EMC® AVAMAR®
BACKUP CLIENTS
5.0

USER GUIDE
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TABLE OF CONTENTS

FOREWORD

Scope and Intended Audience

Scope. This publication describes how to install and use Avamar client software to backup and restore client data.

Intended Audience. The information in this publication 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.

Product Information

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

Your Comments

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

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Please include the following information:

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

Typeface Conventions

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

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

Notes, Tips and Warnings

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

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

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

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

BEFORE YOU INSTALL

Before installing any Avamar software, perform the following:

1. Ensure that you have operating system root (Linux and Unix) or Administrator (Windows) privileges on the client computer.
2. Ensure that the Avamar server is operational and present on the same network as the client computer.

   You can verify this by opening a command shell on the client computer and typing the following:

   `ping AVAMARSERVER`

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

   (a) Avamar server

   (b) Avamar utility node

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

INSTALLING/UNINSTALLING AVAMAR AIX CLIENT

This chapter describes how to install and register the Avamar AIX Client software on a client computer.

IMPORTANT: Uninstall (page 14) any previous version of Avamar AIX Client software before installing the new version.

System Requirements

The client computer on which you want to install the Avamar AIX Client software must meet the following minimum requirements:

REQUIREMENT	MINIMUM
Operating System	• AIX 6.1 • AIX 5.3 • AIX 5.2
Filesystem	• JFS
RAM	128 MB.
Hard Drive Space	200 MB permanent hard drive space (1 GB recommended) for software installation. The Avamar client software also requires an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM. This space is used for local cache files.
Network Interface	10baseT or higher, configured with latest drivers for your platform.

Downloading the Install Package

1. Log into the computer onto which you want to install this software.
2. Point your web browser at the Avamar server by typing the following URL:

   `http://AVAMARSERVER`

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

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

   Depending on your browser security settings, a security alert dialog box might appear.
3. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The Secure Log On page appears.
4. Page down until the **Documents and Downloads** hyperlink is visible.
5. Click **Documents and Downloads**.

   The Documents and Downloads page appears.
6. Click the correct operating system hyperlink for your client computer.

   A directory listing appears in your browser.
7. Download the Avamar AIX Client install package to any convenient temporary install directory on your system.

   NOTE: /tmp is used as an example temporary install directory in the remainder of this chapter. Your actual temporary install directory may be different.

8. Note the actual filename of the Avamar AIX Client install package.

   NOTE: AvamarClient-aix5-ppc-VERSION.bff is used as an example filename for the Avamar AIX Client install package in the remainder of this chapter. Your actual filename will be different.

Installing and Registering the Avamar AIX Client

Log in as root

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

Install Avamar AIX Client Software

2. Type:

   cd /tmp

   geninstall -d AvamarClient-aix5-ppc-VERSION.bff all

   Where AvamarClient-aix5-ppc-VERSION.bff is the actual Avamar AIX Client install package you previously downloaded (page 11).

   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 5.0-100.400                        # Avamar AIX Client 5.0-
100.400...

   << 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 5.0.100.400

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

This software is copyright EMC 2001-2009.

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                  5.0.100.400    USR         APPLY          SUCCESS
```

Register this Client With the Avamar Server

3. Type the following:

   /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]:
```

4. 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):
```

5. Type the actual network hostname (as defined in DNS) of your 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, your Avamar system administrator may have defined other domains and subdomains. Consult your Avamar system administrator for the specific domain you should use when registering this client.

> **IMPORTANT:** If typing a subdomain (for example, (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character will cause an error and prevent you from registering this client.

6. 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 ///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 the Avamar AIX Client

Log in as root

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

Uninstall Avamar Software

2. Type:

   lslpp -l | grep Avamar

   The following appears in the command shell:

```
AvamarClient-aix5-ppc   VERSION COMMITTED EMC Avamar client VERSION
```

3. Type:

   geninstall -u AvamarClient-aix5-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-aix5-ppc    5.0-100.400 # EMC Avamar client 5.0-100.400...

 << 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-aix5-ppc       5.0-100.400    USR         DEINSTALL      SUCCESS
```

Upgrading the Avamar AIX Client

In order to upgrade your Avamar AIX Client software, you must completely uninstall the old software (page 14) and install the new software (page 12).

