

# EMC<sup>®</sup> Avamar<sup>®</sup> 7.0 for SharePoint VSS

## User Guide

P/N 300-015-234  
REV 01

Copyright © 2001 - 2013 EMC Corporation. All rights reserved. Published in the USA.

Published July, 2013

EMC believes the information in this publication is accurate as of its publication date. The information is subject to change without notice.

The information in this publication is provided as is. EMC Corporation makes no representations or warranties of any kind with respect to the information in this publication, and specifically disclaims implied warranties of merchantability or fitness for a particular purpose. Use, copying, and distribution of any EMC software described in this publication requires an applicable software license.

EMC<sup>2</sup>, EMC, and the EMC logo are registered trademarks or trademarks of EMC Corporation in the United States and other countries. All other trademarks used herein are the property of their respective owners.

For the most up-to-date regulatory document for your product line, go to the technical documentation and advisories section on the EMC online support website.

# CONTENTS

## Preface

## Chapter 1

### Introduction

Architecture .....	12
SharePoint topology.....	13
How Avamar works in a SharePoint environment .....	15
Data Domain system support .....	24
Backup .....	24
Backing up a SharePoint farm .....	25
Backing up the operating system .....	27
Multi-streaming.....	27
Backup limitations .....	28
Restore .....	29
Restoring to the original location.....	29
Restoring to a different location .....	31
Granular level recovery.....	31
Restore limitations .....	34
Disaster recovery .....	34
Understand SharePoint .....	34
Develop a comprehensive backup plan .....	35
Perform standard full operating system and SharePoint farm backups ..	35

## Chapter 2

### Installation

Preparing to install the Avamar Plug-in for SharePoint VSS .....	38
System requirements .....	38
Checking the hardware requirements .....	39
Checking the Avamar Plug-in for SharePoint GLR requirements.....	39
Checking the multi-streaming requirements .....	41
Checking the database requirements .....	42
Required account privileges .....	43
Avamar Backup Agent service runs as LocalSystem .....	43
VSS snapshot volume requirements.....	43
Services and writers .....	43
Checking the User Account Control setting on Windows .....	44
Downloading the software.....	44
Verifying the environment .....	45
Installing the Avamar client software.....	46
Installation road map .....	46
Installing the Avamar Client for Windows.....	47
Installing the Avamar Plug-in for SharePoint VSS.....	48
Fixing the Microsoft SharePoint VSS Writer error.....	50
Registering the client .....	51
Configuring the cluster client.....	51
Changing the SharePoint mode .....	53
Installing Ontrack PowerControls.....	53
Ontrack PowerControls installation requirements.....	54
Ontrack PowerControls components.....	54
Ontrack PowerControls installation settings .....	55

	Upgrading the Avamar Plug-in for SharePoint VSS .....	55
	Uninstalling the Avamar client software.....	55
	Uninstall road map.....	55
	Uninstalling the cluster client.....	56
	Uninstalling the EMC Avamar Backup Plug-in for SharePoint .....	56
	Uninstalling the Avamar Client for Windows .....	56
<b>Chapter 3</b>	<b>Backup</b>	
	On-demand backups.....	58
	Backing up an entire SharePoint farm.....	58
	Performing scheduled backups .....	63
	Creating a dataset .....	63
	Creating a group.....	67
	Enabling scheduled backups .....	70
	Monitoring backups .....	71
	Canceling backups.....	71
	Troubleshooting backups.....	72
<b>Chapter 4</b>	<b>Restore</b>	
	SharePoint farm restore workflow.....	74
	Restore from backups created with previous versions of Avamar .....	74
	Restore of SharePoint 2013 backups created with Avamar 6.1 may fail .	74
	Restore of SharePoint 2007 backups created with Avamar 6.0 may fail .	74
	Tasks required to restore specific components .....	75
	Restore of a deleted web application.....	75
	Restore of a deleted search database.....	76
	Finding a backup.....	77
	When to find a backup by date .....	77
	How to find a backup by date .....	77
	Finding a backup by file or folder.....	78
	How to find a backup by file or folder .....	79
	Restoring to the original location.....	80
	Restoring an entire farm to its original location.....	80
	Restoring a content database to its original location .....	83
	Restoring to a different location .....	86
	Performing granular level recovery .....	88
	Granular level recovery task list.....	89
	Avamar Virtual Disk limitations .....	90
	Restoring the Avamar backup and mounting the Avamar Virtual Drive ...	90
	Restoring items from the Avamar Virtual Drive .....	93
	Troubleshooting granular level restores.....	95
	Avamar log files .....	95
	SharePoint command line interfaces .....	96
	Troubleshooting restores.....	97
<b>Chapter 5</b>	<b>Disaster Recovery</b>	
	Preparing for disaster recovery .....	100
	Avamar backups required for each SharePoint server .....	101
	Backup of configuration settings .....	102
	Back up customizations .....	104
	Backing up databases.....	105
	Disaster recovery .....	106

	Rebuilding the SharePoint environment .....	106
	Reinstalling the Avamar software .....	107
	Restoring the SharePoint farm from the Avamar backup .....	107
	Bringing restored servers back online.....	108
<b>Appendix A</b>	<b>Plug-in Options</b>	
	How to set plug-in options .....	110
	Backup options.....	110
	Restore options.....	111
	Restore options for the Avamar Plug-in for SharePoint VSS.....	111
	Restore options for the Avamar Plug-in for SharePoint GLR .....	112
<b>Appendix B</b>	<b>Command Line Interface</b>	
	Understanding the SharePoint VSS plug-in CLI .....	114
	CLI architecture .....	114
	Launching the CLI.....	114
	Available operations .....	114
	Options.....	115
	Help.....	116
	Command reference .....	116
	Synopsis .....	116
	Operations.....	116
	Options.....	117
	CLI examples .....	120
	Example browse commands.....	120
	Example backup commands.....	120
	Example restore commands .....	121



# 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 EMC Avamar in a SharePoint environment and how to back up and restore data in a SharePoint environment by using Avamar with Microsoft Volume Shadow Copy Service (VSS) technology.

## Audience

This document is intended primarily for:

- ◆ System administrators who are responsible for installing software and maintaining servers and clients on a network.
- ◆ SharePoint administrators who are responsible for backing up and maintaining SharePoint servers.

Persons using this document should have current practical experience with the following:

- ◆ Operating system shell commands on the SharePoint platform. Root permission is required.
- ◆ The specific version of SharePoint currently deployed at the site.

## Revision history

The following table presents the revision history of this document.

**Table 1** Revision history

Revision	Date	Description
01	July 10, 2013	Initial release of Avamar 7.0.

## Related documentation

The following EMC publications provide additional information:

- ◆ *EMC Avamar Administration Guide*
- ◆ *EMC Avamar for Windows Server User Guide*
- ◆ *EMC Avamar for SQL Server User Guide*
- ◆ *EMC Avamar Backup Clients User Guide*
- ◆ *EMC Avamar Operational Best Practices*

- ◆ *EMC Avamar Release Notes*
- ◆ *EMC Avamar Compatibility and Interoperability Matrix*
- ◆ *EMC Avamar Config Checker for Microsoft Windows Technical Note*

## Conventions used in this document

EMC uses the following conventions for special notices:

---

**Note:** A note presents information that is important, but not hazard-related.

---

### **IMPORTANT**

---

An important notice contains information essential to software or hardware operation.

---

## Typographical conventions

EMC uses the following type style conventions in this document:

<b>Bold</b>	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"><li>• System output, such as an error message or script</li><li>• System code</li><li>• Pathnames, filenames, prompts, and syntax</li><li>• Commands and options</li></ul>
<i>Monospace italic</i>	Use for variables.
<b>Monospace bold</b>	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.

## Knowledgebase

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

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

Visit EMC Community Network at <https://community.EMC.com> for peer contacts, conversations, and content on product support and solutions. Interactively engage online with customers, partners and certified professionals for all EMC products.

## 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 help us to continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of this document to:

[BSGDocumentation@emc.com](mailto:BSGDocumentation@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

The following topics provide an introduction to using EMC Avamar for SharePoint VSS to back up and restore data in SharePoint Server 2013, 2010, and Microsoft Office SharePoint Server 2007 Service Pack 1 (SP1) environments:

- ◆ Architecture ..... 12
- ◆ Backup ..... 24
- ◆ Restore ..... 29
- ◆ Disaster recovery..... 34

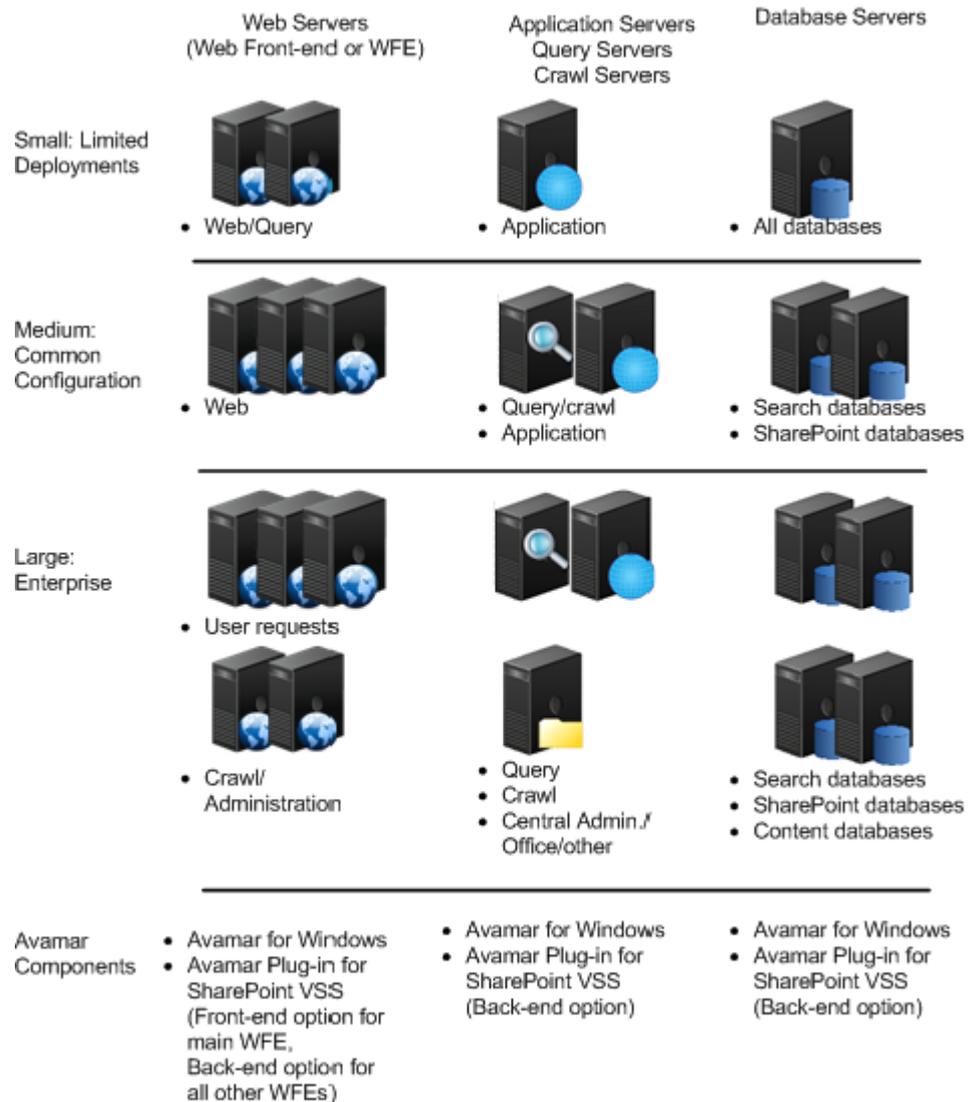
## Architecture

The following topics explain the architecture of a SharePoint environment and how the various EMC® Avamar® components fit in the environment to provide backup and recovery:

- ◆ [“SharePoint topology” on page 13](#)
- ◆ [“How Avamar works in a SharePoint environment” on page 15](#)
- ◆ [“Data Domain system support” on page 24](#)

## SharePoint topology

SharePoint servers are organized as farms. In a stand-alone farm, all SharePoint roles and components reside on one server. In a distributed farm, these components and roles are spread across multiple servers. Avamar SharePoint backup and recovery capabilities scale to all farm sizes. The following figure shows the topologies of small, medium, and large distributed farms and the Avamar components installed on each server by SharePoint server roles.



**Figure 1** SharePoint topologies for small, medium, and large farms

## SharePoint server roles

Each server in a SharePoint farm can assume one or more roles. Roles are not assigned directly to a server. A server assumes a specific role, depending on the components installed and the services it runs.

The following table describes the different types of SharePoint server roles.

**Table 2** SharePoint server roles

Server type	Role
Web server	Hosts all web pages, web parts, and web services required by the server farm. Also called a Web front-end (WFE),
Application server	Hosts the service applications running in the farm, such as Visio services, Forms service, Excel calculations services, and more.
Query server	Responsible for querying the index, finding the matching content, and returning content back to the Web servers for presentation to users.
Crawl or index server	Crawls the content sources, writes the results to the database, and then the database is propagated to the query servers. The crawl server uses a crawl database in a Microsoft SQL Server to store the URLs of all sources crawled.
Database server	An SQL Server that stores most of the data associated with a SharePoint 2010 implementation, including configuration settings, administration information, service applications data, and user content.

## SQL Server in SharePoint

Microsoft SQL Server provides storage for all content, data, and configuration information in a SharePoint environment. The following table lists the SQL Server databases in a SharePoint environment.

**Table 3** Microsoft SQL Server databases in a SharePoint environment (page 1 of 2)

Database	Functions
Configuration	Stores all configuration information for the farm, including topology information and content database information.
Content	Stores: <ul style="list-style-type: none"> <li>• Windows SharePoint Services (WSS) site details</li> <li>• Structure details</li> <li>• User content</li> <li>• Files</li> <li>• Security information</li> </ul>
Shared Service Provider (SharePoint 2007) Service Applications (SharePoint 2010)	Stores: <ul style="list-style-type: none"> <li>• User profiles</li> <li>• Audience data</li> <li>• Business application data</li> <li>• Excel services functions</li> <li>• Site usage data</li> <li>• InfoPath forms</li> <li>• Services session state information</li> </ul>

**Table 3** Microsoft SQL Server databases in a SharePoint environment (page 2 of 2)

Database	Functions
Search	Stores: <ul style="list-style-type: none"> <li>• Search data</li> <li>• History log</li> <li>• Search log</li> <li>• Calculation tables for crawl statistics</li> <li>• Links tables</li> <li>• Statistical tables</li> </ul>
Custom	Separate databases that store third-party application data.
Search indexes	Stores search indexes on the file system.

## How Avamar works in a SharePoint environment

Avamar provides complete protection for a SharePoint farm by using the:

- ◆ Avamar Client for Windows to protect the operating system, system state, and Windows Server.
- ◆ Avamar Plug-in for SharePoint VSS to protect the SharePoint farm structure and content.
- ◆ Avamar Plug-in for SharePoint GLR to provide granular level recovery when used with optional third-party recovery tools, such as Ontrack PowerControls, purchased separately.

### NOTICE

You can also use the Avamar Plug-in for SQL Server to independently back up the SQL Server databases in the farm. “[Avamar Plug-in for SQL Server \(optional\)](#)” on page 17. describes the limitations and disadvantages of this approach.

Avamar provides protection for all scales of SharePoint deployment, from stand-alone farms that contain all SharePoint roles on a single server, to small, medium, or large enterprise distributed farms.

## Avamar Administrator

Avamar Administrator is a graphical management console software application for remote administration of an Avamar system from a supported Windows or client computer. Logging in to the Avamar Administrator program provides access to a specific Avamar server. Backups and restores are configured and run through Avamar Administrator. The *EMC Avamar Administration Guide* provides complete instructions for installing and using Avamar Administrator.

## Avamar clients and plug-ins

The following topics describe how the Avamar clients and plug-ins provide protection for a SharePoint farm:

- ◆ [“Avamar Client for Windows” on page 16](#)
- ◆ [“Avamar Plug-in for SharePoint VSS” on page 16](#)
- ◆ [“Avamar Plug-in for SQL Server \(optional\)” on page 17](#)
- ◆ [“Avamar Plug-in for SharePoint GLR \(optional\)” on page 18](#)

All servers in a SharePoint farm require both the Avamar Client for Windows and Avamar Plug-in for SharePoint VSS. The configuration on each server varies, depending on the SharePoint farm role and whether you will be setting up the farm for granular level recovery.

The following sections describe Avamar client and plug-in installations for stand-alone or distributed farms and granular level recovery options:

- ◆ [“Stand-alone SharePoint farm” on page 20](#)
- ◆ [“Stand-alone SharePoint farm with optional granular level recovery” on page 21](#)
- ◆ [“Distributed SharePoint farm with optional granular level recovery” on page 23](#)

### Avamar Client for Windows

You must install the Avamar Client for Windows on every server in the SharePoint environment. The SharePoint VSS plug-in requires the Windows client. In addition, you can use the Windows client to back up operating system and SharePoint binary files, which are required for disaster recovery.

### Avamar Plug-in for SharePoint VSS

The Avamar Plug-in for SharePoint VSS provides Volume Shadow Copy Service (VSS) backup of SharePoint at the SharePoint farm level; and recovery at the farm level, at the discovered components level, or at the web application level.

The plug-in uses the SharePoint Foundation VSS Writer (SPF-VSS Writer), to determine what content and information from the SharePoint farm to back up. Microsoft describes the features and capabilities of the SPF-VSS Writer in the MSDN article “SharePoint Foundation VSS Writer.”

The VSS-based backup is the foundation for scheduled full backups, and are used to perform disaster recovery or recovery of entire databases, components, or applications.

The Avamar Plug-in for SharePoint VSS can back up and restore a SharePoint farm, or WSS 3.0 components including:

- ◆ Website collections
- ◆ Content databases
- ◆ Web applications
- ◆ Content publishing web services
- ◆ Search Windows service, including databases and indexes

Some listed components cannot be selected for backup or restore but are automatically included by Avamar, based on their dependency on other components that you select.

In addition, the Avamar Plug-in for SharePoint VSS can back up and restore the additional functionality provided by Microsoft Office SharePoint Server 2007 SP1 and 2010, including Shared Service Providers.

The Avamar Plug-in for SharePoint VSS includes in backups and restores, any third-party databases built on a SharePoint foundation registered within the configuration database.

Install the Avamar Plug-in for SharePoint VSS on all machines in the farm. During installation, select whether the server is a front-end or back-end server:

- ◆ Front-end server — A front-end server is the main WFE server in a distributed farm or the sole SharePoint server in a stand-alone farm. The Avamar Plug-in for SharePoint VSS coordinates the farm backups through the WFE server. If there is no SharePoint data on a WFE server, then the SharePoint VSS writer skips that WFE server during backups. However, you still must install the Avamar Plug-in for SharePoint VSS on the WFE server.
- ◆ Back-end server — Back-end servers are all other servers in the SharePoint farm. On a sole SharePoint server in a stand-alone farm, you do not configure any back-end servers.

### Avamar Plug-in for SQL Server (optional)

Use the Avamar Plug-in for SQL Server to back up all SQL databases from SharePoint database server separate from the SharePoint backups. This excludes the search database. Perform full, differential, and incremental backups of the databases and restore individual databases. Install this optional plug-in on the SharePoint farm's database servers that also have SQL Server installed.

#### NOTICE

An Avamar Plug-in for SQL Server backup does not include the search index file. Synchronize the Avamar Plug-in for SQL Server backup with the search index file in the search database backup, and restore the backups together.

The *EMC Avamar for SQL Server User Guide* provides details on installing the Avamar Plug-in for SQL Server and performing backups and restores.

#### Limitations of using the Avamar plug-in for SQL Server

Do not include the SQL Server databases used by SharePoint in an existing Avamar SQL Server plug-in backup schedule that you use for other SQL Server databases outside of SharePoint.

#### NOTICE

Microsoft does not recommend using *any* separate SQL backup tool for SharePoint data protection.

There are several disadvantages to SQL Server backups created with the Avamar Plug-in for SQL Server. These backups:

- ◆ Cannot be used for granular level recovery.
- ◆ Cannot be used for SharePoint disaster recovery.
- ◆ Are not a replacement for a backup with the SharePoint VSS plug-in.

For restore of a SharePoint farm or disaster recovery, you need the full backup provided by the SharePoint VSS plug-in.

- ◆ Require extra storage and resources because there are two backups of the databases.
  - Once in the SharePoint VSS plug-in backups for full farm protection and disaster recovery
  - Once with the Avamar Plug-in for SQL Server to back up the databases
- ◆ Cannot be used for restore of the configuration database and Central Administration content database.

The Microsoft white paper, “Data protection and recovery for Microsoft Office SharePoint Server 2007,” available on the Microsoft website, describes the benefits and disadvantages of using a separate SQL Server backup tool.

The benefits of using a separate SQL Server backup tool include:

- ◆ You can reuse existing SQL Server disaster recovery strategies.
- ◆ You can configure full and differential backups with added verification.
- ◆ The backup tool provides a complete data backup.
- ◆ Backups with the tool can be faster than Office SharePoint Server backups.

The disadvantages of using a separate SQL Server backup tool include:

- ◆ The backup tool does not replace the need for a full backup with the Avamar Plug-in for SharePoint VSS.
- ◆ You cannot use the backup tool for a full farm restore.
- ◆ Microsoft does not formally support the backup tool.
- ◆ The backup tool does not include front-end web server custom solutions.
- ◆ The backup tool can back up the configuration database and Central Administration content database, but does not support restore. The Avamar Plug-in for SharePoint VSS supports restoring of the configuration and Central administration content database as part of a full farm restore.
- ◆ The backup tool does not back up Internet Information Services (IIS) settings set outside of Office SharePoint Server, including host headers, dedicated IP addresses, and Secure Sockets Layer (SSL) certificates.
- ◆ When using search, you must re-crawl after restoring content because SQL Server does not back up indexes.
- ◆ Backups of the search database made with the backup tool cannot be synchronized with the search database.
- ◆ You must manually attach the databases to the web applications after a recovery.

### **Avamar Plug-in for SharePoint GLR (optional)**

The Avamar Plug-in for SharePoint GLR supports granular level recovery of SharePoint items when used with a supported third-party recovery tool.

The Avamar Plug-in for SharePoint GLR can display SharePoint content and database backups in the Avamar Virtual Drive, allowing browsing and selection of items for recovery with a third-party tool, such as the Kroll Ontrack PowerControls software. The Ontrack PowerControls software must be purchased separately and is not included in the Avamar Plug-in for SharePoint VSS installation package.

[“Installing Ontrack PowerControls” on page 53](#) provides more detailed information about purchasing and installing the software.

If you intend to perform granular level recovery, install the Avamar Plug-in for SharePoint GLR and Ontrack PowerControls software on the SharePoint Administrator console computer. The console computer is the computer to which you initially restore data before you browse and select data for granular level recovery.

## Avamar configurations for SharePoint farms

All servers in the SharePoint farm must have the Avamar Client for Windows and the Avamar Plug-in for SharePoint VSS installed. How these Avamar components are installed depends on the roles of each server, the scale of the farm, and whether granular level recovery capabilities are planned.

The following sections describe the most common types of installation and configuration:

- ◆ [“Stand-alone SharePoint farm” on page 20](#)
- ◆ [“Stand-alone SharePoint farm with optional granular level recovery” on page 21](#)
- ◆ [“Distributed SharePoint farm” on page 22](#)
- ◆ [“Distributed SharePoint farm with optional granular level recovery” on page 23](#)

### NOTICE

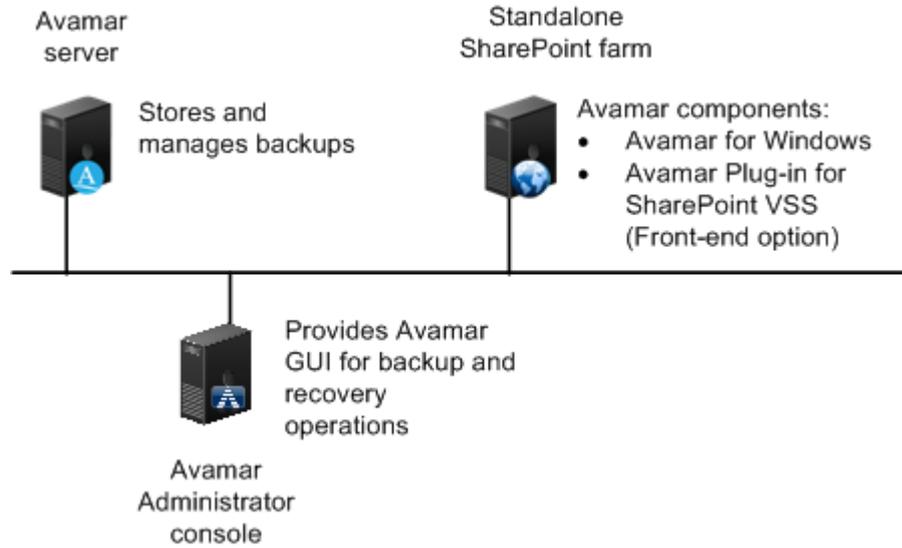
Distributed farms can contain multiple web front end (WFE) servers. WFE servers provide access to SharePoint content on the other SharePoint farm servers, but the WFE servers do not always contain SharePoint content of their own. When you run a backup of a SharePoint farm, Avamar skips WFE servers that do not contain SharePoint data. As part of a SharePoint farm backup plan, back up all SharePoint servers with the Avamar for Windows client. This protects the server file system, non-critical volumes, and system state. The Avamar for Windows client backups are required for disaster recovery of each Windows server.

---

## Stand-alone SharePoint farm

In a stand-alone SharePoint farm, one server handles all SharePoint roles, including the WFE, Search data, and all SharePoint databases.

