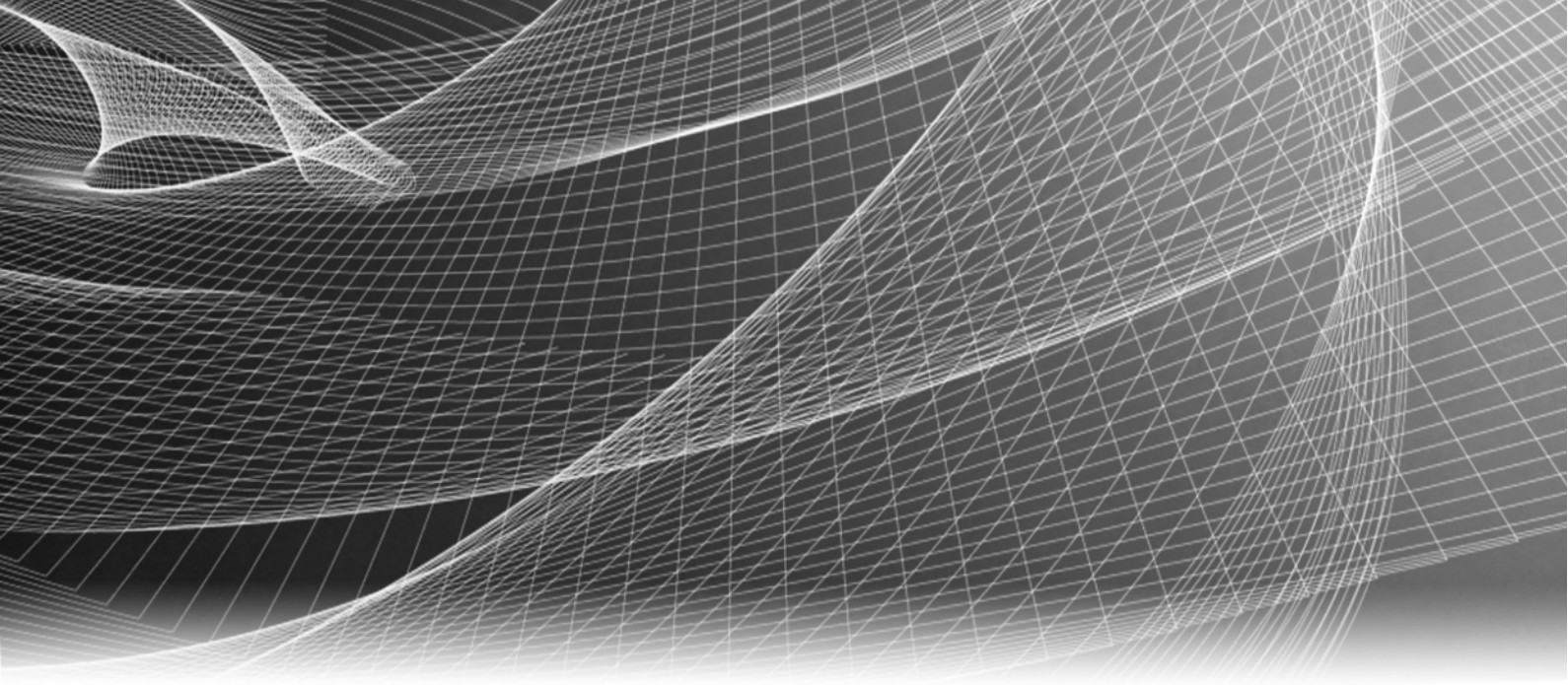

EMC® Avamar® 7.1 Backup Clients

User Guide

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REV 01

EMC²

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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.

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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 and use Avamar client software to back up and restore client data.

Audience

The information in this guide is suitable for both technical and semi-technical audiences. However, persons installing Avamar client software should be familiar with basic application installation procedures and practices on that particular computing platform.

Revision history

The following table presents the revision history of this document.

Table 1 Revision history

Revision	Date	Description
01	June 11, 2014	Initial release of Avamar 7.1

Related documentation

The following EMC publications provide additional information:

- *EMC Avamar Compatibility and Interoperability Matrix*
- *EMC Avamar Release Notes*
- *EMC Avamar Administration Guide*
- *EMC Avamar Operational Best Practices*
- *EMC Avamar Product Security Guide*

Conventions used in this document

EMC uses the following conventions for special notices:

NOTICE

NOTICE is used to address practices not related to personal injury.

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:

Bold	Use for names of interface elements, such as names of windows, dialog boxes, buttons, fields, tab names, key names, and menu paths (what the user specifically selects or clicks)
Italic	Use for full titles of publications referenced in text
`Monospace`	Use for: • System output, such as an error message or script • System code • Pathnames, filenames, prompts, and syntax • Commands and options
`Monospace italic`	Use for variables.
`Monospace bold`	Use for user input.
[ ]	Square brackets enclose optional values
|	Vertical bar indicates alternate selections — the bar means “or”
{ }	Braces enclose content that the user must specify, such as x or y or z
...	Ellipses indicate nonessential information omitted from the example

Where to get help

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

To access the Avamar support page:

1. Go to https://support.EMC.com/products.
2. Type a product name in the **Find a Product** box.
3. Select the product from the list that appears.
4. Click the arrow next to the **Find a Product** box.
5. (Optional) Add the product to the **My Products** list by clicking **Add to my products** in the top right corner of the **Support by Product** page.

Documentation

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

- Release notes provide an overview of new features and known limitations for a release.

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

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 (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:

DPAD.Doc.Feedback@emc.com

Please include the following information:

- Product name and version
- Document name, part number, and revision (for example, 01)
- Page numbers
- Other details that will help us address the documentation issue

CHAPTER 1
Preinstallation

Review the following topics before you install Avamar client software:

- Client compatibility and interoperability 14
- Preinstallation checks 14

Client compatibility and interoperability

Before you install Avamar software on a client system, ensure that the client operating system and hardware configuration is supported.

Updated, detailed client compatibility information is available in the *Avamar Compatibility and Interoperability Matrix* on EMC Online Support at https://support.EMC.com.

Preinstallation checks

Before you install the Avamar software, perform the following:

1. Ensure that you have operating system root privileges on the client computer.
2. Ensure that the Avamar server is operational and present on the same network as the client computer.

   Verify this by opening a command shell on the client computer and typing the following:

   ```
   ping AVAMARSERVER
   ```

   where AVAMARSERVER is the network hostname (as defined in DNS) or IP address of the Avamar server.
3. Make note of the network hostname (as defined in DNS) for:

   - Avamar server
   - Avamar utility node

   These DNS entries should have been added during deployment of the Avamar system.

CHAPTER 2
Avamar Client for AIX

The following topics describe how to install and register the Avamar Client for AIX on a client computer:

- Limitations 16
- Downloading the install package 16
- Customizing the installation 16
- Installing and registering 17
- Uninstalling 19
- Upgrading 21
- Manually stopping and restarting the avagent service 21

Limitations

JFS2 v2 extended attributes not supported

On AIX 6.1, support for JFS2 v2 extended attributes has been added to the operating system. However, the Avamar Client for AIX does not back up or restore these attributes.

Downloading the install package

1. Log in to the computer.
2. In a web browser, type the following URL:

   http://AVAMARSERVER

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

   The server redirects the browser to a secure HTTPS connection.
3. If a security alert dialog box appears due to browser security settings, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The EMC Avamar Web Restore home page appears.
4. From the links at the top of the page, click **Downloads**.

   A list of the software available from the server appears in the browser.
5. Select an operating system heading or software category heading from the list and click **+** next to it.

   When necessary, click **+** next to subheadings until the software package link appears.
6. Click the software package link.

   The server transfers the software package to the web browser.
7. Save the installation package to a temporary folder.

Customizing the installation

You can customize the Avamar Client for AIX installation by changing the base directory, var directory, or both:

- To change the base directory from the default location (/usr/local/avamar) to a new location, use the **-R** option with the **installp** command.
- To change the var directory, set the VARDIR environment variable to a new location before you install the Avamar Client for AIX.

When you install Avamar plug-in software after installing the Avamar Client for AIX to a nondefault directory, the plug-in installation does not automatically relocate the software to the nondefault directory. You must provide provide the relocation directory during the installation.

The installation displays an error message if the relocation directory you specify during a plug-in installation differs from the directory where the Avamar Client for AIX is installed.

Installing and registering

NOTICE

Do not attempt to back up a CIFS/NFS network share by installing an Avamar client on a local machine. Attempting to do so results in a severe degradation in backup and restore performance and metadata such as folders, ACLs, and file permissions are not backed up. To backup a CIFS/NFS share, install an Avamar client on the share machine or use NDMP to back up the data.

1. Open a command shell and log in as root.
2. Uninstall any previous version of Avamar Client for AIX software before you install the new version. "Uninstalling" on page 19 provides instructions.
3. (Optional) Set the VARDIR environment variable to a new location by typing the following command:

   ```
   export VARDIR="NEW-VAR-PATH"
   ```

   where NEW-VAR-PATH is the new var directory.
4. Install the Avamar Client for AIX in the default directory or in an alternate directory:
   - To install the Avamar Client for AIX software in the default directory, type:

     ```
     cd /TMP
     geninstall -d AVAMAR-CLIENT-PACKAGE all
     ```

     where:

     – TMP is the temporary install directory.

     – AVAMAR-CLIENT-PACKAGE is the actual install package file name.

     The following appears in the command shell:

     ```
     +---------------------------------------------------------------+
                     Pre-installation Verification...
     +---------------------------------------------------------------+
     Verifying selections...done
     Verifying requisites...done
     Results...
     SUCCESSES
     ---------
     Filesets listed in this section passed pre-installation
     verification and will be installed.

     Selected Filesets
     -----------------

     AVMRclnt 7.0.0-nnn         # Avamar Client for AIX 7.0.0-nnn...

     << End of Success Section >>

     FILESET STATISTICS
     ------------------
     1 Selected to be installed, of which:
        1 Passed pre-installation verification
     ----
     1 Total to be installed
     Filesystem size changed to 524288
     ```

```
+---------------------------------------------------------------+
                  Installing Software...
+---------------------------------------------------------------+
installp: APPLYING software for:
       AVMRclnt 7.0.0.nnn

. . . . . << Copyright notice for AVMRclnt >> . . . . . .

This software is copyright EMC Corporation, 2001-2013.

Please read and agree to the End User License Agreement which will
be placed in the base directory of the install as a file named
AvamarClient-License.txt.

. . . . . << End of copyright notice for AVMRclnt >>. . . .

Installation complete
You may run /usr/local/avamar/bin/avregister to register and
activate this client with the Administrator server.
avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
avagent Info <5417>: daemonized as process id 17444
avagent.d Info: Client Agent started.
Finished processing all filesets. (Total time: 9 secs).

+---------------------------------------------------------------+
                     Summaries:
+---------------------------------------------------------------+

Installation Summary
--------------------

Name      Level         Part          Event            Result
-----------------------------------------------------------------
AVMRclnt  7.0.0.nnn     USR           APPLY            SUCCESS
```

- To install the Avamar Client for AIX software in an alternate directory, type:

  installp -R /INSTALL-PATH **-d** AVAMAR-CLIENT-PACKAGE **all**

  where:

  – INSTALL-PATH is the directory for the installation files.

  – AVAMAR-CLIENT-PACKAGE is the actual install package file name.

5. Register this client with the Avamar server by typing:

   /usr/local/avamar/bin/avregister

   The following appears in the command shell:

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

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

6. Type the network hostname (as defined in DNS) of the Avamar Administrator server and press **Enter**.

   The following appears in the command shell:

   ```
   Enter the Avamar server domain [clients]:Avamar
   ```

The default domain is “clients.” However, the Avamar system administrator might have defined other domains and subdomains. Consult the Avamar system administrator for the specific domain to use when registering this client.

NOTICE

If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character causes an error and prevents you from registering this client.

7. Press **Enter** to accept the default domain.

   Output similar to the following appears in the command shell:

```
avagent.d Info: Server stopped.
avagent Info <5241>: Logging to ///usr/local/avamar//var/avagent.log
avagent.d Info: Client activated successfully.
avagent.d Info: start
avagent Info <5241>: Logging to ///usr/local/avamar//var/avagent.log
avagent Info <5417>: daemonized as process id 17620
avagent.d Info: Server started.
Registration Complete.
```

Uninstalling

1. Open a command shell and log in as root.
2. List user-specified installation locations (USIL) by typing:

```
lsusil -R ALL
```

   Output similar to the following appears in the command shell:

```
INSTALL PATH = /newpath
COMMENTS = Created by installp on Wed May 23 17:23:40 Asia/Calcutta
2012
```

3. List Avamar packages installed on the system:
   - To list Avamar packages installed in the default location, type:

     lslpp -l | grep Avamar

     The following appears in the command shell:

```
AvamarClient-aix6-ppc   COMMITTED EMC Avamar client VERSION
```

   - To list Avamar packages installed in a specific directory, type:

     lslpp -R /NEW-PATH **-l| grep Avamar**

     where NEW-PATH is a user-specified directory for the installation.

   - To list all Avamar packages installed in nondefault directories, type:

     lslpp -R ALL -l | grep Avamar

     Output similar to the following appears in the command shell:

```
AvamarClient-aix6-ppc   7.0.100.141   COMMITTED     EMC Avamar
client    7.0.100-141
```

4. Uninstall the software:

   - To uninstall the software from the default directory, type:

     installp -u AvamarClient-aix6-ppc

     The following appears in the command shell:

```
+-----------------------------------------------------------+
                    Pre-deinstall Verification...
+-----------------------------------------------------------+
Verifying selections...avagent.d Info: Stopping Avamar Client
Agent (avagent)...
avagent.d Info: Client Agent stopped.
done
Verifying requisites...done
Results...

SUCCESSES
---------
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----------------
AvamarClient-aix6-ppc  7.0.0-nnn # EMC Avamar client 7.0.0-nnn...

 << End of Success Section >>

FILESET STATISTICS
------------------
1 Selected to be deinstalled, of which:
    1 Passed pre-deinstall verification
----
   1 Total to be deinstalled

+-----------------------------------------------------------+
                       Deinstalling Software...
+-----------------------------------------------------------+

installp: DEINSTALLING software for:
   AvamarClient-aix5-ppc VERSION

Finished processing all filesets. (Total time: 2 secs).

+-----------------------------------------------------------+
                           Summaries:
+-----------------------------------------------------------+

Installation Summary
--------------------
Name                    Level         Part   Event     Result
-------------------------------------------------------------
AvamarClient-aix6-ppc   7.0.0-nnn     USR    DEINSTALL SUCCESS
```

   - To uninstall the software from a nondefault directory, type:

     installp -R /NEW-PATH **-u AvamarClient-aix6-ppc**

     The following appears in the command shell:

```
+-----------------------------------------------------------+
                       Pre-deinstall Verification...
+-----------------------------------------------------------+
```

```
Verifying selections...done
Verifying requisites...done
Results...

SUCCESSES
---------
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----------------
AvamarClient-aix6-ppc (R) 7.0.100.138 # EMC Avamar client
7.0.100-13...

   << End of Success Section >>

FILESET STATISTICS
------------------
1  Selected to be deinstalled, of which:
       1  Passed pre-deinstall verification
----
1  Total to be deinstalled

+-----------------------------------------------------------------+
                    Deinstalling Software...
+-----------------------------------------------------------------+

installp:  DEINSTALLING software for:
   AvamarClient-aix6-ppc (R) 7.0.100.138

avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
Finished processing all filesets.  (Total time:  2 secs).

+-----------------------------------------------------------------+
                        Summaries:
+-----------------------------------------------------------------+

Installation Summary
--------------------
Name                    Level         Part   Event     Result
-------------------------------------------------------------------
AvamarClient-aix6-ppc   7.0.100.138   USR    DEINSTALL SUCCESS
```

Upgrading

To upgrade the Avamar Client for AIX software, just install the new version of software. You do not need to uninstall the old version.

Manually stopping and restarting the avagent service

The Avamar Client for AIX agent (**avagent**) runs as a service and starts automatically as part of the installation. The **avagent** service also restarts automatically after a system reboot. In most cases, you do not need to manually stop or restart the **avagent** service. If you experience unexpected system behavior and do not want to reboot the entire system, you can use the following commands to manually stop and restart the **avagent** service.

Manually stopping the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   /etc/rc.d/init.d/avagent stop

Manually restarting the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   /etc/rc.d/init.d/avagent start

Getting avagent status

1. Open a command shell and log in as root.
2. Type the following:

   /etc/rc.d/init.d/avagent status

CHAPTER 3
Avamar Client for FreeBSD

The following topics describe how to install and register the Avamar Client for FreeBSD on a client computer:

- Downloading the install package 24
- Installing and registering 24
- Uninstalling 26
- Upgrading 26
- Manually stopping and restarting the avagent service 27

Downloading the install package

1. Log in to the computer.
2. In a web browser, type the following URL:

   http://AVAMARSERVER

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

   The server redirects the browser to a secure HTTPS connection.
3. If a security alert dialog box appears due to browser security settings, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The EMC Avamar Web Restore home page appears.
4. From the links at the top of the page, click **Downloads**.

   A list of the software available from the server appears in the browser.
5. Select an operating system heading or software category heading from the list and click **+** next to it.

   When necessary, click **+** next to subheadings until the software package link appears.
6. Click the software package link.

   The server transfers the software package to the web browser.
7. Save the installation package to a temporary folder.

Customizing the installation

You can install the Avamar Client for FreeBSD in a directory other than the default (/usr/local/avamar) by using the --prefix option with the **pkg_add** command.

Installing and registering

1. Open a command shell and log in as root.
2. Uninstall any previous version of Avamar Client for FreeBSD software before you install the new version. "Uninstalling" on page 26 provides instructions.
3. Change directory to the temporary install directory. For example:

   cd /tmp

4. Install the Avamar Client for FreeBSD software in the default directory or in an alternate directory:

   - To install the software in the default directory, type:

     pkg_add AvamarClient-freebsd8-x86_64-VERSION**.tbz**

   - To install the software in an alternate, type:

     pkg_add --prefix /NEW-PATH
     AvamarClient-freebsd8-x86_64-VERSION**.tbz**

     where:

     – VERSION is the Avamar software version.

     – NEW-PATH is a user-specified installation directory.

   The following appears in the command shell:

   ```
   Directory to locate cache & log files [/var/avamar]:
   ```

5. Choose the location for the log files:

   - To accept the default location (/var/avamar), press **Enter**.
   - To specify an alternate location, type the full path of the directory and press **Enter**.