Manually Stopping and Restarting the avagent Service

The Avamar AIX Client agent (**avagent**) is configured to run as a service and is started automatically as part of the installation procedure. It will also restart automatically following a system reboot. Therefore, in most cases, you do not need to manually stop or restart it. However, if you experience unexpected system behavior and do not want to reboot your entire system, the following commands can be used to manually stop and restart the **avagent** service.

Manually Stopping the avagent Service

Log in as root

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

Log in as root

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

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

Getting avagent Status

Log in as root

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

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

INSTALLING/UNINSTALLING AVAMAR FREEBSD CLIENT

This chapter describes how to install and register the Avamar FreeBSD Client software on a client computer.

IMPORTANT: Uninstall (page 19) any previous version of Avamar FreeBSD Client software before installing the new version.

System Requirements

The client computer on which you want to install the Avamar FreeBSD Client software must meet the following minimum requirements:

REQUIREMENT	MINIMUM
Operating System	FreeBSD 6.2 (32- and 64-bit)
CPU	• 32-bit Intel IA-32 • 64-bit AMD64/EM64T
Filesystem	Unix Filesystem (UFS)
RAM	128 MB.
Hard Drive Space	100 MB permanent hard drive space (1 GB recommended) for software installation. The Avamar client software also requires an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM. This space is used for local cache files.
Network Interface	10baseT or higher, configured with latest drivers for your platform.

Downloading the Install Package

1. Log into the computer onto which you want to install this software.
2. Point your web browser at the Avamar server by typing the following URL:

   `http://AVAMARSERVER`

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

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

   Depending on your browser security settings, a security alert dialog box might appear.
3. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The Secure Log On page appears.
4. Page down until the **Documents and Downloads** hyperlink is visible.
5. Click **Documents and Downloads**.

   The Documents and Downloads page appears.
6. Click the correct operating system hyperlink for your client computer.

   A directory listing appears in your browser.
7. Download the Avamar FreeBSD Client install package to any convenient temporary install directory on your system.

   NOTE: /tmp is used as an example temporary install directory in the remainder of this chapter. Your actual temporary install directory may be different.

8. Note the actual filename of the Avamar FreeBSD Client install package.

   NOTE: AvamarClient-VERSION.freebsd6_64.tbz is used as an example filename for the Avamar FreeBSD Client install package in the remainder of this chapter. Your actual filename will contain a specific Avamar software VERSION.

Installing and Registering the Avamar FreeBSD Client

Log in as root

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

Install Avamar FreeBSD Client Software

2. Type:

   `cd /tmp`

   `pkg_add AvamarClient-VERSION.freebsd6_64.tbz`

   Where AvamarClient-VERSION.freebsd6_64.tbz is the actual Avamar FreeBSD Client install package you previously downloaded (page 17).

The following appears in the command shell:

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

3. Do one of the following:

IF	DO THIS
You want to locate log files in the default location (/var/avamar).	Press **ENTER** to accept the default location (/var/avamar)
You want to locate log files in an alternative location.	Type the full path of the directory you want to contain your log files 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.
```

Register this Client With the Avamar Server

4. Type the following:

`/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]:
```