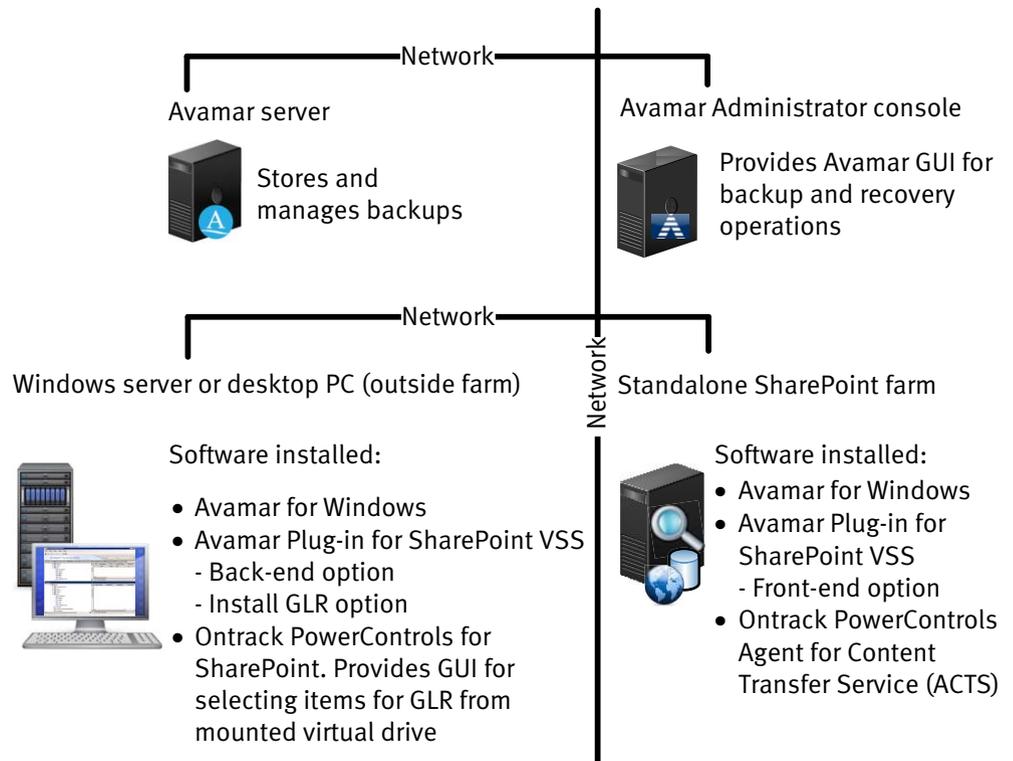
The following figure illustrates the relationship of the Avamar server, Avamar Administrator console, and the Avamar software installed on the SharePoint stand-alone server.



**Figure 2** Architecture of a stand-alone farm with Avamar

## Stand-alone SharePoint farm with optional granular level recovery

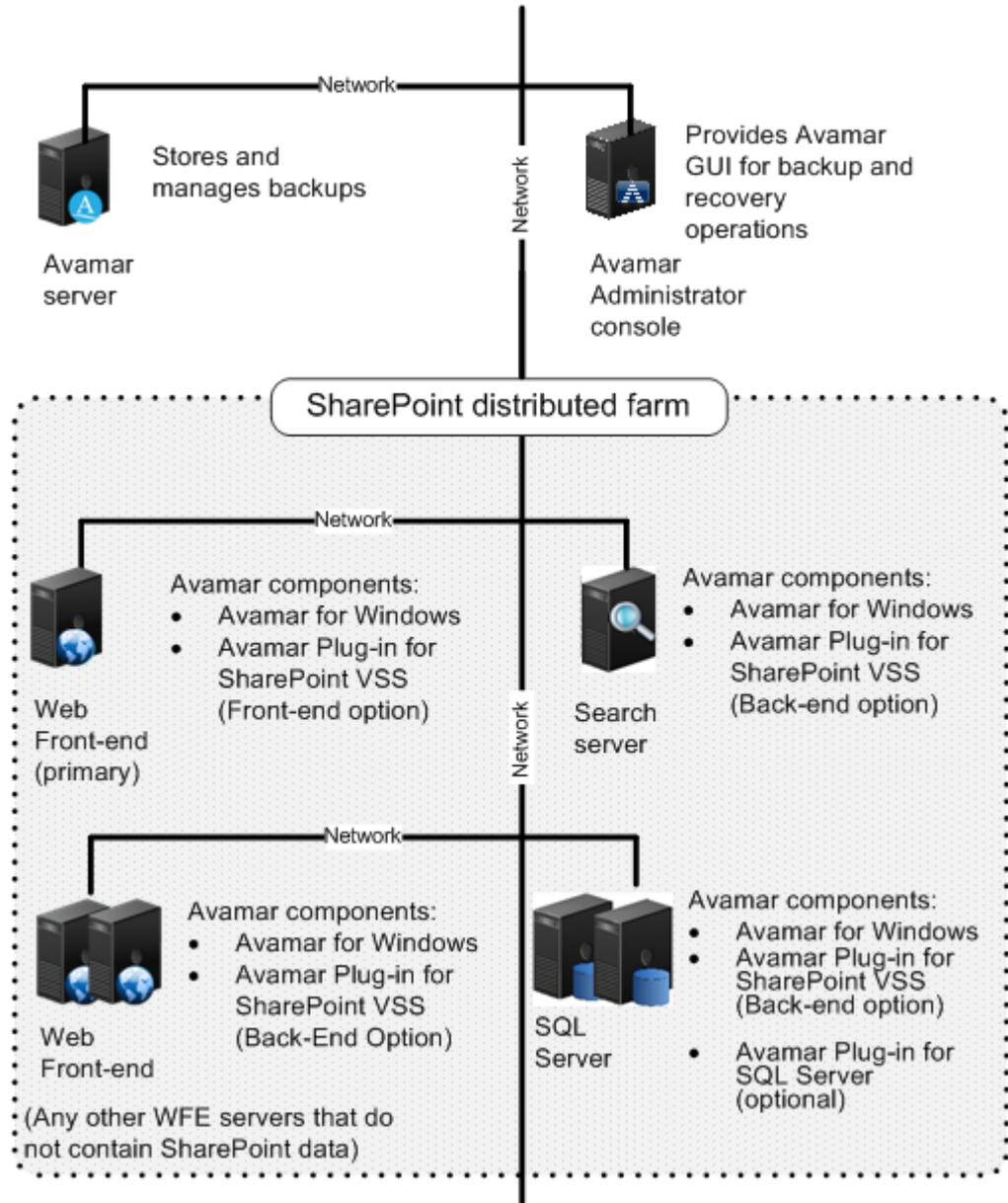
The following figure illustrates the additional installation requirements for granular level recovery support. “[Avamar Plug-in for SharePoint GLR \(optional\)](#)” on page 18 discusses the Avamar Plug-in for SharePoint GLR and Ontrack PowerControls software.



**Figure 3** Architecture of a stand-alone farm with granular level recovery

## Distributed SharePoint farm

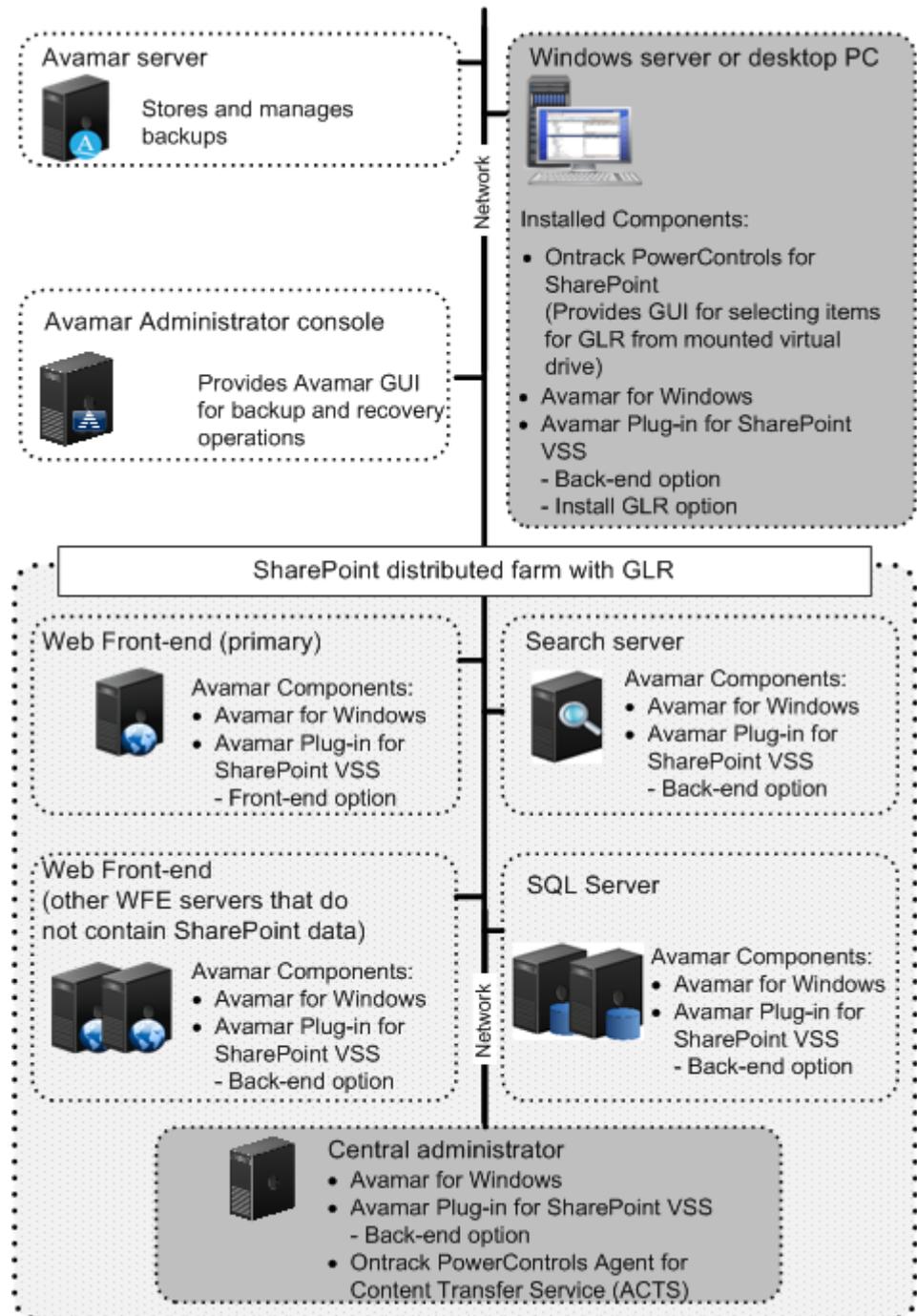
In a distributed SharePoint farm, as described in “[SharePoint topology](#)” on page 13, the SharePoint roles reside on multiple servers. The following figure illustrates the Avamar software installed on multiple SharePoint servers in a distributed farm.



**Figure 4** Architecture of a distributed farm with Avamar

## Distributed SharePoint farm with optional granular level recovery

When compared with Figure 4, the following figure illustrates the additional computers and software required to support granular level recovery.



**Figure 5** Architecture of a distributed farm with granular level recovery

## Data Domain system support

You can store SharePoint VSS and SQL Server backups on either the Avamar server or on an EMC Data Domain<sup>®</sup> system. Avamar stores backups on the Avamar server by default.

To store backups on a Data Domain system, use Avamar Administrator to configure the Data Domain system for use. Then select the Data Domain system during an on-demand backup or when configuring the dataset for a scheduled backup. The *EMC Avamar Administration Guide* provides details on how to configure the Data Domain system in Avamar Administrator. The individual backup procedures in this guide provide the steps for selecting the Data Domain system to use.

### NOTICE

The Data Domain system requires DDOS 5.3 or later to support Remote BLOB Storage.

## Backup

A SharePoint farm backup strategy must include the backup of the entire farm and the backup of the operating system, as described in the following topics:

- ◆ [“Backing up a SharePoint farm” on page 25](#)
- ◆ [“Backing up the operating system” on page 27](#)
- ◆ [“Multi-streaming” on page 27](#)

[Chapter 3, “Backup,”](#) provides instructions on how to perform on-demand and scheduled backups of the entire farm by using the Avamar plug-in for SharePoint VSS:

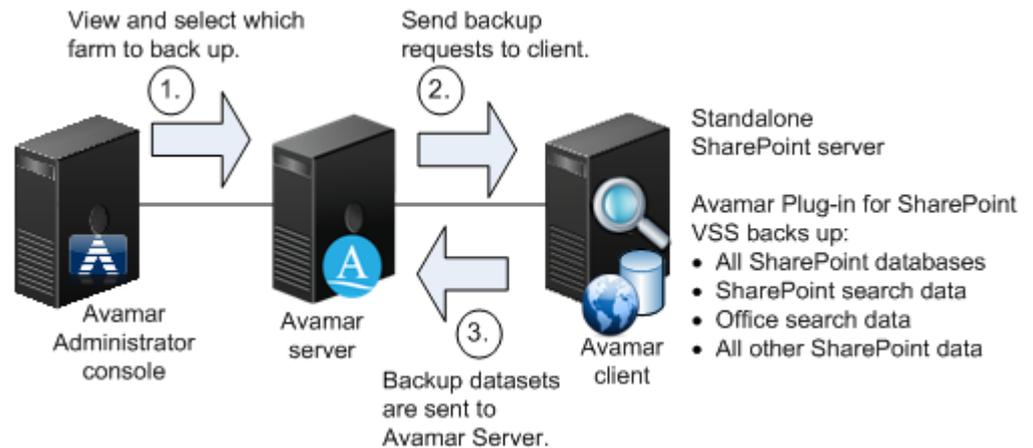
- ◆ [“Backing up an entire SharePoint farm” on page 58](#)
- ◆ [“Performing scheduled backups” on page 63](#)

## Backing up a SharePoint farm

The SharePoint VSS plug-in discovers the topology of the entire farm. This enables you to perform a unified or federated backup and recovery, through the main WFE server.

### Backup workflow for stand-alone farms

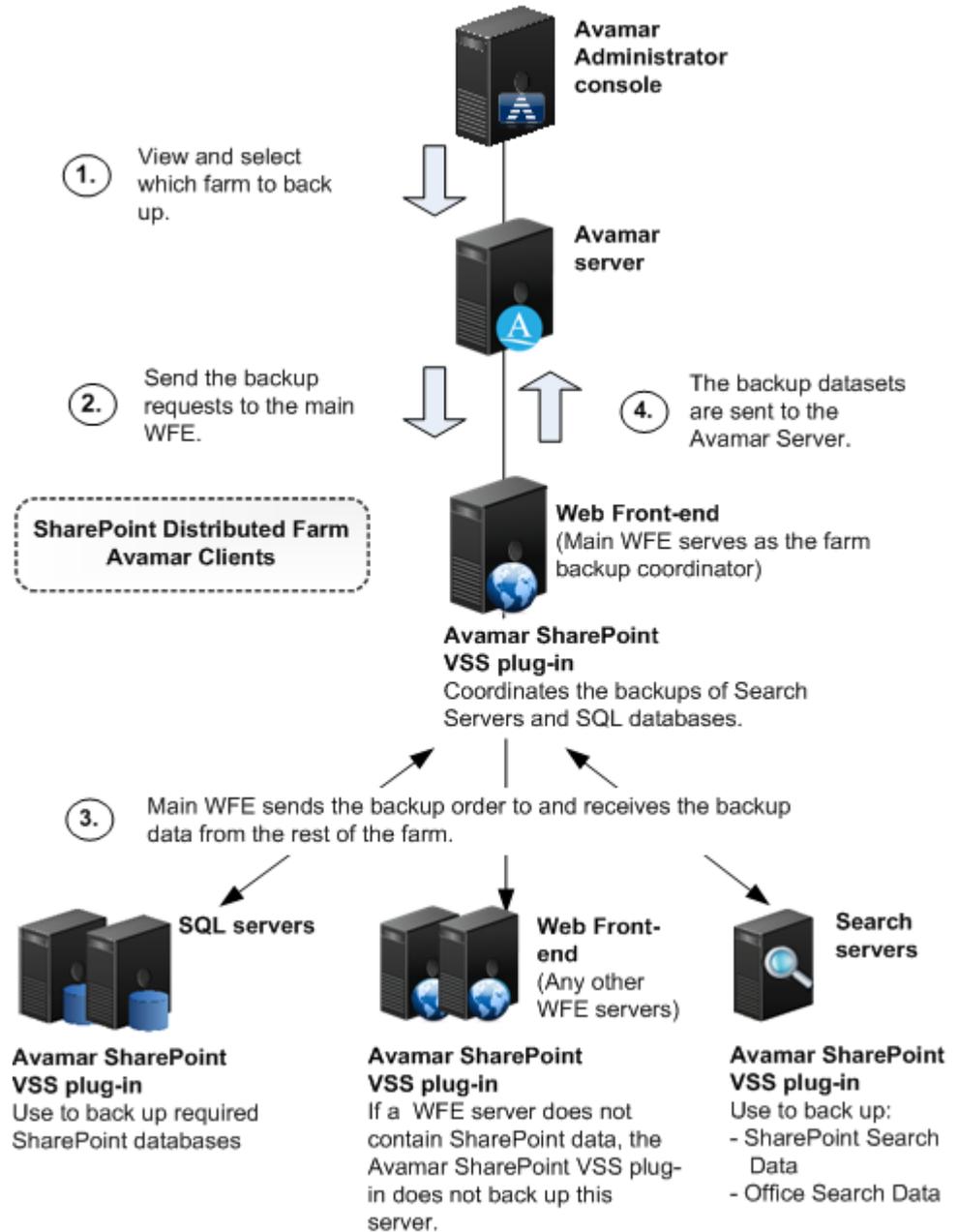
The following figure illustrates the backup workflow for a stand-alone farm, where the SharePoint server is also the WFE server.



**Figure 6** Backup workflow for stand-alone farms

## Backup workflow for distributed farms

In a distributed farm, the WFE server can reside on one computer, or several computers. The SharePoint administrator designates one computer as the main WFE server. Use the main WFE server for backups and recoveries, as illustrated in the following figure.



**Figure 7** Backup workflow for distributed farms

## Backing up the operating system

Prepare for disaster recovery by using Avamar Client for Windows to back up each Windows server in the farm. Completely back up each Windows server, including system state, critical volumes, and Active Directory.

In a farm with more than one WFE, use Avamar Client for Windows to protect IIS on each WFE.

The *EMC Avamar for Windows Server User Guide* provides complete details on performing backups and restores with Avamar Client for Windows.

## Multi-streaming

Multi-streaming enables parallel processing of backup jobs by using multiple processors. You can use as many as ten streams. Each stream requires a separate processor. By taking advantage of multi-processors and multi-core processors, you can improve performance when storing backups on an Avamar server or on a Data Domain system.

Configure multi-streaming for group backups by volume or by database. When volumes have varying database sizes, for example, 500 GB on g:\, 100 GB on h:\, and 100 GB on z:\, it takes longer for the streams to release the volumes with bigger sizes. To help balance multi-stream backup performance, configure multi-streaming by volumes when all volumes are similar in overall size, or configure multi-streaming by database when all databases are similar in size.

### NOTICE

Do not use multi-streaming for the first full backup of a SharePoint farm. The first full backup ingests all data for the first time, and then scans it for deduplication. Because the process is resource intensive, multi-streaming can adversely impact performance. After the first full backup is complete, subsequent backups can take advantage of multi-streaming because those backups include only new data and incremental changes that have not been deduplicated.

Multi-streaming places demands on computer hardware and resources beyond the base requirements for the Avamar Plug-in for SharePoint VSS. [“Checking the multi-streaming requirements” on page 41](#) provides details.

[“Backing up an entire SharePoint farm” on page 58](#) describes how to perform a multi-stream backup.

## Backup limitations

The following limitations apply when using the Avamar Plug-in for SharePoint VSS to back up a SharePoint environment:

- ◆ Backups and restores of individual websites, lists, or list items must be a part of the backup or restore of the parent Content Database.
- ◆ The configuration database or the Central Administration content database of a SharePoint farm can only be backed up as part of the backup or restore of the entire farm.

These databases are special databases that must be backed up or restored with everything (all content databases). A backup of these components provides a snapshot that can be useful for troubleshooting. For instance, the backup can be used with SQL Server tools to compare the present state of the components.

- ◆ The Avamar Plug-in for SharePoint VSS cannot be used to back up a SharePoint farm to tape.
- ◆ The Avamar Plug-in for SharePoint VSS cannot be used to back up an IIS metabase.
- ◆ The Avamar Plug-in for SharePoint VSS cannot be used to back up Registry keys or files on front-end servers.

This content includes files located outside any content database, such as certain master pages, .ascx files, web.config files, and other configuration files. However, this content can be backed up with the Avamar Client for Windows, which includes them in a full Windows Server backup, or with the WSS development kit.

### Avamar Plug-in for SharePoint GLR is for recovery only

After installing the Avamar Plug-in for SharePoint GLR, it appears in the list of plug-ins when you browse for backups. It cannot be selected however, because the Avamar Plug-in for SharePoint GLR is for recovery only. It uses backups created with the Windows SharePoint VSS plug-in to enable granular level recovery.

### Backup can fail when farm servers have multiple NICs or IP addresses

A backup can fail when WFE servers or back-end servers have multiple NICs, multiple IP addresses, or both. Network load balancing can cause the back-end client to see the WFE server's secondary IP address instead of the primary IP address. In that situation, Avamar might report an error similar to the following:

```
Client refused browse request. 10007 Unable to connect to the back-end
client '<MACHINENAME>', error code: 2 Please ensure that the
Back-end backup agent is running.
```

To fix this error, use the Windows command line to add an avagent.cmd file and persistent routes to both clients:

1. Add an avagent.cmd file with `--netbind=<IP address of primary NIC interface>` on both clients.
2. On both clients, use the Windows command line to add persistent routes that use only the primary NIC for outgoing traffic routed to the Avamar system.

## Backups fail when files are available through symbolic links or directory junctions

Backups with the SharePoint VSS plug-in fail if the path to SharePoint files includes symbolic links (symlinks) or directory junctions. Do not store SharePoint configuration or database files in a location that you access through a symlink or directory junction.

## Restore

The following restore options are available when using the backups described in [“Backup” on page 24](#):

- ◆ Restore the SharePoint farm or components to the original location
- ◆ Restore the SharePoint farm or components to a different location
- ◆ Perform granular level recovery of SharePoint items

### Restoring to the original location

After backing up a SharePoint farm using the Avamar Plug-in for SharePoint VSS, you can directly restore the entire farm, or one or more of its components, to the original location.

The following figure illustrates the restore of a stand-alone SharePoint farm.

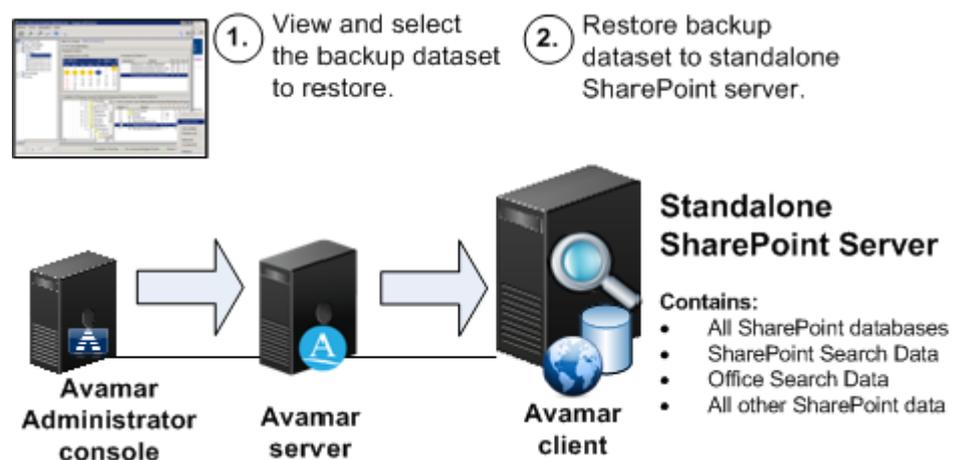
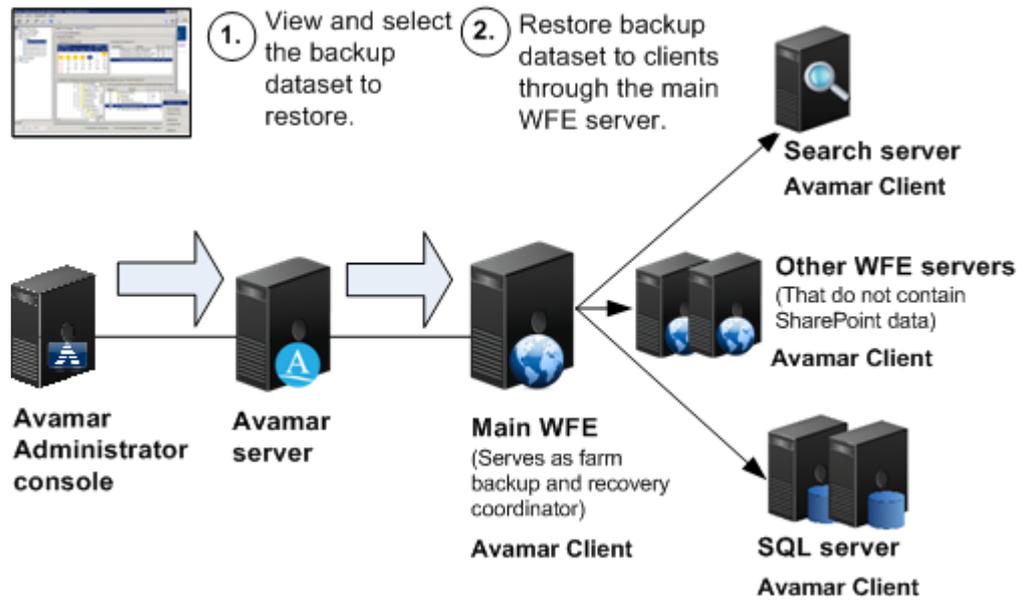


Figure 8 Restore workflow for stand-alone farms

The following figure illustrates a federated restore of a distributed SharePoint farm.