   The following appears in the command shell:

   ```
   Installation complete
   You may run /usr/local/avamar/bin/avregister to register and
   activate this client with the Administrator server.
   avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
   avagent Info <5417>: daemonized as process id 26816
   avagent.d Info: Client Agent started.
   ```

6. Register this client with the Avamar server by typing:

   /usr/local/avamar/bin/avregister

   The following appears in the command shell:

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

   Enter the base directory of the Avamar Client installation
   [/usr/local/avamar]:
   ```

7. Press **Enter** to accept the default base installation directory.

   The following appears in the command shell:

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

8. Type the network hostname (as defined in DNS) of the Avamar Administrator server and press **Enter**.

   The following appears in the command shell:

   ```
   Enter the Avamar server domain [clients]:
   ```

   The default domain is "clients." However, the Avamar system administrator might have defined other domains and subdomains. Consult the administrator for the specific domain to use when registering this client.

   NOTICE

   If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character causes an error and prevents you from registering this client.

9. Press **Enter** to accept the default domain (clients).

   The following appears in the command shell:

   ```
   avagent.d Info: Stopping Avamar Client Agent (avagent)...
   avagent.d Info: Client Agent stopped.
   avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
   avagent.d Info: Client activated successfully.
   avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
   avagent Info <5417>: daemonized as process id 26859
   avagent.d Info: Client Agent started.
   Registration Complete.
   ```

Uninstalling

1. Open a command shell and log in as root.
2. Uninstall the Avamar software by typing:

   `pkg_delete AvamarClient`

   The following appears in the command shell:

   ```
   avagent.d Info: Stopping Avamar Client Agent (avagent)...
   avagent.d Info: Client Agent stopped.
   uninstallation successful
   ```

Upgrading

To upgrade the Avamar Client for FreeBSD software, completely uninstall the old software, and install the new software.

Manually stopping and restarting the avagent service

The Avamar Client for FreeBSD agent (**avagent**) runs as a service and starts automatically as part of the installation. The **avagent** service also restarts automatically after a system reboot. In most cases, you do not need to manually stop or restart the **avagent** service. If you experience unexpected system behavior and do not want to reboot the entire system, you can use the following commands to manually stop and restart the **avagent** service.

Manually stopping the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /etc/rc.d/avagent stop
   ```

Manually restarting the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /etc/rc.d/avagent restart
   ```

Getting avagent status

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /etc/rc.d/avagent status
   ```

CHAPTER 4
Avamar Client for HP-UX

The following topics describe how to install and register the Avamar Client for HP-UX on a client computer:

- Downloading the install package 30
- Customizing the installation 30
- Installing and registering 30
- Uninstalling 33
- Upgrading 33
- Manually stopping and restarting the avagent service 34

Downloading the install package

1. Log in to the computer.
2. In a web browser, type the following URL:

   http://AVAMARSERVER

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

   The server redirects the browser to a secure HTTPS connection.
3. If a security alert dialog box appears due to browser security settings, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The EMC Avamar Web Restore home page appears.
4. From the links at the top of the page, click **Downloads**.

   A list of the software available from the server appears in the browser.
5. Select an operating system heading or software category heading from the list and click **+** next to it.

   When necessary, click **+** next to subheadings until the software package link appears.
6. Click the software package link.

   The server transfers the software package to the web browser.
7. Save the installation package to a temporary folder.

Customizing the installation

You can specify a new location for the var directory during the Avamar Client for HP-UX installation by using the **-x ask=true** option with the **swinstall** command. The **-x ask=true** option runs an interactive request script during the installation. The script prompts you to type a new directory location for /var/avamar.

When you install Avamar plug-in software after installing the Avamar Client for HP-UX, the plug-in installation does not automatically use the same location for the var directory that you specified during the Avamar Client for HP-UX installation. You must install the Avamar plug-in software by using the **-x ask=true** option with the **swinstall** command. The documentation for Avamar plug-ins provide more information.

Installing and registering

NOTICE

Do not attempt to back up a CIFS/NFS network share by installing an Avamar client on a local machine. Attempting to do so results in a severe degradation in backup and restore performance and metadata such as folders, ACLs, and file permissions are not backed up. To backup a CIFS/NFS share, install an Avamar client on the share machine or use NDMP to back up the data.

1. Open a command shell and log in as root.

2. Uninstall any previous version of Avamar Client for HP-UX software before you install the new version. "Uninstalling" on page 33 provides instructions.
3. Change directory to the temporary install directory. For example:

   ```
   cd /TMP
   ```

4. Install the Avamar Client for HP-UX in the default directory or in an alternate directory:
   - To install the Avamar Client for HP-UX software in the default directory, type:

     ```
     swinstall -s /TMP/AVAMAR-CLIENT-PACKAGE \*
     ```

     where:

     – TMP is the temporary install directory.

     – AVAMAR-CLIENT-PACKAGE is the file name of the Avamar Client for HP-UX install package.

     The following appears in the command shell:

     ```
     ======= 2013-1-10 16:12:23 PST BEGIN swinstall SESSION
     (non-interactive)

     * Session started for user "root@hp-ux-01".
     * Beginning Selection
     * Target connection succeeded for "hp-ux-01:/".
     * Source:
          AVAMARHPUX.depot
     * Targets:
          hp-ux-01:/
     * Software selections:
          hpuxclnt.hpuxclnt-exec,r=7.0.0-nnn,a=HP-UX_B.11.00_32/64
     * Selection succeeded.
     * Beginning Analysis
     * Session selections have been saved in the file
          "/.sw/sessions/swinstall.last".
     * The analysis phase succeeded for "hp-ux-01:/".
     * Analysis succeeded.
     * Beginning Execution
     * The execution phase succeeded for "hp-ux-01:/".
     * Execution succeeded.

     NOTE: More information may be found in the agent logfile (location
     ishp-ux-01:/var/adm/sw/swagent.log).

     ======= 2013-1-10 16:13:46 PST END swinstall SESSION
     (non-interactive)
     ```

   - To install the Avamar Client for HP-UX software in an alternate directory:

     a. Type:

     ```
     swinstall -x ask=true -s /tmp/AVAMAR-CLIENT-PACKAGE hpuxclnt,
     l=/INSTALL-PATH
     ```

     where AVAMAR-CLIENT-PACKAGE is the file name of the Avamar Client for HP-UX install package and INSTALL-PATH is the installation directory.

     The following appears in the command shell:

     ```
     ======= 02/10/12 14:13:12 MET BEGIN swinstall SESSION
              (non-interactive) (jobid=hp-ux-01-0201)

     * Session started for user "root@hp-ux-01".
     ```

```
* Beginning Selection
* Target connection succeeded for "hp-ux-01:/".
* Software hpuxclnt-exec has a "request" script.
* It will be executed and corresponding "response" file will be
generated.

Directory to locate cache & log files [/var/avamar]:
```

b. Type the name of the directory to use for the installation.

   The following appears in the command shell:

```
Confirm '/INSTALL-PATH/' is the desired location. [n]
```

c. Type **y** to confirm the location.

   The following appears in the command shell:

```
* Ask task succeeded.
* Source:  /tmp/AVAMAR-CLIENT-PACKAGE.depot
* Targets: hp-ux-01
*Software selections:
hpuxclnt.hpuxclnt-exec,l=/INSTALL-PATH,r=7.0.100-nnn,a=HP-UX_
B.11.00_32/64
* Selection succeeded.

* Beginning Analysis and Execution
* Session selections have been saved in the file
  "/.sw/sessions/swinstall.last".
* The analysis phase succeeded for "hp-ux-01:/".
* The executions phase succeedded for "hp-ux-01:/".
* Analysis and Execution succedded.

NOTE: More information may be found in the agent logfile using
the command "swjob -a log hp-ux-01-0201 @ hp-ux-01:/".

======= 02/10/12 14:14:17 MET END swinstall SESSION
(non-interactive) (jobid=hp-ux-01-0201)
```

5. Register this client with the Avamar server by typing:

   /opt/AVMRclnt/bin/avregister

   The following appears in the command shell:

```
=== Client Registration and Activation
This script will register and activate the client with the
Administrator server.
Enter the Administrator server address (DNS text name or numeric IP
address, DNS name preferred):
```

6. Type the network hostname (as defined in DNS) of the Avamar Administrator server and press **Enter**.

   The following appears in the command shell:

```
Enter the Avamar server domain [clients]:
```

   The default domain is "clients." However, the Avamar system administrator might have defined other domains and subdomains. Consult the Avamar system administrator for the specific domain to use when registering this client.

NOTICE

If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character causes an error and prevents you from registering this client.

7. Press **Enter** to accept the default domain (clients).

   The following appears in the command shell:

```
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
avagent Info <5008>: [avagent] Logging to
 /opt/javamar/var/avagent.log
avagent.d Info: Client activated successfully.
avagent Info <5008>: [avagent] Logging to
 /opt/javamar/var/avagent.log
avagent Info <5417>: [avagent] daemonized as process id 20568
avagent.d Info: Client Agent started.
Registration Complete.
```

Uninstalling

1. Open a command shell and log in as root.
2. Uninstall the Avamar software by typing:

   swremove hpuxclnt

   The following appears in the command shell:

```
======= 2013-1-10 16:09:29 PST BEGIN swremove SESSION
(non-interactive)

   * Session started for user "root@hp-ux-01".
   * Beginning Selection
   * Target connection succeeded for "hp-ux-01:/".
   * Software selections:
         hpuxclnt.hpuxclnt-exec,l=/opt/AVMRclnt,r=7.0.0-nnn,
         a=HP-UX_B.11.00_32/64
   * Selection succeeded.
   * Beginning Analysis
   * Session selections have been saved in the file
         "/.sw/sessions/swremove.last".
   * The analysis phase succeeded for "hp-ux-01:/".
   * Analysis succeeded.
   * Beginning Execution
   * The execution phase succeeded for "hp-ux-01:/".
   * Execution succeeded.
NOTE: More information may be found in the agent logfile (location
is hp-ux-01:/var/adm/sw/swagent.log).

======= 2013-1-106 16:09:45 PST END swremove SESSION
(non-interactive)
```

Upgrading

To upgrade the Avamar Client for HP-UX software, completely uninstall the old software, and install the new software.

Manually stopping and restarting the avagent service

The Avamar Client for HP-UX agent (**avagent**) runs as a service and starts automatically as part of the installation. The **avagent** service also restarts automatically after a system reboot. In most cases, you do not need to manually stop or restart the **avagent** service. If you experience unexpected system behavior and do not want to reboot the entire system, you can use the following commands to manually stop and restart the **avagent** service.

Manually stopping the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /sbin/init.d/avagent stop
   ```

Manually restarting the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /sbin/init.d/avagent restart
   ```

Getting avagent status

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /sbin/init.d/avagent status
   ```

CHAPTER 5
Avamar Client for Linux

The following topics describe how to install and register the Avamar Client for Linux on a client computer:

- Downloading the install package 36
- Customizing the installation 36
- Installing CentOS 32-bit compatibility libraries 37
- Installing SUSE Linux Enterprise Server (SLES) 11 compatibility libraries 37
- Installing and registering 38
- Uninstalling 40
- Upgrading 41
- Manually stopping and restarting the avagent service 41

Downloading the install package

1. Log in to the computer.
2. In a web browser, type the following URL:

   http://AVAMARSERVER

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

   The server redirects the browser to a secure HTTPS connection.
3. If a security alert dialog box appears due to browser security settings, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The EMC Avamar Web Restore home page appears.
4. From the links at the top of the page, click **Downloads**.

   A list of the software available from the server appears in the browser.
5. Select an operating system heading or software category heading from the list and click **+** next to it.

   When necessary, click **+** next to subheadings until the software package link appears.
6. Click the software package link.

   The server transfers the software package to the web browser.
7. Save the installation package to a temporary folder.

Customizing the installation

You can customize the Avamar Client for Linux installation by changing the base directory, the var directory, or both:

- To change the base installation directory, use the **rpm --relocate** option during installation to define an alternate location. For example:

  rpm -ivh --relocate /usr/local/avamar=NEW-BASE-PATH AVAMAR-LINUX.RPM

  where:

  - NEW-BASE-PATH is the new (nondefault) installation directory.
  - AVAMAR-LINUX.RPM is the file name of the Avamar Client for Linux install package.
- To change the base installation directory and var directory, use the **rpm --relocate** option during installation to define alternate locations. For example:

  rpm -ivh --relocate /usr/local/avamar=NEW-BASE-PATH **--relocate /var/avamar**=/NEW-VAR-PATH AVAMAR-LINUX.RPM

  where:

  - /usr/local/avamar is the default installation directory.
  - NEW-BASE-PATH is the new (nondefault) installation directory.
  - /var/avamar is the default var directory.

- NEW-VAR-PATH is the new var directory.
- AVAMAR-LINUX.RPM is the file name of the Avamar Client for Linux install package.

You can only install the Avamar Client for Linux in the default directory on Debian and Ubuntu.

NOTICE

The rpm --relocate feature requires Red Hat Package Manager version 4.0.3 or later.

Installing CentOS 32-bit compatibility libraries

If installing Avamar Client for Linux on a 32-bit version of CentOS, you must install the compat-libstdc++-33 libraries by performing the following:

1. Open a command shell and log in as root.
2. Obtain a copy of the compat-libstdc++-33 libraries for your system.
3. Type the following command to install the system's compat-libstdc++ package:

   ```
   rpm -ivh compat-libstdc++-33-3.2.3-61.i386.rpm
   ```

4. Follow the on-screen prompts to complete the installation.

Installing SUSE Linux Enterprise Server (SLES) 11 compatibility libraries

If installing Avamar Client for Linux on a 64- or 32-bit version of SUSE Linux Enterprise Server (SLES) 11, you must install libxml2 and libxml2-python compatibility libraries.

For 64-bit versions, perform the following:

1. Open a command shell and log in as root.
2. Obtain a copy of the libxml2-2.7.6-0.1.37.x86_64.rpm and libxml2-python-2.7.6-0.1.36.x86_64.rpm for your system.
3. Type the following command on a single command line:

   ```
   rpm -Uvh libxml2-2.7.6-0.1.37.x86_64.rpm
   libxml2-python-2.7.6-0.1.36.x86_64.rpm
   ```

4. Follow the on-screen prompts to complete the installation.

For 32-bit versions, perform the following:

1. Open a command shell and log in as root.
2. Obtain a copy of the libxml2-2.7.6-0.1.37.i586.rpm and libxml2-python-2.7.6-0.1.36.i586.rpm libraries for your system.
3. Type the following command on a single command line:

   ```
   rpm -Uvh libxml2-2.7.6-0.1.37.i586.rpm
   libxml2-python-2.7.6-0.1.36.i586.rpm
   ```

4. Follow the on-screen prompts to complete the installation.

Installing and registering

NOTICE

Do not attempt to back up a CIFS/NFS network share by installing an Avamar client on a local machine. Attempting to do so results in a severe degradation in backup and restore performance and metadata such as folders, ACLs, and file permissions are not backed up. To backup a CIFS/NFS share, install an Avamar client on the share machine or use NDMP to back up the data.

1. Open a command shell and log in as root.
2. Uninstall any previous version of Avamar Client for Linux software before you install the new version. "Uninstalling" on page 40 provides instructions.
3. (Optional) To change the var directory location, set the AVAMAR_INSTALL_VARDIR_PATH variable to a new location.
4. Change directory to the temporary install directory. For example:

   ```
   cd /TMP
   ```

   where TMP is the temporary install directory.
5. Install the Avamar Client for Linux software:
   - To install the software in the default directory on Red Hat, SUSE, or CentOS, type:

     ```
     rpm -ih AVAMAR-LINUX.RPM
     ```

     where AVAMAR-LINUX.RPM is the file name of the Avamar Client for Linux install package.
   - To install the software on Debian or Ubuntu, type:

     ```
     dpkg -i AVAMAR-LINUX.DEB
     ```

     where AVAMAR-LINUX.DEB is the file name of the Avamar Client for Linux install package.

     The following appears in the command shell:

     ```
     ########################################### [100%]
     ########################################### [100%]
     Installation complete
     You may run /usr/local/avamar/bin/avregister to register and
     activate this client with the Administrator server.
     avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
     avagent Info <5417>: daemonized as process id 2066
     avagent.d Info: Client Agent started.
     ```
   - To change the base directory on Red Hat, SUSE, or CentOS during the installation, type:

     ```
     rpm --relocate /usr/local/avamar=/NEW-PATH -i AVAMAR-LINUX.RPM
     ```

     where NEW-PATH is the new directory and AVAMAR-LINUX.RPM is the file name of the Avamar Client for Linux install package.

     The following appears in the command shell:

     ```
     Installation complete
     ```

```
You may run /tmp/avs/bin/avregister to register and activate this
client with the Administrator server.
To detect potential connectivity and firewall issues, you can run
/tmp/avs/bin/detect_firewall, passing the DNS name or IP address
of the Avamar server you wish to connect to as an argument.
avagent Info <5241>: Logging to /tmp/avs/var/avagent.log
avagent Info <5417>: daemonized as process id 5938
avagent.d Info: Client Agent started
```

- To change the base directory and var directory locations on Red Hat, SUSE, or CentOS during the installation, type:

  rpm -ivh --relocate /usr/local/avamar=NEW-BASE-PATH **--relocate /var/avamar=**NEW-VAR-PATH AVAMAR-LINUX.RPM

  where:

  - NEW-BASE-PATH is the new installation directory.
  - NEW-VAR-PATH is the new var directory.
  - AVAMAR-LINUX.RPM is the file name of the Avamar Client for Linux install package.

6. Register and activate this client with the Avamar server by running **avregister**:

   - For software installed in the default directory, type:

     /usr/local/avamar/bin/avregister

   - For software installed in a nondefault location, type:

     /NEW-PATH**/bin/avregister**

     where NEW-PATH is the directory you specified step 5 on page 38.

     The following appears in the command shell:

     ```
     === Client Registration and Activation
     This script will register and activate the client with the
     Administrator server.
     Enter the Administrator server address (DNS text name or numeric
     IP address, DNS name preferred):
     ```

7. Type the network hostname (as defined in DNS) of the Avamar Administrator server and press **Enter**.

   The following appears in the command shell:

   ```
   Enter the Avamar server domain [clients]:
   ```

   The default domain is “clients.” However, the Avamar system administrator might have defined other domains and subdomains. Consult the Avamar system administrator for the specific domain to use when registering this client.

   NOTICE

   If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character causes an error and prevents you from registering this client.

8. Press **Enter** to accept the default domain (clients).

   The following appears in the command shell:

```
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.                       [ OK ]
avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
avagent.d Info: Client activated successfully.              [ OK ]
avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
avagent Info <5417>: daemonized as process id 3385
avagent.d Info: Client Agent started.                       [ OK ]
Registration Complete.
```

Uninstalling

1. Open a command shell and log in as root.
2. List the Avamar packages installed on the system:
   - On Red Hat, SUSE, or CentOS, type:

     rpm -qa | grep Av

   - On Debian or Ubuntu, type:

     dpkg --list | grep Av

   The following appears in the command shell:

   ```
   AvamarClient-VERSION
   ```

3. Note the full package name.
4. Uninstall the software:
   - On Red Hat, SUSE, or CentOS, type:

     rpm -e AvamarClient-VERSION

   - On Debian or Ubuntu, type:

     dpkg -P AvamarClient-VERSION

   where AvamarClient-VERSION is the Avamar software install package returned in step 3.

   The following appears in the command shell:

   ```
   avagent.d Info: Stopping Avamar Client Agent (avagent)...
   avagent.d Info: Client Agent stopped.
   ```

Upgrading

NOTICE

If upgrading a SLES 9 system, ensure that Service Pack 1 is installed. Otherwise, a known issue with RPM Manager 4.1.1 might cause the upgrade to fail.

You can upgrade the Avamar Client for Linux software from 7.1 to a later release by using the **rpm -Uvh** command. You can use the **--relocate** option to specify the alternate installation or var directory that you specified when you installed the initial build of release 7.1.

1. Open a command shell and log in as root.
2. Upgrade the Avamar Client for Linux software:
   - To upgrade the software in the default directory, type:

     ```
     rpm -Uvh AVAMAR-LINUX.RPM
     ```

     where AVAMAR-LINUX.RPM is the file name of the Avamar Client for Linux install package.
   - To upgrade the software in a nondefault installation directory, type:

     ```
     rpm -Uvh --relocate /usr/local/avamar=NEW-BASE-PATH
     AVAMAR-LINUX.RPM
     ```

     where:
     - NEW-BASE-PATH is the installation directory that you specified when you installed release 7.1.
     - AVAMAR-LINUX.RPM is the file name of the Avamar Client for Linux install package.
   - To upgrade the software and use a nondefault var directory, type:

     ```
     rpm -Uvh --relocate /var/avamar=NEW-VAR-PATH AVAMAR-LINUX.RPM
     ```

     where:
     - NEW-VAR-PATH is the var directory that you specified when you installed release 7.1.
     - AVAMAR-LINUX.RPM is the file name of the Avamar Client for Linux install package.

   The **rpm -Uh** command automatically uninstalls the earlier version of the Avamar Client for Linux software, and then installs the new version.

Manually stopping and restarting the avagent service

The Avamar Client for Linux agent (**avagent**) runs as a service and starts automatically as part of the installation procedure. The **avagent** service also restarts automatically after a system reboot. In most cases, you do not need to manually stop or restart the **avagent** service. Ifyou experience unexpected system behavior and do not want to reboot the entire system, you can use the following commands to manually stop and restart the **avagent** service.

Manually stopping the avagent service

1. Open a command shell and log in as root.
2. Manually stop the **avagent** service by typing one of the commands in the following table.

Table 2 Linux operating system commands to stop the avagent service

Operating system and version	Command
Any version of Red Hat Linux, CentOS, or SUSE Linux Enterprise Server 10 and 11	`service avagent stop`
SUSE Linux Enterprise Server 9 or 8.2	`/etc/rc.d/avagent stop`
Debian or Ubuntu	`/etc/init.d/avagent stop`

Manually restarting the avagent service

1. Open a command shell and log in as root.
2. Manually restart the **avagent** service by typing one of the commands in the following table.

Table 3 Linux operating system commands to restart the avagent service

Operating system and version	Command
Any version of Red Hat Linux, CentOS, or SUSE Linux Enterprise Server 10 and 11	`service avagent restart`
SUSE Linux Enterprise Server 9 or 8.2	`/etc/rc.d/avagent restart`
Debian or Ubuntu	`/etc/init.d/avagent restart`

Getting avagent status

1. Open a command shell and log in as root.
2. Get status for the **avagent** service by typing one of the commands in the following table.

Table 4 Linux operating system commands to get avagent status

Operating system and version	Command
Any version of Red Hat Linux, CentOS, or SUSE Linux Enterprise Server 10 and 11	`service avagent status`
SUSE Linux Enterprise Server 9 or 8.2	`/etc/rc.d/avagent status`
Debian or Ubuntu	`/etc/init.d/avagent status`

CHAPTER 6
Avamar Client for Mac OS X

The following topics describe how to install and register the Avamar Client for Mac OS X on a client computer:

- Downloading the install package 44
- Installing 44
- Changing process data size 46
- Registering 47
- Uninstalling 48
- Upgrading 48

Downloading the install package

1. Log in to the computer.
2. In a web browser, type the following URL:

   http://AVAMARSERVER

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

   The server redirects the browser to a secure HTTPS connection.
3. If a security alert dialog box appears due to browser security settings, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The EMC Avamar Web Restore home page appears.
4. From the links at the top of the page, click **Downloads**.

   A list of the software available from the server appears in the browser.
5. Select an operating system heading or software category heading from the list and click **+** next to it.

   When necessary, click **+** next to subheadings until the software package link appears.
6. Click the software package link.

   The server transfers the software package to the web browser and the browser saves the package in the Downloads folder.

Installing

1. In the Downloads folder, double-click the software package.

   The installation wizard starts and the Welcome screen appears.
2. Click **Continue**.

   The Software License Agreement appears.
3. Read the Software License Agreement and click **Continue**.

   The Disagree/Agree dialog box appears.
4. Select **Agree**.

   The Select a Destination screen appears.
5. Select the installation destination and click **Continue**.

   The Standard Install screen appears.
6. Click **Install**.

   The administrator's authentication dialog box appears.

7. Type the name and password for a user account with administrator privileges on the computer and click **OK**.

   The software is installed.

   Depending on the firewall settings on the computer, a warning dialog box might appear:

   - If the following warning message appears, go to step 8:

     ```
     Do you want the application "avagent.bin" to accept incoming
     network connections?
     ```

   - If a successful install message appears, go to step 9.

8. On the warning dialog, click **Allow**.

   The administrator's authentication dialog box appears.

9. Type the name and password for a user account with administrator privileges on the computer and click **OK**.

   The successful install screen appears.

10. Click **Close**.

On some computers, a restart may be required. "Changing process data size" on page 46 provides more information.

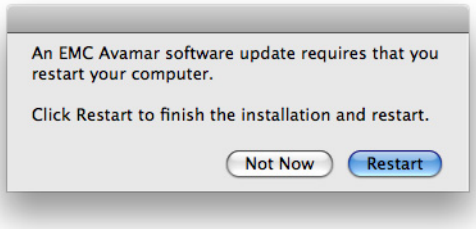
The software is installed, and is ready for registration and activation. "Registering" on page 47 provides instructions.

Changing process data size

After the installation of Avamar for Mac OS X Client, some computers might require a restart. This is caused by a change to the process data size setting that is made on those computers.

During the installation, the installer determines whether the process data size is set to less than 96 MB. Optimal performance of Avamar for Mac OS X Client requires a minimum of 96 MB.

On computers where the process data size is less than 96 MB, the installer changes it to 96 MB and displays a restart reminder.



When this prompt appears, do one of the following:

- To restart the computer and complete the change, click **Restart**.
- To hide the prompt and restart later, click **Not Now**. You are prompted again in two hours.

NOTICE

If you click **Restart** and the restart process is stopped for any reason, the prompt does not appear again. The process data size is changed the next time that the computer restarts.

Registering

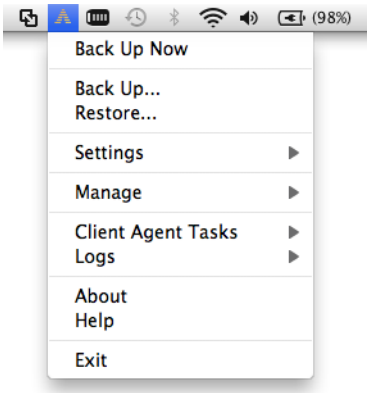
Before you can back up or restore any files on the client computer, you must register and activate the Avamar for Mac OS X Client software with the Avamar server.

NOTICE

Do not register the Avamar for Mac OS X Client software unless instructed to do so by a system administrator. The system administrator often registers and activates the client from the Avamar server.

To register the client from the client computer:

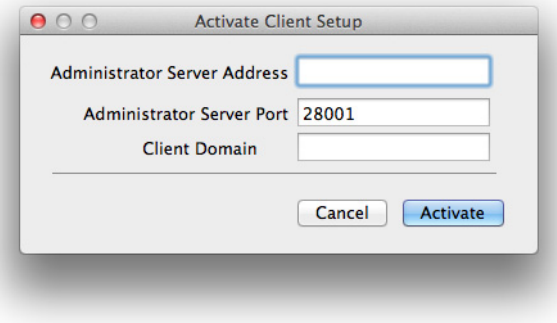
1. On the menu bar, click the Avamar icon.



   A menu appears.

2. Select **Manage** › **Activate Client**.

   The Activate Client Setup dialog box appears.



3. In **Administrator Server Address**, type the hostname of the Avamar server as defined in DNS, or its IP address.
4. In **Administrator Server Port**, type 28001.
5. In **Client Domain**, type the Avamar domain for this client.

NOTICE

The default domain is “clients.” However, the Avamar system administrator might have defined other domains and subdomains. Consult the Avamar system administrator for the domain to use when registering this client.

If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. A slash as the first character causes an error and prevents you from registering this client. Also, do not use a backslash (\) in this field.

6. Click **Activate**.

   The Activate Client Setup dialog box closes, and the registration and activation process starts. Avamar client adds a green checkmark to its menu bar icon when activation is successfully completed.

Uninstalling

To uninstall the Avamar for Mac OS X Client software:

1. Open a Terminal (shell) session.
2. Log in as an administrator.

   The uninstall command requires root (superuser) permissions. Sudo is used to run the command with root permissions. An administrator account or another account listed in the sudoers file is required by sudo.
3. Run the uninstall script by typing:

   ```
   sudo /usr/local/avamar/bin/avuninstall.sh
   ```

Upgrading

To upgrade the Avamar for Mac OS X Client software, run the installer for the upgrade version by using the same steps described in “Installing” on page 44.

NOTICE

Depending on the specific version of Mac OS X, the **Install** button mentioned in those steps might instead say "Upgrade".

The installer removes the older version before installing the upgrade version.

CHAPTER 7
Avamar Client for SCO

This following topics describe how to install and register the Avamar Client for SCO on a client computer.

- Downloading the install package 50
- Installing and registering 50
- Additional SCO 5.0.5 and 5.0.6 configuration and setup 53
- Uninstalling 58
- Upgrading 59
- Manually stopping and restarting the avagent service 59

Downloading the install package

1. Log in to the computer.
2. In a web browser, type the following URL:

   http://AVAMARSERVER

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

   The server redirects the browser to a secure HTTPS connection.
3. If a security alert dialog box appears due to browser security settings, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The EMC Avamar Web Restore home page appears.
4. From the links at the top of the page, click **Downloads**.

   A list of the software available from the server appears in the browser.
5. Select an operating system heading or software category heading from the list and click **+** next to it.

   When necessary, click **+** next to subheadings until the software package link appears.
6. Select the correct software package.

Table 5 Avamar client software packages for the SCO operating system

Operating system	Software package
SCO OpenServer	AvamarClient-sco5.0.7-i386-VERSION.pkg
UnixWare	AvamarClient-unixware7.1.1-i386-VERSION.pkg

   where VERSION is the version of the Avamar Client for SCO software.
7. Click the software package link.

   The server transfers the software package to the web browser.
8. Save the installation package to a temporary folder.

Installing and registering

This procedure demonstrates how to install Avamar Client for SCO software on SCO OpenServer. The procedure is substantially the same to install Avamar Client for SCO software on UnixWare. However, the install package name, files installed, and so forth are slightly different.

1. Open a command shell and log in as root.
2. Uninstall any previous version of Avamar Client for AIX software before you install the new version. "Uninstalling" on page 58 provides instructions.

3. Install Avamar Client for SCO software by typing:

   ```
   cd /TMP
   pkgadd -d - < AvamarClient-sco5.0.7-i386-VERSION.pkg
   ```

   where /TMP is the temporary install directory and AvamarClient-sco5.0.7-i386-VERSION.pkg is the Avamar Client for SCO install package.

   The following appears in the command shell:

   ```
   The following packages are available:

      1  Avamar    AvamarClient
                   (i386) 7.0.0-nnn

   Select package(s) you wish to process (or 'all' to process
   all packages). (default: all) [?,??,quit]:

   PROCESSING:
   Package: AvamarClient (Avamar) from <->.

   AvamarClient
   (i386) 7.0.0-nnn
   Using </usr/local> as the package base directory.
   ## Processing package information.
   ## Processing system information.
   ## Verifying disk space requirements.

   Installing AvamarClient as <Avamar>

   ## Executing preinstall script.
   Directory to locate cache & log files [/var/avamar]:
   Confirm '/var/avamar' is the desired location. [n]
   ```

4. Type **y** and press **Enter**.

   The following appears in the command shell:

   ```
   ## Installing part 1 of 1.
   /usr/local/avamar/bin/avagent.bin
   /usr/local/avamar/bin/avregister
   /usr/local/avamar/bin/avtar
   /usr/local/avamar/bin/avtar.bin
   /usr/local/avamar/bin/unix.pin
   /usr/local/avamar/etc/avagent.d
   /usr/local/avamar/lib/libpthread.so.20
   [ verifying class <none> ]
   ## Executing postinstall script.
   Installation complete
   You may run /usr/local/avamar/bin/avregister to register and
   activate this client with the Administrator server.
   avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
   avagent Info <5417>: daemonized as process id 4318
   avagent.d Info: Client Agent started.

   Installation of AvamarClient (Avamar) was successful.
   ```

5. Register this client with the Avamar server by typing:

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

   The following appears in the command shell:

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

   Enter the base directory of the Avamar Client installation
   [/usr/local/avamar]:
   ```

6. Press **Enter** to accept the default base installation directory.

   The following appears in the command shell:

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

7. Type the network hostname (as defined in DNS) of the Avamar Administrator server and press **Enter**.

   The following appears in the command shell:

   ```
   Enter the Avamar server domain [clients]:
   ```

   The default domain is "clients." However, the Avamar system administrator might have defined other domains and subdomains. Consult the Avamar system administrator for the specific domain to use when registering this client.

   NOTICE

   If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character causes an error and prevents you from registering this client.

8. Press **Enter** to accept the default domain (clients).

   The following appears in the command shell:

   ```
   avagent.d Info: Stopping Avamar Client Agent (avagent)...
   avagent.d Info: Agent not yet terminated (15 seconds), please wait.
   avagent.d Info: Agent not yet terminated (30 seconds), please wait.
   avagent.d Info: Agent not yet terminated (45 seconds), please wait.
   avagent.d Info: Client Agent stopped.
   avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
   avagent.d Info: Client activated successfully.
   avagent Info <5241>: Logging to /usr/local/avamar/var/avagent.log
   avagent Info <5417>: daemonized as process id 4878
   avagent.d Info: Client Agent started.
   Registration Complete.
   ```

Additional SCO 5.0.5 and 5.0.6 configuration and setup

If you install Avamar Client for SCO software on SCO 5.0.5 and you require network socket encryption during backup and restore operations, you must install the following packages:

- OS Supplement (oss646c)
- GWX libs (gwxlibs-2.1.0Ba)
- OpenSSH (openssh-4.2p1)

1. Open a command shell and log in as root.
2. Create temporary directories that will be used to download and extract the SCO packages by typing:

   ```
   cd /tmp
   mkdir supplement gwx openssh
   ls -l
   ```

3. Log in to the SCO FTP server:

   a. Type:

      ```
      ftp ftp.sco.com
      ```

      The following appears in the command shell:

      ```
      Connected to ftp.sco.com.
      220 ftp.sco.com ready.
      Name (ftp.sco.com:root):
      ```

   b. Type **anonymous** and press **Enter**.

      The following appears in the command shell:

      ```
      Password:
      ```

   c. Type an email address and press **Enter**.

      The following appears in the command shell:

      ```
      230-         Welcome to SCO's FTP site!

      This site hosts UNIX software patches, device drivers and
      supplements from SCO.

      To access Skunkware and Supplemental Open Source Packages, please
      connect to ftp2.caldera.com.

      Our FTP site currently only allows Passive (PASV) FTP connections.
      If you are experiencing problems accessing the site please verify
      that passive mode is enabled in your FTP client.

      230 Anonymous access granted, restrictions apply.
      Remote system type is UNIX.
      Using binary mode to transfer files.
      ```

4. Download the OS Supplement (oss646c) package:

   a. Change local directory to /tmp/supplement by typing:

      lcd /tmp/supplement

      The following appears in the command shell:

      ```
      Local directory now /tmp/supplement
      ```

   b. Change FTP working directory to /pub/openserver5/oss646c by typing:

      cd /pub/openserver5/oss646c

      The following appears in the command shell:

      ```
      250 CWD command successful.
      ```

   c. Initiate the download by typing:

      mget *

      The following appears in the command shell:

      ```
      mget VOL.000.000? y
      ```

   d. Type **y** and press **Enter**.

      The following appears in the command shell:

      ```
      200 PORT command successful.
      150 File status okay; about to open data connection.
      226 Transfer complete, closing data connection.
      1536 bytes received in 4.2 seconds (0.36 Kbytes/s)
      mget VOL.000.001? y
      ```

   e. Type **y** and press **Enter**.

      The following appears in the command shell:

      ```
      200 PORT command successful.
      150 File status okay; about to open data connection.
      226 Transfer complete, closing data connection.
      82432 bytes received in 0.69 seconds (116.67 Kbytes/s)
      mget VOL.000.002? y
      ```

   f. Type **y** and press **Enter**.

      The following appears in the command shell:

      ```
      200 PORT command successful.
      150 File status okay; about to open data connection.
      226 Transfer complete, closing data connection.
      33280 bytes received in 0.47 seconds (69.15 Kbytes/s)
      mget VOL.000.003? y
      ```

   g. Type **y** and press **Enter**.

      The following appears in the command shell:

      ```
      200 PORT command successful.
      150 File status okay; about to open data connection.
      226 Transfer complete, closing data connection.
      2175488 bytes received in 8.5 seconds (250.53 Kbytes/s)
      mget VOL.000.004? y
      ```

h. Type **y** and press **Enter**.

The following appears in the command shell:

```
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
488448 bytes received in 2.2 seconds (217.81 Kbytes/s)
mget VOL.000.005? y
```

i. Type **y** and press **Enter**.

The following appears in the command shell:

```
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
512 bytes received in 0.09 seconds (5.56 Kbytes/s)
mget VOL.000.006? y
```

j. Type **y** and press **Enter**.

The following appears in the command shell:

```
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
2802688 bytes received in 11 seconds (253.66 Kbytes/s)
mget VOL.000.007? y
```

k. Type **y** and press **Enter**.

The following appears in the command shell:

```
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
16384 bytes received in 0.37 seconds (43.24 Kbytes/s)
mget VOL.000.008? y
```

l. Type **y** and press **Enter**.

The following appears in the command shell:

```
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
1320448 bytes received in 6 seconds (216.36 Kbytes/s)
mget VOL.000.009? y
```

m. Type **y** and press **Enter**.

The following appears in the command shell:

```
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
7168 bytes received in 0.28 seconds (25.00 Kbytes/s)
mget VOL.000.010? y
```

n. Type **y** and press **Enter**.

The following appears in the command shell:

```
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
356864 bytes received in 1.8 seconds (194.69 Kbytes/s)
mget oss646c.txt? y
```

o. Type **y** and press **Enter**.

The following appears in the command shell:

```
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
3579 bytes received in 0.16 seconds (21.84 Kbytes/s)
```

5. Download the GWX libs (gwxlibs-2.1.0Ba) package:

a. Change local directory to /tmp/gwx by typing:

```
lcd /tmp/gwx
```

The following appears in the command shell:

```
Local directory now lcd /tmp/gwx
```

b. Change FTP working directory to /pub/openserver5/opensrc/gwxlibs-2.1.0Ba by typing:

```
cd /pub/openserver5/opensrc/gwxlibs-2.1.0Ba
```

The following appears in the command shell:

```
250 CWD command successful.
```

c. Initiate the download by typing:

```
get gwxlibs210Ba_vol.tar
```

The following appears in the command shell:

```
local: gwxlibs210Ba_vol.tar remote: gwxlibs210Ba_vol.tar
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
96600576 bytes received in 3.8e+02 seconds (247.74 Kbytes/s)
```

6. Download the OpenSSH (openssh-4.2p1) package:

a. Change local directory to lcd /tmp/openssh by typing:

```
lcd /tmp/openssh
```

The following appears in the command shell:

```
Local directory now lcd /tmp/openssh
```

b. Change FTP working directory to /pub/openserver5/opensrc/openssh-4.2p1 by typing:

cd /pub/openserver5/opensrc/openssh-4.2p1

The following appears in the command shell:

```
250 CWD command successful.
```

c. Initiate the download by typing:

get openssh42p1_vol.tar

The following appears in the command shell:

```
local: openssh42p1_vol.tar remote: openssh42p1_vol.tar
200 PORT command successful.
150 File status okay; about to open data connection.
226 Transfer complete, closing data connection.
692736 bytes received in 3.9 seconds (174.81 Kbytes/s)
```

7. Exit the SCO FTP server by typing:

quit

The following appears in the command shell:

```
221 Service closing control connection.
```

8. Use the SCO Software Manager program to install the packages in the following order:
   - OS Supplement
   - GWX libs
   - OpenSSH

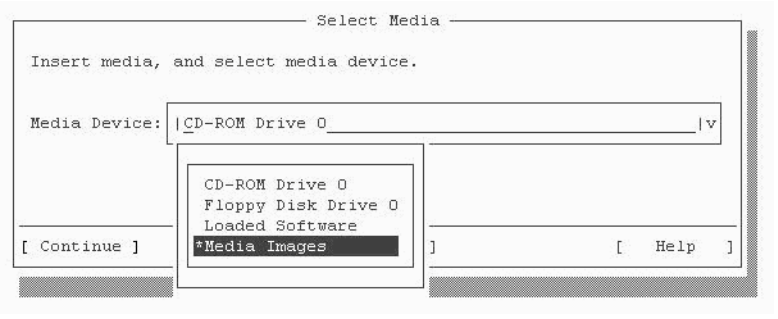
a. Type:

scoadmin software

The SCO Software Manager program appears.