5. 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):
```

6. Type the actual network hostname (as defined in DNS) of your 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, your Avamar system administrator may have defined other domains and subdomains. Consult your Avamar system administrator for the specific domain you should use when registering this client.

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

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 <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 the Avamar FreeBSD Client

Log in as root

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

Uninstall Avamar Software

2. Type the following:

   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 the Avamar FreeBSD Client

In order to upgrade your Avamar FreeBSD Client software, you must completely uninstall the old software (page 19) and install the new software (page 17).

Manually Stopping and Restarting the avagent Service

The Avamar FreeBSD Client agent (**avagent**) is configured to run as a service and is started automatically as part of the installation procedure. It will also restart automatically following a system reboot. Therefore, in most cases, you do not need to manually stop or restart it. However, if you experience unexpected system behavior and do not want to reboot your entire system, the following commands can be used to manually stop and restart the **avagent** service.

Manually Stopping the avagent Service

Log in as root

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

   /etc/rc.d/avagent stop

Manually Restarting the avagent Service

Log in as root

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

   `/etc/rc.d/avagent restart`

Getting avagent Status

Log in as root

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

   `/etc/rc.d/avagent status`

INSTALLING/UNINSTALLING AVAMAR HP-UX CLIENT

This chapter describes how to install and register the Avamar HP-UX Client software on a client computer.

IMPORTANT: Uninstall (page 25) any previous version of Avamar HP-UX Client software before installing the new version.

System Requirements

The client computer on which you want to install the Avamar HP-UX Client software must meet the following minimum requirements:

REQUIREMENT	MINIMUM
Operating System	• HP-UX 11i v2 or v3 (IA-64)
CPU	• Itanium
Filesystem	• HFS • VxFS
RAM	128 MB.
Hard Drive Space	200 MB permanent hard drive space (1 GB recommended) for software installation. The Avamar client software also requires an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM. This space is used for local cache files.
Network Interface	10baseT or higher, configured with latest drivers for your platform.

Downloading the Install Package

1. Log into the computer onto which you want to install this software.
2. Point your web browser at the Avamar server by typing the following URL:

   `http://AVAMARSERVER`

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

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

   Depending on your browser security settings, a security alert dialog box might appear.
3. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The Secure Log On page appears.
4. Page down until the **Documents and Downloads** hyperlink is visible.
5. Click **Documents and Downloads**.

   The Documents and Downloads page appears.
6. Click the correct operating system hyperlink for your client computer.

   A directory listing appears in your browser.
7. Download the Avamar HP-UX Client install package to any convenient temporary install directory on your system.

   NOTE: /tmp is used as an example temporary install directory in the remainder of this chapter. Your actual temporary install directory may be different.

8. Note the actual filename of the Avamar HP-UX Client install package.

   NOTE: AVAMARHPUX.depot is used as an example filename for the Avamar HP-UX Client install package in the remainder of this chapter. Your actual filename will be different.

Installing and Registering the Avamar HP-UX Client

Log in as root

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

Install Avamar HP-UX Client Software

2. Change directory to your temporary install directory (page 22). For example:

   cd /tmp

3. Type the following:

   swinstall -s /tmp/AVAMARHPUX.depot *

   Where AVAMARHPUX.depot is the actual filename of the Avamar HP-UX Client install package you previously downloaded (page 22).

   The following appears in the command shell:

```
======= 02/03/06 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=5.0-100.400,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).

======= 02/03/06 16:13:46 PST END swinstall SESSION (non-interactive)
```

Register this Client With the Avamar Server

4. Type the following:

   /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 base directory of the Avamar Client installation [/opt/AVMRclnt]:
```

5. 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):
```

6. Type the actual network hostname (as defined in DNS) of your 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, your Avamar system administrator may have defined other domains and subdomains. Consult your Avamar system administrator for the specific domain you should use when registering this client.

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

7. 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.d Info: start
   avagent Info <5241>: Logging to ///opt/AVMRclnt//var/avagent.log
   avagent Info <5417>: daemonized as process id 17620
   avagent.d Info: Server started.
   Registration Complete.
   ```

Uninstalling the Avamar HP-UX Client

Log in as root

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

Uninstall Avamar Software

2. Type the following:

   swremove hpuxclnt

   The following appears in the command shell:

```
======= 02/03/06 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=5.0-100.400,
        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).

======= 02/03/06 16:09:45 PST END swremove SESSION (non-interactive)
```

Upgrading the Avamar HP-UX Client

In order to upgrade your Avamar HP-UX Client software, you must completely uninstall the old software (page 25) and install the new software (page 23).

Manually Stopping and Restarting the avagent Service

The Avamar HP-UX Client agent (**avagent**) is configured to run as a service and is started automatically as part of the installation procedure. It will also restart automatically following a system reboot. Therefore, in most cases, you do not need to manually stop or restart it. However, if you experience unexpected system behavior and do not want to reboot your entire system, the following commands can be used to manually stop and restart the **avagent** service.

Manually Stopping the avagent Service

Log in as root

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

   /sbin/init.d/avagent stop

Manually Restarting the avagent Service

Log in as root

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

   `/sbin/init.d/avagent restart`

Getting avagent Status

Log in as root

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

   `/sbin/init.d/avagent status`

INSTALLING/UNINSTALLING AVAMAR LINUX CLIENT

This chapter describes how to install and register the Avamar Linux Client software on a client computer.

IMPORTANT: Uninstall (page 30) any previous version of Avamar Linux Client software before installing the new version.