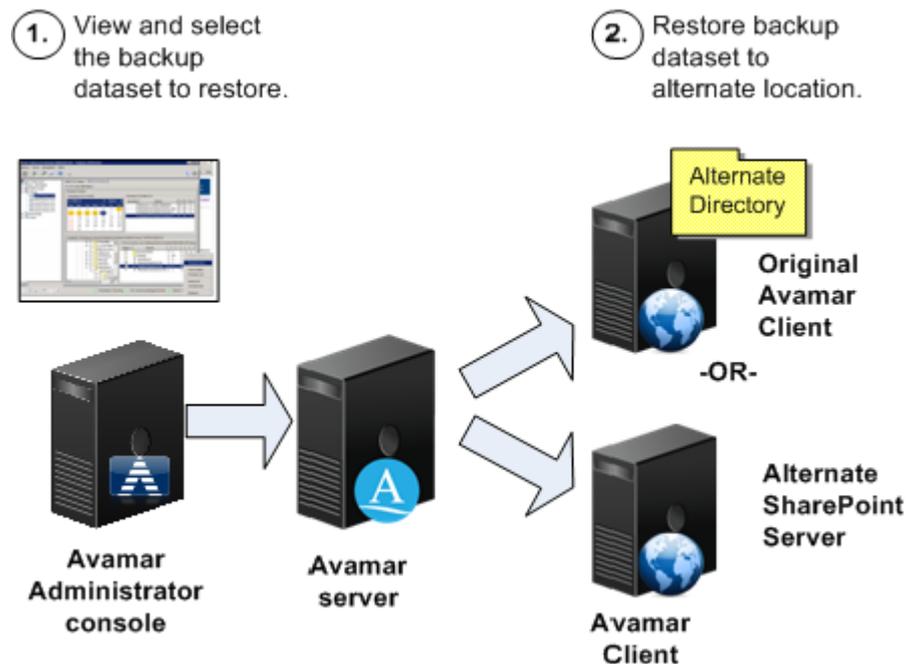
**Figure 9** Restore workflow for distributed farms

The following topics provide instructions for restoring to the original location:

- ◆ [“Restoring an entire farm to its original location” on page 80](#)
- ◆ [“Restoring a content database to its original location” on page 83](#)

## Restoring to a different location

You can restore an entire SharePoint farm, or one or more of its components, to another server, or to a different directory on the same server, as shown in the following figure. This feature enables you to use the Avamar Plug-in for SharePoint VSS to restore content without overwriting existing content in the production SharePoint server databases.



**Figure 10** Restore workflow to a different location

“[Restoring to a different location](#)” on page 86 provides instructions for restoring to a different location.

## Granular level recovery

A standard recovery allows you to recover databases or entire farms. Standard recovery techniques for restoring individual SharePoint items can take a long time and use a lot of resources because you must restore entire farms or databases. Individual databases use range from hundreds of bytes or gigabytes to several terabytes. A standard recovery can take a lot of time and resources and affect SharePoint performance when the data is restored to the original farm or a folder on the original server. A standard recovery requires the following types of resources:

- ◆ Time, network, and processors to copy the backup set to the recovery location.
- ◆ Disk space to stage and store the recovered data.
- ◆ Software resources to open the restored databases and then locate the items to restore.

Windows SharePoint GLR, used with an optional third-party recovery tool like Ontrack PowerControls, can significantly reduce the time, resources, and space needed to recover individual items, files, or folders. With the Windows SharePoint GLR feature, the backup dataset is mounted to the Avamar Virtual Drive. The Avamar Virtual Drive enables you to

browse the contents of the backup without physically moving any files or databases. The time it takes to recover the selected contents to the mounted virtual drive is considerably less than the time required to recover a database, browse the database, and select the items that prompted the recovery.

[“Installing Ontrack PowerControls” on page 53](#) provides more detailed information about purchasing and installing the software.

With these granular recovery tools, Avamar copies and moves just the items you want to restore, not entire databases or farms. The granular level recovery process includes the following steps:

1. In Avamar Administrator, locate the backup that contains the items you want to restore, and then perform the restore.
2. Open Ontrack PowerControls.  
The recovery wizard prompts for the location of the mounted virtual drive.
3. In Ontrack PowerControls, locate and select the items to restore.  
Ontrack PowerControls sends the request to the Avamar server to restore the items selected. Up to this point, you have only been viewing a virtual mounted drive. No databases have been moved.
4. The Avamar server receives the restore request and restores the selected items to the alternate location (farm or server). At this step in the process physical files are copied and transferred.

Limiting the retrieved dataset to the items you want and not a complete database or farm reduces the impact on resources (memory, network, processor, disk space, and SharePoint performance).

The following figure illustrates the granular level recovery process.

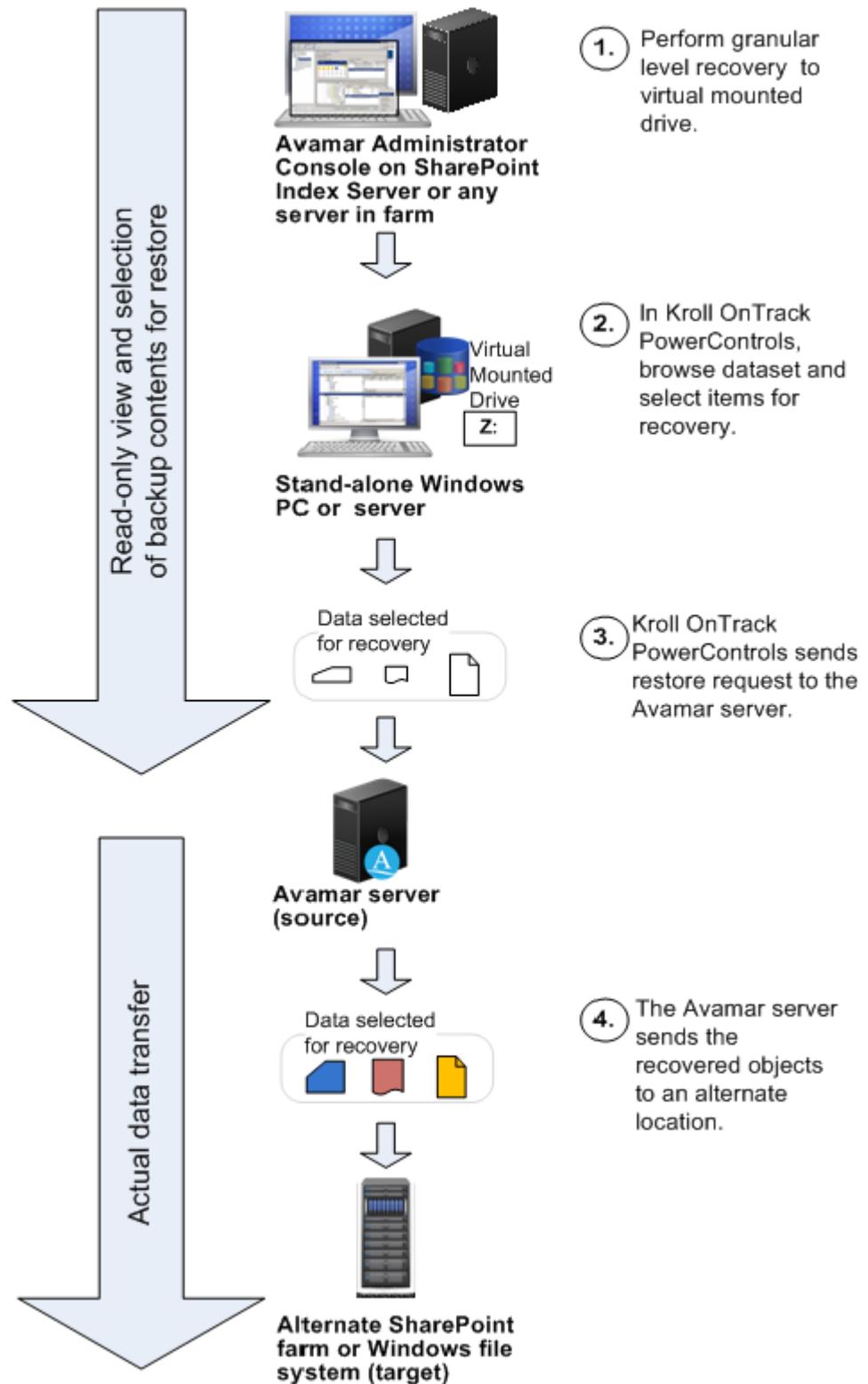


Figure 11 Granular level recovery workflow

[“Performing granular level recovery” on page 88](#) provides detailed steps for performing granular level recovery.

## Restore limitations

The following sections describes known issues and limitations for restore operations.

### **Restore of SQL databases from multiple SQL cluster groups instances on the same physical computer**

When you try to restore a SharePoint farm with a failover SQL cluster backend, if more than one cluster group is actively running on a single physical machine the restore will fail. Only one cluster group instance will be successfully restored, regardless of whether databases in the other instances are restored. Web navigations or requests for content in those databases results in FILE NOT FOUND or FORBIDDEN errors.

To resolve these issues, set up a SQL failover cluster with no more than one cluster group actively running one single physical machine at a time.

### **Restore over locked files incorrectly appears to be successful**

When you try to perform a redirected restore over locked files, such as restoring over database files, the restore shows that it completed successfully, but the files are not restored.

## Disaster recovery

Disaster recovery is required when a catastrophic physical or software event damages major a SharePoint farm.

A SharePoint disaster recovery requires:

- ◆ Rebuild servers
- ◆ Reinstall SharePoint
- ◆ Configure each server for its farm role
- ◆ Restore the SharePoint data, configuration, or databases on each server

The following recommendations are intended to enhance, not replace, a good disaster recovery plan.

#### **NOTICE**

SharePoint disaster recovery requires extensive knowledge of SharePoint installation and configuration.

---

## Understand SharePoint

Keep up-to-date with SharePoint technology, and the software versions, the service packs, and the update levels installed on the SharePoint farms. SharePoint backup and recovery require adherence to specific sequences and synchronization.

Microsoft provides information about SharePoint backup and recovery in the TechNet white paper “Data protection and recovery for Microsoft Office SharePoint Server 2007,” <http://go.microsoft.com/fwlink/?LinkId=102839&clcid=0x409>.

## Develop a comprehensive backup plan

Ensure that you have the necessary backups, and the information needed to perform a complete disaster recovery of a SharePoint environment. Develop a comprehensive backup strategy to protect each component in the environment and the entire farm structure.

A disaster plan can include:

- ◆ Plans for alternate physical sites, and equipment for rebuilding the servers, farms, or sites
- ◆ Identification of key people, with the required skills and knowledge, and sufficient permissions to complete all recovery tasks
- ◆ Documentation of physical hardware requirements, network configurations, and software versions
- ◆ A location to protect all installation media required for reinstalling the operating systems and applications

## Perform standard full operating system and SharePoint farm backups

Avamar Client for Windows and Avamar Plug-in for SharePoint VSS play an integral part in disaster recovery, by providing backups of:

- ◆ operating system
- ◆ system state
- ◆ system volumes
- ◆ applications

“Disaster Recovery” on page 99 provides information on using Avamar software for backup and restore of a SharePoint farm, both stand-alone farms and distributed farms.

- ◆ “Preparing for disaster recovery” on page 100 describes how to use Avamar software as part of a comprehensive backup strategy.

Prepare for disaster recovery by performing consistent backups of:

- All computers with Avamar Client for Windows.
- SharePoint data and configuration of each computer in the SharePoint farm with the Avamar Plug-in for SharePoint VSS and Avamar Plug-in for SQL Server.
- ◆ “Disaster recovery” on page 106 describes how to rebuild and restore the environment from Avamar backups.

### NOTICE

Many parts of the recovery process require extensive knowledge and use of SharePoint technology and tools. Microsoft provides information on the disaster recovery process, and their recommended best practices, in “Data protection and recovery for Microsoft Office SharePoint Server 2007,”

<http://go.microsoft.com/fwlink/?LinkId=102839&clcid=0x409>.



# CHAPTER 2

## Installation

This chapter describes how to install, upgrade, and uninstall the Avamar Plug-in for SharePoint VSS in a Windows environment.

Topics in this chapter include:

- ◆ [Preparing to install the Avamar Plug-in for SharePoint VSS .....](#) 38
- ◆ [Installing the Avamar client software .....](#) 46
- ◆ [Changing the SharePoint mode .....](#) 53
- ◆ [Installing Ontrack PowerControls .....](#) 53
- ◆ [Upgrading the Avamar Plug-in for SharePoint VSS .....](#) 55
- ◆ [Uninstalling the Avamar client software.....](#) 55

## Preparing to install the Avamar Plug-in for SharePoint VSS

The following topics describe prerequisites for Avamar Plug-in for SharePoint VSS installation:

- ◆ “Checking the hardware requirements” on page 39
- ◆ “Checking the Avamar Plug-in for SharePoint GLR requirements” on page 39
- ◆ “Checking the multi-streaming requirements” on page 41
- ◆ “Checking the database requirements” on page 42
- ◆ “Required account privileges” on page 43

### System requirements

The following table lists SharePoint environments and the Avamar client or plug-in version required to back up or restore the system.

**Table 4** Avamar client or plug-in required for SharePoint environments

SharePoint version	Operating system	Avamar client or plug-in
SharePoint 2013	<ul style="list-style-type: none"> <li>• Windows Server 2012</li> <li>• Windows Server 2008 R2 SP1</li> </ul>	Avamar 7.0 plug-in for SharePoint VSS
SharePoint 2010, 2010 SP1	<ul style="list-style-type: none"> <li>• Windows Server 2008</li> <li>• Windows Server 2008 R2</li> </ul>	Avamar 7.0 plug-in for SharePoint VSS
SharePoint 2007 SP2	<ul style="list-style-type: none"> <li>• Windows Server 2008</li> <li>• Windows Server 2008 R2</li> </ul>	Avamar 7.0 plug-in for SharePoint VSS
	<ul style="list-style-type: none"> <li>• Windows Server 2003 (32-bit or 64-bit)</li> <li>• Windows Server 2008 (32-bit)</li> </ul>	Avamar 5.0 client for SharePoint

Up-to-date client compatibility information is available in the *EMC Avamar Compatibility and Interoperability Matrix* on EMC Online Support at <https://support.EMC.com>.

**Note:** Unless specified otherwise, use of the term Windows in this document refers to all supported versions of Microsoft Windows. Unless specified otherwise, use of the term SharePoint in this document refers to all supported versions of Microsoft SharePoint.

### Unsupported configurations

#### SQL Server 2012 AlwaysOn is not supported as a backend

The Avamar Plug-in for SharePoint VSS does not support SQL Server 2012 AlwaysOn as a backend for SharePoint.

#### Windows Small Business Server not supported

The Avamar software does not support backup and recovery of Windows Small Business Server.

## Microsoft Exchange and Microsoft SharePoint Server installations on the same computer not supported

The Avamar software does not support Microsoft Exchange Server and Microsoft SharePoint Server installed on the same computer. Microsoft does not support this configuration and Microsoft best practices advise to install these roles on separate computers.

## Hardware providers are not supported

All Avamar VSS-based backup operations use the Microsoft Software Shadow Copy provider, also known as the Microsoft system provider. Hardware providers are not supported.

## Checking the hardware requirements

The following table lists the hardware requirements for the Avamar Plug-in for SharePoint VSS.

**Table 5** Hardware requirements

Requirement	Minimum
Memory (RAM)	2 GB
File systems	NTFS
Network interface	10BaseT minimum; 100BaseT or higher recommended, configured with latest drivers for the operating system.

## Checking the Avamar Plug-in for SharePoint GLR requirements

The Avamar Plug-in for SharePoint GLR places additional demands on computer hardware and resources beyond the requirements of the Avamar Plug-in for SharePoint VSS. The following topics describe the requirements for the Avamar Plug-in for SharePoint GLR.

### Memory

The Avamar Plug-in for SharePoint GLR may require additional memory (RAM). The amount of additional memory required depends on the current system performance with the existing memory:

- ◆ When performance is slow during normal operations of the Avamar Plug-in for SharePoint VSS, then add significantly more memory to support SharePoint granular level recovery operations.
- ◆ When performance is adequate during normal operations of the Avamar Plug-in for SharePoint VSS, then SharePoint granular level recovery operations may not require additional memory.
- ◆ Third-party recovery tools may require additional memory. Consult the documentation for the tool for specific memory requirements.

## Database size

SharePoint 2010 SP1 supports Content Databases up to 4 TB. The Avamar software supports databases up to the maximum size allowed by SharePoint. However, the maximum database sizes recommended by Microsoft for rapid backup and recovery are 200 GB for SharePoint 2010 and 100 GB for SharePoint 2007. The Microsoft TechNet articles, “Capacity Management for SharePoint Server 2010” and “Database maintenance (Office SharePoint Server 2007)” provide more information about sizing databases for best performance.

## Third-party recovery tool

A third-party recovery tool, such as Ontrack PowerControls, is required to browse and restore individual items from the data that Avamar Plug-in for SharePoint VSS restores to the Administrator Console.

The Ontrack PowerControls software must be purchased separately and is not included in the Avamar Plug-in for SharePoint VSS installation package. “[Installing Ontrack PowerControls](#)” on page 53 provides more detailed information about purchasing and installing the software.

The *EMC Avamar Compatibility and Interoperability Matrix*, available on the EMC Online Support website (<https://support.emc.com>), provides the most up-to-date and accurate listing of supported third-party recovery tools.

## Mapped network drive

Granular level recovery requires the creation of an Avamar Virtual Drive, which appears as a local drive in folder windows, such as Windows Explorer. During granular level recovery, do not select a drive letter for the Avamar Virtual Drive that is also assigned to a mapped network drive. When the Avamar Virtual Drive is assigned the same drive letter as a mapped network drive, the Avamar Virtual Drive is hidden in folder windows.

To prevent this from occurring, use an unused drive letter when you specify the drive letter for the Avamar Virtual Drive. If the Z drive is already mapped to a network drive, do not use the default value of slash (/) because that causes the Avamar Virtual Drive to map to the Z:\ drive.

If you notice the drive mapping issue, then disconnect the conflicting network mapping during the granular level recovery sessions.

## Checking the multi-streaming requirements

Multi-streaming places additional demands on computer hardware and resources beyond the base requirements for the Avamar Plug-in for SharePoint VSS. In addition, there are several configuration requirements for multi-streaming.

### Multi-streaming hardware and software recommendations

The following table lists the hardware and software recommendations for multi-streaming.

**Table 6** Multi-streaming hardware and software recommendations

Hardware and Software	Recommendations
CPU	At least one processor core per stream
Memory (RAM)	48 GB or more
Hard disks	<ul style="list-style-type: none"> <li>• 1 disk drive for operating system/SharePoint common files</li> <li>• Separate disk drive or RAID drive group for each large SharePoint content database</li> <li>• 7200 RPM or faster disk drives</li> </ul>
Network adapter	1 GB
Operating system	Windows Server 2008 64-bit w/SP2 or later (SharePoint 2010 requirement)
SharePoint database	Microsoft SQL Server 2008 SP2 or later (SharePoint 2010 requirement)

### Multi-streaming SharePoint configuration requirements

When you configure multi-streaming for a backup, you can group by database or by volume.

#### NOTICE

Regardless of whether you group by database or by volume, do not use multi-streaming for the first full backup of a SharePoint farm.

[“Multi-streaming” on page 27](#) provides more information about the differences between grouping by database or by volume and the performance issues with using multi-streaming on the first full backup.

### Multi-streaming requirements when grouping by database

When you group by database, perform the following to ensure that the SharePoint configuration meets the multi-streaming requirements:

- ◆ Split large databases so that all databases are relatively close in size.  
For example, if you have a 200 GB database, then move some site collections to new databases and create four 50 GB databases instead.
- ◆ Distribute larger databases to separate disks.  
For example, if there are six 50 GB databases on the same disk drive, then redistribute each database to a separate disk drive.

## Multi-streaming requirements when grouping by volume

When you group by volume, perform the following to ensure that the SharePoint configuration meets the multi-streaming requirements:

- ◆ Ensure that each volume is on its own disk drive spindle.
- ◆ Balance the total database size on each volume to be as equal as possible.

In the following example the total database sizes on each drive are similar in size and balanced:

- Drive 1 is 110 GB and holds Application and Administrative databases.
- Drive 2 is 105 GB and holds Content\_Database\_01.
- Drive 3 is 115 GB and holds Content\_Database\_02a.
- Drive 4 is 108 GB and holds Content\_Database\_02b.

## Multi-streaming Avamar configuration requirements

When you specify multi-streaming options for a backup, specify a maximum of one backup stream for each disk in the backup set. For example:

- ◆ If you back up two databases with each database on its own disk, you can specify a maximum of two streams.
- ◆ If you back up two databases with each database and its logs on two disks (totalling four disks), you can specify a maximum of four streams.

## Checking the database requirements

The Microsoft SharePoint documentation provides a list of SQL Server versions that SharePoint supports. The Avamar Plug-in for SharePoint VSS supports all SQL Server versions that SharePoint supports.

### **IMPORTANT**

Full farm recovery, and disaster recovery, require a full backup provided by the Avamar Plug-in for SharePoint VSS. You cannot use a backup from the Avamar Plug-in for SQL Server. [“Avamar Plug-in for SQL Server \(optional\)” on page 17](#) provides more information about the advantages and disadvantages of using the Avamar Plug-in for SQL Server for SharePoint database backups.

If you plan to use the Avamar Plug-in for SQL Server to back up SharePoint databases, then review the *EMC Avamar Compatibility and Interoperability Matrix*, available on EMC Online Support at <https://support.EMC.com>, for a list of SQL Server versions that the SQL Server plug-in supports.

You can use the Avamar Plug-in for SQL Server to back up all databases in the environment, except for the search database. The Avamar Plug-in for SQL Server backup does not include the search index file, which must be synchronized with the search database backup so that they can both be restored together.

Also, the Avamar Plug-in for SharePoint VSS only performs full backups of SharePoint SQL content databases. A full backup does not manage SQL log file truncation. To work around this limitation, set the SQL databases to Simple Recovery Model so that log truncation is not necessary.

## Required account privileges

The Avamar Plug-in for SharePoint VSS agent service and the SharePoint administrator must run with the same domain account.

Also, to perform a federated farm restore (a full farm restore of a distributed farm), requires domain-level administrator rights. The Administrator account used when installing and configuring the SharePoint farm is typically a member of the Administrators group on each server, and can be used for the federated restore. To use an administrator account other than the one used to install SharePoint, do both of the following:

- ◆ Add the SharePoint Administrator account to the Domain Administrators group.
- ◆ Assign the “Log on as a service” right to the SharePoint Administrator account on each server that runs any of the SharePoint services.

Specify this setting in **Local Computer Policy > Computer Configuration > Windows Settings > Security Settings > Local Policies > User Rights Assignment > Log on as a service**.

## SharePoint 2013 farm administrator account requirements

Backup and restore of a SharePoint 2013 requires that the specified farm administrator account has Shell Admin Privileges. Use the PowerShell command **Add-SPShellAdmin** to provide these credentials. Consult Microsoft documentation for information about using PowerShell commands.

## Avamar Backup Agent service runs as LocalSystem

The Avamar Backup Agent service must be running as LocalSystem on all machines.

## VSS snapshot volume requirements

Microsoft VSS framework allows up to 64 volumes in a VSS snapshot. When creating a dataset, do not include more than 64 volumes. If the number of volumes in a snapshot exceeds 64, backup fails and the Avamar event log lists the following error:

```
VSS_E_MAXIMUM_NUMBER_OF_VOLUMES_REACHED.
```

The VSS framework also limits the number of shadow copies to 64 per volume. If the number of shadow copies in a volume exceeds 64, the backup fails and the Avamar event log lists the following error:

```
VSS_E_MAXIMUM_NUMBER_OF_SNAPSHOTS_REACHED.
```

## Services and writers

The Avamar Plug-in for SharePoint VSS relies on several services and writers to complete backup and recovery operations. Usually, when the SharePoint farm is running normal operations, all the needed services and writers are running. However, if a required writer or service is not running, backup or recovery operations may fail. The writer or service may have stopped because a server was taken offline, crashed, or is undergoing maintenance operations.

Avamar Plug-in for SharePoint VSS plug-in requires the services and writers shown in the following table. In a federated environment, each of these may be on a different computer.

**Table 7 Services and writers used by Avamar Plug-in for SharePoint VSS**

Microsoft application	Service or writer name
SharePoint 2013	<ul style="list-style-type: none"> <li>• OSearch15 VSS Writer (OPSearch15)</li> <li>• SharePoint Services Writer (SPWriterV4)</li> </ul>
SharePoint 2010	<ul style="list-style-type: none"> <li>• SharePoint 2010 Administration (SPAdminV4)</li> <li>• SharePoint 2010 Timer (SPTimerV4)</li> <li>• SharePoint Foundation Search V4 (SPSearch4)</li> <li>• SharePoint Server Search 14 (OSearch14)</li> <li>• SharePoint 2010 VSS Writer (SPWriterV4)</li> </ul>
SharePoint 2007	<ul style="list-style-type: none"> <li>• Windows SharePoint Services Administration (SPAdmin)</li> <li>• Windows SharePoint Services Timer (SPTimerV3)</li> <li>• Windows SharePoint Services Search (SPSearch)</li> <li>• Office SharePoint Server Search (OSearch)</li> <li>• Windows SharePoint Services VSS Writer (SPWriter)</li> </ul>
SQL Server	<ul style="list-style-type: none"> <li>• SQL Server (MSSQLSERVER)</li> <li>• SQL Server VSS Writer (SQLWriter)</li> </ul>

## Checking the User Account Control setting on 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.

On a computer with UAC enabled, the Avamar client software and Avamar plug-in software must be installed with administrator privileges.

You can disable or bypass UAC. The installation procedures in this chapter provide one method to bypass UAC. Other methods and additional information are available in the Microsoft documentation.

## Downloading the software

1. As an administrator, log in to the server where the plug-in will be installed as an administrator.
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 operating system headings until the applicable software installation packages appear.

5. Click the Avamar Client for Windows installation package:  
`AvamarClient-windows-x86_64-version.msi` (64-bit)  
 where *version* is the Avamar client version.
6. Save the installation package to a temporary folder.
7. Click the Avamar Plug-in for SharePoint VSS installation package:  
`AvamarMossVSS-windows-x86_x64-version.msi`  
 where *version* is the Avamar client version.
8. Save the installation package to a temporary folder.
9. Click the Avamar Config Checker installation package:  
`Avamar_ConfigChecker_win_x64.zip` (64-bit)
10. Save the installation package to a temporary folder.

## Verifying the environment

Use the Avamar Config Checker for Microsoft Windows to verify that the Windows environment is correctly configured for Avamar backup and recovery.

The Config Checker checks the configuration for problems that can lead to installation, backup, or recovery failures. These failures can affect the operating system for the application host, and can affect SharePoint.

The Config Checker supports only English language operating systems.

To use the Avamar Config Checker:

1. Unzip the Avamar Config Checker installation package, and run the setup program to install the software.
2. Open the **Start** menu and select **Programs > EMC Config Checker > Avamar Config Checker**.  
 The Avamar Config Checker appears.
3. Click **Next**.  
 The **Avamar Application and User Settings** page appears.
4. Select the version number from the **Avamar version** list.
5. In the application list, select any required applications on the client computer, and specify credentials, if required.
6. Click **Next**.
7. Review the summary information.
8. Click **Run Tests**.

When the verification completes, the **Config Check Results** window appears.

---

**Note:** Save the test results before exiting the wizard. The wizard does not automatically save the results. If you do not save the results, then you must rerun the Config Checker to view them.