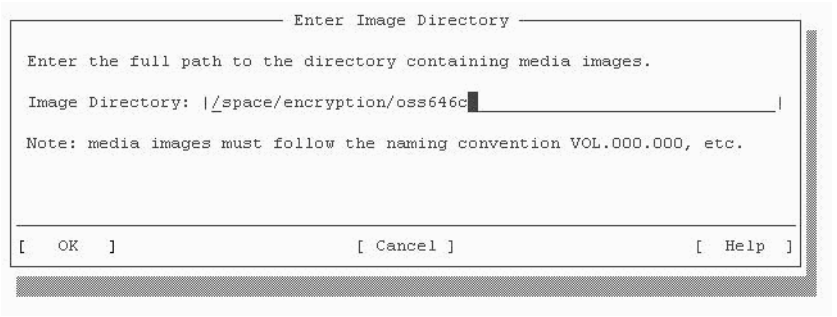
b. Select **Software › Install New**.

c. Select **media images** from the **Media device** menu.

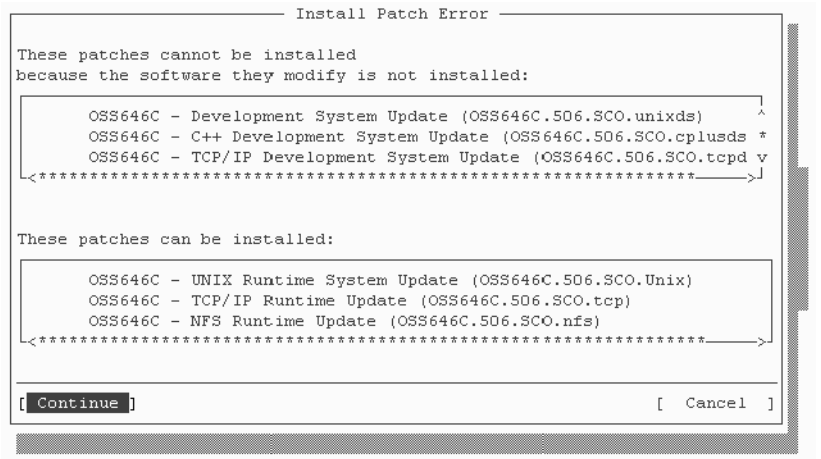


d. Type the full path of the directory that contains the OS Supplement (oss646c) package.

e. Select the OS Supplement (oss646c) package for installation.



f. Select **Continue**.



g. Repeat steps b–f to install the remaining two packages, gwxlibs-2.1.0Ba and openssh-4.2p1.

9. After all three packages are installed, start the **prngd** daemon by typing:

   /etc/prngd start

Uninstalling

This procedure demonstrates how to uninstall Avamar Client for SCO software on SCO OpenServer. The procedure is substantially the same to uninstall Avamar Client for SCO software on UnixWare. However, the install package name, files removed, and so forth are slightly different.

1. Open a command shell and log in as root.
2. Stop the avagent process by typing:

   /usr/local/avamar/etc/avagent.d stop

   The following appears in the command shell:

   ```
   avagent.d Info: Stopping AvamarClient Agent (avagent)...
   avagent.d Info: Agent not yet terminated (15 seconds), please wait.
   avagent.d Info: Agent not yet terminated (30 seconds), please wait.
   avagent.d Info: Agent not yet terminated (45 seconds), please wait.
   avagent.d Info: Client Agent stopped.
   ```

3. Uninstall Avamar software by typing:

pkgrm avamar

The following appears in the command shell:

```
The following package is currently installed:
      Avamar    AvamarClient
                (i386) 7.0.0-nnn

Do you want to remove this package [yes,no,?,quit]
```

4. Type **yes** and press **Enter**.

   The following appears in the command shell:

```
## Removing installed package instance <avamar>
## Verifying package dependencies.
## Executing preremove script.
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Agent not yet terminated (15 seconds), please wait.
avagent.d Info: Agent not yet terminated (30 seconds), please wait.
avagent.d Info: Agent not yet terminated (45 seconds), please wait.
avagent.d Info: Client Agent stopped.
## Processing package information.
## Removing pathnames in <none> class
/usr/local/avamar/var <non-empty directory not removed>
/usr/local/avamar/lib/libpthread.so.20
/usr/local/avamar/lib
/usr/local/avamar/etc/scripts
/usr/local/avamar/etc/avagent.d
/usr/local/avamar/etc
/usr/local/avamar/bin/unix.pin
/usr/local/avamar/bin/avtar.bin
/usr/local/avamar/bin/avtar
/usr/local/avamar/bin/avregister
/usr/local/avamar/bin/avagent.bin
/usr/local/avamar/bin
## Removing pathnames in <syms> class
## Removing pathnames in <dirs> class
## Removing pathnames in <mans> class
## Removing pathnames in <libs> class
## Removing pathnames in <etcs> class
## Removing pathnames in <apps> class
## Executing postremove script.
uninstallation successful
## Updating system information.

Removal of <avamar> was successful.
```

Upgrading

To upgrade the Avamar Client for SCO software, completely uninstall the old software and install the new software.

Manually stopping and restarting the avagent service

The Avamar Client for SCO agent (**avagent**) runs as a service and starts automatically as part of the installation. The **avagent** service also restarts automatically after a system reboot. In most cases, you do not need to manually stop or restart the **avagent** service. If you experience unexpected system behavior and do not want to reboot the entire system, you can use the following commands to manually stop and restart the **avagent** service.

Manually stopping the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /etc/avagent stop
   ```

Manually restarting the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /etc/avagent restart
   ```

Getting avagent status

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /etc/avagent status
   ```

CHAPTER 8
Avamar Client for Solaris

This chapter describes how to install and register the Avamar Client for Solaris on a client computer:

- Downloading the install package 62
- Customizing the install location 62
- Installing and registering 63
- Uninstalling 65
- Upgrading 66
- Manually stopping and restarting the avagent service 67

Downloading the install package

1. Log in to the computer.
2. In a web browser, type the following URL:

   http://AVAMARSERVER

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

   The server redirects the browser to a secure HTTPS connection.
3. If a security alert dialog box appears due to browser security settings, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The EMC Avamar Web Restore home page appears.
4. From the links at the top of the page, click **Downloads**.

   A list of the software available from the server appears in the browser.
5. Select an operating system heading or software category heading from the list and click **+** next to it.

   When necessary, click **+** next to subheadings until the software package link appears.

   Select the correct software package.

Table 6 Avamar client software packages for Solaris operating systems

Solaris version	Avamar software package
Solaris 11 SPARC Solaris 10 SPARC	AvamarClient-solaris10-sparc-VERSION.pkg
Solaris 11 X86_64 Solaris 10 X86_64	AvamarClient-solaris10-x86_64-VERSION.pkg
Solaris 10 X86	AvamarClient-solaris10-x86-VERSION.pkg

6. Click the software package link.

   The server transfers the software package to the web browser.
7. Save the installation package to a temporary folder.

Customizing the install location

You can specify a new location for the installation and var directories during the Avamar Client for Solaris installation. The installation provides prompts to relocate the installation and var directories. By default, the installation directory is /opt/AVMRclnt and the default var directory is /var/avamar.

When you install Avamar plug-in software after installing the Avamar Client for Solaris, the installation automatically installs the plug-in software in the same location as the Avamar Client for Solaris.

Installing and registering

NOTICE

Do not attempt to back up a CIFS/NFS network share by installing an Avamar client on a local machine. Attempting to do so results in a severe degradation in backup and restore performance and metadata such as folders, ACLs, and file permissions are not backed up. To backup a CIFS/NFS share, install an Avamar client on the share machine or use NDMP to back up the data.

1. Open a command shell and log in as root.
2. Uninstall any previous version of Avamar Client for Solaris software before you install the new version. "Uninstalling" on page 65 provides instructions.
3. Change directory to the temporary install directory by typing:

   cd /TMP

   where TMP is the temporary install directory.
4. Install the Avamar Client for Solaris software by typing:

   pkgadd -d AVAMAR-SOLARIS**.pkg**

   where AVAMAR-SOLARIS.pkg is the file name of the Avamar Client for Solaris install package.

   The following appears in the command shell:

   ```
   The following packages are available:
      1   AVMRclnt      Avamar Client for Solaris
                        (sparc) 7.0.0-nnn

   Select package(s) you wish to process (or 'all' to process all
   packages). (default: all) [?,??,q]:
   ```
5. Type **1** and press **Enter**.

   The following appears in the command shell:

   ```
   Processing package instance <AVMRclnt> from
   </AvamarClient-solaris10-sparc-7.0.100.nnn.pkg>

   Avamar Client(sparc) 7.0.0-nnn

   This software is copyright EMC Corporation, 2001-2013.

   Please read and agree to the End User License Agreement which
   will be placed in the base directory of the install as a file
   named AvamarClient-License.txt.

   Relocate install from /opt/AVMRclnt? [n]
   ```
6. Select the installation location:

   - To accept the default location, press **Enter**.

     The following appears in the command shell:

     ```
     Directory to locate cache & log files [/var/avamar]: /var/avamar
     ## Executing checkinstall script.
     Using </opt> as the package base directory.
     ## Processing package information.
     ```

```
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with
super-user permission during the process of installing this
package.

Do you want to continue with the installation of <AVMRclnt>
[y,n,?]
```

- To specify a new installation location:

  a. Type **y** and press **Enter**.

     The following appears in the command shell:

     ```
     Install base [/opt]:
     ```

  b. Type the directory name for the install base.

     Output similar to the following appears in the command shell:

     ```
     Package directgory [AVMRclnt]:
     Confirm '/avs/AVMRclnt' is the desired locatgion. [n]
     ```

  c. Type **y** and press **Enter**.

     ```
     Do you want to continue with the installation of <AVMRclnt>
     [y,n,?]
     ```

7. Type **y** and press **Enter**.

   The following appears in the command shell:

```
## Executing preinstall script.
## Installing part 1 of 1.
/opt/AVMRclnt/AvamarClient-License.txt
/opt/AVMRclnt/bin/avagent.bin
/opt/AVMRclnt/bin/avregister
/opt/AVMRclnt/bin/avscc
/opt/AVMRclnt/bin/avtar
/opt/AVMRclnt/bin/avtar.bin
/opt/AVMRclnt/bin/suncluster-configure.sh
/opt/AVMRclnt/bin/unix.pin
/opt/AVMRclnt/etc/AvamarClient-UpdateReplace.sh
/opt/AVMRclnt/etc/avagent.d
[ verifying class <apps> ]
/opt/AVMRclnt/lib/libDDBoost.so
/opt/AVMRclnt/lib/libgcc_s.so.1
/opt/AVMRclnt/lib/libstdc++.so.5
[ verifying class <libs> ]
## Executing postinstall script.
Installation complete
You may run /opt/AVMRclnt/bin/avregister to register and activate
this client with the Administrator server.
 [or]
You may run /opt/AVMRclnt/bin/suncluster-configure.sh to configure
and register Sun Clusters with the Administrator server
avagent Info <5241>: Logging to /opt/AVMRclnt/var/avagent.log
avagent Info <5417>: daemonized as process id 8098
avagent.d Info: Client Agent started.

Installation of <AVMRclnt> was successful.
```

8. Register this client with the Avamar server by typing:

   /opt/AVMRclnt/bin/avregister

   The following appears in the command shell:

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

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

9. Type the network hostname (as defined in DNS) of the Avamar Administrator server and press **Enter**.

   The following appears in the command shell:

   ```
   Enter the Avamar server domain [clients]:
   ```

   The default domain is "clients." However, the Avamar system administrator might have defined other domains and subdomains. Consult the Avamar system administrator for the domain to use when registering this client.

   NOTICE

   If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character causes an error and prevents you from registering this client.

10. Press **Enter** to accept the default domain (clients).

    The following appears in the command shell:

    ```
    avagent.d Info: Server stopped.
    avagent Info <5241>: Logging to /opt/AVMRclnt/var/avagent.log
    avagent.d Info: Client activated successfully.
    avagent Info <5241>: Logging to /opt/AVMRclnt/var/avagent.log
    avagent Info <5417>: daemonized as process id 10459
    avagent.d Info: Server started.
    Registration Complete.
    ```

Uninstalling

1. Open a command shell and log in as root.
2. Uninstall the Avamar Client for Solaris software by typing:

   pkgrm AVMRclnt

   The following appears in the command shell:

   ```
   The following package is currently installed:
               AVMRclnt         Avamar Client for Solaris
                                (sparc) 7.0.0-nnn
   Do you want to remove this package?
   ```

3. Type **y** and press **Enter**.

   The following appears in the command shell:

```
## Removing installed package instance <AVMRclnt>

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

Do you want to continue with the removal of this package [y,n,?,q]
```

4. Type **y** and press **Enter**.

   The following appears in the command shell:

```
## Verifying package <AVMRclnt> dependencies in global zone
## Processing package information.
## Executing preremove script.
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
## Removing pathnames in class <syms>
## Removing pathnames in class <dirs>
## Removing pathnames in class <mans>
## Removing pathnames in class <libs>
/opt/AVMRclnt/lib/libstdc++.so.5
/opt/AVMRclnt/lib/libgcc_s.so.1
/opt/AVMRclnt/lib/libDDBoost.so
/opt/AVMRclnt/lib
## Removing pathnames in class <etcs>
## Removing pathnames in class <apps>
/opt/AVMRclnt/etc/avagent.d
/opt/AVMRclnt/etc/AvamarClient-UpdateReplace.sh
/opt/AVMRclnt/etc
/opt/AVMRclnt/bin/unix.pin
/opt/AVMRclnt/bin/suncluster-configure.sh
/opt/AVMRclnt/bin/avtar.bin
/opt/AVMRclnt/bin/avtar
/opt/AVMRclnt/bin/avscc
/opt/AVMRclnt/bin/avregister
/opt/AVMRclnt/bin/avagent.bin
/opt/AVMRclnt/bin <non-empty directory not removed>
/opt/AVMRclnt/AvamarClient-License.txt
/opt/AVMRclnt <non-empty directory not removed>
## Removing pathnames in class <none>
## Updating system information.

Removal of <AVMRclnt> was successful.
```

Upgrading

1. Open a command shell and log in as root.
2. Copy the new installation package to /opt/AVMRclnt/etc.
3. Upgrade the Avamar Client for Solaris software by typing:

   /opt/AVMRclnt/etc/AvamarClient-UpdateReplace.sh AVAMAR-SOLARIS.pkg

Manually stopping and restarting the avagent service

The Avamar Client for Solaris agent (**avagent**) runs as a service and starts automatically as part of the installation. The **avagent** service also restarts automatically after a system reboot. In most cases, you do not need to manually stop or restart the **avagent** service. If you experience unexpected system behavior and do not want to reboot the entire system, you can use the following commands to manually stop and restart the **avagent** service.

Manually stopping the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /etc/init.d/avagent Stop
   ```

Manually restarting the avagent service

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /etc/init.d/avagent start
   ```

Getting avagent status

1. Open a command shell and log in as root.
2. Type the following:

   ```
   /etc/init.d/avagent status
   ```

CHAPTER 9
Avamar Client for Solaris in Solaris Clusters

The following topics describe how to install, register, and configure the Avamar Client for Solaris in a Solaris two-node cluster that runs Solaris Cluster:

- Cluster configurations 70
- Preinstallation 70
- Installing the Avamar Client for Solaris 71
- Configuring Solaris Cluster nodes 71
- Bringing Solaris Cluster resources online 73
- Registering with a new server 74
- Controlling Avamar resource behavior 75
- Uninstalling 76

Cluster configurations

Avamar supports backup and restore of all the supported file systems on Solaris platforms that run Solaris Cluster 3.2. Avamar supports single-node and multi-node (active/active and active/passive) Solaris Cluster configurations.

- In an active/active cluster configuration, each node runs an instance of Avamar Client for Solaris software as an application in separate resource groups. This functionality provides application redundancy. When a failure occurs on one active node, the other active node hosts both resource groups.
- In an active/passive cluster configuration, the resource group is online on the active node until a failover occurs. Then the resource group comes online on the passive node.

You can run backups and restores on both nodes.

Preinstallation

Before you install the Avamar client software, ensure that the environment meets the following requirements:

1. The following software has been installed on each Solaris Cluster node:
   - One of the supported Solaris operating systems:
     - Solaris 10 SPARC
     - Solaris 10 X86_64
   - Solaris Cluster version 4.0 or 3.2 software
   - One of the supported volume managers:
     - Veritas Volume Manager (VxVM)
     - Sun Volume Manager
   - Shared storage with one of the supported file systems:
     - Veritas File System (VxFS)
     - QFS
     - UFS
     - ZFS
2. The following resources have been configured for Solaris Cluster resource groups:
   - IP resource, which identifies the resource group
   - Mount resource, which is the mount point of the shared disk where the Avamar var directory resides
3. The Avamar server can resolve the resource group name through DNS.

Installing the Avamar Client for Solaris

1. Download the required Avamar Client for Solaris installation packages as described in "Downloading the install package" on page 62.
2. On each Solaris Cluster node, install the Avamar Client for Solaris software as described in "Installing and registering" on page 63.
   a. Only perform step 1–step 7. Do not run **avregister**.
   b. To relocate the installation or var directory, do not select a shared directory for the installation or var directory.

Configuring Solaris Cluster nodes

Configure the required resource groups on each node in the Solaris Cluster. If the cluster includes a passive node, perform the configuration procedure on the passive node first and then on the active node.

1. Open a command shell and log in to each passive Solaris Cluster node as root.
2. Type the following:

   /opt/AVMRclnt/bin/suncluster-configure.sh

   The main menu appears in your command shell:

```
Avamar Install directory: /opt/AVMRclnt
Avamar Cluster Install directory: /opt/AVMRclnt/avcluster
*****************************************************************
Please select following options, you wish to process
*****************************************************************
1) Add Avamar agent resource into Sun Cluster resource group and
   register with Avamar server
2) Remove Avamar agent resource from Sun Cluster resource group
3) Exit
Select an option from the above list:
```

3. Type **1** and press **Enter**.

   The list of existing resource groups appears in the command shell. For example:

```
Please wait...gathering list of Resource groups on which Avamar agent
can be installed
*****************************************************************
Please select eligible resource group for Avamar agent resource
*****************************************************************
1) qfs-rg
2) Return to previous menu
Enter the option:
```

4. Type the number for the required resource group and press **Enter** to configure the resource group for the Avamar agent.

   The following appears in the command shell:

```
Enter Logical Hostname for selected resource group [qfs-rg]:
```

5. Type the hostname (as defined in DNS) for the resource group you selected in step 4 and press **Enter**.

   Information similar to the following appears in the command shell:

   ```
   Checking whether Cluster group [qfs-rg] 'qfsnode' configured with IP
   Enter the shared disk path :
   ```

6. Type the shared disk path for this resource group and press **Enter**.

   Information similar to the following appears in the command shell:

   ```
   Shared disk '/global/qfsnode/clusterfs' configured for selected
   cluster resource group 'qfs-rg'
   Configuring 'AvamarClient-License.txt'
   Configuring 'bin'
   Configuring 'etc'
   Configuring 'lib'
   Avamar binaries copied successfully
   Configuration completed
   Press enter to continue
   ```

   If you attempted to configure resource groups on an active node before configuring all passive nodes, the configuration script terminates with an error message.

7. After configuring all passive Solaris Cluster nodes, log in to the active Solaris Cluster node as root and repeat step 2–step 6.

   After successfully completing step 2–step 6, the following appears in the command shell:

   ```
   Do you want to register selected cluster resource group with Avamar
   server (y/n) [y]:
   ```

8. Type **y** and press **Enter**.

   The following appears in the command shell:

   ```
   === Client Registration and Activation
   This script will register and activate the client with the
   Administrator server.
   Enter the Administrator server address (DNS text name or numeric IP
   address, DNS name preferred):
   ```

9. Type the network hostname (as defined in DNS) of the Avamar Administrator server and press **Enter**.

   The following appears in the command shell:

   ```
   Enter the Avamar server domain [clients]:
   ```

   The default domain is "clients." However, the Avamar system administrator might have defined other domains and subdomains. Consult the Avamar system administrator for the domain to use when registering this client.

   NOTICE

   If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character causes an error and prevents you from registering this client.

10. Press **Enter** to accept the default domain (clients).

    The following appears in the command shell:

```
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
avagent Info <5241>: Logging to
/opt/AVMRclnt/avcluster/qfs-rg/var/avagent.log
avagent Info <5174>: - Reading
/opt/AVMRclnt/avcluster/qfs-rg/var/avagent.cmd
avagent.d Info: Client activated successfully.
avagent Info <5241>: Logging to
/opt/AVMRclnt/avcluster/qfs-rg/var/avagent.log
avagent Info <5174>: - Reading
/opt/AVMRclnt/avcluster/qfs-rg/var/avagent.cmd
avagent Info <5417>: daemonized as process id 28803
avagent.d Info: Client Agent started.
Registration Complete.
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.
Press enter to continue
```

11. Press **Enter**.

    The main menu appears in your command shell.

12. Exit the **suncluster-configure.sh** configuration script by typing **3** and pressing **Enter**.

Bringing Solaris Cluster resources online

After you complete the configuration procedure on each node of the Solaris Cluster, type the following to bring online any group resources that are in an offline state:

```
# clrg online -n NODENAME RESOURCEGROUPNAME
```

where:

- NODENAME is the Solaris Cluster node name.
- RESOURCEGROUPNAME is the name of a resource group that is in an offline state.

The following example shows the command used to bring online the qfs-rg resource group on the node named aiqsunbox07:

```
# clrg online -n aiqsunbox07 qfs-rg

# clrg status

=== Cluster Resource Groups ===

Group NameNode NameSuspendedStatus
-----------------------------------
qfs-rgaiqsunbox07NoOnline
   aiqsunbox08NoOffline
```

Registering with a new server

To register the resource groups on Solaris Cluster nodes with a new Avamar server, perform the following on each Solaris Cluster node that has the required resource group online:

1. Open a command shell and log in to a Solaris Cluster active node as root.
2. Type the following:

   /opt/AVMRclnt/bin/suncluster-configure.sh

   The following appears in the command shell:

   ```
   Avamar Install directory: /opt/AVMRclnt
   Avamar Cluster Install directory: /opt/AVMRclnt/avcluster
   ********************************************************************
   Please select following options, you wish to process
   ********************************************************************
   1) Add Avamar agent resource into Sun Cluster resource group and
      register with Avamar server
   2) Remove Avamar agent resource from Sun Cluster resource group
   3) Exit
   Select an option from the above list:
   ```

3. Type **1** and press **Enter**.

   A list of existing resource groups appears in the command shell. For example:

   ```
   Please wait...gathering list of Resource groups on which Avamar agent
   can be installed
   ********************************************************************
   Please select eligible resource group for Avamar agent resource
   ********************************************************************
   1) qfs-rg
   2) Return to previous menu
   Enter the option:
   ```

4. Type the number of the required resource group.

   The following appears in the command shell:

   ```
   Avamar file system client has been already configured for selected
   cluster group 'selected_group_name'
   Do you want to register selected cluster resource group with Avamar
   server (y/n) [y]:
   ```

5. Type **y** and at the following prompts, provide the DNS address of the new Avamar server and the domain to which the client should be assigned. For example:

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

   Enter the Administrator server address (DNS text name or numeric IP
   address, DNS name preferred): DNS_address_of_Avamar_server
   Enter the Avamar server domain [clients]: domain_name
   avagent.d Info: Stopping Avamar Client Agent (avagent)...
   avagent.d Info: Client Agent stopped.
   avagent Info <5241>: Logging to
   /opt/AVMRclnt/avcluster/selected_group_name/var/avagent.log
   avagent Info <5174>: - Reading
   /opt/AVMRclnt/avcluster/selected_group_name/var/avagent.cmd
   avagent.d Info: Client activated successfully.
   ```

```
avagent Info <5241>: Logging to
/opt/AVMRclnt/avcluster/selected_group_name/var/avagent.log
avagent Info <5174>: - Reading
/opt/AVMRclnt/avcluster/selected_group_name/var/avagent.cmd
avagent Info <5417>: daemonized as process id 3112
avagent.d Info: Client Agent started.
Registration Complete.
avagent.d Info: Stopping Avamar Client Agent (avagent)...
avagent.d Info: Client Agent stopped.

Press enter to continue
```

The main menu appears in your command shell.

6. Exit the **suncluster-configure.sh** configuration script by typing **3** and pressing **Enter**.

Controlling Avamar resource behavior

When an Avamar resource exception occurs (for example, the **avagent** process is killed by a user or the system), the Avamar resource by default displays its state as "online faulted" when you issue the **clresource status** command. For example, a process failure does not cause a resource group failover or an automatic resource restart.

As a Solaris Cluster administrator, you can issue specific commands to change the default behavior of an Avamar resource:

- Issue the following commands to ensure that the failover of a resource group occurs immediately after an Avamar resource exception:

  ```
  clrs disable AVMRAppRes-<resource_group_name>
  clrs set -p Failover_enabled=true AVMRAppRes-<resource_group_name>
  clrs enable AVMRAppRes-<resource_group_name>
  ```

- Issue the following commands to ensure that the failover of a resource group occurs after a specific number of restarts of the Avamar resource:

  ```
  clrs disable AVMRAppRes-<resource_group_name>
  clrs set -p Failover_enabled=true -p Retry_count=#
  AVMRAppRes-<resource_group_name>
  clrs enable AVMRAppRes-<resource_group_name>
  ```

- Issue the following commands to ensure that the failover of a resource group never occurs after an Avamar resource exception but the Avamar resource is marked as "faulted" after a specific number of restarts (for example, within 370 seconds):

  ```
  clrs disable AVMRAppRes-<resource_group_name>
  clrs set -p Failover_enabled=false -p Retry_count=#
  AVMRAppRes-<resource_group_name>
  clrs enable AVMRAppRes-<resource_group_name>
  ```

Uninstalling

To uninstall Avamar client software, perform the following on each Solaris Cluster node:

1. Open a command shell and log in to a Solaris Cluster node as root.
2. Type the following:

   /opt/AVMRclnt/bin/suncluster-configure.sh

   The main menu appears in your command shell:

   ```
   Avamar Install directory: /opt/AVMRclnt
   Avamar Cluster Install directory: /opt/AVMRclnt/avcluster
   ********************************************************************
   Please select following options, you wish to process
   ********************************************************************
   1) Add Avamar agent resource into Sun Cluster resource group and
      register with Avamar server
   2) Remove Avamar agent resource from Sun Cluster resource group
   3) Exit
   Select an option from the above list:
   ```

3. Type **2** and press **Enter**.

   The list of existing resource groups appears in the command shell. For example:

   ```
   Please wait...gathering list of Resource groups on which Avamar agent
   can be installed
   ********************************************************************
   Please select eligible resource group for Avamar agent resource
   ********************************************************************
   1) qfs-rg
   2) Return to previous menu
   Enter the option:
   ```

4. Type the number for the required resource group and press **Enter**.

   You are prompted to confirm that you want to unregister the Avamar agent and unconfigure the resource group. For example:

   ```
   Selected Cluster group name is 'qfs-rg'
   Do you want to unregister Avamar agent and unconfigure Avamar from
   selected Cluster group (y/n) [n]:
   ```

5. Type **y** and press **Enter**.

   The script performs the following:

   - Brings the resource group offline.
   - Unregisters the Avamar application from the selected resource group.
   - Removes the Avamar binaries for the selected resource group.

6. Repeat steps 2–5 for each Solaris Cluster node.

   The main menu appears in your command shell.

7. Exit the **suncluster-configure.sh** configuration script by typing **3** and pressing **Enter**.
8. On each Solaris Cluster node, uninstall the Avamar Client for Solaris software as described in "Uninstalling" on page 65.

CHAPTER 10
Avamar Cluster Client for Solaris on VCS

The following topics describe how to install and register the Avamar Cluster Client for Solaris software in a Solaris two-node cluster that runs Veritas Cluster Server (VCS):

- Cluster configurations 78
- Preinstallation 78
- Downloading the cluster install packages 78
- Installing and registering 79
- Bringing VCS resources online 84
- Uninstalling 84
- Registering with a new server 86

Cluster configurations

Avamar supports backup and restore of the Veritas File System (VxFS) from Solaris platforms that run VCS. Avamar supports single-node and multi-node (active/active and active/passive) VCS configurations.

- In an active/active cluster configuration, each node runs an instance of Avamar Cluster Client for Solaris as an application in separate service groups. This functionality provides application redundancy. When a failure occurs on one active node, the other active node hosts both service groups.
- In an active/passive cluster configuration, the service group is online on the active node until a failover occurs. Then the service group comes online in the passive node.

You can run backups and restores from both nodes.

Preinstallation

Before you install the Avamar Cluster Client for Solaris software, ensure that the environment meets the following requirements:

1. The following software has been installed on each cluster node:
   - Veritas Cluster Server
   - Veritas Volume Manager (VxVM)
   - Veritas File System (VxFS)
   - Avamar Client for Solaris
     "Avamar Client for Solaris" on page 61 provides installation instructions.
2. The following resources have been configured for VCS service groups:
   - IP resource, which identifies the service group
   - Mount resource, which is the mount point of the shared disk where the Avamar /var directory resides
3. The Avamar server can resolve the service group name through DNS.

Downloading the cluster install packages

1. Log in to the active VCS node.
2. Open a command shell and log in as root.
3. In a web browser, type the following URL:

   http://AVAMARSERVER

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

   The server redirects the browser to a secure HTTPS connection.
4. If a security alert dialog box appears due to browser security settings, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The EMC Avamar Web Restore home page appears.
5. From the links at the top of the page, click **Downloads**.

A list of the software available from the server appears in the browser.

6. Select an operating system heading or software category heading from the list and click **+** next to it.

   When necessary, click **+** next to subheadings until the software package link appears.

7. Select the correct software package.

Table 7 Avamar cluster client software packages for Solaris operating systems

Platform	Software package
Solaris 11 Sparc Solaris 10 Sparc	AvamarClusterClient-solaris10-sparc-VERSION.pkg
Solaris 11 x86 64-bit Solaris 10 x86 64-bit	AvamarClusterClient-solaris10-x86_64-VERSION.pkg

8. Click the software package link.

   The server transfers the software package to the web browser.

9. Save the installation package to a temporary folder.

Installing and registering

Install the Avamar Cluster Client for Solaris software on both nodes in the VCS cluster. Start the installation from the active node.

NOTICE

This chapter uses /tmp as an example of a temporary directory. You may choose to use a different temporary directory for the installation.
The output in this procedure refers to AvamarClusterClient-solaris10-sparc-7.0.100-nnn.pkg for illustration purposes only.

1. Log in to the active VCS node as root.
2. Change directory to the temporary install directory. For example:

   ```
   cd /tmp
   ```

3. Install the Avamar Cluster Client for Solaris software by typing:

   ```
   pkgadd -d AVAMARSOLARISCLUSTERCLIENT.pkg
   ```

   where AVAMARSOLARISCLUSTERCLIENT.pkg is the installation package.

   The following appears in the command shell:

   ```
   The following packages are available:
      1 AVMRclusclnt          Avamar Cluster Client
                              (sparc) 7.0.100-nnn
   Select package(s) you wish to process (or 'all' to process all
   packages). (default: all) [?,??,q]:
   ```

4. Type **1** and press **Enter**.

   The following appears in the command shell:

```
Processing package instance <AVMRclusclnt> from
</home/source/fresh/installers/solpkgs/PKGS/AvamarClusterClient-sol
aris10-sparc-7.0.100-nnn.pkg>
Avamar Cluster Client(sparc) 7.0.100-nnn
This software is copyright EMC Corporation, 2001-2010.
Please read and agree to the End User License Agreement which
will be placed in the base directory of the install as a file
named AvamarClient-License.txt.
## Executing checkinstall script.
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user
permission during the process of installing this package.
Do you want to continue with the installation of <AVMRclusclnt>
[y,n,?] y
```

5. Type **y** and press **Enter**.

   The following appears in the command shell:

```
## Installing part 1 of 1.
/opt/AVMRclusclnt/AvamarClient-License.txt
/opt/AVMRclusclnt/bin/avagent.bin
/opt/AVMRclusclnt/bin/avclusinstall
/opt/AVMRclusclnt/bin/avclusuninstall
/opt/AVMRclusclnt/bin/avoracle
/opt/AVMRclusclnt/bin/avregister
/opt/AVMRclusclnt/bin/avscc
/opt/AVMRclusclnt/bin/avtar
/opt/AVMRclusclnt/bin/avtar.bin
/opt/AVMRclusclnt/bin/oracle.pin
/opt/AVMRclusclnt/bin/sbtscan
/opt/AVMRclusclnt/bin/unix.pin
/opt/AVMRclusclnt/etc/AvamarClient-UpdateReplace.sh
/opt/AVMRclusclnt/etc/avagent.d
/opt/AVMRclusclnt/etc/start.sh
/opt/AVMRclusclnt/etc/stop.sh
[ verifying class <apps> ]
/opt/AVMRclusclnt/lib/libgcc_s.so.1
/opt/AVMRclusclnt/lib/libobk_avamar.so
/opt/AVMRclusclnt/lib/libobk_avamar64.so
/opt/AVMRclusclnt/lib/libstdc++.so.5
[ verifying class <libs> ]
## Executing postinstall script.
Installation complete
You may run /opt/AVMRclusclnt/bin/avclusinstall to configure avamar
cluster client.
Installation of <AVMRclusclnt> was successful.
```

6. Run **avclustinstall** by typing:

```
cd /opt/AVMRclusclnt/bin/
./avclusinstall
```

   The following appears in the command shell:

```
Setting PATH set for Veritas Cluster Server commands
Available service groups for configuration
                1. oraclegrp
   Select an option:
```

7. Type **1** and press **Enter**.

   The following appears in the command shell:

```
          Selected service group: oraclegrp
             Group                     State
          oraclegrp                    PARTIAL
Enter the resource name of Avamar application for selected service
group (Default: avagent_oraclegrp):
```

   NOTICE

   The state of oraclegrp can be either ONLINE or PARTIAL. Usually the state is ONLINE.

8. Type the resource name of the Avamar application and press **Enter**.

   The following appears in the command shell:

```
Available mount Resources:
                1. oramnt (Mount point: /fsclus01)
Selected mount resource: oramnt
Do you want to install Avamar Client Plugin for Oracle RMAN? (y/n)
[y]:
```

9. If you are installing Oracle, type **y** and press **Enter**. Otherwise, type **n** and press **Enter**.

   The following appears in the command shell:

```
Enter the hostname or dns alias associated with virtual-ip
(10.0.140.15):
```

10. (Optional) For VCS IPv6 environments only, edit the avagent.cmd file on the active VCS node. For IPv4 environments, skip this step.

    a. In a second command shell, log in to the active VCS node as root.

    b. Change directory to the /opt/AVMRclusclnt/cluster/CLUSTERGROUPNAME/var/ directory by typing:

       cd /opt/AVMRclusclnt/cluster/CLUSTERGROUPNAME/var/

       where CLUSTERGROUPNAME is the name of the cluster group.

    c. Use a UNIX text editor to open the avagent.cmd file.

    d. Add the following on a separate line at the end of the file:

```
--addr-family=6
```

    e. Save the changes.

    f. Return to the first command shell session.

11. Type the hostname or DNS alias and press **Enter**.

```
Active node detected
=== Client Registration and Activation
This script will register and activate the client with the
Administrator server.
Using /opt/AVMRclusclnt/cluster/oraclegrp/var as the var dir for the
group oraclegrp avagent
Enter the Administrator server address (DNS text name or numeric IP
address, DNS name preferred):
```

12. Type the hostname (defined in DNS) or IP address for the Avamar server and press **Enter**.

    The following appears in the command shell:

    ```
    Enter the Avamar server domain [clients]:
    ```

13. Type the domain name and press **Enter**.

    The following appears in the command shell:

    ```
    avagent.d Info: Client Agent not running.
    avagent Info <5241>: Logging to
    /opt/AVMRclusclnt/cluster/oraclegrp/var/avagent.log
    avagent Info <5174>: - Reading
    /opt/AVMRclusclnt/cluster/oraclegrp/var/avagent.cmd
    avagent.d Info: Client activated successfully.
    avagent Info <5241>: Logging to
    /opt/AVMRclusclnt/cluster/oraclegrp/var/avagent.log
    avagent Info <5174>: - Reading
    /opt/AVMRclusclnt/cluster/oraclegrp/var/avagent.cmd
    avagent Info <5417>: daemonized as process id 7154
    avagent.d Info: Client Agent started.
    avagent.d Info: Stopping Avamar Client Agent (avagent)...
    avagent.d Info: Client Agent stopped.
    Registration Complete.
    Avamar Client has been installed for service group 'oraclegrp'
    successfully.
    Do you want to install Avamar in another service group? (y/n) [n]:
    ```

14. Type **n** and press **Enter**.

15. Log in to the passive node as root.

16. Install the Avamar Cluster Client for Solaris software by typing:

    pkgadd -d AVAMARSOLARISCLUSTERCLIENT**.pkg**

    where AVAMARSOLARISCLUSTERCLIENT.pkg is the installation package.

    The following appears in the command shell:

    ```
    The following packages are available:
       1 AVMRclusclnt          Avamar Cluster Client
                               (sparc) 7.0.100-nnn
    Select package(s) you wish to process (or 'all' to process all
    packages). (default: all) [?,??,q]:
    ```

17. Type **1** and press **Enter**.

    The following appears in the command shell:

    ```
    Processing package instance <AVMRclusclnt> from
    </home/source/fresh/installers/solpkgs/PKGS/AvamarClusterClient-sol
    aris10-sparc-7.0.100-nnn.pkg>
    Avamar Cluster Client(sparc) 7.0.100-nnn
    This software is copyright EMC Corporation, 2001-2014.
    Please read and agree to the End User License Agreement which
    will be placed in the base directory of the install as a file
    named AvamarClient-License.txt.
    ```

```
## Executing checkinstall script.
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user
permission during the process of installing this package.
Do you want to continue with the installation of <AVMRclusclnt>
[y,n,?] y
```

18. Type **y** and press **Enter**.

    The following appears in the command shell:

```
## Installing part 1 of 1.
/opt/AVMRclusclnt/AvamarClient-License.txt
/opt/AVMRclusclnt/bin/avagent.bin
/opt/AVMRclusclnt/bin/avclusinstall
/opt/AVMRclusclnt/bin/avclusuninstall
/opt/AVMRclusclnt/bin/avoracle
/opt/AVMRclusclnt/bin/avregister
/opt/AVMRclusclnt/bin/avscc
/opt/AVMRclusclnt/bin/avtar
/opt/AVMRclusclnt/bin/avtar.bin
/opt/AVMRclusclnt/bin/oracle.pin
/opt/AVMRclusclnt/bin/sbtscan
/opt/AVMRclusclnt/bin/unix.pin
/opt/AVMRclusclnt/etc/AvamarClient-UpdateReplace.sh
/opt/AVMRclusclnt/etc/avagent.d
/opt/AVMRclusclnt/etc/start.sh
/opt/AVMRclusclnt/etc/stop.sh
[ verifying class <apps> ]
/opt/AVMRclusclnt/lib/libgcc_s.so.1
/opt/AVMRclusclnt/lib/libobk_avamar.so
/opt/AVMRclusclnt/lib/libobk_avamar64.so
/opt/AVMRclusclnt/lib/libstdc++.so.5
[ verifying class <libs> ]
## Executing postinstall script.
Installation complete
You may run /opt/AVMRclusclnt/bin/avclusinstall to configure avamar
cluster client.
Installation of <AVMRclusclnt> was successful.
```

19. Run **avclustinstall** by typing:

```
cd /opt/AVMRclusclnt/bin
./avclusinstall
```

    The following appears in the command shell:

```
Setting PATH set for Veritas Cluster Server commands
Available service groups for configuration
                1. oraclegrp
      Select an option:
```

20. Type **1** and press **Enter**.

    The following appears in the command shell:

```
   Selected service group: oraclegrp
         Group                      State
      oraclegrp                     OFFLINE
Do you want to install Avamar Client Plugin for Oracle RMAN? (y/n)
[y]:
```

21. Type **y** and press **Enter**.

```
Passive node detected.
Avamar Client has been installed for service group 'oraclegrp'
successfully.
Do you want to install Avamar in another service group? (y/n) [n]:
```

22. Type **n** and press **Enter**.
23. Repeat steps 15–22 on each passive node.

Bringing VCS resources online

To bring VCS resources online, type:

```
hares -online avagent_SERVICEGROUP -sys HOSTNAME
```

where:

- avagent_SERVICEGROUP is the default name of the Avamar VCS cluster agent. If you did not select the default name, use the name that you specified.
- HOSTNAME is the system where the VCS service group is in PARTIAL state.