System Requirements

The client computer on which you want to install the Avamar Linux Client software must meet the following minimum requirements:

REQUIREMENT	MINIMUM
Operating System	• Red Hat Enterprise Linux Release 5 (32- and 64-bit) • Red Hat Enterprise Linux Release 4 (32- and 64-bit) • Red Hat Enterprise Linux Release 3 (32- and 64-bit) • Red Hat Linux Release 9 • SUSE Linux Enterprise Server 10, 9, 8.2 (32- and 64-bit) **IMPORTANT:** 32-bit Red Hat Enterprise Linux Release 5 systems must also install Red Hat LIBC-5 compatibility libraries in order to use Avamar Linux Client software.
CPU	• x86
Filesystem	• ext2 • ext3 • JFS • ReiserFS
RAM	128 MB.

REQUIREMENT	MINIMUM
Hard Drive Space	100 MB permanent hard drive space (1 GB recommended) for software installation. The Avamar client software also requires an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM. This space is used for local cache files.
Network Interface	10baseT or higher, configured with latest drivers for your platform.

Downloading the Install Package

1. Log into the computer onto which you want to install this software.
2. Point your web browser at the Avamar server by typing the following URL:

   `http://AVAMARSERVER`

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

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

   Depending on your browser security settings, a security alert dialog box might appear.
3. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The Secure Log On page appears.
4. Page down until the **Documents and Downloads** hyperlink is visible.
5. Click **Documents and Downloads**.

   The Documents and Downloads page appears.
6. Click the correct operating system hyperlink for your client computer.

   A directory listing appears in your browser.
7. Download the Avamar Linux Client install package to any convenient temporary install directory on your system.

   NOTE: /tmp is used as an example temporary install directory in the remainder of this chapter. Your actual temporary install directory may be different.

8. Note the actual filename of the Avamar Linux Client install package.

   NOTE: AVAMARLINUX.rpm is used as an example filename for the Avamar Linux Client install package in the remainder of this chapter. Your actual filename will be different.

Customizing the Install Location

This topic describes how to install the Avamar Linux Client somewhere other than the default location.

Environment Variable

To customize the var directory location, set AVAMAR_INSTALL_VARDIR_PATH to the desired location before beginning the installation procedure.

rpm --relocate

You can also change the base installation directory using the **rpm --relocate** option during installation. For example:

```
rpm -ih --relocate /usr/local/avamar=NEW_PATH AVAMARLINUX.rpm
```

Where /usr/local/avamar is the default installation directory, NEW_PATH is the new (non-default) installation directory and AVAMARLINUX.rpm is the actual filename of the Avamar Linux Client install package you previously downloaded (page 28).

IMPORTANT: The **rpm --relocate** feature requires Red Hat Package Manager version 4.0.3 or higher.

Installing and Registering the Avamar Linux Client

Log in as root

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

Install Avamar Linux Client Software

2. Change directory to your temporary install directory (page 28). For example:

   ```
   cd /tmp
   ```

3. Type the following:

   ```
   rpm -ih AVAMARLINUX.rpm
   ```

   Where AVAMARLINUX.rpm is the actual filename of the Avamar Linux Client install package you previously downloaded (page 28).

   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.
   ```

Register and Activate this Client With the Avamar Server

4. Type the following:

   ```
   /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):
   ```

5. Type the actual network hostname (as defined in DNS) of your 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, your Avamar system administrator may have defined other domains and subdomains. Consult your Avamar system administrator for the specific domain you should use when registering this client.

   > **IMPORTANT:** If typing a subdomain (for example, (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character will cause an error and prevent you from registering this client.

6. Press **ENTER** to accept the default domain (clients).

   The following appears in the command shell:

   ```
   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 the Avamar Linux Client

Log in as root

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

Uninstall Avamar Software

2. Type the following:

   `rpm -qa | grep Av`

   The following appears in the command shell:

   ```
   EMCClient-VERSION
   ```

3. Note the full package name.
4. Type the following:

   `rpm -e EMCClient-VERSION`

   Where EMCClient-VERSION is the Avamar software install package returned in step 3.

   The following appears in the command shell:

   ```
   avagent.d Info: Client Agent stopped.
   ```

Upgrading the Avamar Linux Client

In order to upgrade your Avamar Linux Client software, you must completely uninstall the old software (page 30) and install the new software (page 29). Use of the Linux software upgrade command (**`rpm -Uh`**) is not supported.