---

9. Save or open the results in HTML format.
10. Click **Finish** to exit the wizard.
11. Review the HTML result file, and correct all of the conditions listed under Failure.
12. Rerun the Config Checker to ensure that all of the checks are successful.

You also can run the Avamar Config Checker after you install Avamar software on the client computer.

The *EMC Avamar Config Checker for Microsoft Windows Technical Note*, available on EMC Online Support at <https://support.EMC.com>, provides troubleshooting information and details about the results that appear for each application.

## Installing the Avamar client software

You can install the Avamar client software on a stand-alone SharePoint farm or on a distributed SharePoint farm. The following topics provide instructions:

### Installation road map

The installation and configuration of Avamar software in a SharePoint environment depends on the type of farm, and whether the granular level recovery feature and optional third-party recovery tool are installed. The following topics provide an overview of the common types of installation, including diagrams of the client and plug-in installations by SharePoint farm type and roles:

- ◆ “Stand-alone SharePoint farm” on page 20
- ◆ “Distributed SharePoint farm” on page 22

To install the Avamar software that is required for back up and restore of a SharePoint environment:

1. Install Avamar Client for Windows on every server in the SharePoint farm. “[Installing the Avamar Client for Windows](#)” on page 47 provides instructions
2. Install the Avamar Plug-in for SharePoint VSS on every server in the SharePoint farm. “[Installing the Avamar Plug-in for SharePoint VSS](#)” on page 48 provides instructions.

If you intend to perform granular level recovery, on the SharePoint Administrator Console install the Avamar Plug-in for SharePoint VSS, and select the option to install the Avamar Plug-in for SharePoint GLR.

#### NOTICE

Avamar Client for Windows and Avamar Plug-in for SharePoint must be installed on each computer that is the target of a restore.

---

3. Register the SharePoint server as a client with the Avamar server. “[Fixing the Microsoft SharePoint VSS Writer error](#)” on page 50 provides instructions.

4. (Optional) Install the Avamar Plug-in for SQL Server on the database servers to back up SQL Server databases in the SharePoint farm.

Installation instructions are provided in the *EMC Avamar for SQL Server User Guide*.

5. Configure the cluster client if the SQL backend is clustered. “[Configuring the cluster client](#)” on page 51 provides instructions.
6. (Optional) Install the third-party recovery tool, such as Ontrack PowerControls, on the Administrator Console, if you intend to perform granular level recovery. “[Installing Ontrack PowerControls](#)” on page 53 provides instructions

#### NOTICE

In some stand-alone installations, the SQL Server VSS Writer service might be in a disabled or stopped state after you install the Avamar Plug-in for SharePoint VSS. Without this service running, backups and recoveries can fail. Before you perform a backup, check Services.msc to verify that the SQL Server VSS Writer service is enabled and set to automatic.

7. Prepare the SharePoint stand-alone server or distributed server farm and its related components for disaster recovery, as discussed in “[Preparing for disaster recovery](#)” on page 100.

## Installing the Avamar Client for Windows

1. As an administrator, log in to the SharePoint server.
2. Go to the temporary folder that contains the Avamar installation files that you downloaded in “[Downloading the software](#)” on page 44.
3. Start the installer by using the appropriate method:
  - If UAC is disabled, double-click the installation file to open it.
  - If UAC is enabled, perform the following steps:
    - a. In Windows, right-click the **Command Prompt** icon and select **Run as administrator**.
    - b. In the **Command Prompt** window, change the working folder to the location of the installation package by typing:

```
cd install_path
```

where *install\_path* is the full path of the temporary folder that contains the installation package.

- c. Type the following command to start the installer:

```
msiexec /i AvamarClient-windows-x86_64-version.msi
```

where *version* is the Avamar client version.

The installation wizard welcome page appears.

4. Click **Next**.  
The **End-User License Agreement** page appears.
5. Review the license agreement.

6. Select the checkbox to accept the terms in the license agreement, and then click **Next**.  
The **Custom Setup** page appears.
7. Select **Avamar Client User Interface**.
8. (Optional) To specify a different folder for the Avamar client installation, click **Browse**, and then select a location.
9. Click **Next** on the **Custom Setup** page.  
The **Ready to Install EMC Avamar for Windows** page appears.
10. Click **Install**.
11. When the installation completes, click **Finish**.

## Installing the Avamar Plug-in for SharePoint VSS

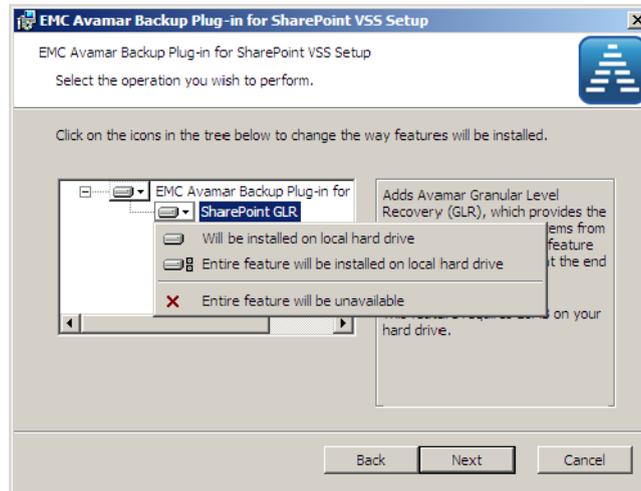
1. Log in to the client computer with the SharePoint administrator's domain account.  
This account is used for the Avamar Plug-in for SharePoint VSS agent service and must be the same domain account as the SharePoint administrator account.
2. Go to the temporary folder that contains the Avamar installation files that you downloaded in [“Downloading the software” on page 44](#).
3. Start the Avamar Plug-in for SharePoint VSS installation by using the appropriate method:
  - If UAC is disabled, double-click the file to open it.
  - If UAC is enabled, perform the following steps:
    - a. In Windows, right-click the **Command Prompt** icon and select **Run as administrator**.
    - b. In the **Command Prompt** window, change the working folder to the location of the installation package by typing:  
  
`cd install_path`  
  
where *install\_path* is the full path of the temporary folder that contains the installation package.
    - c. Type the following command to start the installer:  
  
`msiexec /i AvamarMossVSS-x86_x64-VERSION.msi`  
  
where *version* is the Avamar plug-in version.

The installation wizard welcome page appears.
4. Click **Next**.  
The **Ready to Install EMC Avamar Backup Plug-in for SharePoint VSS** page appears.

### NOTICE

In the next step, after installing the SharePoint GLR, plug-in, you must reboot.

5. (For granular level recovery, and only when installing on the Administrator Console) Complete the following:
  - a. Select the **SharePoint GLR** plug-in.
  - b. Select **Will be installed on local hard drive**.



#### NOTICE

A Windows security dialog box might appear during installation, indicating a possible security risk because of an unsigned driver or device. The exact message can vary, depending on the version of Windows you are installing this on. The message might identify the software publisher EldoS Corporation. If this message appears, click **Install** or **Install this driver software anyway**.

#### NOTICE

For full SharePoint granular level recovery functionality, in addition to installing the Avamar Plug-in for SharePoint GLR, you must purchase and install a third-party granular level recovery tool such as Ontrack PowerControls. [“Installing Ontrack PowerControls” on page 53](#) provides more information about ordering the software and which machines in the Avamar and SharePoint farm environments it must be installed on.

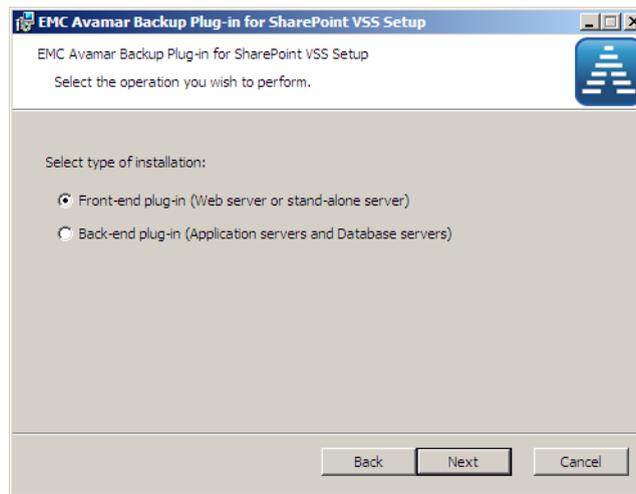
6. When the Select the type of installation page appears, select the type of SharePoint server on which you are installing the plug-in:
  - When the server is the main WFE server in a distributed farm, or the sole SharePoint server in a stand-alone farm, select **Front-end plug-in**.

#### NOTICE

When there is more than one WFE, select the **Front-end plug-in** option for only one WFE.

- When the server is an application server, database server, or another WFE, select **Back-end plug-in**.

The following figure illustrates the selection page.



7. Click **Finish**.

## Fixing the Microsoft SharePoint VSS Writer error

During the installation of the Avamar Plug-in for SharePoint VSS, an error message might appear, stating that the Microsoft SharePoint VSS Writer failed to register. This can occur when a computer has been unregistered from the farm prior to installation and was not re-registered. When this occurs, you can fix the error after installation of the Avamar Plug-in for SharePoint VSS.

Use the Microsoft Stsadm tool to fix this error. This tool is located on the drive where SharePoint is installed. The default location for the tool depends upon the version of SharePoint, as follows:

- ◆ SharePoint 2007

```
%COMMONPROGRAMFILES%\microsoft shared\web server extensions\12\bin
```

- ◆ SharePoint 2010

```
%COMMONPROGRAMFILES%\microsoft shared\web server extensions\14\bin
```

- ◆ SharePoint 2013

```
%COMMONPROGRAMFILES%\microsoft shared\web server extensions\15\bin
```

To use this tool, you must be an administrator on the local computer. Run the command by typing the following text on a command line:

```
stsadm.exe -o registerwsswriter
```

Microsoft TechNet provides documentation on using this tool in “Stsadm command-line tool (Office SharePoint Server)” at

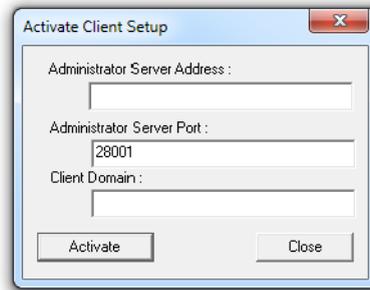
<http://technet.microsoft.com/en-us/library/cc261956.aspx>.

## Registering the client

1. Log in to the SharePoint server.
2. Right-click the Avamar client system tray icon .
 

A menu appears.
3. Select **Manage > Activate Client**.
 

The **Activate Client Setup** dialog box appears.



4. In **Administrator Server Address**, type the network hostname defined in DNS for the Avamar server.
5. In **Administrator Server Port**, specify the port on the Avamar server for client/server communication.
6. In **Client Domain**, type the name of the Avamar domain for the client.
 

The default domain is “clients.” Consult the Avamar system administrator for the appropriate domain or subdomain to use.

Do not use a slash (/) as the first character when you type a subdomain. If you use a slash, an error occurs and you cannot register the client.
7. Click **Activate**.
 

A confirmation message appears.
8. Click **OK**.

## Configuring the cluster client

1. As a domain administrator, log in to the host of the SQL Instance Shared Volume.
 

The account must also be a member of the local Administrators group on each cluster node.
2. Select **Start > EMC Avamar > Cluster Configuration Tool**.
 

The welcome page appears.
3. Click **Next**.
 

The **Plug-Ins** page appears.
4. Select **SharePoint**, and click **Next**.
 

The **Cluster Nodes** page appears with a list of nodes and their status.

5. Ensure that the environment meets the following requirements:
    - The status for each SharePoint node is **Up**.
    - The Windows client installation status on each SharePoint node is **True**.
    - The Avamar Plug-in for SharePoint VSS installation status on each SQL Server node is **True**.
  6. Click **Next**.

The **Operations** page appears.
  7. Select **Configure a new cluster client for all nodes**.
  8. Click **Next**.

The **Prerequisites** page appears. A check mark indicates that the prerequisite has been met.
  9. Ensure that the environment meets each prerequisite.

If a prerequisite is not met, then exit the wizard, resolve the issue, and restart the wizard.
  10. Select the Internet Protocol version that the environment uses, and click **Next**.

The **SharePoint Settings** page appears.
  11. Specify the settings for the Avamar server:
    - a. Type either the DNS name of the Avamar server in the **Name** box or the IP address in the **IPv4/IPv6** address box.
    - b. Type the name of the Avamar domain for the cluster client in the **Client domain for cluster** box.

The default domain is “clients.” Consult the Avamar system administrator for the appropriate domain or subdomain to use.

Do not use a slash (/) as the first character when you type a subdomain. If you use a slash, an error occurs and you cannot register the client.
    - c. Type the data port for Avamar client/server communication in the **Port number** box.
    - d. Type the name of the shared network directory or volume in the **Cluster client’s var directory** box, or click **Browse** to select a shared network directory or volume.

The shared network directory or volume stores the cluster client configuration and log files. All nodes in the cluster must have write permission for this directory or volume.

**NOTICE**

Select a volume that the cluster owns instead of a remote pathname on the network.

---
12. Click **Next**.

The **Summary** page appears.
13. Review the settings that you specified in the wizard, and click **Configure**.

The **Progress** page provides the status of the configuration. When the configuration is complete, the **Results** page appears.

14. Click **Close**.

## Changing the SharePoint mode

After you install the Avamar Plug-in for SharePoint VSS, you can change the mode of a SharePoint computer from front-end to back-end or back-end to front-end. You might need to change the mode if you change which server is the main WFE or you specified the wrong mode for a server during installation.

To change the installation type:

1. On the server for which you want to change the installation type, open the Windows Control Panel.
2. Click **Programs and Features**.
3. Select the Avamar Plug-in for SharePoint VSS, and then click **Change**.

The setup wizard appears.

4. Click **Next**.

The **Change, repair, or remove installation** page appears.

5. Click **Change**.
6. Select **Front-end plug-in** or **Back-end plug-in**, and click **Next**.
7. Complete the remaining steps in the wizard.

## Installing Ontrack PowerControls

The Avamar Plug-in for SharePoint GLR enables you to recover a backup to the Avamar Virtual Drive. Ontrack PowerControls is a third-party tool that enables you to browse the Avamar Virtual Drive to select items and restore them to any of the following target computers:

- ◆ A server in the farm where the backup was performed.
- ◆ A server outside of the farm where the backup was performed.
- ◆ A server that does not host SharePoint or SQL services.

---

**Note:** The Avamar for Windows VSS client, the Avamar SharePoint VSS plug-in, and Avamar for SharePoint GLR plug-in must be installed on the target computer.

---

Ontrack PowerControls must be purchased separately and is not included in the Avamar SharePoint VSS client installation package.

Ontrack PowerControls is available for resale through the EMC Select program. It can be ordered through the EMC ordering system. The Avamar ordering flow on Direct Express and Channel Express provides the option of selecting PowerControls. For details on the software, go to the EMC online support website at [http:// Powerlink.EMC.com](http://Powerlink.EMC.com), and select **Home > Products > EMC Select > Kroll Ontrack** to view the Ontrack landing page.

The *EMC Avamar Compatibility and Interoperability Matrix*, available on the EMC Online Support website (<https://support.emc.com>), provides the most up-to-date and accurate listing of supported third-party recovery tools.

## Ontrack PowerControls installation requirements

The minimum requirements to install Ontrack PowerControls software are:

- ◆ Windows Server 2008 or later (Required by the associated Avamar SharePoint GLR plug-in)
- ◆ Computer that is compatible with Hyper-V or VMware environments
- ◆ Intel Pentium compatible processor, 64-bit (Required by the associated Avamar SharePoint GLR plug-in)
- ◆ 1024 MB RAM
- ◆ Microsoft .NET Framework 3.5

For the most up-to-date requirements and instructions for installing Ontrack PowerControls software:

- ◆ Go to the Kroll website at [www.krollontrack.com](http://www.krollontrack.com).
- ◆ Call 800-866-7176.
- ◆ Email [Techsupport@krollontrack.com](mailto:Techsupport@krollontrack.com).

## Ontrack PowerControls components

Before performing an item-level, or granular, recovery with Ontrack PowerControls, you must install two components:

- ◆ Ontrack PowerControls
- ◆ Ontrack PowerControls Agent for Content Transfer Services (ACTS).

These components must be installed on separate servers, as described in the following table:

**Table 8** Ontrack PowerControls installation for SharePoint farms

On this type of farm	Perform these installations
Stand-alone farm	<ul style="list-style-type: none"> <li>• Install the PowerControls software on a server outside of the stand-alone farm.</li> <li>• Install ACTS on the stand-alone server.</li> </ul> <p><a href="#">“Stand-alone SharePoint farm with optional granular level recovery” on page 21</a> illustrates a stand-alone SharePoint farm with the PowerControls installed.</p>
Distributed farm	<ul style="list-style-type: none"> <li>• Install the PowerControls software on a server outside of the distributed farm.</li> <li>• Install ACTS on the SharePoint server, typically on a central administration computer.</li> </ul> <p><a href="#">“Distributed SharePoint farm with optional granular level recovery” on page 23</a> illustrates a small distributed farm with the PowerControls installed.</p>

ACTS checks to ensure that it is on the correctly computer during the installation.

## Ontrack PowerControls installation settings

To enable granular recovery using Ontrack PowerControls, ensure the following:

- ◆ The default port is 49175. You can change the port if the default port is already in use.
- ◆ An exception within the firewall is allowed, no matter which port you choose.
- ◆ The computer running Ontrack PowerControls has twice the amount of space of the data that is being restored. This is temporary space and is not used continuously. This space is for the file data and all associated metadata fields.
- ◆ The install path is C:\Program Files (x86)\Kroll Ontrack\Ontrack PowerControls Agent for Content Transfer Service.
- ◆ The configuration file name is PC.SharePoint.Service.exe.config.
- ◆ The location for the temporary path is <appSettings> <add key="TempPath" value="C:\Windows\Temp\PC" />.

The Ontrack documentation on the Ontrack website provides information about installing and using Ontrack PowerControls.

## Upgrading the Avamar Plug-in for SharePoint VSS

To upgrade the Avamar Plug-in for SharePoint VSS to version 7.0, run the installation wizard for version 7.0.

You do not need to uninstall earlier versions of the plug-in before you install a new version.

## Uninstalling the Avamar client software

The following topics explain how to uninstall Avamar client and plug-in software from a SharePoint client.

### Uninstall road map

To uninstall Avamar client and plug-in software from a SharePoint client on either a stand-alone server or in a cluster:

1. (Cluster only) Uninstall the Avamar Cluster Client. [“Uninstalling the cluster client” on page 56](#) provides instructions.
2. Uninstall the Avamar Plug-in for SharePoint VSS. [“Uninstalling the EMC Avamar Backup Plug-in for SharePoint” on page 56](#) provides instructions.
3. Uninstall the Avamar Client for Windows. [“Uninstalling the Avamar Client for Windows” on page 56](#) provides instructions.
4. (Cluster only) Repeat [step 2](#) and [step 3](#) on each node.

## Uninstalling the cluster client

1. As a domain administrator, log in to the active node in the cluster.  
The account must also be a member of the local Administrators group on each cluster node.
2. Select **Start > EMC Avamar > Cluster Configuration Tool**.  
The welcome page appears.
3. Click **Next**.  
The **Plug-Ins** page appears.
4. Select **EMC Avamar Backup Plug-in for SharePoint**, and click **Next**.  
The **Cluster Nodes** page appears with a list of nodes and their status.
5. Ensure that the status of each SharePoint node is Up, and click **Next**.  
The **Operations** page appears.
6. Select **Remove the SharePoint Cluster Client from all nodes in cluster**, and then click **Next**.  
The **Prerequisites** page appears. A check mark next to a prerequisite indicates that the prerequisite has been met.
7. Ensure that the environment meets all prerequisites on the page, and then click **Next**.  
The **Summary** page appears.
8. Review the settings, and then click **Uninstall**.  
The **Progress** page provides the status of the uninstall. When the uninstall is complete, the **Results** page appears.
9. Click **Close**.

## Uninstalling the EMC Avamar Backup Plug-in for SharePoint

To uninstall the Avamar Backup Plug-in for SharePoint on a Windows Server 2008 or Windows Server 2012 installation, use **Programs and Features**.

## Uninstalling the Avamar Client for Windows

To uninstall the Avamar Client for Windows on a Windows Server 2008 or Windows Server 2012 installation, use **Programs and Features**.

# CHAPTER 3

## Backup

The following topics describe how to use the Avamar Plug-in for SharePoint VSS to perform on-demand and scheduled backups of SharePoint farms:

- ◆ On-demand backups..... 58
- ◆ Performing scheduled backups ..... 63
- ◆ Monitoring backups ..... 71
- ◆ Canceling backups..... 71
- ◆ Troubleshooting backups ..... 72

## On-demand backups

You can perform an on-demand backup of a SharePoint farm with or without multi-streaming.

Multi-streaming enables parallel processing of backup jobs using multiple processors. You can use as many as ten streams. Each stream requires a separate processor. By taking advantage of multiple processors, you can improve performance when storing backups on either the Avamar server or a Data Domain system. [“Checking the multi-streaming requirements” on page 41](#) provides details.

The following topics provide an overview of Avamar backups of SharePoint servers, including diagrams of the Avamar backup workflow:

- ◆ [“Backing up a SharePoint farm” on page 25](#)
- ◆ [“Backup workflow for stand-alone farms” on page 25](#)
- ◆ [“Backup workflow for distributed farms” on page 26](#)

The following topic is useful for troubleshooting and understanding backup issues and limitations:

- ◆ [“Backup limitations” on page 28](#)

### NOTICE

To prepare for disaster recovery, you must back up additional files and databases. [“Preparing for disaster recovery” on page 100](#) provides details.

## Backing up an entire SharePoint farm

To perform an on-demand backup of an entire SharePoint farm:

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

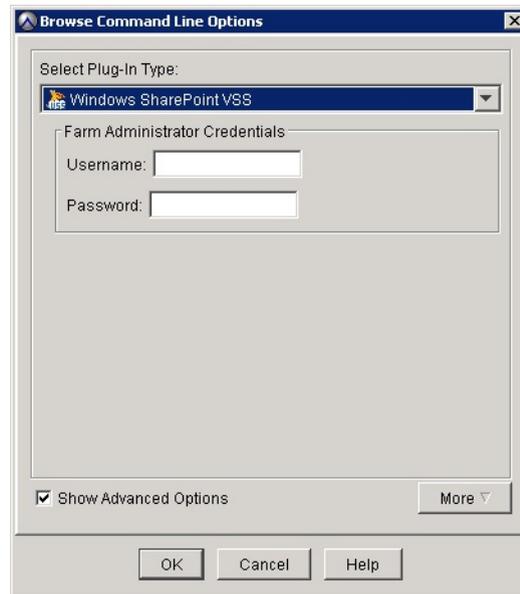
The **Backup, Restore and Manage** window appears.

2. In the clients tree, select the SharePoint server.

The clients tree shows only the clients in the same domain as the account used to log in. To view all clients, log in to the root domain.

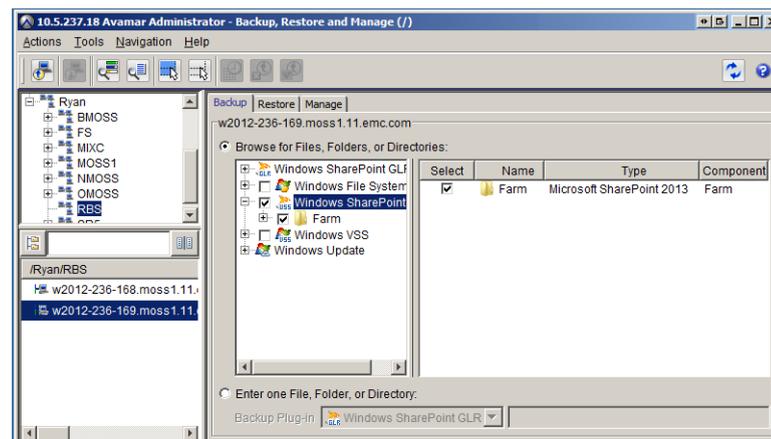
- When prompted to provide **Farm Administrator Credentials**, shown in the following figure, type the SharePoint administrator credentials.

When entering credentials in a domain, use the format “domain\username”. When entering credentials for a computer, use the format “computer\username”.



**Note:** If you do not specify any credentials, or specify non-SharePoint administrator credentials, the names of the components displayed in the browse tree will remain as the lengthy SharePoint-assigned GUIDs. The GUIDs are what SharePoint displays when you use the stsadm command or SharePoint Central Administration.

- Click **OK** when you have completed typing in the credentials.
- In the **Backup, Restore and Manage** window, click the **Backup** tab.  
A list of plug-ins installed on the selected client appears in the left pane of the **Backup** tab.
- Under the **Windows SharePoint VSS** plug-in node, select the checkbox next to the farm to back up, as shown in the following figure.

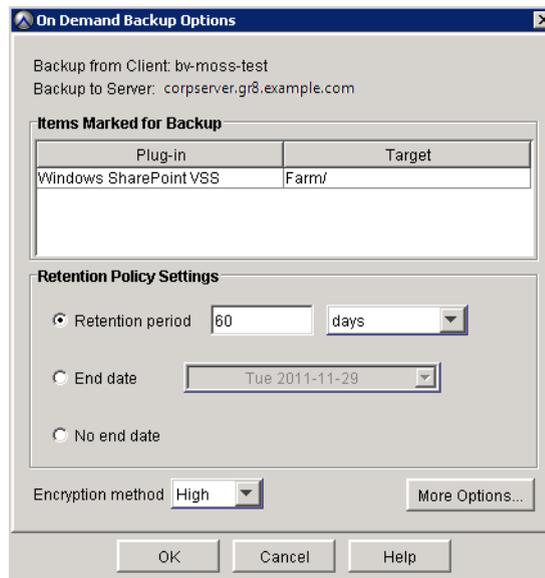


**NOTICE**

Do not clear individual components of the farm. When you select a farm, all the components in the farm are automatically selected. When you clear the selections for individual components, the backup fails because only full backups are supported.

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

The **On Demand Backup Options** dialog box appears.