Uninstalling

1. Open a command shell and log in to a VCS node as root.
2. Remove the Avamar agent from the VCS service groups by typing:

```
cd /opt/AVMRclusclnt/bin
./avclusuninstall
```

The following appears in the command shell:

```
            1. oraclus
          Select an option: 1
          Selected service group: oraclus
Avamar will be uninstalled for the selected service group.
Do you want to continue? (y/n) [n]:
```

3. Type **y** and press **Enter**.

```
Current backup or restore activity will be stopped on active node for
this group.
Do you want to continue? (y/n) [n]:
```

4. Type **y** and press **Enter**.

```
Removing Agent from oraclus service group...
Agent resource deleted from group oraclus ...
Removing the binaries now...
Do you want to uninstall Avamar in another service group? (y/n) [n]:
```

5. Type **n** and press **Enter**.
6. Remove the Avamar Cluster Client for Solaris software by typing:

```
pkgrm AVMRclusclnt
```

The following appears in the command shell:

```
The following package is currently installed:
      AVMRclusclnt Avamar Cluster Client
                   (sparc) 7.0.100-nnn
Do you want to remove this package? [y,n,?,q]
```

7. Type **y** and press **Enter**.

   The following appears in the command shell:

```
## Removing installed package instance <AVMRclusclnt>
This package contains scripts which will be executed with super-user
permission during the process of removing this package.
Do you want to continue with the removal of this package [y,n,?,q]
```

8. Type **y** and press **Enter**.

   The following appears in the command shell:

```
## Verifying package <AVMRclusclnt> dependencies in global zone
## Processing package information.
## Executing preremove script.
## Removing pathnames in class <syms>
## Removing pathnames in class <dirs>
## Removing pathnames in class <mans>
## Removing pathnames in class <libs>
/opt/AVMRclusclnt/lib/libstdc++.so.5
/opt/AVMRclusclnt/lib/libobk_avamar64.so
/opt/AVMRclusclnt/lib/libobk_avamar.so
/opt/AVMRclusclnt/lib/libgcc_s.so.1
/opt/AVMRclusclnt/lib
## Removing pathnames in class <etcs>
## Removing pathnames in class <apps>
/opt/AVMRclusclnt/etc/stop.sh
/opt/AVMRclusclnt/etc/start.sh
/opt/AVMRclusclnt/etc/avagent.d
/opt/AVMRclusclnt/etc/AvamarClient-UpdateReplace.sh
/opt/AVMRclusclnt/etc
/opt/AVMRclusclnt/bin/unix.pin
/opt/AVMRclusclnt/bin/sbtscan
/opt/AVMRclusclnt/bin/oracle.pin
/opt/AVMRcluscl
nt/bin/avtar.bin
/opt/AVMRclusclnt/bin/avtar
/opt/AVMRclusclnt/bin/avscc
/opt/AVMRclusclnt/bin/avregister
/opt/AVMRclusclnt/bin/avoracle
/opt/AVMRclusclnt/bin/avclusuninstall
/opt/AVMRclusclnt/bin/avclusinstall
/opt/AVMRclusclnt/bin/avagent.bin
/opt/AVMRclusclnt/bin
/opt/AVMRclusclnt/AvamarClient-License.txt
## Removing pathnames in class <none>
## Updating system information.
Removal of <AVMRclusclnt> was successful.
```

Registering with a new server

To re-register VCS cluster client against a new server:

1. Open a command shell and log in to the active VCS node as root.
2. Type the following:

   /opt/AVMRclusclnt/cluster/oraclegrp/bin/avregister

   The following appears in the command shell:

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

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

3. Type the network hostname (as defined in DNS) of the Avamar Administrator server and press **Enter**.

   The following appears in the command shell:

   ```
   Enter the Avamar server domain [clients]:
   ```

   The default domain is "clients." However, the Avamar system administrator might have defined other domains and subdomains. Consult the Avamar system administrator for the domain to use when registering this client.

   NOTICE

   If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character causes an error and prevents you from registering this client.

CHAPTER 11
Avamar Client for Windows

The following topics describe how to install and register the Avamar Client for Windows on a client computer:

- Capabilities and limitations 88
- Downloading the install package 89
- Installing 90
- Registering 91
- Uninstalling and upgrading 92

Capabilities and limitations

This topic discusses capabilities and limitations of Avamar Client for Windows.

The *Avamar for Windows Server Guide* provides installation instructions for the Avamar Client for Windows on a computer running Windows cluster, Windows Server 2008, or Windows Server 2003.

Computers with User Account Control

In Windows Vista, Microsoft added the User Account Control (UAC) feature. Later versions of the Windows operating system, such as Windows 7, continued this feature with minor changes. Microsoft designed UAC to provide additional operating system security by preventing the installation of software that runs with administrator privileges, unless an administrator authorizes the elevated privileges.

When you start the Avamar Client for Windows installer without administrator privileges on a computer with a default implementation of UAC, the software requires that you provide the username and password for an account with administrator privileges. Otherwise, the installation exits.

After successful installation of Avamar Client for Windows, any nonadministrative user can start and use it without loss of functionality.

Disabling NTFS last access time inhibits backing up changed ACLs

If you disable NTFS Last Access Time feature on a Windows backup client, then the Avamar Client for Windows software cannot detect any further Windows ACL changes. This means that the ACL setting stored during the original file backup is the ACL setting that Avamar Client for Windows applies on all future restores.

The Windows operating system enables the NTFS Last Access Time feature by default, but sometimes users disable this setting for performance purposes. Reestablishing proper ACL backup behavior requires that you:

1. Enable NTFS Last Access Time feature.

   There are two ways to reenable the NTFS Last Access Time feature:

   a. Search the Windows Registry for the following key:

      HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\FileSystem\NtfsDisableLastAccessUpdate

      If the key exists, and its value is **0**, modify the value to **1**.

      If the key does not exist, or if it exists with a value of **1**, then Windows has NTFS Last Access Time enabled. Take no further action.

   b. On Windows XP, Server 2003, and Vista platforms, you can enable NTFS Last Access Time by typing the following command at a command prompt:

      ```
      fsutil behavior set disablelastaccess 0
      ```

2. Delete all local Avamar Client for Windows cache files.

   The Avamar Client for Windows cache files are:

   ```
   C:\Program Files\avs\var\f_cache.dat
   C:\Program Files\avs\var\p_cache.dat
   ```

   Delete these files. Avamar Client for Windows regenerates these files during the next backup.

Downloading the install package

1. Log in to the computer.
2. In a web browser, type the following URL:

   http://AVAMARSERVER

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

   The server redirects the browser to a secure HTTPS connection.
3. If a security alert dialog box appears due to browser security settings, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The EMC Avamar Web Restore home page appears.
4. From the links at the top of the page, click **Downloads**.

   A list of the software available from the server appears in the browser.
5. Select an operating system heading or software category heading from the list and click **+** next to it.

   When necessary, click **+** next to subheadings until the software package link appears.
6. Click the software package link.

   The server transfers the software package to the web browser.
7. Save the installation package to a temporary folder.

NOTICE

Do not rename a software package. The Avamar push upgrade mechanisms are incompatible with renamed packages.

Installing

Use the following procedure to install Avamar Client for Windows software on all supported versions of Microsoft Windows except any Windows Server or Windows Cluster installations. The *EMC Avamar for Windows Server User Guide* provides information for installation, configuration, and use on Microsoft Windows Server 2008, Windows Server 2008 Core, Windows Server 2003, and Windows Cluster Server 2003.

NOTICE

Do not attempt to back up a CIFS/NFS network share by installing an Avamar client on a local machine. Attempting to do so results in a severe degradation in backup and restore performance and metadata such as folders, ACLs, and file permissions are not backed up. To backup a CIFS/NFS share, install an Avamar client on the share machine or use NDMP to back up the data.

1. Log in to the computer.

   "Downloading the install package" on page 89 describes how to access and download the software.

2. Locate the downloaded software package and double-click it.

   A User Account Control dialog box appears.

3. Click **Yes**.

   When you run the install program from a user account that does not have Adminstrator privileges, type the username and password for an account with Administrator privileges and then click **Yes**.

4. Follow the instructions in the wizard.

   After you accept the End User Licensing Agreement, the Custom Setup screen appears.

5. Select whether to install Avamar Client for Windows software with a Graphical User Interface (GUI):

   - To install with a GUI, leave the **Avamar Client User Interface** option enabled, and click **Next**.
   - To install without a GUI, click **Avamar Client User Interface** and select **Entire feature will be unavailable**, and click **Next**.

   The Ready to install EMC Avamar for Windows screen appears.

6. Click **Install**.

   A User Account Control dialog box appears.

7. Click **Yes**.

8. When the installation completes, click **Finish**.

   The installation wizard closes and the Avamar icon appears in the system tray.

Registering

Before you can back up files or restore files, you must register the client with the Avamar server.

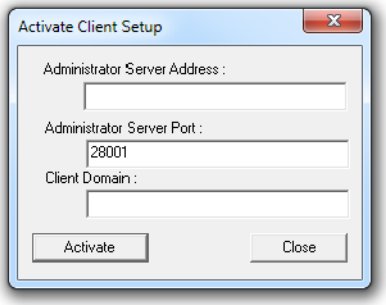
NOTICE

Do not register the Avamar Client for Windows unless instructed to do so by the system administrator. The administrator often registers and activates the client from the Avamar server.

To register and activate the Avamar Client for Windows software from the client computer:

1. Right-click the Avamar system tray icon.
2. Select **Manage** › **Activate Client**.

   The Activate Client Setup dialog box appears.



3. In **Administrator Server Address**, type the hostname of the Avamar server as defined in DNS, or its IP address.
4. In **Administrator Server Port**, type 28001.
5. In **Client Domain**, type the Avamar domain for this client.

   NOTICE

   The default domain is “clients.” However, the Avamar system administrator can define other domains and subdomains. Consult the Avamar system administrator for the domain to use when registering this client.

   When typing a domain (for example, clients/MyClients), do not include a slash (/) as the first character. A slash as the first character causes an error and prevents you from registering this client. Also, do not use a backslash (\) in this field.

6. Click **Activate**.

   The Activate Client Setup dialog box closes, and the activation process starts. Avamar client adds a green check mark to its system tray icon when activation successfully completes.

Uninstalling and upgrading

You do not have to uninstall earlier versions of Avamar Client for Windows software before you install a new version. When installing the Avamar Client for Windows on a computer that has a version of the software installed, the installation program prompts you to select one of the following:

- Upgrade current Avamar Client for Windows installation to the new version.
- Remove old Avamar Client for Windows installation.

If you decide to remove the old installation, you need to rerun the installation file to install the new version. The current installation session becomes an “uninstall” session, then terminates.

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

NOTICE

If you need to revert to an older version of the Avamar Client for Windows software, you must completely uninstall the existing version before installing the older version. You cannot revert to an older version by using the upgrade process.

CHAPTER 12
Backup and Restore

The following topics describe client backup and restore procedures:

- Overview 94
- Restore authority 94
- Capabilities and limitations 94
- Avamar Web Restore for Windows, Mac, and Linux clients 97
- Windows clients 100
- Mac OS X clients 105
- Linux clients 109
- AIX, FreeBSD, HP-UX, Linux, and Solaris clients 112

Overview

After installation and registration, the data on Avamar clients is typically backed up automatically by way of regularly scheduled backups initiated by the Avamar server. Backed up data can be restored by a system administrator using Avamar Administrator. However, you can also initiate on-demand backup and restore operations directly from the Avamar client.

NOTICE

The *EMC Avamar for Windows Server User Guide* provides information on installation, backup, and recovery on Microsoft Windows Server 2008, Windows Server 2008 Core, Windows Server 2003, and Windows Cluster Server 2003.

IMPORTANT

When performing on-demand backups, you can only initiate a single backup at a time. The Avamar client user interface governs this limitation but if backups are performed from the command line, you must ensure that each on-demand backup operation is complete before initiating another one.

There are two restore interfaces for Windows, Macintosh, and Linux clients:

- Avamar Web Restore
- Avamar client web UI

Use these interfaces to restore directories and files backed up using a file system plug-in. To restore data backed up with other plug-ins, refer to the guide specific to the plug-in.

Use Avamar Web Restore to restore individual files and to restore directories and multiple files as zip files. Certain limitations apply to Avamar Web Restore, as described in "Capabilities and limitations" on page 94.

The Avamar client web UI provides enhanced features for desktop computers and laptop computers. Use the Avamar client web UI to restore a file, restore several files, or restore complete folders. Restore files and folders to their original location or to a new location. Also use Avamar client web UI to launch interactive backups through file system plug-ins.

Restore authority

Avamar client grants you authority to restore a folder or a file only if your login credentials grant operating system Write permission for the restore location.

Also, if you want to restore a folder or file that has the same path and name as one that exists on your computer, your login credentials must authenticate you as the owner of that existing folder or file before Avamar client will restore over it.

Capabilities and limitations

This section describes capabilities and limitations of Avamar Web Restore. These limitations do not apply to the Avamar client web UI.

International character support

Avamar generally supports the use of specific supported international characters in the names of directories, folders, and files. However, proper display of international language characters is contingent on the client computer installed system fonts being compatible with the original language. If you attempt to browse backups that were created with international characters and a compatible font is not installed on the system, then any characters that cannot be resolved by the system are displayed as rectangles. This is a normal limitation of that particular situation and does not affect the ability to restore these directories, folders, or files. The *EMC Avamar Release Notes* provide additional international language support information.

Restoring international characters with web restore

With the Avamar Web Restore feature, restores with directories or multiple files are delivered in the form of a zip file. When unzipping the file, file and directory names with international characters might not restore properly due to inherent limitations in some zip utilities. To correctly restore files with international characters using the Avamar Web Restore feature, use a zip utility that fully supports international characters. Examples of zip utilities that have been confirmed to work properly include:

- Winrar 3.80 or later
- Winzip 12.0 or later
- 7zip 4.65 or later

NOTICE

Microsoft Windows compressed folders are specifically known to not reliably handle international characters and should not be used with the Avamar Web Restore feature.

Restoring encrypted files is not supported

It is not possible to restore encrypted files with the Avamar Web Restore feature. Any files that were encrypted at the time of the original backup are restored as empty (0 byte) files. Contact the Avamar system administrator, who can restore encrypted files using Avamar Administrator.

Avamar Web Restore client-type limitation

You can use the Avamar Web Restore feature to restore data from Windows clients, Macintosh clients, and Linux clients. If you use the Web Restore interface to restore data from other client types, the data is corrupted during the restore process. This applies also to data that originated on a Windows computer, Macintosh computer, or Linux computer but was copied to and backed up from another computer, such as a NetWare server. The data backed up from the NetWare server cannot be restored to the original computer through Avamar Web Restore. If you need to restore data from other client types contact the Avamar system administrator, who can restore the files using Avamar Administrator.

ACLs not preserved by Avamar Web Restore

When you restore folders or files with the Avamar Web Restore feature, ACLs and any other access rights to the folders or files that might have existed on the original client are not preserved.

Mixed backups are not supported

The full backup for a client and all subsequent incremental and differential backups must be stored on either the Avamar server or a single Data Domain system. Avamar does not support any of the following scenarios:

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

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

Wildcard characters not supported during restores

When performing restores from the **avtar** command line, wildcard pattern matching characters, such as asterisk (*) and question mark (?), are not supported. The only way to constrain a restore operation is to define a partial path within the backup (that is, a single file or directory structure) and restore just that data.

Backup always modifies the atime value

On UNIX and UNIX variants, **avtar** will always modify the atime (access time) value for files that are opened and read during the backup. This occurs during an initial backup, if the file has been modified since the last backup or if the client's file cache has been deleted.

Avamar Web Restore for Windows, Mac, and Linux clients

Use Avamar Web Restore to restore files that were backed up from Windows clients, Mac OS X clients, and Linux clients.

For proper display, view Avamar Web Restore in a web browser that provides a viewport that is at least 1024 pixels in width and at least 768 pixels in height.

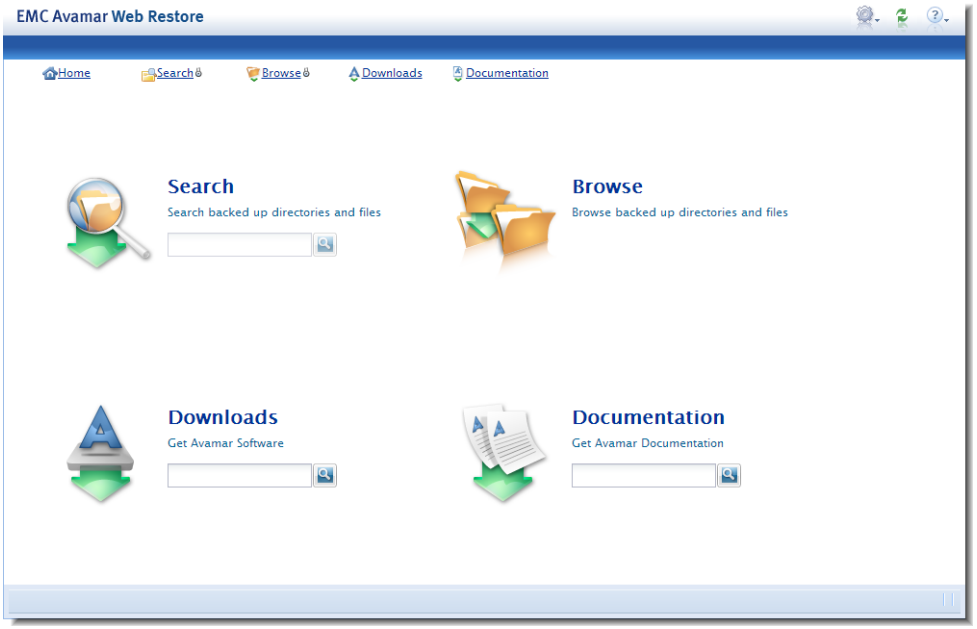
Opening Avamar Web Restore

1. Open a web browser and type the following URL:

   `http://AVAMARSERVER`

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

   You are redirected to the Avamar secure web server. The protocol changes to HTTPS. You may see an alert page if the server's certificate is not accepted by your web browser. Continue to the EMC Avamar Web Restore home page.



2. From the links at the top of the page, click a destination.

   Alternatively, click one of the icons on the body of the page.

Logging in to Avamar Web Restore using LDAP

1. On the home page, from the links at the top of the page, click one of the following:
   - **Search**
   - **Browse**

   Click **Search** to search for files by filename. Click **Browse** to browse through a directory tree for files.

   Alternatively, hover the cursor over the Search or Browse icons on the home page, and click the **Log-in Required** icon that appears.

   The login page appears.
2. In **User ID**, type your username.

   This is the username that you use to log into your company's domain applications; applications that use LDAP v.3-compatible authentication, such as Active Directory. When your username includes a domain segment (@domain), remove that segment.

