify a point-in-time recovery when you restore a log backup, the Sybase plug-in automatically applies the log backup to the preceding full backup only.

For example, two consecutive backup cycles of database db1 contain the following sequence of backups:

1. Backup cycle #1:
 - Full backup, f-0, performed at time t1
 - Log backup, i-1, performed at time t2
 - Log backup, i-2, performed at time t3
2. Backup cycle #2:
 - Full backup, f-0, performed at time t4
 - Log backup, i-1, performed at time t5

You cannot use the Sybase plug-in to automatically restore to a point-in-time between t3 and t4. You must use special procedures. You also cannot restore to the point-in-time

unless the backup i-1 of cycle #2 exists. (Create the i-1 backup of cycle #2 if it does not yet exist.)

Restoring the database db1 to a point-in-time between t3 and t4

You must complete the required steps to restore the database db1 to a point-in-time between times t3 and t4.

Procedure

1. Restore backups f-0, i-1, and i-2 of cycle #1 by using the `--leave-offline` option that leaves the database offline and ready for the application of additional logs. For example, use the following command:

```
avsybase --operation=restore --flagfile=file_path server1/db1 --
labelnum=label_number --leave-offline
```

where:

- *file_path* is the full path of the Sybase plug-in options file for the restore.
 - *label_number* is the label number of the backup that includes f-0, i-1, and i-2 of cycle #1.
2. Perform a point-in-time recovery by using backup i-1 of cycle #2 with the `--postfix` and `--postfix-only` options. For example, use the following command:

```
avsybase --operation=restore --flagfile=file_path server1/db1 --
labelnum=label_number --pointintime=date_and_time --postfix="i-1"
--postfix-only
```

where:

- *file_path* is the full path of the Sybase plug-in options file for the recovery.
- *label_number* is the label number of backup i-1 of cycle #2.
- *date_and_time* is the timestamp in Avamar format, *yyyy-mm-dd hh:mm:ss*, enclosed in quotes, as the date and time to which the data will be recovered.

Database restore verification with the avsybase command

You can use the `avsybase` command option `--ase_verify=verification_level` to specify the level of backup data verification during a restore, where *verification_level* can be one of the following values:

- **full**—Specifies to use the Sybase `load` command option with `verify=full` to verify both the header information and rows structure for full verification of the backup.
- **header**—Specifies to use the Sybase `load` command option with `verify=header` to verify the page header information only.
- **verifyonly**—Specifies to use the Sybase `load` command option with `verify=verifyonly` to verify minimal header information without restoring the database. This verification level applies only to CLI restores with the `avsybase` command.

APPENDIX C

Troubleshooting

This appendix includes the following topics:

- [Logging information](#) 122
- [Configuration checklist](#).....123
- [Common problems and solutions](#)..... 127

Logging information

An Avamar Plug-in for Sybase ASE (Sybase plug-in) operation started in Avamar Administrator writes its logging information to a file named `MOD-wid-pidnum-sybase.log` in the `var` directory (for example, `/var/avamar`), where *wid* is a unique number assigned by the `avagent` process and *pidnum* is the plug-in ID number. The first `avtar` process started by the operation creates a separate log file named `progress-MOD-wid-pidnum-sybase.log`. The `avagent` process also creates a separate log file named `MOD-wid-pidnum-sybase.alg`.

The Sybase plug-in logging for a Sybase backup or restore is not enabled automatically. To enable this logging, perform either of the following actions:

- Specify the **Enable debugging messages** option in Avamar Administrator for GUI on-demand backups and scheduled backups, as described in [Performing on-demand backups on page 56](#).
- Specify the `--logfile` option with the `avsybase` command, as described in [Command Line Interface on page 93](#).

You must enable debugging of Sybase plug-in backups or restores by specifying the debugging option, as described in [Plug-In Options on page 87](#) or [Command Line Interface on page 93](#). For example, you can specify the `--debug` option with the `avsybase` command.

When debugging is enabled, the XML text of backup or restore workorders can be viewed in the logs and on the screen:

- A backup workorder is an XML message with details about the backup, including a list of Sybase databases or transaction logs for backup and information required to connect to the Sybase server.
- A restore workorder is an XML message with details about the restore, including a list of Sybase databases for restore and information required to connect to the Sybase server.