8. Select the backup retention setting:

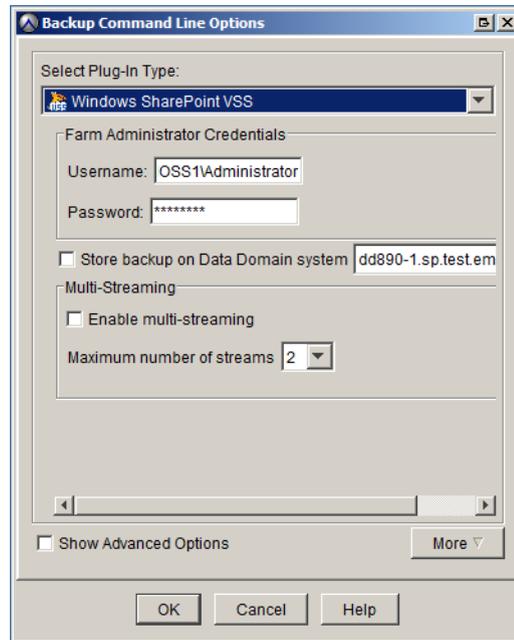
- To automatically delete this backup from the Avamar server after a specific amount of time, select **Retention period** and then specify the number of days, weeks, months, or years for the retention period.
- To automatically delete this backup from the Avamar server on a specific calendar date, select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

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

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

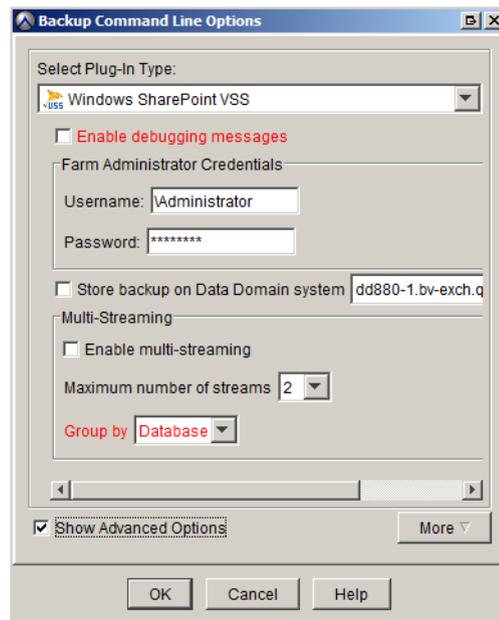
10. Click **More Options**.

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



11. Select the **Show Advanced Options** checkbox.

Additional options appear in red on the **Backup Command Line Options** dialog box, as shown in the following figure.



12. In **Backup Command Line Options**, set the plug-in options:

- To write maximum information to log files, select **Enable debugging messages**. Selecting this option creates very large log files.
- Review the **SharePoint Farm Administrator** credentials. This should already be autofilled by the credentials check in step 2. These credentials are required for SharePoint 2013 backups.
- To store the backups for this dataset on a Data Domain system instead of the Avamar server, select **Store backup on Data Domain system**, and select the Data Domain system from the list.
- To use multi-streaming:
  1. Select the **Enable multi-streaming** checkbox.
  2. In **Maximum number of streams**, select the maximum number of streams to use for the backup. Specify a maximum of one backup stream for each disk in the backup set.  
For example:  
  
If you are backing up two databases with each database on its own disk, then specify a maximum of two streams.  
  
If you are backing up two databases with each database and its logs on two disks (totalling four disks), then specify a maximum of four streams.
  3. In **Group by**, select **Database**, or **Volume**.  
**Note:** When using multi-streams by volume, performance degrades when backing up with a stream number that does not match the volume number.

[“Plug-in Options” on page 109](#) provides additional information about plug-in options.

13. To specify command line flags, such as those listed in [“Command line flags” on page 111](#):

- a. Click **More**.
- b. In **Enter Attribute**, type the flag.
- c. In **Enter Attribute value**, type the value, if applicable.
- d. Click the **+** button.

14. Click **OK**.

The **Backup Command Line Options** dialog box closes.

Click **OK**.

15. The **On Demand Backup Options** dialog box closes.

The following status message appears:

```
Backup initiated.
```

16. Click **OK**.

## Performing scheduled backups

To use the Avamar Plug-in for SharePoint VSS to perform scheduled backups of a SharePoint farm, complete each task in the order shown:

1. Create a dataset for the backups, as discussed in [“Creating a dataset” on page 63](#).
2. Create a group for the backups, as discussed in [“Creating a group” on page 67](#). During the group creation process:
  - a. Assign the new dataset to the new group.
  - b. Assign a schedule to the new group.
  - c. Assign a retention policy to the new group.
  - d. Add the SharePoint server to the new group.
3. Enable scheduling for the group, as discussed in [“Enabling scheduled backups” on page 70](#).

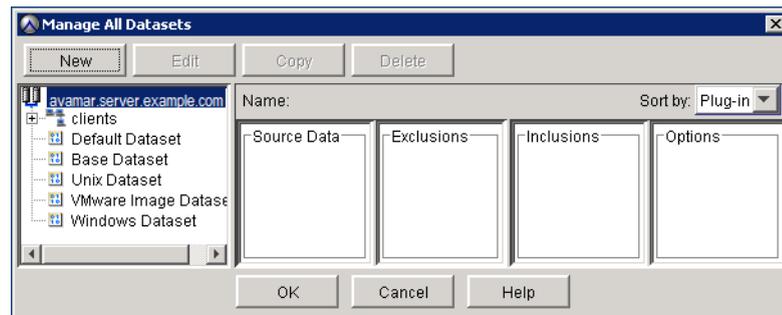
A thorough discussion of groups, group policy, datasets, schedules, and retention policies is beyond the scope of this guide. The *EMC Avamar Administration Guide* provides additional information.

## Creating a dataset

To create a dataset for scheduled backups:

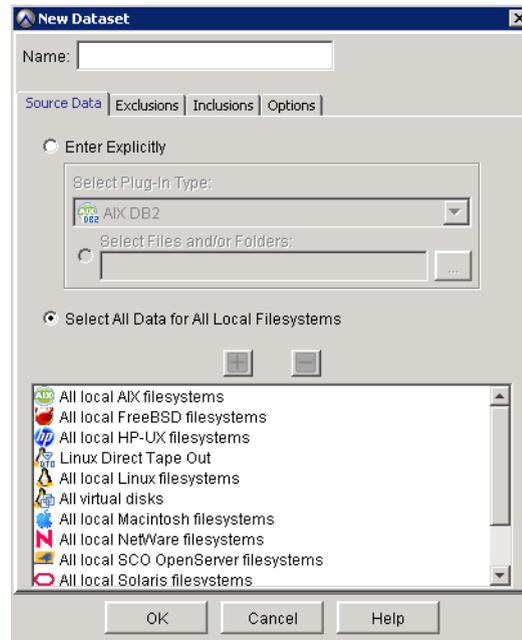
1. In Avamar Administrator, select **Tools > Manage Datasets**.

The **Manage All Datasets** window appears.



2. Click **New**.

The **New Dataset** dialog box appears.

3. In the **Name** box, type a name for the dataset.

Do not use any of the following characters in the dataset name:

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

4. On the **Source Data** tab, choose whether the dataset includes data from all plug-ins installed on the client or only specific plug-ins installed on the client:

- To include data from all plug-ins installed on the client, select **Select All Data for All Local Filesystems**.
- To include data from only specific plug-ins installed on the client, select **Enter Explicitly**.

If you chose **Enter Explicitly**, you can customize the dataset by including a subset of the installed plug-ins:

- To remove a plug-in from the dataset, select the plug-in from the list in the bottom portion of the **New Dataset** dialog box, and then click - (**Remove From List**). Repeat this step as necessary.
- To add a plug-in to the dataset, select the plug-in from the **Select Plug-In Type** list, and then click + (**Add to List**). Repeat this step as necessary.

If you select the Windows SharePoint VSS plug-in, then the **All SharePoint VSS Data** option is selected by default and cannot be changed. This option indicates that all SharePoint data in the farm is included in the backup with this plug-in.

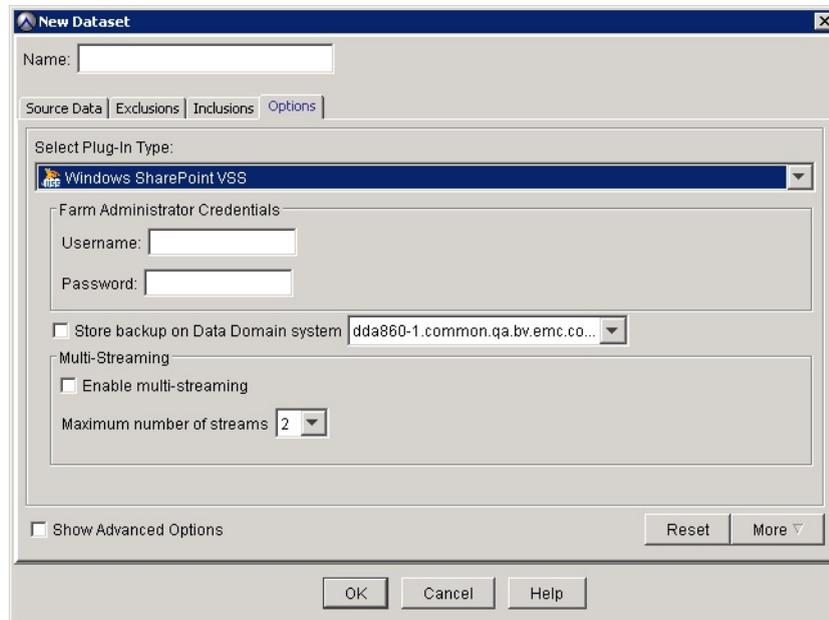
---

**Note:** Skip the **Exclusions** and **Inclusions** tabs. The Avamar Plug-in for SharePoint VSS does not support include or exclude lists in datasets.

---

5. Click the **Options** tab and set the plug-in options:
  - a. Select the **Windows SharePoint VSS** plug-in from the **Select Plug-In Type** list.

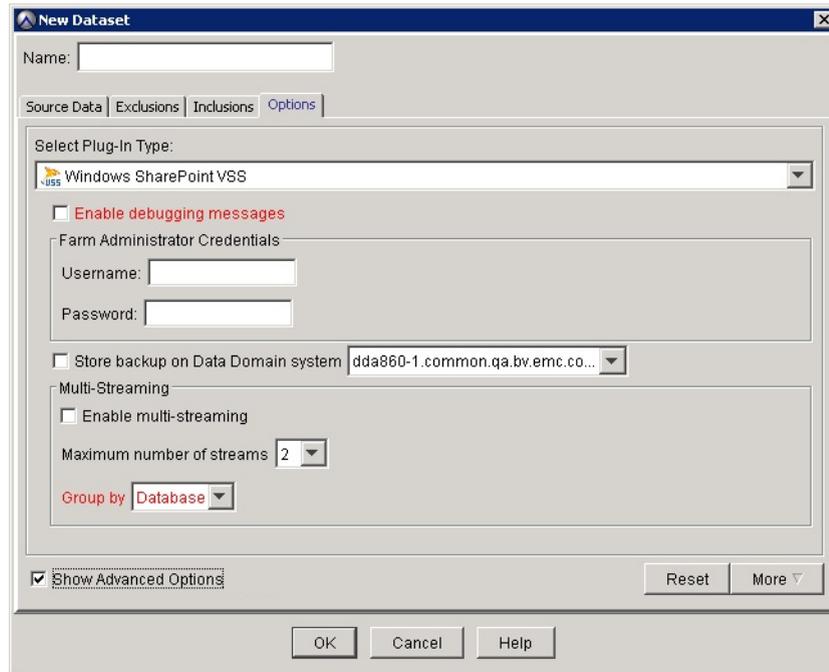
The plug-in options appear on the Options tab, as shown in the following figure.



- b. To store the backups for this dataset on a Data Domain system instead of the Avamar server, select **Store backup on Data Domain system** and select the Data Domain system from the list.
    - To use multiple processors to back up multiple targets in parallel:
      1. Select **Enable multi-streaming**.
      2. In **Maximum number of streams**, select the maximum number of streams to use for the backup. Specify a maximum of one backup stream for each disk in the backup set.
      3. In **Group by**, select **Database**, or **Volume**.
 

**Note:** When using multi-streams by volume, performance degrades when backing up with a stream number that does not match the volume number.
  - c. To specify advanced backup options, select the **Show Advanced Options** checkbox. Otherwise, go to [step 6 on page 66](#).

Additional options appear in red on the Options tab in the New Dataset dialog box, as shown in the following figure.



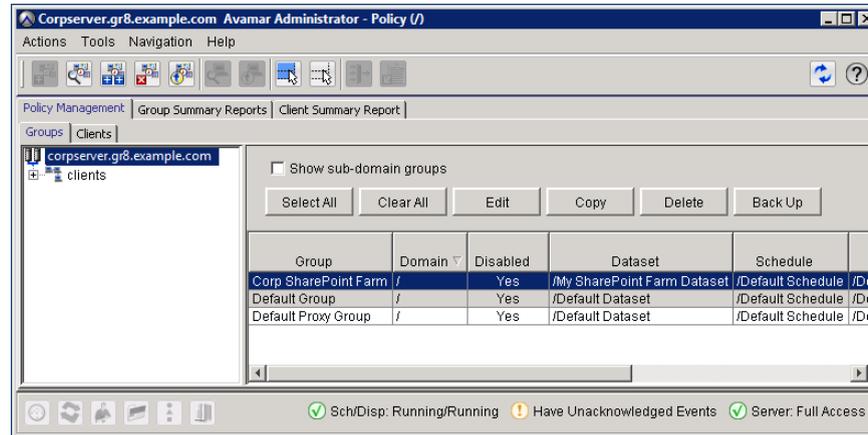
- d. To write maximum information to log files, select **Enable debugging messages**. Selecting this option creates very large log files.
  - e. If you enabled multi-streaming, choose whether to group the backups by **Database** or by **Volume** using the **Group by** list.
6. Click **OK**.  
The **New Dataset** dialog box closes.
  7. Click **OK**.  
The **Manage All Datasets** dialog box closes.

## Creating a group

To create a group for scheduled backups:

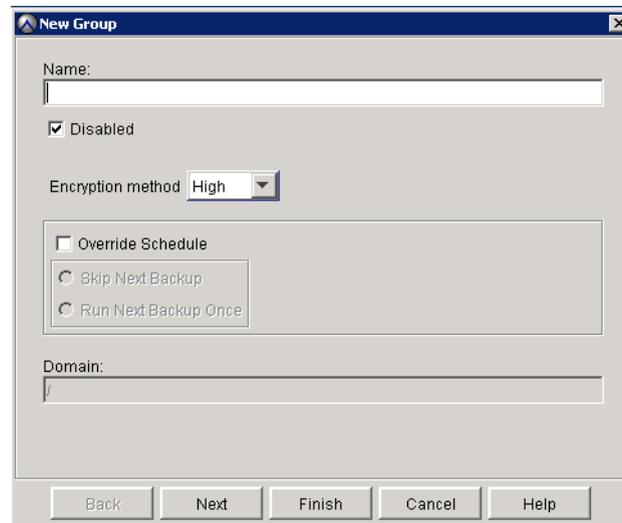
1. In Avamar Administrator, click the **Policy** launcher button.

The **Policy** window appears.



2. Select the **Groups** tab.
3. In the left pane, select an Avamar domain for the group.
4. Select **Actions > New Group**.

The **New Group** wizard appears.



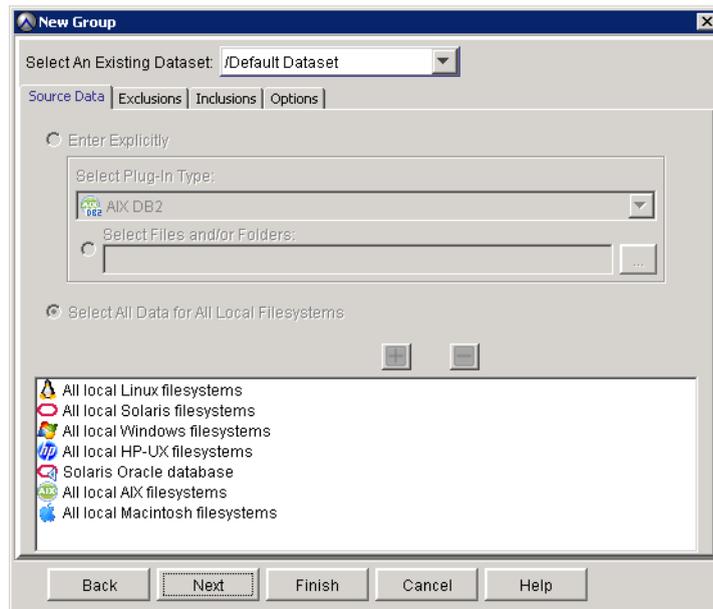
5. In the **Name** box, type a name for the new group.  
Do not use any of the following characters in the group name:  
~!@\$%^&(){}[]|,;#\/:\*?<>'"&
6. (Optional) Clear **Disabled** to permit scheduled backups for the group.  
Select **Disabled** to prevent schedules backups for the group.
7. In **Encryption method**, select the encryption method to use for client/server network communications.

This method is applied to all clients in the group unless encryption is set at the client level.

The exact encryption technology and bit strength used for any given client-server connection depends on several factors, including the client operating system and Avamar server version. The *EMC Avamar Product Security Guide* provides additional information.

8. 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**.
9. Click **Next**.

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



10. In **Select An Existing Dataset**, select the dataset that you defined in [“Creating a dataset”](#) on page 63.

11. Click **Next**.

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

The screenshot shows the 'New Group' wizard window. At the top, 'Select An Existing Schedule:' is set to '/Default Schedule'. Below this, the 'Next Run Time' is '2009-01-09 10:00 PM'. The 'Repeat this schedule' section has radio buttons for 'Daily', 'Weekly' (selected), 'Monthly', and 'On-Demand'. Underneath, checkboxes for all days of the week (Sunday through Saturday) are checked. There are 'Select All' and 'Unselect All' buttons. The 'Operating Hours' section includes 'Earliest start time:' (10:00 PM), 'End no later than:' (06:00 AM), and 'Backup window duration:' (8.0 hours). The 'Activation Constraints' section has 'Delay until:' (Fri 2008-10-24), 'No End Date' (selected), and 'End after:' (Sat 2009-01-10). At the bottom are buttons for 'Back', 'Next' (highlighted), 'Finish', 'Cancel', and 'Help'.

12. In **Select An Existing Schedule**, select a schedule for the group.

You cannot edit schedules from this screen. Detailed schedule properties are shown so that you can review them prior to making a selection. The *EMC Avamar Administration Guide* provides additional information about editing schedule properties.

13. Click **Next**.

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

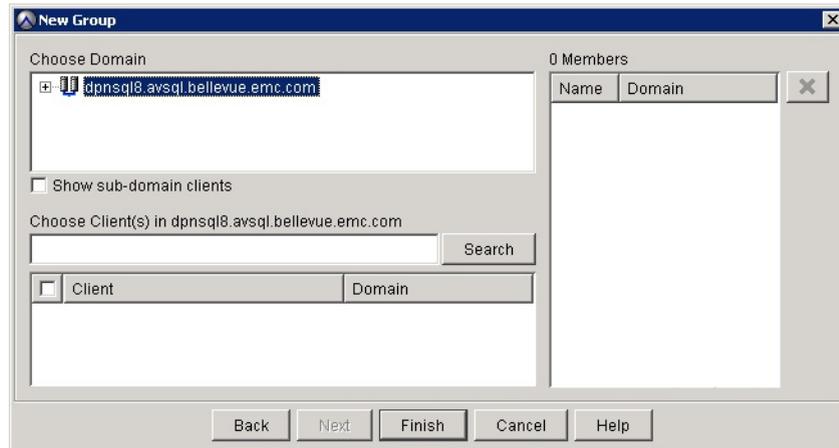
The screenshot shows the 'New Group' wizard window for retention policy. 'Select An Existing Retention Policy:' is set to '/Default Retention'. The 'Basic Retention Policy' section has radio buttons for 'Retention period' (selected), 'End date', and 'No end date'. The 'Retention period' is set to '60' days. The 'End date' is 'Wed 2009-03-11'. There is a checkbox for 'Override basic retention policy for scheduled backups' which is checked, and an 'Advanced...' button. At the bottom are buttons for 'Back', 'Next' (highlighted), 'Finish', 'Cancel', and 'Help'.

14. In **Select An Existing Retention Policy**, select a retention policy for the group.

You cannot edit retention policies from this screen. Detailed retention policy properties are shown so that you can review them prior to making a selection. The *EMC Avamar Administration Guide* provides additional information about editing retention policy properties.

15. Click **Next**.

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



16. Select the SharePoint server from the client list.

17. Click **Finish**.

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

## Enabling scheduled backups

To ensure that the group is enabled for scheduled backups:

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

The **Policy** window appears.

2. On the **Policy Management** tab, select the **Groups** tab.

3. Select the group that you created in [“Creating a group”](#) on page 67.

4. Select **Actions** > **Group** > **Disable Group**.

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

A confirmation message appears.

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

## Monitoring backups

1. In Avamar Administrator, click the **Activity** tab.

The **Activity** window appears.

2. Select the **Activity Monitor** tab.

A list of all activities appears.

Activity retained for 72 hours up to a maximum of 5000 rows.  
Waiting-Queued: 0 Waiting-Client: 0 Active: 0 Finished: 15

Filtered by:  
 Status: All Statuses    Group: All Groups    Client: All Clients  
 Type: All Types        Plug-in: All Plugins    Domain: All Domains  
 Source: All Sources    Container: All Containers

Status	Error Code	Start Time (PST)	Elapsed	End Time (PST)	Type	Server	Progress Bytes	New Bytes	Client
Failed	10007	2013-01-05 19:23	00h:00m:15s	2013-01-05 19:23	On-Demand Backup	Avamar	0	0%	fileshare2k3x32
Completed		2013-01-04 18:54	00h:00m:02s	2013-01-04 18:54	Restore	Avamar	< 1MB	100%	vm-winserv12-n1.virtua
Completed		2013-01-05 19:17	00h:00m:24s	2013-01-05 19:17	On-Demand Backup	Avamar	20.7 MB	1.1%	fshare2k3x64-1.virtua
Completed		2013-01-04 18:01	00h:01m:05s	2013-01-04 18:02	On-Demand Backup	Avamar	1.0 GB	0.6%	vm-winserv12-n2.virtua
Completed		2013-01-04 18:57	00h:00m:02s	2013-01-04 18:57	Restore	Avamar	< 1MB	100%	vm-winserv12-n1.virtua
Failed	10007	2013-01-04 18:27	00h:00m:03s	2013-01-04 18:27	Restore	Avamar	0	0%	vm-winserv12-n1.virtua
Failed	10012	2013-01-04 17:46	00h:00m:09s	2013-01-04 17:46	On-Demand Backup	Avamar	0	0%	cxclus4.virtualqa.com
Completed		2013-01-04 18:56	00h:00m:02s	2013-01-04 18:56	Restore	Avamar	< 1MB	100%	vm-winserv12-n1.virtua
Completed		2013-01-05 19:46	00h:02m:03s	2013-01-05 19:48	On-Demand Backup	Avamar	3.9 GB	<0.05%	vmcluster3.virtualqa.c
Completed		2013-01-04 19:13	00h:31m:40s	2013-01-04 19:45	On-Demand Backup	Avamar	17.7 GB	29.2%	vmcluster4.virtualqa.c
Failed	10007	2013-01-04 18:30	00h:00m:02s	2013-01-04 18:30	Restore	Avamar	0	0%	vm-winserv12-n1.virtua
Completed		2013-01-04 18:53	00h:00m:02s	2013-01-04 18:53	Restore	Avamar	< 1MB	100%	vm-winserv12-n1.virtua
Completed		2013-01-04 17:34	00h:00m:44s	2013-01-04 17:34	On-Demand Backup	Avamar	1.0 GB	0.5%	cxclus4.virtualqa.com
Failed	10007	2013-01-04 18:25	00h:00m:02s	2013-01-04 18:25	Restore	Avamar	0	0%	vm-winserv12-n1.virtua
Completed		2013-01-04 18:04	00h:00m:45s	2013-01-04 18:04	Restore	Avamar	1.0 GB	1.1%	vm-winserv12-n2.virtua

Sch/Disp: Running/Running    No Unacknowledged Events    Server: Full Access

**Note:** The **Proxy** column on the **Activity Monitor** tab displays N/A for all Windows File System and Windows Cluster File Server plug-in activities. The column is used only for VMware proxy activities.

3. To filter the results to show only backup activity, select **Actions** > **Filter**.

The **Filter Activity** dialog box appears.

4. In the **Filter Activity** dialog box, select **All Backups** from the **Type** list.

5. Click **OK**.

## Canceling backups

1. In Avamar Administrator, click the **Activity** tab.

The **Activity** window appears.

2. Select the **Activity Monitor** tab.

A list of all activities appears.

3. From the list of activities, select a backup.

4. Select **Actions** > **Cancel Activity**.

A confirmation message appears.

5. Click **Yes**.

The cancellation may take five minutes or more to complete. The backup may complete before the cancellation finishes.

## Troubleshooting backups

### Backup of multiple Search Service Applications fails for SharePoint 2013

SharePoint 2013 supports configurations that have multiple Search Service Applications, with some components hosted on separate web front ends. Backup of a farm with this configuration fails with an error that says OSearch15 writer isn't running.

When this error occurs review the following Microsoft TechNet articles:

- ◆ Change the default search topology in SharePoint Server 2013  
<http://technet.microsoft.com/en-us/library/jj862356.aspx>
- ◆ Create and configure a Search service application in SharePoint Server 2013  
<http://technet.microsoft.com/en-us/library/gg502597.aspx>

# CHAPTER 4

## Restore

The following topics explain how to restore data in a SharePoint environment by using the Avamar Plug-in for SharePoint VSS:

- ◆ SharePoint farm restore workflow ..... 74
- ◆ Restore from backups created with previous versions of Avamar ..... 74
- ◆ Tasks required to restore specific components ..... 75
- ◆ Finding a backup..... 77
- ◆ Restoring to the original location ..... 80
- ◆ Restoring to a different location ..... 86
- ◆ Performing granular level recovery ..... 88
- ◆ Troubleshooting granular level restores ..... 95
- ◆ Troubleshooting restores..... 97

## SharePoint farm restore workflow

The workflow and restore options vary depending on whether you are recovering to the original location, a different location, or performing a granular level recovery. The following topics provide an overview of each of these types of restore, including diagrams of the workflow and which Avamar components and optional components are used:

- ◆ [“Restoring to the original location” on page 29](#)
- ◆ [“Restoring to a different location” on page 31](#)
- ◆ [“Granular level recovery” on page 31](#)

## Restore from backups created with previous versions of Avamar

---

**Note:** EMC recommends performing a new backup immediately after upgrading an Avamar server or an Avamar client. This practice provides a new baseline backup and reduces incompatibility issues that may occur from significant version changes between the backup software and restore software.