   For example, if you log in with the username "jsmith@biz.domain.com", use jsmith.
3. In **Password**, type your password.
4. In **Domain**, select **LDAP**.

   The list of LDAP domains appears.
5. From the list of LDAP domains, select the domain of your user account.

   The list only includes domains that an administrator configures Avamar to recognize.
6. Begin the authentication process by using one of the following methods:
   - When you have backups from more than one computer, in **Client Path**, select the Avamar client path for a computer.
   - When you have backups from only one computer, click **Login**.

Avamar Web Restore authenticates your credentials and the page you selected appears.

Logging in to Avamar Web Restore using Avamar

1. On the home page, from the links at the top of the page, click one of the following:
   - **Search**
   - **Browse**

   Click **Search** to search for files by filename. Click **Browse** to browse through a directory tree for files.

   Alternatively, hover the cursor over the Search or Browse icons on the home page, and click the **Log-in Required** icon that appears.

   The login page appears.
2. In **User ID**, type your username.

   Use your Avamar system username.
3. In **Password**, type your password.

4. In **Domain**, select **Avamar**.
5. In the text area of **Domain**, type the full path of the Avamar domain of your computer.

   The path is case-sensitive. The server does not validate the existence of the path that you type.

   For example, if the Avamar server registered your computer in the /clients/accounting domain, type `/clients/accounting`. Typing `/Clients/accounting` does not display the /clients/accounting domain.
6. In **Client Name**, type the client computer's name.

   Use the same name that the Avamar server used to register the computer.
7. Click **Login**.

Avamar Web Restore authenticates your credentials and the page you selected appears.

Performing a restore using Avamar Web Restore

To restore files and folders using Avamar Web Restore:

1. On the EMC Avamar Web Restore home page, from the links at the top of the page, click one of the following:

   - **Search**
   - **Browse**

   Click **Search** to search for files by filename. Click **Browse** to browse through a directory tree for files.
2. Log in.
3. Using either search or browse, select files and folders.
4. Click the Download icon.

   When you select multiple files, Avamar Web Restore combines all selections into one zip file that retains the relative path structure of the source. When you select only one file, Avamar Web Restore does not place it in a zip file.

   Avamar Web Restore sends the file to your web browser.
5. Save the zip file or individual file on your computer.

   Open zip files using a zip utility.

Windows clients

Avamar Client for Windows initiates on-demand backups and restores using the Avamar client application. This application is accessible through the system tray icon.

Restore requirement

To restore files to a Windows computer, the logged in account must have the Windows "Restore files and directories" user right assigned to it in Local Security. This user right is assigned by default to an account if it is a member of either the Administrators or Backup Operators groups.

An account that is not a member of either of these groups, or of another group that includes this user right, must have this right assigned, either through group membership or individual assignment, before it can be used to restore files.

Network optimization

Avamar Client for Windows is designed to minimize network and server load by blocking a backup request if you currently have an on-demand or a scheduled backup running or waiting to run. A message is displayed when this occurs.

Performing a single-click backup

You can launch an on-demand backup with a single click on the Avamar Client for Windows context menu. This backup does not open a user interface.

The backup dataset depends on whether the client is running a server version of the Windows operating system, as shown in Table 8.

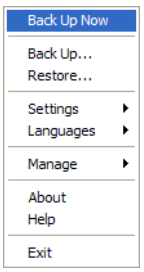
Table 8 Backup datasets for Windows operating systems

Windows OS type	Dataset
Non-server	Dataset for each of the computer's assigned groups.
Server	Default dataset.

To start a single-click backup:

1. Right-click the Avamar icon in the system tray.

   The context menu appears.



2. Click **Back Up Now**.

   The backup request is sent to the server.

Performing an interactive backup

You can launch an on-demand backup using the Avamar client web UI. This interactive backup permits the selection of:

- **Dataset by group** — Choose to back up the dataset of any of the assigned groups for the computer.
- **Specific backup sets** — Select individual files, multiple files, and directories to include in the backup. This feature must be administratively enabled.

To start an interactive backup:

1. Right-click the Avamar icon in the system tray and select **Back Up...** from the context menu.

   The Backup page opens in a web browser. This page displays information about the dataset and backup schedule for each of the groups for the computer.

2. Review the available policy trees, and select the appropriate backup group.

   If the computer is in only one backup group, only one policy tree appears.

   NOTICE

   If the Backup page includes the Select Now button, you can select the files and directories to include in the backup instead of selecting a backup group. The online help describes how to use this feature.

3. Click **Back Up Now**.

Performing a restore using Avamar client web UI

You can initiate an on-demand restore using the Avamar client web UI from the Avamar icon in the system tray. The web UI opens in the default web browser for the computer.

From the web UI, use the Search page to search for files and directories by name; or use the Browse page to find files and directories using a familiar directory tree view. Using either method, you can select and restore any of the retained versions of a file.

To restore files and directories using the Avamar client web UI:

1. Right-click the Avamar icon in the system tray and select **Restore...** from the context menu.

   The web UI opens in the default web browser.

   Depending on the Avamar server settings, a login screen may appear. If so, log in. The web UI opens with the Search page. To use the Browse page instead, select Browse from the side menu.

2. (Optional) Select an alternate computer as the backup source.

   This feature is described in the online help.

3. Use the **Search** page or the **Browse** page to add folders and files to the restore set.

4. Choose how to name the restored files:
   - Select **New Name** to assign an automatically generated new name to each file that you restore.
   - Select **Overwrite Existing File** to retain the names of all files in the restore set.
5. (Optional) Select a new restore location:
   a. Click **Browse**.

      The location browser appears and displays a list of folders on the computer.

   b. Select a folder for the restore location.
   c. Click **Select Folder**.

      The location tool closes and the new restore location is listed in Restore to.
6. Click **Restore**.

Getting status

The Avamar Client status window provides information about backup and restore tasks. It also provides supplementary access to local settings and logs for Avamar client.

To view the status of backup and restore tasks from the Avamar client:

1. Right-click the Avamar icon.

   The context menu appears.
2. Select **Manage › View Console**.

   In-progress and completed backups appear in the main window pane of the Avamar Client status window. Access to local settings and logs is available through the menu bar.

Client notification settings

You can configure Avamar Client for Windows to display or hide client notifications. These notifications are enabled by default. The client notifications are:

- **Backup Reminder**—Reminder that appears after a set number of days have elapsed since the last backup. Possible values are: **1**, **2**, **3**, **4**, **5**, **6**, **7**, or **Never**.
- **Balloon Messages**—Task messages that appear in balloons near the Avamar icon.

To enable or disable client notifications:

1. Right-click the Avamar icon in the system tray.

   The context menu appears.
2. On **Settings › Show Backup Reminder**, select a setting.

   A checkmark appears next to the selected setting.
3. On the **Settings** submenu, click **Show Balloon Messages**.

   When a checkmark appears, the balloon messages appear. When the checkmark is cleared, the balloon messages do not appear.

Balloon messages are brief messages that appear near the Avamar icon. The following table describes these messages.

Table 9 Avamar balloon message descriptions

Message	Description
Backup Started	An automatic backup starts, and an on-demand backup task is received.
Backup Finished	Either an automatic backup or an on-demand backup finishes.
Backup Canceled	A backup (automatic or on-demand) is canceled through the Progress window, the console, or administrative action.
Restore Started	A restore task is received from the web UI. One message for each separately selected folder, and for each folder that contains selected files.
Restore Finished	A restore task finishes.
Restore Canceled	A restore is canceled through the Progress window, the console, or administrative action.
Upgrade Started	An upgrade of the Avamar Client for Windows software started.
Upgrade Finished	An upgrade of the Avamar Client for Windows software finished successfully.
Upgrade Failed	An upgrade of the Avamar Client for Windows software failed.

Progress window

The Progress window provides a visual means of determining the progress of an Avamar Client for Windows task, and enables you to pause or cancel the task.

By default the Progress window appears whenever a task starts.

You can change the setting so that the window is hidden. However, while the window is hidden, you cannot pause backups.

To show or hide the Progress window:

1. Right-click the Avamar icon in the system tray.

   The context menu appears.

2. On the **Settings** submenu, click **Show Progress Bar**.

   When a checkmark appears, the Progress window appears. When the checkmark is cleared, the Progress window does not appear.

Canceling a backup

To cancel an automatic or on-demand backup, click **Stop** on the **Progress** window.

Pausing a backup

You can pause manual and automatic backups for up to 30 minutes. When you restart a paused backup, the backup resumes at the point it was paused. After 30 minutes, the backup resumes automatically.

Avamar Client for Windows is designed so that backups have a low impact on system resources. However, you may pause a backup to reclaim resources. When paused, a backup uses minimal system resources.

To pause a backup, click **Pause** on the **Progress** window. To resume a backup, click **Resume**.

Mac OS X clients

You can initiate on-demand backups and restores using the Avamar for Mac OS X Client, located in the Applications folder. By default, this application is launched at login. All features and actions are accessible through its icon on the menu bar.

Network optimization

The Avamar for Mac OS X Client is designed to minimize network and server load by blocking a backup request if you currently have an on-demand or a scheduled backup running or waiting to run. A message is displayed when this occurs.

Performing a single-click backup

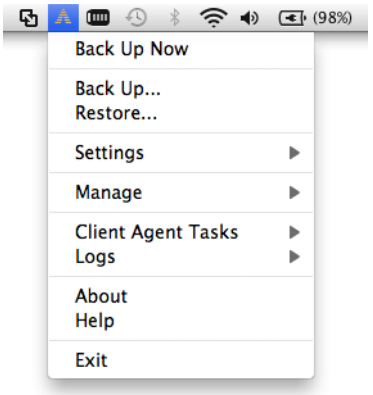
You can launch an on-demand backup with a single click on the Avamar for Mac OS X Client context menu. This backup does not open a user interface.

A single-click backup includes the dataset for each of the assigned groups for the computer.

To start a single-click backup:

1. Click the Avamar icon on the menu bar.

   The context menu appears.



2. Click **Back Up Now**.

Performing an interactive backup

You can launch an on-demand backup using the Avamar client web UI. This interactive backup permits the selection of:

- **Dataset by group**—Choose to back up the dataset of any of the computer assigned groups for the computer.
- **Specific backup sets**—Select individual files, multiple files, and directories to include in the backup. This feature must be administratively enabled.

To start an interactive backup:

1. Click the Avamar icon on the menu bar, and then click **Back Up** from the context menu.

   The Backup page opens in the web browser. This page displays information about the dataset and backup schedule for each of the groups for the computer.

2. Review the available policy trees, and select the appropriate backup group.

   If the computer is in only one backup group, only one policy tree appears.

   NOTICE

   If the Backup page includes the Select Now button, you can select the files and directories to include in the backup instead of selecting a backup group. The online help describes how to use this feature.

3. Click **Back Up Now**.

Performing a restore using Avamar client web UI

You can initiate on-demand restores from the Avamar icon on the menu bar using the Avamar client web UI. The web UI opens in the default web browser.

From the web UI, use the Search page to search for files and directories by name; or use the Browse page to find files and directories using a familiar directory tree view. Using either method, you can select and restore any of the retained versions of a file.

To restore files and directories using the Avamar client web UI:

1. Click the Avamar icon on the menu bar, and then click **Restore** from the context menu.

   The web UI opens in the default web browser.

   Depending on the Avamar server settings, a login screen may appear. If so, log in.

   The web UI opens with the Search page. To use the Browse page instead, select Browse from the side menu.

2. Use the **Search** page or the **Browse** page to add folders and files to the restore set.
3. Choose how to name the restored files:
   - Select **New Name** to assign an automatically generated new name to each file that you restore.
   - Select **Overwrite Existing File** to retain the names of all files in the restore set.
4. (Optional) Select a new restore location:
   a. Click **Browse**.

      The location browser appears and displays a list of the folders on the computer.

   b. Select a folder for the restore location.
   c. Click **Select Folder**.

      The location tool closes, and the new restore location is listed in Restore to.
5. Click **Restore**.

Getting status

The Work Order List window provides information about backup and restore tasks. It also provides supplementary access to local settings and logs for the Avamar client.

To view the status of backup and restore tasks:

1. Click the Avamar icon on the menu bar.

   The context menu appears.

2. Select **Manage** › **View Console**.

Backup reminder

You can configure the Avamar for Mac OS X Client to display or hide the backup reminder. This notification is enabled by default. The backup reminder appears when more than 24 hours have elapsed since the last backup.

To enable or disable the backup reminder:

1. Click the Avamar icon on the menu bar.

   The context menu appears.

2. On **Settings** › **Show Backup Reminder**, select a setting.

   The possible values are: **1**, **2**, **3**, **4**, **5**, **6**, or **7** days, or **Never**.

   A checkmark appears next to the selected setting.

Progress window

The Progress window provides a visual means of determining the progress of an Avamar for Mac OS X Client task. It also enables you to pause or cancel the task.

By default the Progress window appears whenever a task starts.

You can change this setting so that the window is hidden. However, while the window is hidden, you cannot pause backups.

To show or hide the **Progress** window:

1. Click the Avamar icon on the menu bar.

   The context menu appears.

2. On the **Settings** submenu, click **Show Progress Bar**.

   When a checkmark appears next to the option, then the **Progress** window appears. When the checkmark is cleared, then the **Progress** window does not appear.

Canceling a backup

To cancel an automatic or manual backup, click **Stop**.

Pausing a backup

You can pause manual and automatic backups for up to 30 minutes. When you restart a paused backup, the backup resumes at the point it was paused. After 30 minutes, the backup resumes automatically.

Avamar for Mac OS X Client is designed so that backups have a low impact on system resources. However, you may pause a backup to reclaim resources. When paused, a backup uses minimal system resources.

To pause a backup, click **Pause** on the **Progress** window. To resume a backup, click **Resume**.

Linux clients

The following sections describe tasks you can initiate for Linux clients:

- "Full backup using avscc command" on page 109
- "Interactive backup and restore using Avamar client web UI" on page 109
- "Backup and restore using avtar commands" on page 112

Back up and restore of Linux clients can also be performed using avtar commands from the command line as described in "AIX, FreeBSD, HP-UX, Linux, and Solaris clients" on page 112.

Full backup using avscc command

Running avscc at the command line with the backupnow flag backs up Linux clients much the same as a single-click backup of a Windows or Mac computer.

This command launches a backup of the source dataset for each group assigned to the client and includes any additional source added through the web UI.

To initiate a backup using avscc:

1. Open a command shell.
2. Change the working directory to the location of the **avscc** executable by typing:

   ```
   cd /usr/local/avamar/bin
   ```

3. Invoke **avscc** with the **backupnow** flag by typing:

   ```
   avscc --command=backupnow
   ```

   The invoked instance of **avscc** submits a backup request to the server and exits. The server schedules and runs the backup task.

Interactive backup and restore using Avamar client web UI

You can perform interactive backups and restores using a web browser to access the Avamar client web UI.

Linux clients require the following environment to use these features:

- Desktop environment with a window system
- Firefox 3.0 or newer web browser that is configured to be launched by a call to one of the following environment variables:
  - (For KDE) kfmclient
  - (For GNOME) gnome-open
  - (Others) BROWSER

Performing a backup

When you perform an on-demand backup through the Avamar client web UI, you can select:

- **Dataset by group**—Choose to backup the dataset of any of the assigned groups for the computer.
- **Specific backup sets**—Select individual files, multiple files, and directories to include in the backup. This feature must be administratively enabled.

To initiate an on-demand backup using the web UI:

1. Open a command shell.
2. Change the working directory to the location of the **avscc** executable by typing:

   ```
   cd /usr/local/avamar/bin
   ```

3. Invoke **avscc** with the **backup** flag by typing:

   ```
   avscc --command=backup
   ```

   The login window appears in the web browser.
4. Log in to the web UI.

   The Backup page opens in a web browser. This page displays information about the dataset and backup schedule for each of the groups for the computer.
5. Review the available policy trees, and select the appropriate backup group.

   If there is only one backup group for the computer, then only one policy tree appears.

   NOTICE

   If the Backup page includes the Select Now button, you can select the files and directories to include in the backup instead of selecting a backup group. The online help describes how to use this feature.
6. Click **Back Up Now**.

Performing a restore

You can initiate an on-demand restore through the Avamar client web UI. Use this interface to select and restore single files, multiple files, and directories. You can restore files and directories to their original location or to a new location.

To initiate an on-demand restore using the web UI:

1. Open a command shell.
2. Change the working directory to the location of the **avscc** executable by typing:

   ```
   cd /usr/local/avamar/bin
   ```

3. Invoke **avscc** with the **restore** flag by typing:

   ```
   avscc --command=restore
   ```

   The login window appears in the web browser.

4. Log in to the web UI.

   The Search page appears. To use the Browse page instead, select **Browse** from the side menu.

5. Use the **Search** page or the **Browse** page to add folders and files to the restore set.
6. Choose how to name the restored files:
   - Select **New Name** to assign an automatically generated new name to each file that you restore.
   - Select **Overwrite Existing File** to retain the names of all files in the restore set.
7. (Optional) Select a new restore location:
   a. Click **Browse**.

      The location browser appears and displays a list of the folders on the computer.

   b. Select a folder for the restore location.
   c. Click **Select Folder**.

      The location tool closes and the new restore location is listed in Restore to.

8. Click **Restore**.

AIX, FreeBSD, HP-UX, Linux, and Solaris clients

This section describes on-demand back up and restore for AIX, FreeBSD, HP-UX, Linux, and Solaris clients.

Back up and restore of Linux clients can also be performed using **avscc** commands and the web UI, as described in "Linux clients" on page 109.

Backup and restore using avtar commands

AIX, FreeBSD, HP-UX, Linux, and Solaris clients can initiate on-demand backups and restores using the **avtar** command line.

NOTICE

Space limitations in this guide causes the examples in this topic to continue (wrap) to more than one line. However, you must type all commands and options in a command shell on a single command line (no line feeds or returns allowed).

Performing an on-demand backup

Back up AIX, FreeBSD, HP-UX, Linux, and Solaris clients on-demand from the command line using an **avtar** command in the following basic format:

```
avtar -c --label=NAME FILE1 [FILE2 ... ] DIR1 [DIR2 ... ] --id=USER
```

where:

- NAME is a short descriptive name for the backup.
- FILE1 [FILE2 ...] DIR1 [DIR2 ...] is a space-separated list of filepaths and directory paths to include in the backup.
- USER is the username to use for authentication.

  This must be the username of an Avamar internal user account and use the format USERNAME@DOMAIN, where USERNAME is the username of the account and DOMAIN is the authentication domain for the account.

The following example backs up files within the MyFiles and abcd directories on a Linux computer, and labels the backup jdoeFiles:

```
/usr/local/avamar/bin/avtar -c --label="jdoeFiles"
    MyFiles/ abcd/ --id=jdoe@avamar/clients/MyClient
```

Performing a restore

Restore files to AIX, FreeBSD, HP-UX, Linux, and Solaris clients from the command line using an **avtar** command in the following basic format:

```
avtar -xv --label=NAME --before=DATE --after=DATE FILE1 [FILE2 ... ]
   DIR1 [DIR2 ... ] --target=PATH --id=USER
```

where:

- NAME is a short descriptive name for the backup.
- DATE is the endpoint date for backups used in the restore. When used with **after**, all backups on or after DATE are included. When used with **before**, all backups on or before DATE are included. When both are used a time span can be expressed.

  DATE is formatted as YYYY-MM-DD HH:MM:SS. The value of DATE may be truncated to reduce its specificity. For example, YYYY is acceptable.
- FILE1 [FILE2 ...] DIR1 [DIR2 ...] is a space-separated list of filepaths and directory paths to include in the restore.
- PATH is the top level directory of a new restore location for the files and directories in the restore.