The first tag in a backup workorder is always the `snapup` tag. The following example is an abbreviated sample workorder for a Sybase plug-in backup:

```
<snapup pid="Sybase" time="1286978619" ack="false" type="work"
msgver="4" pidnum="1029" work="backup" ticket="encrypted_value"
key="1029-Sybase-MOD-1286978619164" sync="bg"
sessionid="adb91da37081ac3f546c593a63ad59e1963d1a74"
cid="b08955af212057a7408f5aefb36ae79252372206" mid="10472/10472/32"
wid="MOD-1286978619164">
<targets>SYBSERVER/db1
</targets>
<directives>
  <flag type="string" value="bu-sybserver.com" name="hfsaddr" />
  <flag type="string" value="27000" name="hfspport" />
  <flag type="string" value="backuponly" name="id" />
  <flag type="string" value="backuponly1" name="ap" />
  <flag type="string" value="/clients/sybserver.com" name="path" />
</directives>
<catalog>
  <flag type="pulldown" pidnum="1029" value="full" name="brtype" />
  <flag type="string" pidnum="1029"
value="/space2/sybase/OCS-15_0/lib" name="ocslibpath" />
  <flag type="string" pidnum="1029" value="/space2/sybase"
name="sybase" />
  <flag type="string" pidnum="1029" value="sa" name="syblogin" />
</catalog>
```

```
<free-form />
</snapup>
```

The meanings of tags and values in the preceding example are as follows:

- **pid**—The plug-in name (not a process ID)
- **pidnum**—The plug-in ID number (not a process ID). Each Avamar plug-in has a unique ID number.
- **ticket**—A security ticket that enables the `avtar` process started by the plug-in to connect to the Avamar server GSAN. The ticket is always printed in an encrypted form.
- **cid**—The client ID of the backup client.
- **mid**—The message ID of the workorder.
- **wid**—A unique number assigned to the workorder by the `avagent` process.
- **targets**—The data to be backed up. In this example, the database `db1` on the Sybase server `SYBSERVER` is to be backed up.
- **directives**—The options that are common to both the `avtar` process and the Sybase plug-in process. During backups with the `avsybase` command you specify these options on the command line.
- **catalog**—The options that are specific to the Sybase plug-in. During backups with the `avsybase` command, you specify these options on the command line.

NOTICE

The catalog section in this example is abbreviated for display purposes.

Configuration checklist

The following sections describe common configuration problems and their solutions.

Determining the Sybase ASE server version

The Avamar Plug-in for Sybase supports the Sybase versions described in the *EMC Avamar Compatibility and Interoperability Matrix*.

You must complete the required steps to determine the Sybase ASE server version and bitness.

Procedure

1. Log in to the Sybase server as the Sybase operating system user.
2. Run the appropriate Sybase operating system command:

- On UNIX or Linux, run the following command:

```
sybusr::-> dataserver -v
```

The following type of output appears in the command shell:

```
Adaptive Server Enterprise/15.5/EBF 17211 SMP/P/Sun_svr4/
OS 5.8/ase155/2391/32-bit/FBO/Mon Nov 9 20:54:05 2009
```

- On Windows, run the following command:

```
C:\Users\Administrator> sqlsrvr -v
```

The following type of output appears in the command shell:

```
Adaptive Server Enterprise/15.5/EBF 18374 SMP ESD#3/P/X64/
Windows Server/asear155/2531/64-bit/OPT/Fri Jan 14
02:06:35
```

Bitness of Avamar Plug-in for Sybase ASE and Sybase

The bitness of the Sybase software, Avamar software, and operating system must match.

Ensure that you download the correct software package for the platform and version of Sybase. [Preparing to install the Avamar Plug-in for Sybase on page 36](#) provides more information.

To determine the bitness of the Sybase ASE server, use the procedure described in [Determining the Sybase ASE server version on page 123](#).

Requirements for libsybase_avamar.so and libsybase_avamar.dll

The library file `libsybase_avamar.so` (on Linux or Solaris) or `libsybase_avamar.dll` (on Windows) implements the Sybase stream device that Avamar requires for successful backup and restore operations.