---

The following issues have been noted to occur when performing a restore from a backup made with a previous version of Avamar:

- ◆ [“Restore of SharePoint 2007 backups created with Avamar 6.0 may fail” on page 74](#)
- ◆ [“Restore of SharePoint 2013 backups created with Avamar 6.1 may fail” on page 74](#)

### Restore of SharePoint 2013 backups created with Avamar 6.1 may fail

You can perform full restores of most SharePoint 2013 backups created with Avamar 6.1. However, sometimes a restore fails. Avamar 6.1 does not support backup and restore of Search Service Applications (SSA). Avamar 7.0 supports backup and restore of SSA but cannot restore SSA from an Avamar 6.1 backup. Restore fails with the warning “Failed to open SSA meta datafile ‘...\\ssa\_topology.xml’ for reading.”, an error “Failed to parse Search Service Applications metadata file.”, and “Vss exception code 0x19930520 has been thrown by PostRestore()...”

If this error occurs, follow the steps in [“Restoring the SharePoint farm from the Avamar backup” on page 107](#).

### Restore of SharePoint 2007 backups created with Avamar 6.0 may fail

Restoring backups of SharePoint 2007 created with Avamar 6.0 may fail after the Avamar SharePoint plug-in or the Avamar server is upgraded to Avamar 7.0. The following combinations of backups and restore will fail:

- ◆ SharePoint 2007 farm backed up with Avamar 6.0, restore of farm with Avamar 7.0.
- ◆ SharePoint 2007 farm backed up with Avamar 6.0, redirected restore of individual Content Databases to file system path with Avamar 7.0.

The backups will fail with the following error: “GetMetaDataFileFromSnapup: avtar Error 5195>: Path".system\_info\\view-plugin.xml" not found in backup. (Element 'view-plugin.xml' not found).”

## Tasks required to restore specific components

When you restore certain individual SharePoint components, additional steps are required to prepare the environment before the restore. The following topics explain how to prepare to restore a deleted web application or search database.

### Restore of a deleted web application

The tasks to restore a deleted web application depend on whether you need to restore just the web application data, the data and the web application configuration, or the entire web application and other critical components.

**Note:** To correctly restore a search component, the search index flat files and associated search databases must be restored together.

If you are restoring only selected web applications or other components, then shut down the web applications or components during the restore.

The following table describes the tasks required to restore a deleted web application.

**Table 9** Tasks required when restoring a deleted web application

Web application and other SharePoint component status	Restore tasks
The web application with attributes still exists, and you want to restore only the web application data.	Restore the deleted web application database using the steps in <a href="#">“Restoring a content database to its original location” on page 83</a> . You do not need to stop SharePoint or any services.
The web application has been deleted, but the IIS website and content database still exist.	Perform the steps in <a href="#">“Restoring a deleted web application to an existing IIS website and content database” on page 75</a> .
The web application, the IIS website, and the content database were all deleted.	Perform the steps in <a href="#">“Restoring the SharePoint farm from the Avamar backup” on page 107</a> .

### Restoring a deleted web application to an existing IIS website and content database

Re-create the deleted web application and attach it to the content database before you restore the web application:

1. Open the SharePoint **Central Administration** page.
2. On the **Applications Management** tab, manually re-create the deleted web application.  
Ensure that all configuration attributes match the original web application environment. You can only restore data to an environment that matches the environment in which the backup was performed.
3. Attach the re-created web application to the content database.
4. Restore the deleted web application using the steps in [“Restoring a content database to its original location” on page 83](#)

## Restore of a deleted search database

The tasks to restore a deleted search database depend on whether you need to restore just the database, the database and the Search Web application, or the database and other critical components.

If you are restoring only selected web applications or other components, then shut down the web applications or components during the restore.

The following table describes the processes to restore a deleted search database.

**Table 10** Tasks required when restoring a deleted search database

Search database and other SharePoint component status	Task steps
The Search web application with attributes still exists, and you want to restore only the search database.	Restore the deleted Search Web application using the steps in <a href="#">“Restoring a content database to its original location” on page 83</a> . You do not need to stop SharePoint or any services.
The Search Web application has been deleted, but the IIS website and search database still exist.	Perform the steps in <a href="#">“Restoring a deleted Search Web application to an existing IIS website and content database” on page 76</a> . 3.
The Search Web application, the IIS website, and the search database were all deleted.	Perform the steps in <a href="#">“Restoring the SharePoint farm from the Avamar backup” on page 107</a> .

### Restoring a deleted Search Web application to an existing IIS website and content database

Re-create the deleted Search Web application and attach it to the content database before you restore the web application:

1. Open the SharePoint **Central Administration** page.
2. On the **Applications Management** tab, create the **Search Service** in **Manage Search Services**.

Ensure that all configuration attributes match the original search database environment. You can only restore data to an environment that matches the environment in which the backup was performed.

3. On the **Operations** tab, re-enable **Search Services** in **Services on Server**.
4. On the **Applications Management** tab, verify that the **Office SharePoint Server Search** service is running in **Manage Search Services**.
5. Restore the deleted search database using the steps in [“Restoring a content database to its original location” on page 83](#).

## Finding a backup

You can find Avamar client backups for a restore by either:

- ◆ Date
- ◆ Files or folders

You can only locate and browse SharePoint backups through the primary WFE computer. Though the non-primary WFE machines or other back-end machines may be displayed in the Avamar clients list, you cannot browse them.

The following topics provide details on finding a backup to restore:

- ◆ [“When to find a backup by date” on page 77](#)
- ◆ [“How to find a backup by date” on page 77](#)
- ◆ [“Finding a backup by file or folder” on page 78](#)
- ◆ [“How to find a backup by file or folder” on page 79](#)

### When to find a backup by date

Locate backups by date when:

- ◆ All SharePoint data to restore is backed up in a single backup set.
- ◆ The exact path or name of the file, folder, or data you want to restore is unknown.
- ◆ The content from a backup you want to restore is before a specific date or event.

For example, you know approximately when a file or folder was lost or corrupted, and need to find the last backup before that date.

- ◆ The specific types of backups are known.

For example, you run scheduled disaster recovery backups every Wednesday and Saturday night, and you run full volume backups daily. If you need to rebuild a server, you can select the disaster recovery backup with the date closest to the event that caused the loss of data.

### How to find a backup by date

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

The **Backup, Manage, and Restore** window appears.

2. In the clients tree, select the SharePoint server.

The clients tree shows only the clients in the same domain as the account used to log in. To view all clients, log in to the root domain.

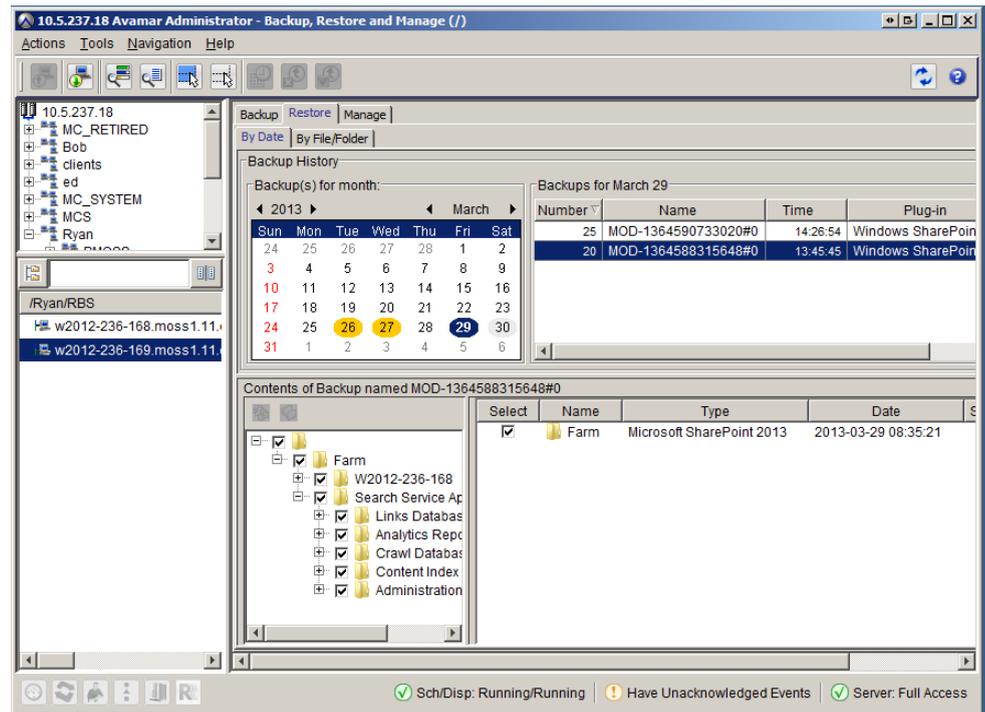
3. Click the **Restore** tab.
4. Click the **By Date** tab.
5. Select a backup from the calendar:

- a. Use the year and month navigational arrows to browse to a backup.

Dates highlighted by yellow indicate a valid backup exists for 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.



6. Select the data to restore from the **Contents of Backup** pane at the bottom of the **Restore** tab, as described in the following topics:
  - [“Restoring an entire farm to its original location” on page 80](#)
  - [“Restoring a content database to its original location” on page 83](#)
  - [“Restoring to a different location” on page 86](#)

## Finding a backup by file or folder

Locate backups by the specific files or folders contained within each backup when:

- ◆ Each database is backed up in a separate backup set.

For example, you know that \\Server\_Name\Databases\Database\_1 is backed up in one backup set and \\Server\_Name\Databases\Database\_2 is backed up in another backup set. If you know the content you need is in Database\_2, or is the entire Database\_2 database, then you can specify the path or browse to the Database\_2 folder.
- ◆ You want to see multiple versions of the same file.
- ◆ The date of the backup or what was saved in a backup is unknown, but you know the name of the file or folder.
- ◆ You need to restore a SharePoint database that is no longer in the SharePoint farm, but you know the farm path to the SQL server, computer name, or database to recover.

## How to find a backup by file or folder

To find a backup by specific files or folders:

1. In Avamar Administrator, click the **Backup & Restore** launcher button.  
The **Backup, Restore and Manage** window appears.
2. In the clients tree, select the SharePoint server.  
You cannot view clients outside the domain for the login account. To view all clients, log in to the root domain.
3. Click the **Restore** tab.
4. Click the **By File/Folder** tab.
5. In **Enter path to retrieve history for**, specify the path by one of the following methods:
  - Type the full path to the client folder or file in the **Enter path to retrieve history for** text box.
  - Browse to the file or folder:
    - a. Click **Browse**.  
The **Select File or Folder** window appears.
    - b. Select the client.
    - c. Select the plug-in.  
A list of folders appears in a table to the right of the plug-ins pane.
    - d. Select the file or folder to restore.
    - e. Click **OK**.  
The selected file or folder appears in **Enter path to retrieve history for**.
6. Click **Retrieve**.  
The **Version History** table lists all versions and sizes for that folder or file that have been backed up from the selected client.
7. Select the folder or file version in the **Version History** table.  
All backups for the selected client that contain the selected version appear in the **Backups** table next to the **Version History** table.
8. Select the backup to restore from the **Backups** table.
9. Select the data to restore from the **Contents of Backup** pane at the bottom of the **Restore**.  
Data selection is described in more detail in the following topics:
  - [“Restoring an entire farm to its original location” on page 80](#)
  - [“Restoring a content database to its original location” on page 83](#)
  - [“Restoring to a different location” on page 86](#)

## Restoring to the original location

When you perform backups of a SharePoint farm using the Avamar Plug-in for SharePoint VSS, you can restore to the original location the entire farm or a just content database. The following topics provide details:

- ◆ [“Restoring an entire farm to its original location” on page 80](#)
- ◆ [“Restoring a content database to its original location” on page 83](#)

### NOTICE

If you are restoring an entire federated farm, ensure that the “Log on as a service” right is assigned to the SharePoint Administrator account on each server that runs any of the SharePoint services, as discussed in [“Required account privileges” on page 43](#).

## Restoring an entire farm to its original location

To restore an entire SharePoint farm to its original location using the Avamar Plug-in for SharePoint VSS:

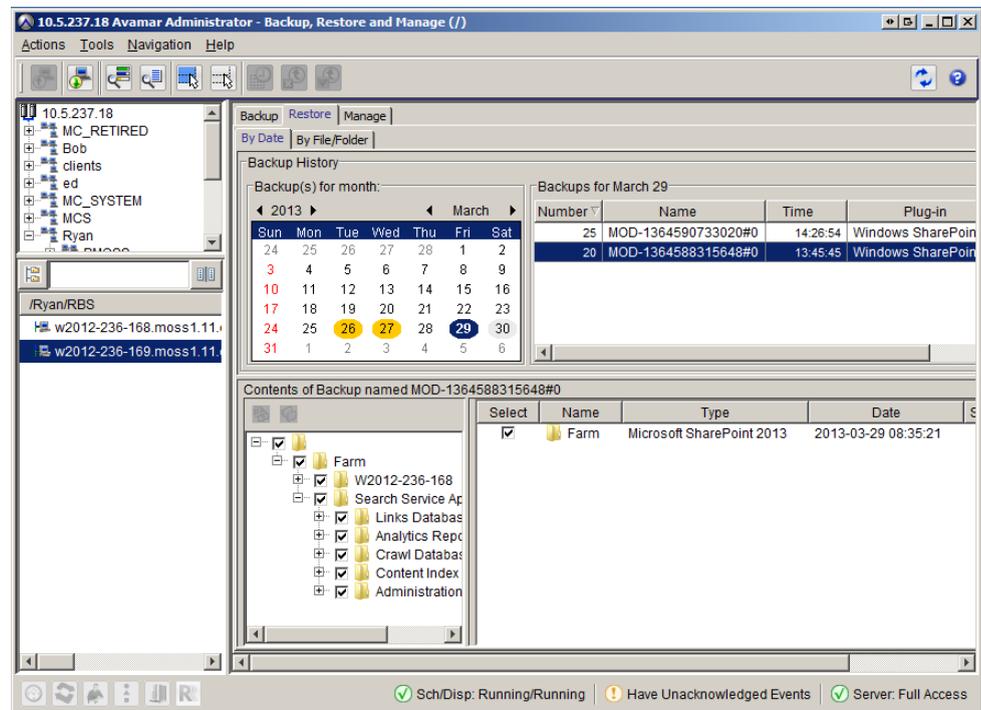
1. In Avamar Administrator, click the **Backup & Restore** launcher button.

The **Backup, Restore and Manage** window appears.

2. Find the backup to restore.

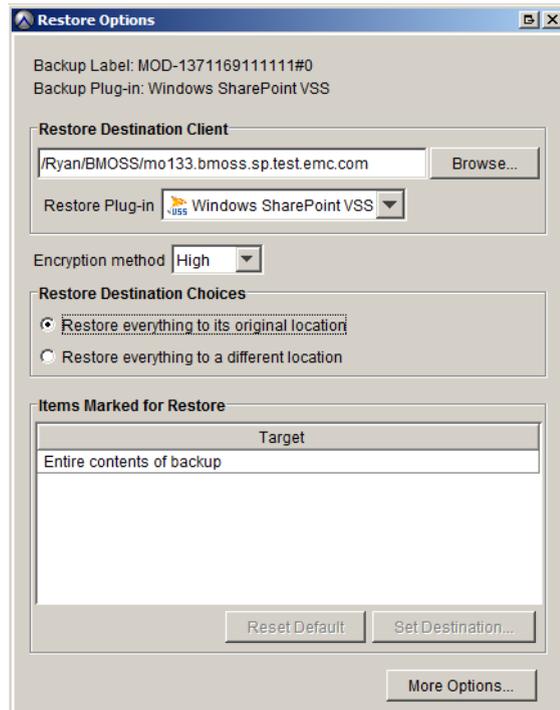
[“How to find a backup by date” on page 77](#) describes this in detail.

The backup to restore from is selected in the **Backups** pane.



3. In the bottom left pane, select the farm to restore.
4. Select **Actions > Restore Now**.

The **Restore Options** dialog box appears. The client that you selected for recovery appears in **Restore Destination Client**.



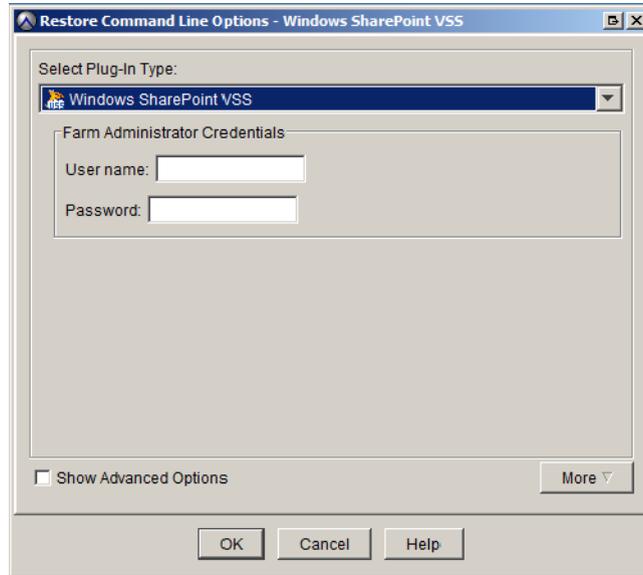
5. In **Restore Plug-In**, select **Windows SharePoint VSS**.
6. In **Encryption method**, select the encryption method to use for client/server data transfer during this restore.

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

7. Select **Restore everything to its original location**.

8. Do one of the following:
  - To recover to a stand-alone farm, go to step 10.
  - To recover to a distributed SharePoint farm, specify an account for the restore that has administrator rights on all SharePoint clients in the farm:
    - a. Click **More Options**.

The **Restore Command Line Options** dialog box appears with Windows SharePoint VSS plug-in options.



- b. In **User name** and **Password**, type the account information.  
[“Plug-in Options” on page 109](#) provides additional information about plug-in options.
9. (Optional) To specify command line flags, such as those listed in [“Command line flags” on page 111](#):
  - a. Click **More**.
  - b. In **Enter Attribute**, type the flag.
  - c. In **Enter Attribute value**, type the value, if applicable.
  - d. Click the + button.
  - e. Click **OK**.
10. On the **Restore Options** dialog box, click **OK**. If a confirmation dialog box appears, click **OK** again.  
 The following status message appears:  

```
Restore initiated.
```
11. Click **OK**.
12. After the restore completes, restart IIS.

## Restoring a content database to its original location

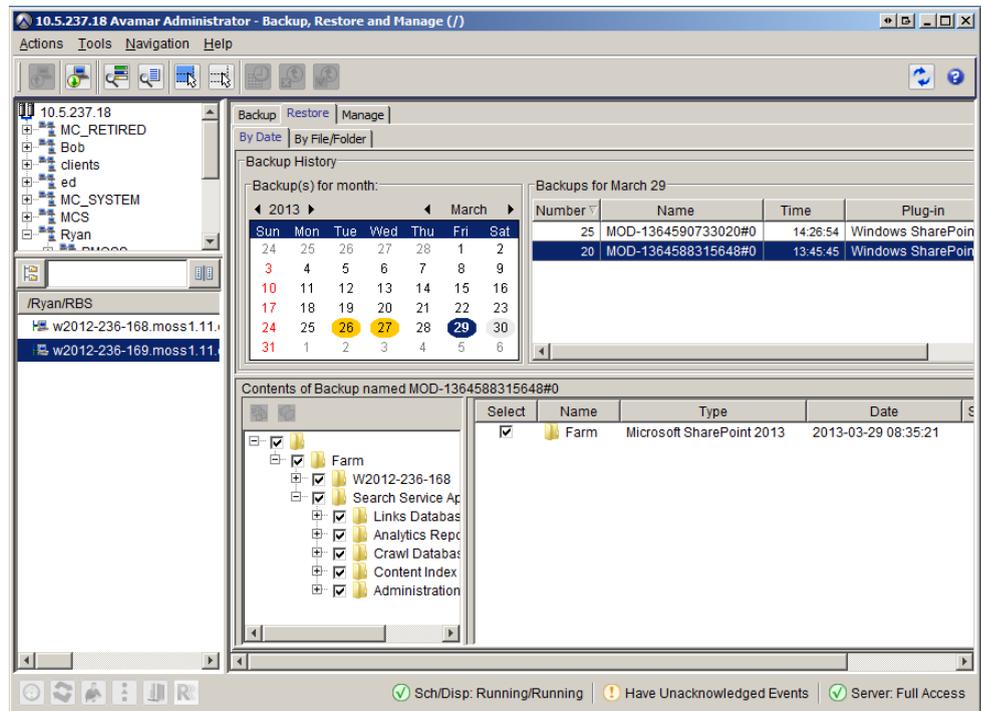
Use a backup created with Avamar Plug-in for SharePoint VSS to restore a SharePoint content database to its original location.

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

The **Backup, Manage, and Restore** window appears.

2. Use the **Backup History** calendar to locate a backup, as described in [“How to find a backup by date”](#) on page 77.

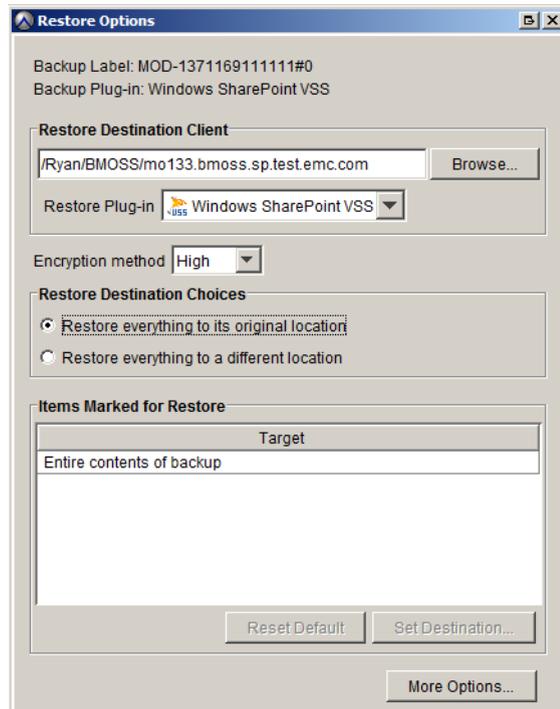
The restore uses the backup that is selected in the **Backups** pane.



3. In the bottom left pane, expand the node for the farm.
4. Expand the SQL Server farm host to display either the SQL instance folder or databases.
5. Select the content database to restore.

6. Select **Actions > Restore Now**.

The **Restore Options** dialog box appears. The client selected for recovery appears in **Restore Destination Client**.



7. In **Restore Plug-In**, select **Windows SharePoint VSS**.

8. In **Encryption method**, select the encryption method to use for client/server data transfer during this restore.

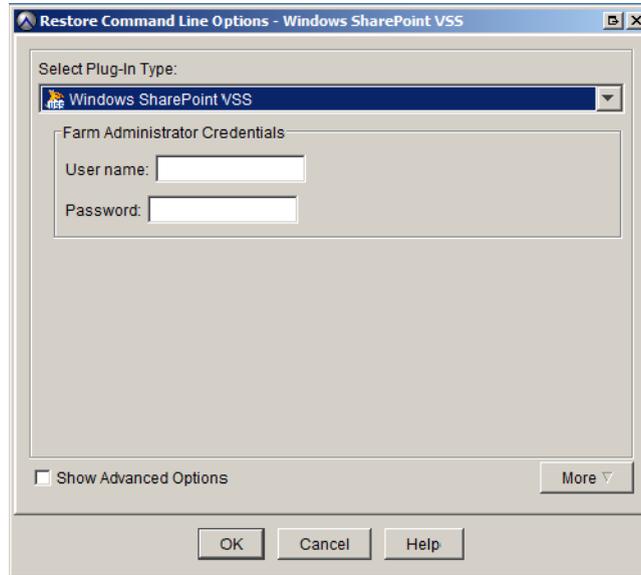
The exact encryption technology and bit strength used for a client/server connection depends on several factors, including the client operating system and Avamar server version. The *EMC Avamar Product Security Guide* provides additional information.

9. Select **Restore everything to its original location**.

10. Do one of the following:

- To recover to a stand-alone farm, go to step 11.
- To recover to a distributed SharePoint farm, specify an account for the restore that has administrator rights on all SharePoint clients in the farm:
  - a. Click **More Options**.

The **Restore Command Line Options** dialog box appears with Windows SharePoint VSS plug-in options.



b. In **User name** and in **Password**, type the account information.

c. Click **OK**.

11. On the **Restore Options** dialog box, click **OK**. If a confirmation dialog box appears, click **OK** again.

The following status message appears:

```
Restore initiated.
```

12. Click **OK**.

## Restoring to a different location

Use a backup created with Avamar Plug-in for SharePoint VSS to restore an entire farm, or just a content database, to a new location. This enables you to restore content without directly overwriting existing content in the production SharePoint server databases.

### NOTICE

When you restore, the Avamar Client for Windows and Avamar Plug-in for SharePoint VSS must be installed on the target or destination servers. [“Checking the User Account Control setting on Windows” on page 44](#) provides details on what to install on each server in a SharePoint farm.

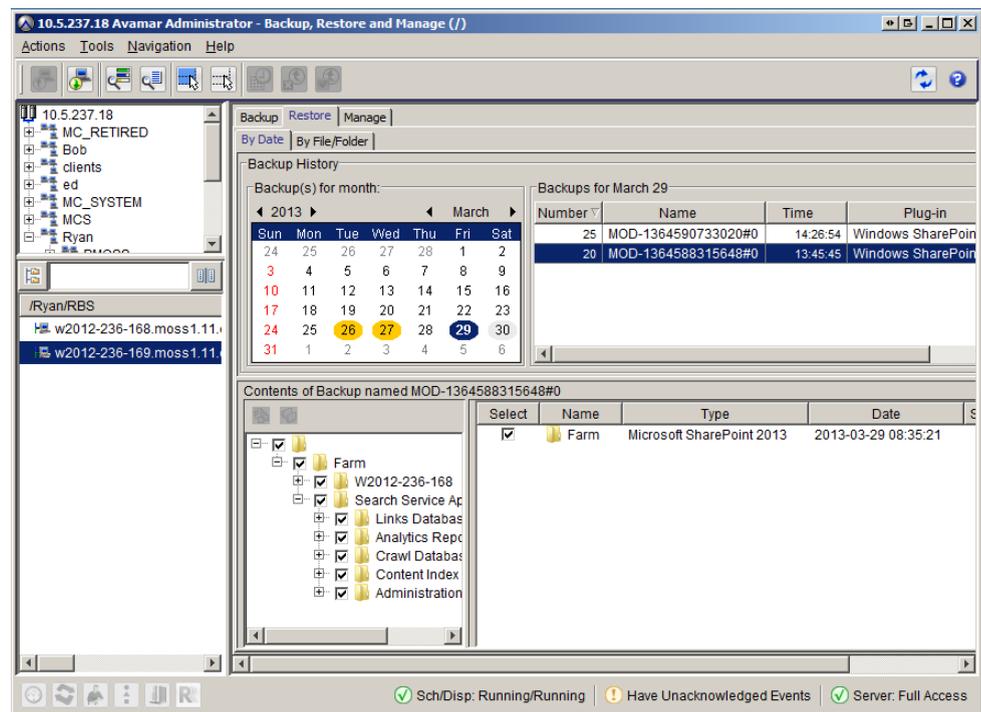
To restore a SharePoint farm or individual components to a different location using the Avamar Plug-in for SharePoint VSS:

1. Ensure that the target computer has enough free space to hold the total size of data you have selected to restore.
2. In Avamar Administrator, click the **Backup & Restore** launcher button.