  When **--target=**PATH is not included in the restore command, files and directories are restored to their original location. In that case, files are not overwritten unless the **overwrite** option is included, using the following format:

  ```
  --overwrite={always | modified | newest | newname}
  ```

  where:

  - always—Replaces any file existing on the client with a back up from the same filepath.
  - modified—Replaces any file existing on the client with a back up from the same filepath, unless the date/time stamp of the backed up file is the same as the existing file.
  - newest—Replaces any file existing on the client with a back up from the same filepath, only if the date/time stamp of the backed up file is newer than the date/time stamp of the existing file.
  - newname—Restores a file that matches the filepath of a file existing on the client but appends a version number to the restored file to prevent overwritting the existing file.
- USER is the username to use for authentication.

  This must be the username of an Avamar internal user account and use the format USERNAME@DOMAIN, where USERNAME is the username of the account and DOMAIN is the authentication domain for the account.

The following example restores all of the files found in the backup labeled newsletters that were created before the indicated date and time into the old_newsletters directory on an HP-UX or Solaris computer.

```
/opt/AVMRclnt/bin/avtar -xv --target="old_newsletters"
    --before="2011-12-1 15:00:00"
    --id=jdoe@avamar/clients/MyClient --label="newsletters"
```

The following example restores files found in the abcd and MyFiles directories in the backup labeled newsletters into the old_newsletters directory on a Linux computer.

```
/usr/local/avamar/bin/avtar -xv --label="newsletters"
    --target="old_newsletters" abcd/ MyFiles/
    --id=jdoe@avamar/clients/MyClient
```

Getting status using the command line

Get status of AIX, FreeBSD, HP-UX, Linux, and Solaris clients from the command line using an avtar command in the following basic format:

```
avtar {--backups | --list} --verbose=LEVEL --label=NAME --after=DATE
   --before=DATE --count=NUMBER --id=USER
```

where:

- LEVEL isthe level of verbosity returned by the command.
- DATE is the endpoint date for backups used in the restore. When used with **after**, all backups on or after DATE are included. When used with **before**, all backups on or before DATE are included. When both are used a time span can be expressed.

  DATE is formatted as YYYY-MM-DD HH:MM:SS. The value of DATE may be truncated to reduce its specificity. For example, YYYY is acceptable.
- NUMBER isthe number of backups to list. If not specified, all backups are listed.
- NAME is a short descriptive name for the backup.
- USER is the username to use for authentication.

  This must be the username of an Avamar internal user account and use the format USERNAME@DOMAIN, where USERNAME is the username of the account and DOMAIN is the authentication domain for the account.

The following example uses **--backups** to display information about the three most recent backups created after the indicated date and time. Verbose (status and warning) messages are enabled, and the command path is correct for a Linux client.

```
/usr/local/avamar/bin/avtar --backups --verbose --count=3
    --after="2011-4-1 11:17:33"--id=jdoe@avamar/clients/MyClient
```

The following example uses **--list** to list files and directories inside the backup labeled jdoeFiles that were created before the indicated date and time. Highly verbose (**--verbose=2**) messages are enabled, and the command path is correct for an HP-UX or Solaris computer.

```
/opt/AVMRclnt/bin/avtar --list --verbose=2 /myfiles/rem
    --label="jdoeFiles" --before="2011-12-1 04:30:15"
    --id=jdoe@avamar/clients/MyClient
```

CHAPTER 13
Solaris Zones

The following topics present additional information about using the Avamar Client for Solaris to protect Solaris Zones:

- Important terms and concepts 116
- Capabilities and limitations 116
- Installation and configuration 117
- Non-global zone disaster recovery 119

Important terms and concepts

This topic introduces important terms and concepts that you should be familiar with before you deploy Avamar in a Solaris 10 Zones environment.

- **Solaris 10 containers**—As an integral part of the Solaris 10 operating system, Solaris Containers isolate software applications and services by using flexible, software-defined boundaries. Solaris Containers allow many private execution environments to be created within a single instance of the Solaris operating system. Each environment has its own identity, separate from the underlying hardware, yet behaves as if it is running on its own system, making consolidation simple, safe, and secure.
- **Solaris 10 zones**—Solaris Zones are part of a Solaris Container, delivering security, application fault, and namespace isolation. A Solaris Zone is a virtual environment that has security and application fault containment plus its own namespace that can be tailored to the application that runs in it.
- **Global and non-global zones**—One zone is always designated as and named the "global zone." Global zones provide a structure within which other "non-global" zones can be created.

  The global zone encompasses all processes running on the system, regardless of whether these processes run within a non-global zone.

  "Non-global zone" is used rather than "local zone" because, in the context of Solaris zones, "local" is not an antonym of "global."

Capabilities and limitations

The following sections provide information about Avamar Client for Solaris capabilities and limitations:

- "Installation errors can occur with earlier version software" on page 116
- "Avagent restart limitation" on page 116

Installation errors can occur with earlier version software

If you install earlier versions of Avamar Client for Solaris software in non-global zones, then the following error may appear:

```
pkgadd: ERROR: postinstall script did not complete successfully
```

You can safely ignore this error as it is incorrect—the software did install correctly. Furthermore, version 3.7.2.94 and later software does not return this error.

Avagent restart limitation

If you restart the **avagent** process from the global zone, it forcibly terminates all **avagent** processes (both global and non-global), but only restarts the **avagent** process in the global zone. If you install Avamar Client for Solaris software in non-global zones, then you must manually restart each **avagent** process in each non-global zone. Restarting the **avagent** processes directly from the non-global zone works as expected.

Installation and configuration

You can install the Avamar Client for Solaris software in the global zone or in individual non-global zones. The only difference is whether you begin the installation sequence from the global zone or from a non-global zone.

Installing Avamar Client for Solaris software in the global zone

1. Open a command shell and log in as root.
2. Log in to the global zone.

   The "global#" prompt indicates that you are successfully logged in to the global zone.
3. Perform the following installation tasks:

   a. "Downloading the install package" on page 62

   b. "Installing and registering" on page 63

Installing Avamar Client for Solaris software in a non-global zone

1. Open a command shell and log in as root.
2. Log in to the global zone.

   The "global#" prompt indicates that you are successfully logged in to the global zone.
3. From the global zone, log in to the desired non-global zone.

   The shell prompt should change from "global#" to some other zone designation.
4. Perform the following installation tasks:

   a. "Downloading the install package" on page 62

   b. "Installing and registering" on page 63

Ensuring backup of all non-global zone configurations

Use the following procedure to back up and restore global zone data: "AIX, FreeBSD, HP-UX, Linux, and Solaris clients" on page 112.

Keep in mind, however, that to successfully restore non-global zone data, a current copy of the non-global zone configuration must exist on the Avamar server.

NOTICE

Attempting to restore non-global zone data without current zone configuration information might result in loss of data.

There are two methods to export and save a non-global zone configuration:

- "Manually exporting and saving a non-global zone configuration" on page 118
- "Automatically exporting and saving a non-global zone configuration" on page 118

The advantage to the second method is that each time you perform a backup, the zone configuration is automatically saved with the backup.

Manually exporting and saving a non-global zone configuration

1. Open a command shell and log in to the global zone as root.

   The "global#" prompt indicates that you are successfully logged into the global zone.

2. Print each non-global zone configuration and direct it to a file by typing:

   zonecfg -z zone1 export > zone1.config

   where zone1 is the non-global zone configuration to back up.

3. Place this configuration file in a location that ensures that it is included in the next backup by the Avamar server.

4. Repeat steps 2–3 for each global zone you back up.

Automatically exporting and saving a non-global zone configuration

The best practice to back up the zone configuration is to create a preprocessing script that exports and saves the zone configuration each time a backup occurs.

1. Open a command shell and log in to the global zone as root.

   The "global#" prompt indicates that you are successfully logged in to the global zone.

2. Use a UNIX text editor to create a separate preprocessing script for each non-global zone in the /opt/AVMRclnt/etc/scripts directory.

   For example, the following command creates the zone1_config.sh preprocessing script for the zone1 non-global zone:

   vi /opt/AVMRclnt/etc/scripts/zone1_config.sh

   Each script should contain the following entries:

   ```
   #!/usr/bin/sh
   zonecfg -z zone1 export > /zone_configs/zone1.config
   ```

   where zone1 is the non-global zone name.

3. Save the changes.

4. Create an Avamar dataset for each non-global zone to back up:

   a. In Avamar Administrator, select **Tools › Manage Datasets**.

      The Manage All Datasets window appears.

   b. Click **New**.

      The New Dataset dialog box appears.

   c. Type a name for the new dataset.

      Do not use any of the following characters in the dataset name: ~!@$^%(){}[]|,`;#\/:*?‹›'"&.

   d. Click the **Source Data** tab.

   e. Select **Enter Explicitly**, and select **Solaris File System** from the **Select Plug-in Type** list.

   f. Select **Select All Data for All Local File Systems**.

g. Click the **Options** tab.

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

i. In the **Run user-defined script at beginning of backup** text box in the **Pre-Script** section of the **Options** tab, type the name of the preprocessing script, such as zone1_config.sh.

j. Click **OK**.

5. Repeat steps 2–4 for each non-global zone to back up.

Non-global zone disaster recovery

As previously mentioned, restoring global zone data is performed by using the procedure provided in "AIX, FreeBSD, HP-UX, Linux, and Solaris clients" on page 112.

To perform disaster recovery of the entire non-global zone, use one of the following procedures:

- "Restoring an entire non-global zone from a global zone backup" on page 119

  This is the recommended method. Information about backing up and restoring global zone data is in "AIX, FreeBSD, HP-UX, Linux, and Solaris clients" on page 112.

- "Restoring an entire non-global zone from a non-global zone backup" on page 120

Redirected restores are supported. Any zone that has been backed up from one machine can be restored to a different machine, provided that the new target machine has the same operating system, software packages and dependencies as the original machine.

Restoring an entire non-global zone from a global zone backup

To restore a non-global zone from a global zone backup, first restore the zone configuration file to a temporary directory in the global zone. Then restore the rest of the non-global zone. This requires two separate restore operations.

1. In Avamar Administrator, restore only the zone configuration file to a temporary directory in the global zone.

   Do not restore any other files at this time.

2. Open a command shell and log in to the global zone as root.

   The "global#" prompt indicates that you are successfully logged into the global zone.

3. Type:

   ```
   cd /tmp
   ```

   where /tmp is the temporary directory in the global zone.

4. Specify that the zone1.config file should be used when re-creating the zone by typing:

   ```
   zonecfg -z zone1 -f zone1.config
   ```

5. Install the zone by typing:

   ```
   zoneadm -z zone1 install
   ```

6. To prevent the system from displaying sysidtool prompts on initial zone login, delete the .UNCONFIGURED file by typing:

   rm /export/home/zones/zone1/root/etc/.UNCONFIGURED

7. Return to Avamar Administrator and restore the remaining non-global zone files and directories.

   During the restore, include the **--restoresystem** advanced plug-in option.

   The *EMC Avamar Administration Guide* provides additional information about supplying advanced plug-in options.

8. Return to the command shell session.

9. After the restore completes, boot up the zone by typing:

   zoneadm -z zone1 boot

10. Confirm that the zone is running by typing:

    zoneadm list -cv

    The following appears in the command shell:

    ```
    ID  NAME       STATUS     PATH            BRAND   IP
    0   global     running    /               native  shared
    4   zone1      running    /zones/zone1    native  shared
    ```

11. Confirm that you can log in to the zone by typing:

    zlogin zone1

Restoring an entire non-global zone from a non-global zone backup

1. In Avamar Administrator, restore only the zone configuration file to a temporary directory in the global zone.

   Do not restore any other files at this time.

2. Open a command shell and log in to the global zone as root.

   The “global#” prompt indicates that you are successfully logged into the global zone.

3. Type:

   cd /tmp

   where /tmp is the temporary directory in the global zone.

4. Specify that the zone1.config file should be used when re-creating the zone by typing:

   zonecfg -z zone1 -f zone1.config

5. Install the zone by typing:

   zoneadm -z zone1 install

6. To prevent the system from displaying sysidtool prompts on initial zone login, delete the .UNCONFIGURED file by typing:

   rm /export/home/zones/zone1/root/etc/.UNCONFIGURED

7. Boot up the zone by typing:

   zoneadm -z zone1 boot

8. Confirm that the zone is running by typing:

   zoneadm list -cv

   The following appears in the command shell:

```
ID  NAME     STATUS    PATH          BRAND    IP
0   global   running   /             native   shared
4   zone1    running   /zones/zone1  native   shared
```

9. Log in to the zone by typing:

   zlogin zone1

10. Reinstall the Avamar Client for Solaris software in the non-global zone, and register it with the Avamar server.

    NOTICE

    It might be necessary to deactivate this non-global zone client instance from the Avamar server to successfully reactivate it with the Avamar server.

11. Return to Avamar Administrator, and restore the remaining non-global zone files and directories.

    NOTICE

    Sun Microsystems has recommended that no shared LOFS file systems be restored from within a non-global zone. By default, Avamar does not traverse any LOFS or NFS file systems during backups, so this should not be an issue.

APPENDIX A
Novell NSS Volumes

The following topics describe Avamar support for Novell Storage Services (NSS) volumes on Novell Open Enterprise Server (OES) Linux:

- Overview 124
- Capabilities and limitations 124
- Additional resources 124

Overview

Novell Storage Services (NSS) is the file system originally created for NetWare.

With the introduction of Novell Open Enterprise Server (OES) Linux, Novell made its common services available on this operating system. By doing so, it has provided an easier migration path for customers wishing to deploy Linux in their environments. Therefore, you can create NSS volumes on and manage them from Linux.

Novell Open Enterprise Server (OES) Linux has introduced a new feature, XAttr Extension for Novell Storage Services (NSS), which allows easy backup and restore of NSS file metadata.

Capabilities and limitations

Consider the following capabilities and limitations.

Files hosted on NSS volumes

To maintain data integrity of transactional systems that use files hosted on NSS volumes, shut down those applications before you initiate a backup.

Lack of snapshot support

There is no snapshot support for NSS on OES Linux.

OES Linux local eDirectory database

The OES Linux local eDirectory database is not included in backups.

Additional resources

Table 10 Additional resources on Novell NSS volumes

Topic	Location	File name
Novell Storage Services	Novell web site	nss_enu.pdf
Linux User Management	Novell web site	lumadgd.pdf

APPENDIX B
Tuning Client Caches

The following topics describe Avamar client caches and how to tune them to enhance backup performance:

- Demand-paging cache 126
- File cache 127
- Demand-paging cache example scenario 127
- Cache migration after upgrading the client 128

Demand-paging cache

Demand-paging cache is the new method for managing Avamar file and hash caches. File and hash caches store information about data that has been backed up to the Avamar server. Starting with Avamar 7.0, demand-paging cache replaces the original Avamar caching implementation for all client backups.

Demand-paging cache improves the **avtar** program's capacity to handle a file cache for large file systems by enabling the system to automatically determine the optimal in-RAM cache size for the client environment and to adjust the cache size as needed. Demand-paging cache reduces memory consumption by removing the need to store the entire cache in memory for each instance of **avtar**.

Figure 1 on page 126 contrasts the original monolithic cache implementation with the demand-paging cache implementation.

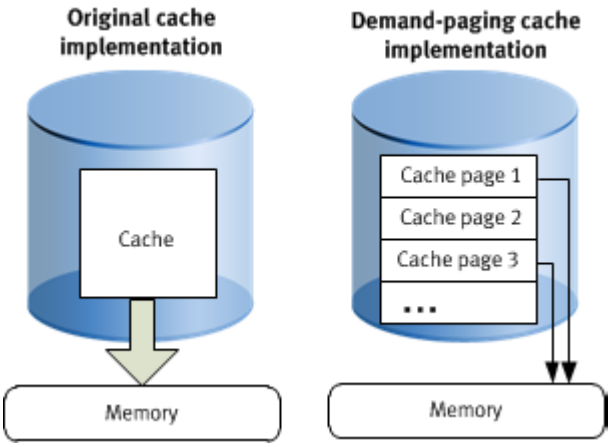


Figure 1 Monolithic cache implementation compared to page cache

The original cache implementation stored cache information in the f_cache.dat file. The demand-paging cache feature uses a new cache file, f_cache2.dat, which is stored in the var directory. Because the demand-paging cache files use unique names, the demand-paging cache feature does not interfere with the original cache file, f_cache.dat. The *EMC Avamar Operational Best Practices* for earlier releases of Avamar provides more information about the original monolithic cache implementation.

Demand-paging cache divides the cache into a series of pages. All pages that belong to a backup are kept in a page list. Not all of these pages are memory-resident, but are brought into memory in time order. Demand-paging cache keeps a subsampled list of hashes for each page in memory to handle out-of-order access. This list is called the champion list.

Files that are larger than a threshold size are designated as "must have entries." These entries almost always are added to the champion list. If a hash is not in the pages in memory, but is in the champion list, the associated page is read into memory. A semi-random selection process designates champions beyond those that are designated as "must have" entries.

File cache

File cache management is implemented by using pages from f_cache2.dat. The **avtar** process loads pages, as needed, from f_cache2.dat into RAM instead of the entire file.

The original file cache implementation uses approximately 1 GB of disk space and 1 GB of RAM to track approximately 10 million files when **avtar** is running. This data is shared among all of the 16 backups that can be stored in the cache file. This method imposes limits on the maximum size of file systems that Avamar can back up. Demand-paging cache removes this size limitation.

Demand-paging cache requires 1 GB of disk space to track approximately 10 million files during a backup. The demand-paging file cache can store up to 16 backups worth of nonshared information, which means that the file cache for a normal use case can use approximately 20 GB of disk space. In comparison to the original file cache method, backups that implement the demand-paging file cache require up to 20 times more disk space.

Demand-paging cache, however, enables RAM utilization to remain fairly flat at a much lower size regardless of the number of files in the file system. Automatic tuning can change the actual RAM utilization amount.

Demand-paging cache example scenario

Each page consists of 100,000 entries and 15,000 champions.

NOTICE

The entries and champion sizes are the maximums per page. The actual utilization is about 60% to 70% of that maximum because of the characteristics of the hash tables, which are used here for their fast access.

For the file cache, each entry is 64 bytes, or 6.4 MB per page and each champion is 20 bytes or 300 KB per page.

On disk, the champions are stored with the entries that give a size of about 6.7 MB for each page of the file cache. There is some overhead, but it is a very small percentage of the total size, and usually not relevant.

In RAM, the champions are stored separately. The page sizes are about 6.4 MB for the file cache. The champions are brought into RAM in a single array that contains all of the champions for all of the applicable backups in the cache.

The file cache required for 40 M files is approximately 616 pages: 40 M / 65,000 (estimated) or 4.13 GB on disk (616 * 6.7 MB).

Auto-tuning alters the number of pages stored in memory based on the size of previous backups and other factors, including the actual memory available to the process. The values may be considerably smaller or larger, based on previous backups requirements.

Cache migration after upgrading the client

After you upgrade a client to Avamar 7.0, the demand-paging cache feature automatically migrates the contents of the f_cache.dat file to the new cache file during **avtar** backup operations.

The migration runs when **avtar** determines that demand-paging cache files do not exist or exist but are not valid, or when **avtar** finds that the f_cache.dat files and their relative timestamps fit within the migration period.

The default migration period is 14 days. You can change the default migration period by specifying the **---cache-migration-period** option with the **avtar** command. Memory improvements from the use of the demand-paging cache feature are not noticeable until after the migration completes. Memory use increases slightly during the migration period since **avtar** uses both forms of cache at the same time.

After the migration period ends, the backup process no longer checks the original cache. After 180 days, the **avagent** process automatically deletes the old cache files. You can change the default time period of 180 days by specifying the **---cachelifetime=***DAYS* option with the **avagent** command.

At any time, you can prevent a client migration by removing the f_cache.dat and file before you run an **avtar** backup. You can also prevent a migration by performing one of the following alternatives:

- To prevent a cache migration, run **avtar** with the **--nocache** option. Use of the **--nocache** option stops all caching. Use the **-nocache** option with caution.
- To prevent only a file cache migration, run **avtar** with **--enable-filecache=false** option.

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