The following requirements apply to the library file:

- The file must provide read and execute access to the Sybase user.
- The file must be located in the correct directory:
 - On UNIX or Linux, create a symbolic link in the `$SYBASE/$SYBASE_ASE/lib` directory to point to the library file in the Avamar binary directory, which is `/usr/local/avamar/bin` on AIX or Linux and `/opt/AVMRclnt/bin` on HP-UX or Solaris SPARC.
 - On Windows, copy the library file to the `%SYBASE%\%SYBASE_ASE%\lib` directory from the Avamar binary directory, which is `C:\Program Files\avs\bin` by default.
- The file must have the same bitness as the Sybase backup server. For example, a 64-bit Sybase ASE server for Solaris SPARC has a 32-bit backup server.

To verify the bitness of the Sybase backup server, run the appropriate Sybase operating system command:

- On Windows, run the following command:

```
C:\Users\Administrator>bcksrvr -v
```

The following type of output appears in the command shell:

```
Backup Server/15.5/EBF 18374 ESD#3/P/X64/Windows Server/
asear155/3231/64-bit/OPT/Fri Jan 14 00:07:25 2013
```

- On UNIX or Linux, run the following command:

```
sybusr::->backupserver -v
```

The following type of output appears in the command shell:

```
Backup Server/15.5/EBF 17335/P/Sun_svr4/OS 5.8/ase155/
2895/32-bit/OPT/Mon Nov 9 12:34:17 2009
```

Verifying the bitness of the library file

You can run the `file` command on both the symbolic link and actual library file to verify the bitness of the library file. For example, you can use the following procedure to verify the bitness on 64-bit RedHat Linux.

Procedure

1. Run the `file` command on the symbolic link:

```
sybusr@bu-niu:~> file $SYBASE/$SYBASE_ASE/lib/libsybase_avamar.so
```

The following type of output appears in the command shell:

```
/bigspace/avamar/sybase/15.0.3/opt/sybase/ASE-15_0/lib/
libsybase_avamar.so: symbolic link to '/usr/local/
avamar/lib/libsybase_avamar.so'
```

2. Run the `file` command on the actual library file:

```
sybusr@bu-niu:~> file /usr/local/avamar/lib/libsybase_avamar.so
```

The following type of output appears in the command shell:

```
/usr/local/avamar/lib/libsybase_avamar.so: ELF 64-bit LSB
shared object, x86-64, version 1 (SYSV), dynamically linked,
not stripped
```

Avamar client and Avamar Plug-in for Sybase ASE installation

For all supported platforms, install the Avamar client before installing the Avamar Plug-in for Sybase ASE.

The versions of the Avamar client and Avamar Plug-in for Sybase ASE must be the same. [Preparing to install the Avamar Plug-in for Sybase on page 36](#) provides more information.

The following table includes the methods and commands to verify the installation of the Avamar client and Avamar Plug-in for Sybase ASE.

Table 12 Commands to verify the Avamar client and Sybase plug-in installation

For this platform	Perform the following actions
HP-UX	Use the <code>swlist</code> command: swlist grep -i avamar
IBM AIX	Use the <code>lspp</code> command: lspp [-R <i>relocated_directory</i>] -L all grep -i avamar Note You must use the <code>-R <i>relocated_directory</i></code> option if the Avamar software is installed in a relocated directory.
Microsoft Windows	Use the Add/Remove Programs application in the Windows Control Panel (or the equivalent application on newer Windows versions) to verify that the following software is installed: <ul style="list-style-type: none"> • EMC Avamar for Windows (This is the Avamar client)

Table 12 Commands to verify the Avamar client and Sybase plug-in installation (continued)

For this platform	Perform the following actions
	<ul style="list-style-type: none"> EMC Avamar Backup Plug-in for Sybase (This is the Sybase plug-in)
Red Hat or SUSE Linux	Use the <code>rpm</code> command: <code>rpm -qa grep -i avamar</code>
Sun Solaris	Use the <code>pkginfo</code> command: <code>pkginfo grep -i avamar</code>

Ensure that you meet the following requirements on a 64-bit operating system:

- The 64-bit Avamar client package is installed before the Avamar Plug-in for Sybase ASE.
- The appropriate Avamar Plug-in for Sybase ASE package is installed:
 - To support a 32-bit Sybase server on a 64-bit operating system, either the 32-bit or 64-bit Avamar Plug-in for Sybase ASE package is installed.
 - To support a 64-bit Sybase server on the 64-bit operating system, the 64-bit Avamar Plug-in for Sybase ASE package is installed. Copy the `libsybase_avamar.dll` file to the `%SYBASE%\%SYBASE_ASE%\lib` directory.