The **Backup, Restore, and Manage** window appears.

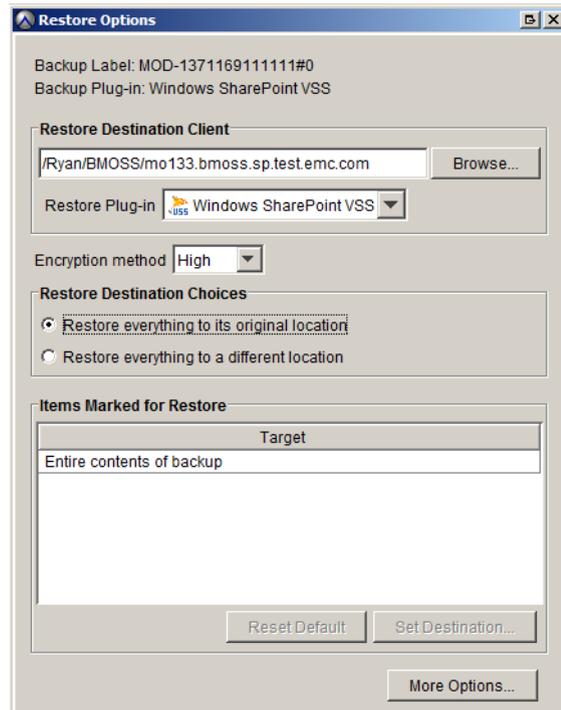
3. Use the **Backup History** calendar to locate a backup, as discussed in [“How to find a backup by date” on page 77](#).

The restore uses the backup that is selected in the **Backups** pane.



4. In the bottom left pane, select the farm or component to restore.
5. Select **Actions > Restore Now**.

The **Restore Options** dialog box appears. The client selected for the recovery appears in **Restore Destination Client**.



6. In **Restore Plug-In**, select **Windows SharePoint VSS**.
7. In **Encryption method**, select the encryption method to use for client/server data transfer during this restore.

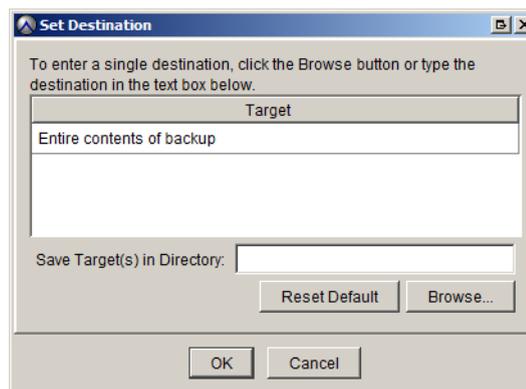
The exact encryption technology and bit strength used for a client/server connection depends on several factors, including the client operating system and Avamar server version. The *EMC Avamar Product Security Guide* provides additional information.

8. Select **Restore everything to a different location**.

The **Reset Default** and **Edit Destination** buttons are now available.

9. In the **Items Marked for Restore** box, click **Set Destination** to specify the target drive for the restore.

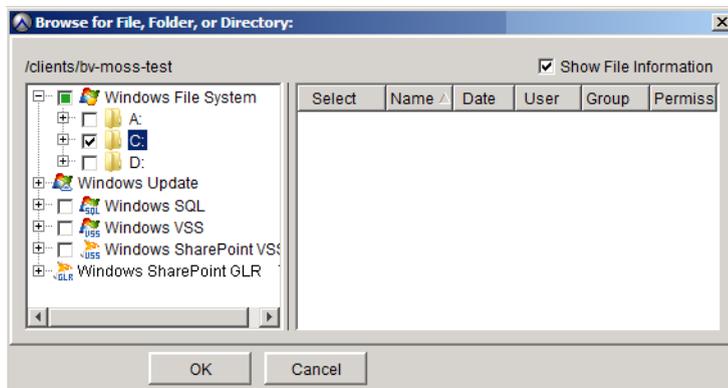
The **Set Destination** dialog box appears.



10. Specify the target destination in the **Destination** box.

An error will occur if you leave this field blank or use incorrect syntax.

11. Click the **Browse** button.
12. In the **Browse for File, Folder, or Directory** dialog box, expand **Windows File System**, select the volume or location, and then click **OK**.



13. On the **Set Destination** dialog box, click **OK**.
14. Click **OK** to close the **Restore Options** dialog box.
15. When the **Restore initiated** status message appears, click **OK**.

## Performing granular level recovery

With the Avamar Plug-in for SharePoint GLR, you can use granular level recovery to restore specific content in a SharePoint farm backup without overwriting existing content on a SharePoint server.

Before using granular level recovery, become familiar with the required software components. The following table lists the sections in this guide that will help you prepare for using granular level recovery.

**Table 11** Granular level recovery information in this guide (page 1 of 2)

This section	Provides the following information
<a href="#">“Avamar Plug-in for SharePoint GLR (optional)” on page 18</a>	Describes this optional plug-in and where it should be installed in the SharePoint farm.
<a href="#">“Distributed SharePoint farm with optional granular level recovery” on page 23</a>	Illustrates the topology of a SharePoint distributed farm in an Avamar grid, including where the Avamar clients, plug-ins, and Ontrack PowerControls components are installed on each SharePoint server role.
<a href="#">“Granular level recovery” on page 31</a>	Describes: <ul style="list-style-type: none"> <li>• The advantages of granular level recovery over conventional recoveries.</li> <li>• How to obtain information about purchasing and ordering the Ontrack PowerControls from EMC.</li> <li>• The end-to-end process using the Avamar Plug-in for SharePoint GLR and Ontrack PowerControls.</li> <li>• The granular level recovery process with a diagram that includes information flow and recovery roles of the computers.</li> </ul>

**Table 11** Granular level recovery information in this guide (page 2 of 2)

This section	Provides the following information
<a href="#">“Checking the Avamar Plug-in for SharePoint GLR requirements” on page 39</a>	Describes memory, database size, third-party recovery tool, and Avamar Virtual Drive requirements.
<a href="#">“Installing the Avamar Client for Windows” on page 47</a>	Provides the steps for installing the Avamar client for Windows. This client must be installed on all servers in the SharePoint farm before installing the Avamar plug-in for SharePoint.
<a href="#">“Installing the Avamar Plug-in for SharePoint VSS” on page 48</a>	Provides the steps for installing the SharePoint plug-in after installing the Avamar client for Windows. The Avamar Plug-in for SharePoint GLR is an optional component of the Avamar plug-in for SharePoint, but it is required for granular level recovery functionality.
<a href="#">“Third-party recovery tool” on page 40</a>	Describes how to obtain information about purchasing, ordering, and downloading the Ontrack PowerControls from EMC. Ontrack PowerControls are not included in the Avamar product kits or downloads.
<a href="#">“Restoring the Avamar backup and mounting the Avamar Virtual Drive” on page 90</a>	Describes the granular level recovery process when using the Avamar Plug-in for SharePoint GLR and mounting the Avamar Virtual Drive.
<a href="#">“Restoring items from the Avamar Virtual Drive” on page 93</a>	Describes how to use Ontrack PowerControls to browse and select the items for recovery from the Avamar Virtual Drive.

## Granular level recovery task list

The process of granular level recovery is similar to the process described in [“Restoring to a different location” on page 86](#). However granular level recovery is different in the following ways:

- ◆ The restore is performed using the Avamar Plug-in for SharePoint GLR, not the Avamar Plug-in for SharePoint VSS.
- ◆ At the end of the granular level recovery, the backup set is mounted to the Avamar Virtual Drive.

This is quick and uses little memory, storage, or processor resources. A conventional restore requires physically moving or copying the data to another drive or location. This can take a long time with large databases, using considerable processor, memory, and storage resources.

- ◆ In granular level recovery, an optional third-party tool, such as Ontrack PowerControls, is used to browse and select the individual folders, files, or items you want to restore.

Only the items selected for restore are physically copied to the SharePoint farm or other destination you have chosen.

Perform the following two major tasks for a granular level recovery:

1. Locate, restore, and mount a backup, following the steps in [“Restoring the Avamar backup and mounting the Avamar Virtual Drive” on page 90](#). Granular level recovery is performed through the Avamar Administrator console.

The backup is restored to the Avamar Virtual Drive, which is temporarily mounted for the purposes of granular level recovery.

2. Use the third-party recovery tool to browse, select, and restore the data from the Avamar Virtual Drive to the SharePoint farm, as described in [“Restoring items from the Avamar Virtual Drive” on page 93](#).

## Avamar Virtual Disk limitations

The primary limitations are:

- ◆ The virtual disk is temporary. It is created solely for GLR, and will be unmounted at the time limit you specify, when you stop the GLR service, or when the computer reboots.
- ◆ Sharing the virtual disk is not supported. When you perform a GLR and mount the Avamar Virtual Disk, do not mount the disk to a public share, or share the folder publicly on the computer you mounted the disk on.
- ◆ Though the virtual disk may appear in the file system, you can only access it from the computer that controls the mount point.
- ◆ You cannot map to the virtual disk from other machines.

## Restoring the Avamar backup and mounting the Avamar Virtual Drive

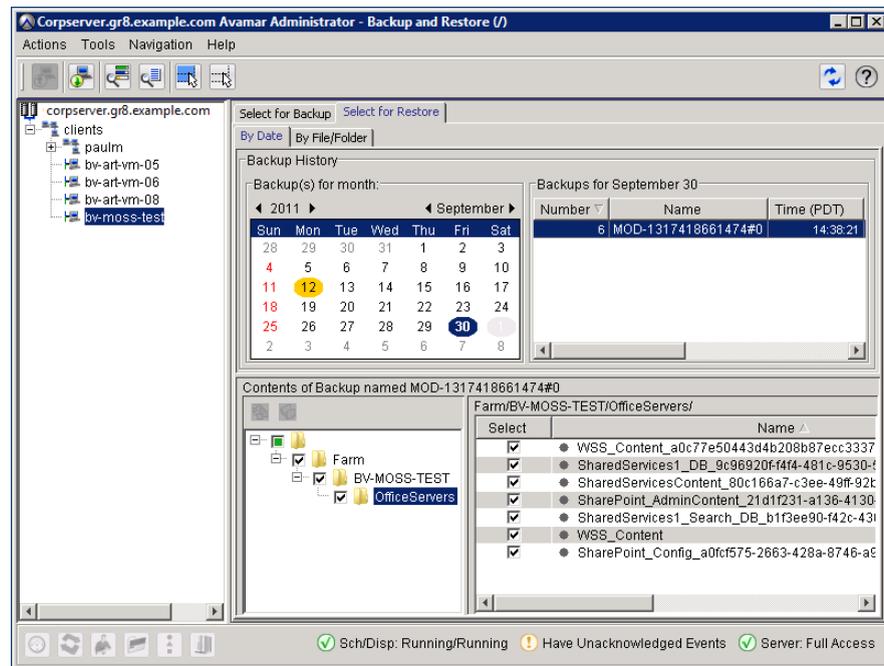
To restore the backup using the Avamar Plug-in for SharePoint GLR, and mount the Avamar Virtual Drive for granular level recovery:

1. Ensure that the target computer has more free space than the size of the VSS snapshot of the largest component of the SharePoint farm.
2. Ensure that the Avamar Client for Windows and the Avamar Plug-in for SharePoint VSS are installed on the target computer.
3. In Avamar Administrator, click the **Backup & Restore** launcher button.

The **Backup, Restore and Manage** window appears.

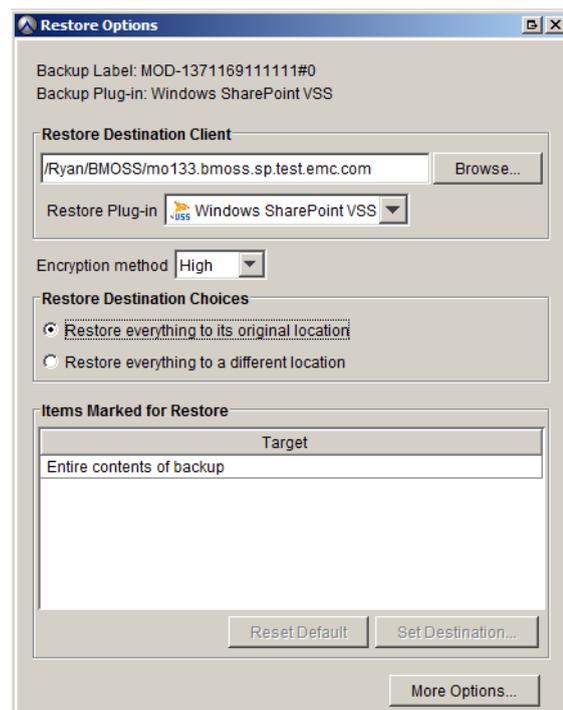
4. User the **Backup History** calendar to locate a backup, as discussed in [“How to find a backup by date” on page 77](#).

The restore uses the backup that is selected in the **Backups** pane.



5. In the bottom left pane, select the farm with the data to restore.
6. Select **Actions > Restore Now**.

The **Restore Options** dialog box appears. The client selected for recovery appears in **Restore Destination Client**.



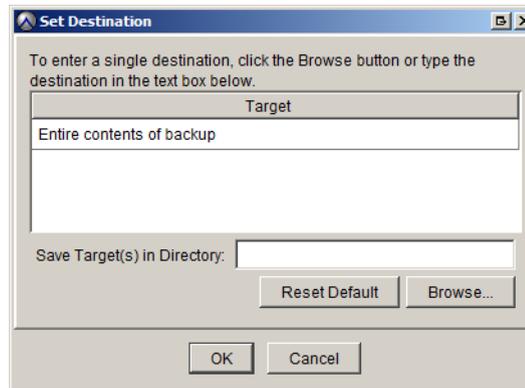
7. In **Restore Plug-In**, select **Windows SharePoint GLR**.

8. In **Encryption method**, select the encryption method to use for client/server data transfer during this restore.

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

9. Select **Restore everything to a different location**.
10. In **Items Marked for Restore**, click **Set Destination** to specify the target drive for the restore.

The **Set Destination** dialog box appears.



11. Specify the target destination using one of the following:

- Type a forward (/) or backward (\) slash to let the Avamar software detect and select an available drive.

The system starts with the letter Z and works its way backward until an available drive is located. If you specify a drive letter, ensure that the drive letter is not already in use on the target server.

- Type a valid path name to a folder.

For example, F:\folder\_name.

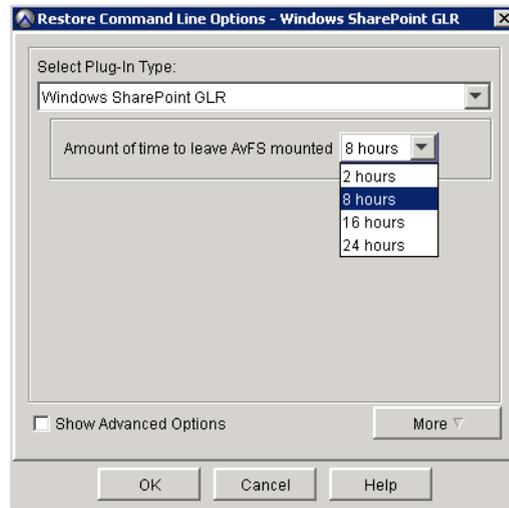
- Click **Browse** to navigate to and select the target.

#### NOTICE

If another user or user session has mapped a network drive within a user session on the client computer, the Avamar software cannot detect those drive mappings when assigning a drive letter for the Avamar Virtual Drive. If you regularly use network drive mapping, then specify a drive letter that you know is not in use instead of specifying a forward or backward slash.

12. Click **OK** to close the **Set Destination** dialog box.
13. In the **Restore Options** dialog box, click **More Options**.

The **Restore Command Line Options** dialog box appears with Windows SharePoint GLR plug-in options.



14. In **Amount of time to leave AvFS mounted**, select the amount of time to leave the Avamar Virtual Drive mounted.

When the specified time has passed the drive is disconnected, even if the drive is in use. Select a length of time that enables you to complete the granular level recovery.

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

The following status message appears:

```
Restore initiated.
```

17. Click **OK**.

The restored content can now be used as a source for recovery by Ontrack PowerControls or possibly other third-party recovery software.

## Restoring items from the Avamar Virtual Drive

After you restore the Avamar backup to the Avamar Virtual Drive, use a third-party recovery tool, such as Ontrack PowerControls, to recover specific items to the SharePoint farm.

### **NOTICE**

When performing a granular recovery with Ontrack PowerControls software, ensure that the `OntrackPowerControlsAgentForContentTransfer` service is running.

The following steps describe the general process for restoring from the Avamar Virtual Drive using Ontrack PowerControls.

To perform a granular recovery from the Avamar Virtual Drive by using the Ontrack PowerControls software:

1. On the target computer where the Avamar Virtual Drive is mounted, open the recovery program by clicking **Start > Program Files > Kroll Ontrack PowerControls > Ontrack PowerControls for SharePoint**.

The Ontrack PowerControls software appears, and displays the **Data Wizard** to gather information about the source and target locations.

2. When prompted, provide the following information:
  - a. The full local path to the Avamar Virtual Drive. For example: Z:\
  - b. Target server information:
    - **SharePoint Server Site URL** — Provide the site collection URL.
    - **Agent for Content Transfer Service Port Number** — Use the default value, which is 49175.
    - **Authentication Information** — Provide the credentials required to access the site collection URL. The Ontrack PowerControls administrator must have full access control permissions.
3. Click **Finish**.

Ontrack PowerControls connects to the source and the target. The Ontrack PowerControls window appears as a split directory window. The source directory tree is on top, and the target directory tree is on the bottom.

4. Browse the source directory tree and select the items to restore.
5. Initiate the restore by using one of the following methods:
  - Drag and drop from the source to the target.
  - Select items in the source tree, right-click to copy, select the destination, right-click to paste.

When you complete the paste operation, a Copy Progress window displays the details of the file transfer.

When the copy is complete, you can print or save a file copy of the completion report.

## Troubleshooting granular level restores

There are log files in both Avamar and Windows can be useful in troubleshooting restores. Also, SharePoint has logs and reports that can provide more insight into SharePoint operations and features.

An example of a useful Windows log file for monitoring SharePoint-related activities is the Windows Application Event log. Check Windows documentation for information about viewing the Windows Application Event log.

### Avamar log files

There are several Avamar log files that capture Avamar, GLR, and service events. The following table describes each log file. These files are in the var directory, typically `c:\program files\avs\var`.

**Table 12** Avamar log files (page 1 of 2)

Log file	Description	Command file and flags for debugging
avmossglr.log	Avamar SharePoint GLR Contains trace and debugging for Avamar SharePoint GLR creation, mount, browse, and restore.	avmossglr.cmd --debug
avmossglrsvc.log	Avamar SharePoint GLR Service log Contains trace and debugging for Avamar SharePoint GLR creation, mount, browse, and restore.	avmossglrsvc.cmd --debug
axionfs.log	Contains trace and debug information for AvFS file system calls.	Axionfs.cmd --debug --x19=65536 (Trace AvFS I/O calls. Use with --debug) --x19=262144 (Trace AvFS directory enumeration. Use with --debug) --x19=327680 (Trace AvFS I/O and directory enumeration calls. Use with --debug)

**Table 12 Avamar log files (page 2 of 2)**

Log file	Description	Command file and flags for debugging
avmossvss.log	SharePoint VSS log	avmossvss.cmd --debug --debugvss --logfile="c:\somefile.txt" --subprocesstimeoutsecs=300 --subworkorder-timeout=5 --remotebrowse-timeout=300 --writerid={Writer_GUID}
av_cluster_config_wizard.log	Cluster Configuration Wizard log for SQL clusters	av_cluster_config_wizard.cmd --debug
avagent.log	Avamar agent log	avagent.cmd --debug

To generate log files add a command file with the flags, prior to running GLR:

1. Create the cmd file in the var directory, typically c:\program files\avs\var.
2. In the cmd file, add debugging flags as listed in [Table 12 on page 95](#).

## SharePoint command line interfaces

SharePoint provides command line interfaces for some SharePoint features and operations. MSDN, TechNet, and SharePoint online help provide extensive documentation for these tools; the references listed in the following are suggested starting points and are subject to change by Microsoft.

**Table 13 Microsoft SharePoint command-line tools**

SharePoint Tool	Description	
stsadm	Command-line tool available in SharePoint 2007, 2010, and 2013	Search Microsoft TechNet for: <ul style="list-style-type: none"> <li>• “Stsadm command-line tool”</li> </ul>
Windows Powershell	Command-line tool available in SharePoint 2010 and 2013.	Search Microsoft TechNet for: <ul style="list-style-type: none"> <li>• “Windows PowerShell for SharePoint 2010 reference”</li> <li>• “Windows PowerShell for SharePoint 2013 IT pros”</li> <li>• “Stsadm to Windows PowerShell mapping (SharePoint Server 2010)”</li> </ul>

## Troubleshooting restores

You can use the appropriate troubleshooting guidelines to resolve restore issues.

### Problem when selecting only SharePoint Content Index Catalog database for restore

In SharePoint 2013, when only one SharePoint Content Index Catalog database is selected for restore, using all default restore options, restore fails.

A workaround is to select additional databases for restore when selecting the Content Index Catalog database.

Restore

# CHAPTER 5

## Disaster Recovery

The following topics describe how to prepare for and perform disaster recovery for a SharePoint farm:

- ◆ [Preparing for disaster recovery .....](#) 100
- ◆ [Disaster recovery.....](#) 106

## Preparing for disaster recovery

Preparing for recovery of a SharePoint farm includes reviewing the SharePoint disaster recovery information available from Microsoft, including the following white paper: “Data protection and recovery for Microsoft Office SharePoint Server 2007,” <http://go.microsoft.com/fwlink/?LinkId=102839&clid=0x409>.

To prepare a SharePoint environment for disaster recovery:

1. Ensure that you have onsite and offsite copies of the installation disks for the following:
  - Operating system
  - SharePoint software
  - Any updates for the software
2. Back up the entire farm using the Avamar Plug-in for SharePoint VSS.  
[Chapter 3, “Backup,”](#) provides backup instructions.
3. Back up operating system and SharePoint binary files using the Avamar Client for Windows. Be sure to include IIS files from the operating system’s system state.  
  
This ensures that the application pools and website settings are backed up.
4. Review and complete the tasks in the following topics to ensure that you have developed a sufficient backup strategy for each component in the SharePoint environment:
  - [“Avamar backups required for each SharePoint server” on page 101](#)
  - [“Backup of configuration settings” on page 102](#)
  - [“Back up customizations” on page 104](#)
  - [“Backing up databases” on page 105](#)

## Avamar backups required for each SharePoint server

The following table lists each server type in a distributed SharePoint farm, the items that should be backed up on that server, and which plug-in to use for the backups. Back up all data needed for disaster recovery.

**Table 14** SharePoint distributed farm roles and backups required for disaster recovery

SharePoint server role	Backup required	Avamar plug-in required
Main WFE	Perform full Windows backup: <ul style="list-style-type: none"> <li>• File system</li> <li>• System state</li> <li>• Volumes</li> </ul>	Avamar Client for Windows
	Perform full SharePoint farm backup.	Avamar Plug-in for SharePoint VSS
<p><b>Note:</b> When you perform a full SharePoint farm backup through the main WFE, it is a federated backup that includes all SharePoint content from all other WFEs and SharePoint servers in the farm. You also must perform a full Windows backup of each SharePoint server in the farm.</p>		
All other WFE servers	Perform full Windows backup: <ul style="list-style-type: none"> <li>• File System</li> <li>• System State</li> <li>• Volumes</li> </ul>	Avamar Client for Windows
Search server	Perform full Windows backup: <ul style="list-style-type: none"> <li>• File System</li> <li>• System State</li> <li>• Volumes</li> </ul>	Avamar Client for Windows
SQL server	Perform full Windows backup: <ul style="list-style-type: none"> <li>• File System</li> <li>• System State</li> <li>• Volumes</li> </ul>	Avamar Client for Windows

The following table lists the items that should be backed up on a stand-alone server and which plug-in to use for the backups, in order to back up all data needed for disaster recovery.

**Table 15** SharePoint stand-alone farm backups required for disaster recovery

SharePoint server role	Backup required	Avamar plug-in required
Stand-alone SharePoint server	Perform full Windows backup: <ul style="list-style-type: none"> <li>• File system</li> <li>• System state</li> <li>• Volumes</li> </ul>	Avamar Client for Windows
	Perform full SharePoint farm backup.	Avamar Plug-in for SharePoint VSS
	Perform backup of all SQL databases.	Avamar Plug-in for SharePoint VSS or Avamar Plug-in for SQL Server

## Backup of configuration settings

SharePoint includes two sets of configuration settings:

- ◆ IIS configurations
- ◆ Configurations stored in the configuration database and Central Administration content database

The following topics provide details on backing up the configuration settings.

### Backing up IIS configurations

IIS configurations are stored in the SharePoint Central Administration Application or IIS Manager on each WFE server in the system with SQL Server Reporting Services in the SharePoint environment.

IIS settings include:

- ◆ Application pool, including service accounts
- ◆ HTTP compression
- ◆ Timeout
- ◆ Custom Internet Server API (ISAPI) filters
- ◆ Computer domain membership
- ◆ Internet Protocol security (IPsec)
- ◆ Network load balancing
- ◆ Host header entries
- ◆ Secure Sockets Layer (SSL) certificates
- ◆ Dedicated IP address

IIS settings are stored in the IIS metabase, which is located at %systemroot%\system32\inetsrv\MetaBack.

A SharePoint farm backup by Avamar Plug-in for SharePoint VSS does not include the IIS metabase. To back up the IIS metabase, use the Avamar Client for Windows.