Manually Stopping and Restarting the avagent Service

The Avamar Linux Client agent (**avagent**) is configured to run as a service and is started automatically as part of the installation procedure. It will also restart automatically following a system reboot. Therefore, in most cases, you do not need to manually stop or restart it. However, if you experience unexpected system behavior and do not want to reboot your entire system, the following commands can be used to manually stop and restart the **avagent** service.

Manually Stopping the avagent Service

Log in as root

1. Open a command shell and log in as root.
2. Do one of the following:

IF	DO THIS
Stopping the **avagent** service on any version Red Hat Linux or SUSE Linux Enterprise Server 10.	Type the following: **`service avagent stop`**
Stopping the **avagent** service on SUSE Linux Enterprise Server 9 or 8.2.	Type the following: **`/etc/rc.d/avagent stop`**

Manually Restarting the avagent Service

Log in as root

1. Open a command shell and log in as root.
2. Do one of the following:

IF	DO THIS
Restarting the **avagent** service on any version Red Hat Linux or SUSE Linux Enterprise Server 10.	Type the following: **`service avagent restart`**
Restarting the **avagent** service on SUSE Linux Enterprise Server 9 or 8.2.	Type the following: **`/etc/rc.d/avagent restart`**

Getting avagent Status

Log in as root

1. Open a command shell and log in as root.
2. Do one of the following:

IF	DO THIS
Getting **avagent** status on any version Red Hat Linux or SUSE Linux Enterprise Server 10.	Type the following: **service avagent status**
Getting **avagent** status on SUSE Linux Enterprise Server 9 or 8.2.	Type the following: **/etc/rc.d/avagent status**

INSTALLING/UNINSTALLING AVAMAR MAC OS X CLIENT

This chapter describes how to install and register Avamar Mac OS X Client software on a client computer.

System Requirements

The client computer on which you want to install the Avamar Mac OS X Client software must meet the following minimum requirements:

REQUIREMENT	MINIMUM
Operating System	• Apple Mac OS X v10.5 Leopard • Apple Mac OS X v10.4 Tiger • Apple Mac OS X Server v10.5 Leopard • Apple Mac OS X Server v10.4 Tiger
RAM	512 MB.
Hard Drive Space	250 MB permanent hard drive space (1 GB recommended) for software installation. The Avamar client software also requires an additional 12MB of permanent hard drive space for each 64 MB of physical RAM. Additional disk space might be required by your snapshot technology.
Network Interface	10baseT or higher, configured with latest drivers for your platform.

IMPORTANT: The default process data size limit on Mac OS X (6 MB) is lower than the EMC recommended limit of 96 MB.

To set this correctly for use with the Avamar Mac OS X Client, add the following entry to your /etc/launchd.conf file and restart your computer:

```
limit data 100663296 unlimited
```

Installing the Avamar Mac OS X Client

1. Log into the computer onto which you want to install this software.
2. Point your web browser at the Avamar server by typing the following URL:

   http://AVAMARSERVER

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

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

   Depending on your browser security settings, a security alert dialog box might appear.
3. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The Secure Log On page appears.
4. Page down until the **Documents and Downloads** hyperlink is visible.
5. Click **Documents and Downloads**.

   The Documents and Downloads page appears.
6. Click the correct operating system hyperlink for your client computer.

   A directory listing appears in your browser.
7. Double-click the **AvamarClient-macosx-uni-VERSION.pkg.zip** file.

   Your browser will prompt you to either open the file “in-place” (on the server) or save it to your local computer.
8. Save **AvamarClient-macosx-uni-VERSION.pkg.zip** to your computer desktop.
9. Double-click the **AvamarClient-macosx-uni-VERSION.pkg.zip** file.

   The zip file is extracted to the AvamarClient-VERSION.MacOSX.uni.mpkg file on your desktop.
10. Double-click AvamarClient-VERSION.MacOSX.uni.mpkg to begin installing the Avamar Mac OS X Client software.

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

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

    The Disagree/Agree dialog appears.
13. Select **Agree**.

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

    The Easy Install screen appears.