Avamar client and Avamar Plug-in for Sybase registration

To back up or restore Sybase data with the Avamar Plug-in for Sybase ASE software, the Avamar client must be registered with the Avamar server.

The registration process can fail if one of the following conditions occurs:

- The Avamar MCS plug-in catalog does not support the Avamar Plug-in for Sybase ASE version.
- An administrator disables the Avamar Plug-in for Sybase ASE.

If the Avamar client is successfully registered, Avamar Administrator lists it in the Sybase databases. In addition, the `avagent.log` file will contain information that verifies a successful registration. By default, the `avagent.log` file is located in `/var/avamar` on UNIX or Linux and in `C:\Program Files\avs\var` on Windows. For example, the following information appears in the `avagent.log` file:

```
***** Current MCS name 'avamar-1.example.com' *****
2015-3-1 15:08:37 avagent Info <7452>: Registration of client
/clients/example.avamar.emc with MCS avamar-1.example.com:28001
successful.
2015-3-1 15:08:37 avagent Info <5928>: Registration of plugin 1002
Sybase successful.
2015-3-1 15:08:37 avagent Info <5928>: Registration of plugin 1001
Unix successful.
2015-3-1 15:08:37 avagent Info <5619>: Registration of client and
plugins complete.
2015-3-1 15:08:37 avagent Info <7150>: first work request delayed for
180 seconds.
2015-3-1 15:11:37 avagent Info <7151>: first work request delay
finished.
```

Disk space for the Avamar var directory

The Avamar `var` directory must have sufficient disk space for log and other files. Backups and restores will fail if the `var` directory does not have enough space. Check the free space in the Avamar `var` directory by using the applicable method for the system.

The following example shows output from the `df -h` command on a Red Hat Linux system:

```
Filesystem Size Used Avail Use% Mounted on
/dev/mapper/VolGroup00 985G 310G 625G 34% /
```

A minimum of 100 MB of disk space is recommended for `avsybase` log files and other files.

Common problems and solutions

The following topics describe the most common problems and solutions for the Sybase plug-in.

Backup or restore failure with Sybase ASE15.5

On a Sybase ASE 15.5 system with Sybase SDK installed, a Sybase plug-in backup or restore might fail with a fatal signal due to Sybase bug 589847. If the required Sybase patch is not installed on the system, the fatal signal occurs at the end of the backup or restore when the software unloads the Sybase OCS libraries.

If you encounter this problem on a Sybase ASE 15.5 system with Sybase SDK installed, ensure that the Sybase SDK 15.5 ESD#11 or later is installed on the Sybase system.

"Cannot open file f_cache.dat" error

If the user that runs a Sybase plug-in backup or restore does not have the required permissions for the Avamar `var` directory, the Avamar `activity.log` file contains `avtar` errors similar to the following errors:

```
2015-3-1 17:30:27 avtar Error <5064>: Cannot open file "/usr/local/
avamar/var/f_cache.dat"
2015-3-1 17:30:27 avtar Info <5065>: Creating new cache file /usr/
local/avamar/var/f_cache.dat (2,884,128 bytes)
2015-3-1-12:00:27.36745 [avtar] setslice64 failed requested 32, but
wrote -1
2015-3-1-12:00:27.36800 [avtar] cache::clear_cache: Caught exception
12:Cannot allocate memory
2015-3-1 17:30:27 avtar Error <5803>: Error writing 32-byte header to
cache file /usr/local/avamar/var/f_cache.dat. Possibly out of disk
space
```

For a backup or restore with the `avsybase` command, the user that initiates the `avsybase` command requires read, write, and execution permissions for the `var` directory. You can specify the `var` directory with the `--vardir` option. By default, the `var` directory is `/var/avamar` on UNIX or Linux and `C:\Program Files\avs\var` on Windows.