In addition, Microsoft recommends that you document the IIS configurations using a tool that provides Desired Configuration Monitoring (DCM) to ensure that you can restore the configuration manually, if required.

IIS also includes a script for backup and restore of the metabase. To back up the metabase with this script, use the following command:

```
cscript.exe %systemroot%\system32\iisback.vbs /s servername /u  
accountname /p password /backup /b WeeklyBackup /v NEXT_VERSION /e  
backuppassword
```

## Backing up SharePoint configurations

SharePoint configurations settings are stored in Central Administration. The settings are stored in the configuration database and the Central Administration content database.

SharePoint settings include:

- ◆ Application pool settings, including service accounts
- ◆ Alternate access mapping
- ◆ Farm-level search
- ◆ External service connection
- ◆ Workflow management
- ◆ Email
- ◆ A/V
- ◆ Usage analysis processing
- ◆ Diagnostic logging
- ◆ Content deployment
- ◆ Timer job
- ◆ HTML viewer
- ◆ Recycle bin and other web application general
- ◆ Administrator-deployed form templates
- ◆ Default quota templates
- ◆ Database names and locations
- ◆ Crawler impact rules
- ◆ Activated features
- ◆ Blocked file types
- ◆ Web application names and database

### **IMPORTANT**

Be sure to document the content database names associated with each Web application.

When you back up a SharePoint farm using the Avamar Plug-in for SharePoint VSS, it includes the configuration database and Central Administration content database. However, keep in mind that all these backups contain information specific to the host computers. You can only restore the configuration database and Central Administration content database to an environment configured exactly the same as the environment in which the backup occurred. The environment must have the same number of servers, the same server names, and the same software updates installed.

You should also document all configuration settings and consider implementing a redundancy solution, such as clustering or mirroring, for the computer on which the configuration database is located.

To document alternate access mapping (AAM) settings, export the AAM settings to a text file, and then back up the exported file with the Avamar Client for Windows. To export the AAM settings to a text file, use the SharePoint Stsadm.exe tool for command-line administration of servers and sites. The following Stsadm.exe command exports AAM settings to a text file:

```
stsadm -o enumalternatedomains
```

## Back up customizations

Customizations of SharePoint sites can include:

- ◆ Master pages, page layouts, and cascading stylesheets, which are stored in the content database for a Web application.
- ◆ Web parts, site or list definitions, custom columns, new content types, custom fields, custom actions, coded workflows, or workflow activities and conditions.
- ◆ Third-party solutions, including associated binary files and registry keys, such as filters.
- ◆ Changes to standard XML files.
- ◆ Custom site definitions (webtemp.xml).

Customizations are included when you perform a backup using the Avamar Plug-in for SharePoint VSS. You also can use the Avamar Client for Windows to back up the following locations on WFE servers, which are the most common locations for customizations:

- ◆ SharePoint 2007 SP2  
Program Files\Common Files\Microsoft Shared\Web server extensions\12  
This includes commonly updated files, custom assemblies, custom templates, and custom site definitions. This location is often called the 12 hive.
- ◆ SharePoint 2010  
Program Files\Common Files\Microsoft Shared\Web server extensions\14  
This includes commonly updated files, custom assemblies, custom templates, and custom site definitions.
- ◆ SharePoint 2013  
Program Files\Common Files\Microsoft Shared\Web server extensions\15  
This includes commonly updated files, custom assemblies, custom templates, and custom site definitions.
- ◆ Inetpub  
This is the location of IIS virtual folders.
- ◆ %systemroot%\assembly  
This is the global assembly cache (GAC), a protected operating system location that contains .NET Framework code assemblies that are installed to provide full system access.

## Backing up databases

When you back up a SharePoint farm using the Avamar Plug-in for SharePoint VSS, the backup includes all databases in the SharePoint environment.

The following table lists the back-end SQL Server databases for SharePoint.

**Table 16** Back-end SQL Server databases for SharePoint

Database	Functions
Configuration	Stores all configuration information about the entire farm, including topology information and context database information.
Content	Stores: <ul style="list-style-type: none"> <li>• WSS site details</li> <li>• Structure details</li> <li>• User content</li> <li>• Files</li> <li>• Security information</li> </ul>
<ul style="list-style-type: none"> <li>• Shared Service Provider (SSP) (SharePoint 2007)</li> <li>• Service Applications (SharePoint 2013, 2010)</li> </ul>	Stores: <ul style="list-style-type: none"> <li>• User profiles</li> <li>• Audience data</li> <li>• Business application data</li> <li>• Excel services functions</li> <li>• Site usage data</li> <li>• InfoPath forms</li> <li>• Services session state information</li> </ul>
Search	Stores: <ul style="list-style-type: none"> <li>• Search data</li> <li>• History log</li> <li>• Search log</li> <li>• Calculation tables for crawl statistics</li> <li>• Links tables</li> <li>• Statistical tables</li> </ul>
Custom	Stores separate databases that store third-party application data.
Search indexes	Stores search indexes stored on the file system.

## Disaster recovery

The disaster recovery process for SharePoint consists of four tasks:

1. Rebuild the SharePoint environment, as discussed in [“Rebuilding the SharePoint environment” on page 106](#).
2. Reinstall the Avamar software in the SharePoint environment, as discussed in [“Reinstalling the Avamar software” on page 107](#).
3. Restore the SharePoint farm from the Avamar backups, as discussed in [“Restoring the SharePoint farm from the Avamar backup” on page 107](#).
4. Bring the restored SharePoint servers back online or into production, as discussed in [“Bringing restored servers back online” on page 108](#).

### Rebuilding the SharePoint environment

To rebuild the SharePoint environment as part of disaster recovery:

1. Rebuild the database servers:
  - a. Install Windows and all patches.
  - b. Install the same version of Microsoft SQL Server used on the old server.
  - c. Install software updates (to match the SP and release level of the old server).
2. Rebuild the application servers:
  - a. Install Windows and all patches.
  - b. Install Microsoft .NET Framework 3.0.
  - c. Install the complete version of Microsoft Office SharePoint Server (to match the SP and release level of the old server) with an installation type of Complete.
3. Rebuild the WFE servers:
  - a. Install Windows and all patches.
  - b. Install IIS.
  - c. Install ASP.NET.
  - d. Install Microsoft .NET Framework 3.0.
  - e. Install Microsoft Office SharePoint Server (to match the SP and release level of the old server) with the front-end Web installation option.
4. Using the SharePoint Products & Technologies wizard on the application server, create a new farm server.
5. Start Search services.
6. Re-create all Web applications using the original port number for Central Admin Web Application.
7. Using the SharePoint Products & Technologies wizard on the WFE servers, connect to an existing server farm.

## Reinstalling the Avamar software

To reinstall the Avamar software in the SharePoint environment after you rebuild the farm:

1. Install the Avamar Client for Windows on every server in the SharePoint farm, as discussed in [“Installing the Avamar Client for Windows” on page 47](#).
2. Install the Avamar Plug-in for SharePoint VSS on every server in the SharePoint farm, as discussed in [“Installing the Avamar Plug-in for SharePoint VSS” on page 48](#).  
  
If you perform granular level recovery, then select the option to install the Avamar Plug-in for SharePoint GLR as well as the Avamar Plug-in for SharePoint VSS on the SharePoint Administrator Console.
3. If you perform granular level recovery, then install the third-party recovery tool, such as Ontrack PowerControls, on the Administrator Console.
4. If you use the Avamar Plug-in for SQL Server to back up the SQL Server databases in the environment, then install the plug-in on the database servers by following the instructions in the *EMC Avamar for SQL Server User Guide*.
5. Check Services.msc to verify that the SQL Server VSS Writer service is enabled and set to automatic. In some stand-alone installations, the SQL Server VSS Writer service might be in a disabled or stopped state after you install the Avamar Plug-in for SharePoint VSS. Without this service running, backups and recoveries can fail.
6. Deactivate the Avamar clients on each server in the SharePoint farm by clearing the **Activate it** checkbox on the **Client Properties** dialog box. The *EMC Avamar Administration Guide* provides details.
7. Invite the clients, as discussed in the *EMC Avamar Administration Guide*.

## Restoring the SharePoint farm from the Avamar backup

To restore the SharePoint farm from the Avamar backup:

1. Ensure the following services are already running:
  - Volume Shadow Copy
  - SharePoint VSS Writer
  - SharePoint Timer
2. Perform the steps in [“Restoring an entire farm to its original location” on page 80](#) to restore the farm from the backup performed with the Avamar Plug-in for SharePoint VSS.

When you run the SharePoint plug-in restore, it automatically stops the following services:

- SharePoint Administration
- SharePoint Search
- SharePoint Timer
- SharePoint Server Search (If SharePoint Server is installed)

## Bringing restored servers back online

To bring the SharePoint servers back online after you restore the farm:

1. Reconfigure IIS settings to accommodate any changes made between the time of the backup and the disaster. Otherwise, IIS settings should not need to be changed.
2. (Optional) Reconfigure alternate access mappings.
3. (Optional) On all WFE servers, redeploy solutions and reactivate features. For SharePoint Server 2007 only, restore the 12 hive by using the Avamar Client for Windows.

# APPENDIX A

## Plug-in Options

The following topics provide information about backup and restore plug-in options for the Avamar Plug-in for SharePoint VSS:

- ◆ [How to set plug-in options .....](#) 110
- ◆ [Backup options.....](#) 110
- ◆ [Restore options.....](#) 111

## How to set plug-in options

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

You specify plug-in options in Avamar Administrator for on-demand backup or restore operations, or when you create a dataset for a scheduled backup. You can set options by using the graphical user interface (GUI) controls (text boxes, checkboxes, radio buttons, and so forth). In addition to using the GUI controls for the options, you can type an option and its value in the Enter Attribute and Enter Attribute Value fields.

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

Detailed instructions on how to access and set plug-in options during a backup or restore are available in [Chapter 3, “Backup,”](#) and [Chapter 4, “Restore.”](#)

## Backup options

The following backup plug-in options are available for the Avamar Plug-in for SharePoint VSS plug-in.

**Table 17** Backup plug-in options (page 1 of 2)

Option	Description
Select Plug-In Type	Specifies the Windows SharePoint VSS plug-in.
Store backup on Data Domain system	Stores the backup on a Data Domain system instead of the Avamar server. Select the checkbox and then select the Data Domain system from the list.
<b>Multi-streaming</b>	
Enable multi-streaming	Enables the backup of multiple targets in parallel to reduce backup time.
Maximum number of streams	Specifies the maximum number of streams to use for the backup. The default is 2, and the maximum value is 10. Each stream requires a separate processor.
<b>Advanced options</b>	
Enable debugging messages	Write maximum information to log files. This creates large log files.
Group by	For multi-streaming, specifies whether to group the backups by Database or by Volume. The default is Database.

**Table 17** Backup plug-in options (page 2 of 2)

Option	Description
<b>Command line flags</b>	
--debugvss	Excludes non-critical dynamic disks from backup. According to Microsoft Best Practices, if any dynamic disk is critical then the entire dynamic disk pack should be treated as critical and included in the backup. Set this flag to 'true' if non-critical dynamic disks should be excluded from the backup. If this option is used it may be necessary to use <code>-exclude_non_critical_disks</code> during the offline disaster recovery. You can specify this option in the Backup Command Line Options dialog box, in a scheduled backup dataset definition, or in the <code>avvss.cmd</code> file.
--vss-ignore-missing-windows-files	Allows the backup to ignore any missing VSS writer files. Set to 'true' to enable. The backup will fail if VSS writers contain files that do not exist on the computer. You can specify this option in the Backup Command Line Options dialog box, in a scheduled backup dataset definition, or in the <code>avvss.cmd</code> file.

## Restore options

The plug-in options that are available during a restore depend on whether you are performing a standard restore by using the Avamar Plug-in for SharePoint VSS or a granular level recovery by using the Avamar Plug-in for SharePoint GLR.

### Restore options for the Avamar Plug-in for SharePoint VSS

The following options are available when you perform a restore using the Avamar Plug-in for SharePoint VSS.

**Table 18** Restore options for the SharePoint VSS plug-in

Option	Description
Select Plug-in Type	Plug-in to use for the restore. For standard restores, this value should be Windows SharePoint VSS.
<b>Farm administrator credentials</b>	
Username	Username for an account for the restore that has administrator rights on all SharePoint clients in the farm.
Password	Password for the account that has SharePoint administrator rights.
<b>Advanced options</b>	
Enable debugging messages	Write maximum information to log files. This creates large log files.
<b>Command line flags</b>	
target=name	Specifies the restore target, this is required for directed restores.
farm-password=PSWD	Specifies the farm admin password. This is required for restores.
farm-username=DOMAIN\Username	Specifies the farm admin username. This is required for restores.

## Restore options for the Avamar Plug-in for SharePoint GLR

The following options are available when you perform a restore using the Avamar Plug-in for SharePoint GLR.

**Table 19** Restore options for the Avamar Plug-in for SharePoint GLR

Option	Description
Select Plug-in Type	Plug-in to use for the restore. For granular level recovery restores, this value should be Windows SharePoint GLR.
Amount of time to leave AvFS mounted	Amount of time to leave the Avamar Virtual Drive mounted before a timeout occurs. The drive is disconnected after the timeout, even if the drive is in use. Select a length of time that enables you to perform the granular level recovery.
<b>Advanced options</b>	
Enable debugging messages	Write maximum information to log files. This creates large log files.

# APPENDIX B

## Command Line Interface

The following topics explain how to use the Avamar Plug-in for SharePoint VSS command line interface (CLI) to back up or restore SharePoint data:

- ◆ [Understanding the SharePoint VSS plug-in CLI .....](#) 114
- ◆ [Command reference .....](#) 116
- ◆ [CLI examples .....](#) 120

## Understanding the SharePoint VSS plug-in CLI

The following topics provide an overview of the Avamar Plug-in for SharePoint VSS CLI.

### CLI architecture

The CLI command to start a backup or restore also specifies the options for the SharePoint VSS plug-in binary. The plug-in interacts with the **avtar** process to write backup data to or read backup data from the Avamar server or Data Domain system.

When you use Avamar Administrator instead, the Management Console Server (MCS) service on the Avamar server gives the **avagent** process on the client a workorder with the options that you specify through Avamar Administrator. The **avagent** process then starts the Avamar Plug-in for SharePoint VSS with those options, which then interacts with **avtar** for the backup or restore.

Using the CLI, does not involve the MCS and **avagent** process in the backup or restore.

### Launching the CLI

The **avmossvss** binary is located in *C:\Program Files\avs\bin*, where *C:\Program Files\avs* is the Avamar client installation directory. To launch the CLI, open a command prompt and change directory to the bin directory of the Avamar client installation directory. [“Command reference” on page 116](#) provides a complete list of available commands and options.

### Available operations

The following topics provide an overview of the operations that are available with the **avmossvss** command. To specify the operation, use **--operation={browse | backup | restore}** on the **avmossvss** command line.

#### Browse

The browse operation returns information about the farm available for backup. The command results appear as standard output in the command window. The following information is displayed:

- ◆ Name (farm name)
- ◆ Date
- ◆ Size
- ◆ Type (SharePoint 2013, 2010, or 2007)

#### Backup

The backup operation performs an on-demand backup of the entire farm.

You can specify plug-in options for the backup, including the backup destination as a Data Domain system. Many of these plug-in options are the same options that you specify in the Backup Command Line Options dialog box when you perform an on-demand backup using Avamar Administrator, or on the Options tab when you create a dataset for a scheduled backup.

## Restore

The restore operation restores the specified data.

You can specify plug-in options for the restore. Many of these plug-in options are the same options that you specify in the Restore Command Line Options dialog box when you perform a restore using Avamar Administrator.

### NOTICE

Granular level recovery through the CLI is not presently supported. Directed restore can only be performed to the computer the command is being run on.

## Options

You can specify options for avmoss to control backup or restore behavior.

### How to specify options for avmossvss

There are several ways to specify options for the **avmossvss** command:

- ◆ Type the individual options at the command prompt.
- ◆ List the options in the avmossvss.cmd file, which is located in the C:\Program Files\avs\var directory, where C:\Program Files\avs is the Avamar client installation directory. List each option on its own line, as shown in the following example:

```
--debug
--logfile=avamarclient.log
--verbose=5
```

- ◆ Create an option file as a text file, and then specify the option file at the command prompt using the **--flagfile=FILEPATH** option, where FILEPATH is the full path and file name of the option file.
- ◆ Pass options to the CLI as environment variables. For example, if you set Instance1=NamedInstance1 in the environment variables, then you can browse the instance by typing the following command:

```
avmossvss --operation=browse %Instance1%
```

## Password encryption

To encrypt a password:

```
avtar --encodepassword=<PASSWORD>
```

where PASSWORD is your password for the Avamar server. You will get an encrypted password back, for example:

```
d3a6d7959e46d1b40b4e61b9a4eb7045eb3ec08a86f382c0cb1384e15e1b34ecf1be25
10be1795df.
```

The encrypted password can be used on the CLI instead of the regular password. One of the main uses for this encrypted password is to automate backups through a script, without having your administrator password visible in the script as plain text.

## Help

To view command-line help output, use the `--help` option, as shown in the following example command line. The output of this command provides a descriptive list of available operations and options:

```
avmossvss --helpx
```

To view only the options for a specific operation, use the `--helpx` and `--operation=OPERATION` options together.

The following example provides a list of options for the backup command:

```
avmossvss --helpx --operation=backup
```

## Command reference

Use the **avmossvss** command to browse SharePoint data, to perform a backup, or to perform a restore.

### Synopsis

```
avmossvss --operation={browse | backup | restore}
```

### Operations

Supply one of the following operations for **avmossvss** by using the `--operation` flag.

**Table 20** Operations for the **avmossvss** command

Command	Description
browse	Returns a list of data on the client that is available for backup.
backup	Performs an on-demand backup of the specified data.
restore	Restores the specified data.

To check whether an operation was successful echo the error level.

For example, if the echo returns a value of **0**, it indicates success. Any other value indicates a failure.:

```
echo %ERRORLEVEL%
```

## Options

The following topics list the options that are available for the **avmossvss** command.

### Common options

The following common option is available for the **avmossvss** command.

**Table 21** Common **avmossvss** option

Option	Description
--version	Displays the build version of the Avamar for SharePoint VSS plug-in.

### Account options

The following account options are available for the **avmossvss** command.

**Table 22** Account options for the **avmossvss** command

Option	Description
--account= <i>DEST</i>   --path= <i>DEST</i>   --acnt= <i>DEST</i>	Specifies the Avamar server account path.
--id= <i>USER@DOMAIN HOMEACNT</i>	Specifies the client user name for authentication where: <i>USER</i> is the username of the registered client. <i>DOMAIN</i> is the Avamar domain. <i>HOMEACNT</i> is the hostname of the Avamar Plug-in for SharePoint VSS host.
--password= <i>PASSWORD</i>   --ap= <i>PASSWORD</i>   --pswd= <i>PASSWORD</i>	Specifies the password for --id= <i>USER@DOMAIN HOMEACNT</i> .
--server= <i>IPADDR</i>   --hfsaddr= <i>IPADDR</i>	Specifies the Avamar server IP address.

### Logging options

The following logging options are available for the **avmossvss** command.

**Table 23** Logging options for the **avmossvss** command (page 1 of 2)

Option	Description
--informationals	Sets the information level for status messages.
--logfile	Creates log files in the Avamar var directory. On Windows, the directory path is C:\Program Files\avs\var
--logfile= <i>FILE</i>   --log	Specifies the full path and file name of the <b>avmossvss</b> plug-in log file.  <b>Notice:</b> The Activity Monitor in Avamar Administrator displays only <b>avtar</b> logs for backups with the command-line interface. To create a plug-in log for CLI activities, you must specify the <b>--log</b> or <b>--logfile</b> option at the command prompt.
--noinformationals	Disables informational messages.

**Table 23** Logging options for the **avmossvss** command (page 2 of 2)

Option	Description
--nostdout	Disables output to standard output (stdout).
--nowarnings	Disables warning messages.
--quiet	Disables both warnings and status messages.
--verbose   --verbose= <i>N</i>   -v	Enables all status and warning messages. Use --verbose= <i>N</i> to specify a verbosity level, where <i>N</i> is a number from 1–6 with 6 being the highest level of verbosity.

## Browse options

The following browse option is available for the **avmossvss** command.

**Table 24** Browse option for the **avmossvss** command

Option	Description
--farm-username= <i>DOMAIN\USERNAME</i>	Specifies the farm administrator username. When the farm administrator's user name and password are specified, the actual components and names are displayed. If the credentials are not specified, long numerical GUIDs are displayed.
--farm-password= <i>PASSWORD</i>	Specifies the farm administrator password. When the farm administrator's user name and password are specified, the actual components and names are displayed. If the credentials are not specified, long numerical GUIDs are displayed.
--initialbrowse-timeout= <i>SECONDS</i>	Seconds waiting for an initial browse response before the timeout pop-up appears and command execution terminates. The default value is 60.

## Backup options

The following **avmossvss** command options are available for the backup operation.

**Table 25** Backup options for the **avmossvss** command

Option	Description
<code>--expires={DAYS TIMESTAMP}</code>	Specifies the backup expiration date as a number of days from the day of the backup ( <i>NUM-DAYS</i> ) or an absolute timestamp ( <i>TIMESTAMP</i> ). Specify <i>TIMESTAMP</i> by using 24-hour local time zone values conforming to the following syntax: <i>YYYY-MM-DD HH:MM:SS</i> You can specify partial date strings. For example, 2011-02 is equivalent to 2011-02-01 00:00:00.
<code>--path=AVAMAR_DOMAIN_NAME/SHAREPOINT_SERVER_NAME</code>	Specifies the Avamar (MCS) domain name, and the SharePoint WFE name.
<code>--retention-type=TYPE</code>	Specifies one of the following retention types: <ul style="list-style-type: none"> <li>• none</li> <li>• daily</li> <li>• weekly</li> <li>• monthly</li> </ul>
<code>--send-adhoc-request</code>	Notifies the server that a CLI backup will occur. The backup operation will appear in the Avamar activity log. This flag is not required for CLI operations, and the flag is not enabled by default.

## Restore options

The following **avmossvss** command options are available for the restore operation.

**Table 26** Restore options for the **avmossvss** command

Option	Description
<code>--farm-username=DOMAIN\USERNAME</code>	Specifies the farm administrator username.
<code>--farm-password=PASSWORD</code>	Specifies the farm administrator password.
<code>--initialbrowse-timeout=SECONDS</code>	Specifies the number of seconds to wait for a browse response before timing out. The default value is 60 seconds. This can be increased in slow environments to avoid browse timeouts.
<code>--overwrite-existing</code>	Allows overwriting of the existing farm components during restore.
<code>--target=PATH</code>	Specifies the target directory path. Required for directed restores.
<code>--send-adhoc-request</code>	Notifies the server that a CLI restore will occur. The restore operation will appear in the Avamar activity log. This flag is not required for CLI operations, and the flag is not enabled by default.

## CLI examples

You can get a list of available backups and their label numbers using the **avtar --backups** command. For example:

```
avtar --id=MCSUSERNAME --ap=MCSUSERPASSWORD
      --path=/Keith/149ca.dc148.example.com --backups
```

The following topics provide examples of **avmossvss** commands.

### Example browse commands

For browsing, specify the farm name to display the content of the farm. This will display the components and names in the farm as long GUID numbers.

```
avmossvss --operation=browse Farm_name
```

Specify the farm administrator's credentials with the **--farm-username** and **--farm-password** to view the SharePoint components and names, instead of the GUID numbers.

```
avmossvss --operation=browse --farm-username=SHAREPOINT_ADMINISTRATOR
          --farm-password= farm
```

### Example backup commands

For a backup, the MCS user credentials must be supplied by using the **--id**, **--ap**, **--server**, and **--path** options. When backing up distributed farms (not stand-alone), specify the SharePoint farm credentials using the **--farm-username** and **--farm-password** options. The server does not need to be specified when running the command on the Avamar server associated with the client. The ad-hoc functionality is also required for both backup and browse operations.

```
avmossvss --operation=backup --id=MCS_USERNAME
          --ap=MCS_USER_PASSWORD --server=MCS_ADDRESS
          --farm-username=SHAREPOINT_ADMINISTRATOR
          --farm-password=SHAREPOINT_ADMINISTRATOR_PASSWORD
          --path=AVAMAR_DOMAIN_NAME/SHAREPOINT_SERVER_NAME
          --send-adhoc-request
```

You can back up to a DDR server by adding the **--ddr** and **-ddr-index=1** options.

**Note:** The number in the **-ddr-index=1** option represents the number of added DDRs. If there is only one DDR attached to the Avamar server, the index value is always 1.

```
avmossvss --operation=backup --id=MCS_USERNAME --ap=MCS_USER_PASSWORD
          --server=MCS_ADDRESS --farm-username=SHAREPOINT_ADMINISTRATOR
          --farm-password=SHAREPOINT_ADMINISTRATOR_PASSWORD
          --path=AVAMAR_DOMAIN_NAME/SHAREPOINT_SERVER_NAME
          --send-adhoc-request --ddr=true --ddr-index=1
```

## Example restore commands

For restore, the MCS user credentials must be supplied by using the `--id`, `--ap`, `--server`, and `--path` options, and the SharePoint farm user credentials must be supplied by using the `--farm_username` and `--farm-password`, as well as the restore target. The server does not need to be specified when running the command on the Avamar server associated with the client.

```
avmossvss --operation=restore --id=MCS_USERNAME
--ap=<MCS USER PASSWORD> --server=MCS_ADDRESS
--path=FARM_PATH/ACCOUNT
--farm-username=SHAREPOINT_ADMINISTRATOR
--farm-password=SHAREPOINT_ADMINISTRATOR_PASSWORD
--send-adhoc-request --target=PATH
```

You can specify a specific component to restore. In the following example, a specific database, `Sales_EMEA`, is specified.

```
avmossvss --operation=restore Farm/154QC/sql/Sales_EMEA
--id=MCS_USERNAME
--ap=<MCS USER PASSWORD> --server=MCS_ADDRESS
--path=/CorpMoss/149ca.dc148.example.com
--target=C:\Restore
```

### Notes:

- ◆ You do not need to specify the file name extension when you specify the database to restore. For example, `avmossvss --operation=restore Farm/154QC/sql/Sales_EMEA` restores `Sales_EMEA.mdf` and `Sales_EME.ldf`.
- ◆ For an SQL cluster, the instance name must be included in the path: `Farm/MACHINE/INSTANCE/DATABASE`.
- ◆ Path names are case-sensitive. If the case specified does not match, the backup is not located and restore fails.