15. Do one of the following:

IF	DO THIS
You want to install enhanced desktop/laptop support.	Go to step 16.
You do not want to install enhanced desktop/laptop support.	Skip steps 16 and 17. Go directly to step 18.

16. Select **Customize**.

    The Custom Install screen appears.

17. Select **Desktop/Laptop Support** and click **Install**.

    The Authenticate dialog appears.

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

    The software is installed and the successful install screen appears.

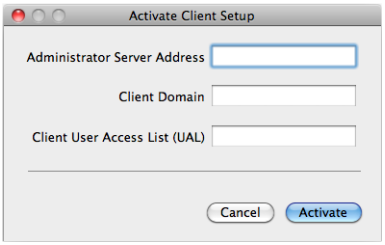
19. Click Close.

    The Avamar Desktop/Laptop software is installed, and is ready for registration and activation as described in *Registering the Avamar Mac OS X Client* (page 36).

Registering the Avamar Mac OS X Client

Before you can backup or restore any files on this client computer, you must register it with the Avamar server.

1. Launch the Activate Client Setup dialog box:
   - Use the context menu of the Avamar icon on the Dock and click **Activate**.
   - From the AvamarClient menu bar in the AvamarClient application, select **Actions** > **Activate**.



2. Type the following:

FIELD	DESCRIPTION
Administrator Server Address	Administrator server network hostname as defined in DNS.
Client Domain	Avamar domain where you want this client to reside. The default domain is “clients.” However, your Avamar system administrator may have defined other domains and subdomains. Consult your Avamar system administrator for the specific domain you should use when registering this client. **IMPORTANT:** If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character will cause an error and prevent you from registering this client.
Client User Access List (UAL)	Not used.

3. Click **Activate**.

Uninstalling the Avamar Mac OS X Client

Uninstalling the Avamar Mac OS X Client is accomplished by running the **avuninstall.sh** script.

Log in as root

1. Open a terminal window and log in as root.
2. Run the **avuninstall.sh** script by typing:

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

   The following appears in the command shell:

```
./avuninstall.sh: line 26: /usr/local/avamar/bin/avregister: Permission denied
Warning: Cannot unregister avagent.
/usr/local/avamar/var/avagent.lck
/usr/local/avamar/var/cid.bin
/usr/local/avamar/var/avagent.cfg
/usr/local/avamar/var/avagent.log
/usr/local/avamar/bin/avagent.bin
/usr/local/avamar/bin/avregister
/usr/local/avamar/bin/avrunner
/usr/local/avamar/bin/avtar.bin
/usr/local/avamar/bin/avuninstall.sh
/usr/local/avamar/bin/macosx.pin
/usr/local/avamar/var
/usr/local/bin/avtar
rmdir: /var/avamar: Directory not empty
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Archive.bom
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Info.plist
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/PkgInfo
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
AxionClient-1.0.bom
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
AxionClient-1.0.sizes
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
BundleVersions.plist
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
English.lproj/AxionClient-1.0.info
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
English.lproj/Description.plist
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
English.lproj
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
License.html
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
package_version
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
postflight
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
preflight
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
ReadMe.html
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources/
Welcome.html
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents/Resources
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg/Contents
/Library/Receipts/AvamarClient-VERSION.MacOSX.uni.mpkg
/Library/LaunchDaemons/com.avamar.avagent.plist
```

Upgrading the Avamar Mac OS X Client

In order to upgrade your Avamar Mac OS X Client software, you must completely uninstall the old software (page 37) and install (page 34) and register (page 36) the new software.

INSTALLING/UNINSTALLING AVAMAR NETWARE CLIENT

This chapter describes how to install and register Avamar NetWare Client software on a Novell NetWare server.

System Requirements

The client computer on which you want to install the Avamar NetWare Client software must meet the following minimum requirements:

REQUIREMENT	MINIMUM
Operating System	OES (Open Enterprise Server) NetWare 6.5 SP6, SP7 or SP8 (x86)
Filesystem	NSS (Novell Storage Services)
RAM	4 GB.
Hard Drive Space	200 MB permanent hard drive space (1 GB recommended) for software installation. The Avamar client software also requires an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM. This space is used for local cache files.
Network Interface	10baseT or higher, configured with latest drivers for your platform.

Capabilities and Limitations

This topic explains the current capabilities and limitations of the Avamar NetWare Client.