For a scheduled backup, an on-demand backup with Avamar Administrator, or a restore with Avamar Administrator, the root user (UNIX or Linux) or SYSTEM user (Windows)

requires access to the `var` directory. Typically, the root or SYSTEM user already has read and write access to the Avamar `var` directory.

You might encounter the permissions problem with the first backup after a new installation. Perform at least one backup with the `avsybase` program to ensure that the necessary files are created and have the proper permissions.

Failure of list-times operation

[Point-in-time recovery with the `avsybase` command on page 118](#) describes how you can use the `avsybase --operation=list-times` command to determine an incremental backup to use for a point-in-time recovery.

If the `avsybase --operation=list-times` command fails for any reason to provide the required “old time” and “new time” information for an incremental, you can use the `avsybase --operation=print-headers --labelnum=label_number` command to obtain the old time and new time values of specific backups.

You can also use the `avsybase --operation=print-headers --labelnum=label_number` command if the “old time” and “new time” information displayed in the GUI is determined to be inaccurate for any reason.

Hidden backups

At the end of each database backup, the Sybase plug-in performs a final step to group the current backup with any previous backups required to restore the current database backup, creating a consolidated backup, described in [Reviewing backups on page 72](#).

If a backup fails in that final consolidation step, the backup becomes a hidden backup, which cannot be searched for and restored by standard methods. At the moment of this backup failure, the Sybase plug-in displays the following error message:

```
Backup failed. If transaction log truncation was performed
during an
incremental backup of any Sybase database with data and log on
separate devices, the transaction log is now at risk of being
lost.
Perform an immediate full backup of the impacted database to
protect
the data. Consult the Avamar Plug-in for Sybase documentation
for
more information.
```

If the failure occurs during a log backup, the original log on disk might be deleted by the Sybase server as part of the backup process. In that case, perform an immediate full database backup after the backup failure.

When the next backup is performed after a backup failure that created a hidden backup, the Sybase plug-in recognizes that the last backup failed in the consolidation step and promotes an incremental backup to a full backup.

You cannot view a hidden backup in Avamar Administrator or by using the standard `avtar --backups` command. To view information on hidden backups, you must use the `avtar --backups --incpartials` command:

```
avtar -backups -incpartials --server=Avamar_server_name
--id=Avamar_server_username --password=Avamar_server_password
--account=Avamar_domain
```


The following example shows the output from the command:

Date	Time	Seq	Label	Size	Plugin	Working dir	Targets
2012-02-1	08:29:15	55	SYBASE-MOD-129312530260	2525K	Sybase	/var/avamar	BWINK/owesk/i-1
2012-02-1	08:29:10	54	SYBASE-MOD-129312530260	24489K	Sybase	/var/avamar	BWINK/symgtdb/f-0
2012-02-1	08:29:01	52	SYBASE-MOD-129312530260	969K	Sybase	/var/avamar	BWINK/sysysdb/f-0
2012-02-1	08:28:57	51	SYBASE-MOD-129312530260	925K	Sybase	/var/avamar	BWINK/model/f-0
2012-02-1	08:28:53	50	SYBASE-MOD-129312530260	7973K	Sybase	/var/avamar	BWINK/master/f-0

Completing a database recovery of a hidden backup

In the output from the `avtar --backups --incpartials` command, the lines that start with an asterisk (*) indicate hidden backups. You can use the command output to determine the label number (in the Seq column) of a hidden backup that you want to restore.

Use the following procedure to complete a database recovery that involves the restore of a hidden backup named i-2:

Procedure

1. Restore the required full and incremental backups that completed successfully for the database by using the `--leave-offline` option that leaves the database offline and ready for the application of additional logs. For example, use the following command:

```
avsybase --operation=restore --flagfile=file_path
--labelnum=label_number --leave-offline
```

where:

- *file_path* is the full path of the Sybase plug-in options file for the restore.
- *label_number* is the label number of the backup that includes the required full and incremental backups.

2. Restore the hidden backup by using the `--incpartials`, `--postfix`, and `--postfix-only` options. For example, use the following command:

```
avsybase --operation=restore --flagfile=file_path
--labelnum=label_number --postfix="i-2" --postfix-only
```

where:

- *file_path* is the full path of the Sybase plug-in options file for the restore.
- *label_number* is the label number of the hidden backup.

Failure of point-in-time recovery

If you cannot perform the required point-in-time recovery by using the backup metadata obtained through methods outlined in [Point-in-time recovery with the avsybase command on page 118](#), you can specify a particular incremental backup and time for the point-in-time recovery by using the `--postfix=backup_name` option, as described in [Restore and recovery options on page 107](#).

For example, to determine the backup to use for a point-in-time recovery, you can obtain “old time” and “new time” values for specific backups by using the `avsybase --operation=list-times` command or the Avamar Administrator GUI display. However, the “old time” and “new time” values that you obtain with these methods are not accurate and might vary from the actual list times by a few minutes. As a result, the

backup that you decide to use for a point-in-time recovery, based on these methods, might not include the required point-in-time. This could lead to a failure of the point-in-time recovery.

As an alternative method, you can use the `avsybase --operation=print-headers` command to obtain the actual “old time” and “new time” values of backups and determine the log backup that contains a specific point-in-time. Then you can run a point-in-time recovery with the `avsybase` command and `--postfix=backup_name` option to recover to the point-in-time in the particular backup. For example, the `--postfix="i-3"` option specifies that the log backups are recovered up to the i-3 backup.

Unable to browse databases with Avamar Administrator

The **Browse for Files, Folder, or Directories** option in Avamar Administrator does not display Sybase databases.

To investigate the browse problem, use the following command to browse the Sybase server:

```
avsybase --operation=browse --flagfile=option_file_path
```

[Browse operations with the avsybase command on page 108](#) provides details about this command.

If a browse problem also exists with the CLI, the output from the `avsybase` command will contain the following message:

```
avsybase Info <7908>: browse returning with 0 items
```

A browse problem can exist for one of the following reasons:

- An `avsybase` command option is missing or used incorrectly, for example, `--ocslibpath`, `--sybase`, `--syblogin`, or `--sybpassword`. [Command Line Interface on page 93](#) provides details on the supported command options.
- The Sybase server is not up and running.
- The `libsybase_avamar.x` library is not copied or linked properly.

GLOSSARY

A

active/active application cluster	Type of cluster configuration where a group of linked virtual or physical hosts with shared storage, called cluster nodes, can access the database data from multiple nodes concurrently.
active/passive cluster	Type of cluster configuration where the data server runs on the active physical node and other nodes are passive nodes that maintain data updates and wait to take over if the active node fails.
Adaptive Server Enterprise (ASE) server	Only type of Sybase database server that the Avamar Plug-in for Sybase software supports for backups and restores.
administrator	Person who normally installs, configures, and maintains software on network computers, and who adds users and defines user privileges.
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 <i>client agent</i> and one or more <i>plug-ins</i> .
Avamar Plug-in for Sybase	Avamar software that resides on a Sybase server and works with Avamar server software to back up and restore Sybase databases and transaction logs.

See also Sybase plug-in

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.
----------------------	--

B

backup (noun)	<ol style="list-style-type: none">1. Duplicate of database or application data or an entire computer system stored separately from the original, which can be used to recover the original if it is lost or damaged.2. Operation that saves data to backup storage for use during a recovery.
back up (verb)	Make backup copies of data to the Avamar server for later restore in the case of data loss.
backup browsing	Type of browsing that generates a list of objects to be backed up.
backup cycle	Full backup and all the subsequent incremental (transaction log) backups that are dependent on that backup.

backup group See "group."

backup level See "level."

C

CLI backup On-demand backup that a user initiates through the operating system command line interface (CLI).

See also on-demand backup

client Sybase database server whose data can be backed up and restored with the Avamar Plug-in for Sybase software. This is equivalent to the "Avamar client."

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*.

See also registration

CLI restore Restore that a user initiates through the operating system command line interface.

cluster nodes A group of linked virtual or physical hosts with shared storage in a cluster, which work together and represent themselves as a single host called a virtual cluster host.

D

- database**
1. A collection of data arranged for ease and speed of update, search, and retrieval by computer software.
 2. An instance of a database management system (DBMS), which in a simple case might be a single file containing many records, each of which contains the same set of fields.

database administrator (DBA) Person who is typically responsible for installing, configuring, and maintaining database systems.

Data Domain system Disk-based deduplication appliances and gateways that provide data protection and disaster recovery (DR) in the enterprise environment.

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.

DD Boost API that Avamar clients use to access a Data Domain system. The DD Boost API is installed automatically on the client computer when you install the Avamar client. It is also installed automatically on the Avamar server when you install Avamar.

- disaster recovery**
1. Restore and recovery of business operations and data in the event of hardware failure or software corruption.
 2. Recovery of the entire Sybase server to the original host and a remote host.

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.

F

full backup Type of backup that backs up all the data in one or more Sybase databases, including the transaction logs for the databases.

G

granular restore Restore of one or more databases of a Sybase 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 The *dataset*, *schedule*, and *retention policy* for all clients in an Avamar group.

GUI backup On-demand backup that a user initiates through the Avamar Administrator GUI.

See also on-demand backup

GUI restore Restore that a user initiates through the Avamar Administrator GUI.

H

high-availability system System of multiple computers configured as cluster nodes on a network that ensures the application services continue despite a hardware or software failure.

host Computer on a network.

I

incremental backup Type of backup that backs up Sybase transaction logs only, not the Sybase databases.

See also transaction log backup

internationalization (I18N) Adaptation of software to accept the input and output of the linguistic characters and data formats for various locales.

L

- level** Backup configuration option that specifies how much data is saved during a scheduled or manual backup:
- A full backup backs up one or more Sybase databases and the associated transaction logs.
 - An incremental backup backs up only Sybase transaction logs.

log backup See "transaction log backup."

M

manual backup See "on-demand backup."

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*.

multiple session backup or restore Method of backing up or restoring multiple Sybase databases simultaneously.

multi-streaming Feature that enables a single backup or restore to use multiple sessions (data stream) to the Avamar server of Data Domain system. Multi-streaming enables you to improve backup and restore performance in most environments.

O

on-demand backup Type of backup that a user initiates from the client, also known as a manual or unscheduled backup.

online backup Backup of database objects performed while the corresponding database or instance is running and available to users. Also known as a hot backup.

P

pathname Set of instructions to the operating system for accessing a file:

- An absolute pathname indicates how to find a file by starting from the root directory and working down the directory tree.
- A relative pathname indicates how to find a file by starting from the current location.

physical host Node or host that forms part of a cluster.

plug-in Avamar client software that recognizes a particular kind of data resident on that client.

point-in-time restore Restore of a backup to a specific point-in-time.

policy A set of rules for client backups that can be named and applied to multiple groups. Groups have dataset, schedule, and retention policies.

R

- recovery** Application of transaction logs to restored data to make the data consistent with a given point-in-time.
- See also** restore
- 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*.
- See also** client registration
- relocated restore** Restore of data from a backup to a different location on the same host or an alternate host.
- restore** To retrieve data from a backup and pass the data to a Sybase database.
- See also** recovery
- restore browsing** Type of browsing that searches the previously created backups for specific backups to be restored.
- 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.

S

- 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.
- scheduled backup** Type of backup that is configured to start automatically through an Avamar policy for a group of one or more Avamar clients.
- shared storage** Storage that is connected to multiple nodes in the cluster.
- Sybase plug-in** Alternative term for the Avamar Plug-in for Sybase software.
- See also** Avamar Plug-in for Sybase
- Sybase server** Sybase ASE server, which is the only type of Sybase database server that the Avamar Plug-in for Sybase software supports for backups and restores.

T

- target database** Database that the Avamar server backs up as a safeguard against data loss.
- transaction log** System table in each Sybase database that keeps track of the changes to the database.

transaction log backup Backup of the transaction log of a Sybase database, not the entire database.

See also incremental backup

U

unscheduled backup See "on-demand backup."

V

virtual cluster client Client that is not permanently bound to one physical host but is managed by a cluster manager. It is also referred to as a logical cluster client or a virtual client.