Directory and File Metadata. The Avamar NetWare Client protects NetWare directory and file metadata as follows:

- Basic attributes are protected and recovered
- Trustee assignments are protected and recovered
- Inherited Rights Filters are protected and recovered

NSS Compression Should Be Suspended During Backups. NSS volumes with compression enabled can cause memory contention issues during backups. The **avtar --suspend_nss_compression** backup option, which is enabled by default, will automatically suspend NSS compression during backups and automatically resume NSS compression following backups. Therefore, EMC strongly recommends that you do not disable this option during your backup operations.

Encryption Is Not Supported. The Avamar NetWare Client does not support encryption for backup or restore operations. If an encryption method other than "None" is specified for a backup or restore, Avamar automatically changes the encryption method to "None."

Important Memory Allocation Information

Beginning with version 4.1.105, the Avamar NetWare Client reserves a block of NetWare server memory (512MB is the default amount) for performing Avamar backups. This reserved memory space is automatically allocated each time the Avamar backup agent service (**avagent**) is started or restarted.

The initial memory allocation is logged in the avagent.log file with entries similar to the following:

```
avagent Info <0000>: Allocating 512 MBs for shared heap (PhysicalRAM=3987 MB,
Avail=1582 MB)
avagent Info <0000>: Shared Heapbase=0x03437680
```

NOTE: Your actual PhysicalRAM, Avail and the Shared Heapbase values will be different.

Once **avagent** has allocated the reserved memory (512MB is the default amount), it is not accessible to other applications on the NetWare server. This memory is strictly reserved for use by the Avamar backup process (**avtar**).

When a backup or restore is performed using Avamar Administrator, the shared heap location is automatically transferred from **avagent** to **avtar**, and the reserved memory space is used for all future Avamar backups and restores on this NetWare server. This can be seen in the avtar.log file with an entry similar to:

```
avtar Info <0000> Using Shared Heap Storage: 512 MBs at address 0x03437680
```

As with avagent.log file, your actual Shared Heap address will be different.

The agentsharedheap.cfg File. In addition to logging memory allocation in the avagent.log file, **avagent** also creates the agentsharedheap.cfg file in SYS:AVAMAR/VAR/. This file stores memory allocation settings for that **avagent** session (it is removed each time **avagent** exits).

If **avtar** cannot complete the backup or restore within the reserved Shared Heap space, it will exit with an `Out of Memory` error.

Invoking avtar Directly. If the Avamar backup process (**avtar**) is invoked directly on the NetWare client (for example, from within a script file or a command prompt), the following additional option must be included on each **avtar** command line:

`--flagfile=SYS:AVAMAR/VAR/agentsharedheap.cfg`

SYS:AVAMAR/VAR is the default location where agentsharedheap.cfg should exist on most systems. If your actual location is different, include the correct path to agentsharedheap.cfg.

Changing the Size of the Reserved Shared Heap

The default amount of reserved memory is 512MB. If you would like to increase this, you must create an avagent.cmd file in SYS:AVAMAR/VAR and add the following entry:

```
--sharedheapsize=MB
```

For example, to change the reserved shared heap space to 600 MB, the following entry should be placed in the avagent.cmd file:

```
--sharedheapsize=600
```

> **IMPORTANT:** Although, it is possible to configure the amount of reserved memory to be less than 512MB, EMC strongly advises against doing so as it might compromise the operational integrity and readiness of the Avamar backup process.

After making your changes to your avagent.cmd file, you must stop, then restart **avagent** in order for this change to take effect. Refer to *Manually Stopping and Restarting the avagent Service* (page 50) for additional information.

Note that **avagent** by default will refuse to allocate more than one-half of the total amount of physical RAM or available memory. In order to force **avagent** to allocate the specified amount, even if it exceeds the 50% limitation, you must also add the following additional entry to your avagent.cmd file:

```
--x21=512
```

However, be advised that overriding the 50% limitation can cause adverse behavior such as NetWare ABEND errors when **avagent** is started or restarted.

Troubleshooting

The Avamar NetWare Client software installation program appends the following entries at the end of the SYS:\SYSTEM\AUTOEXEC.NCF.

```
# Added by Avamar Client Install
SYS:\AVAMAR\BIN\AVCTL.NLM start
```

There might be situations when **avagent** is unable to secure the 512 MB of memory when the NetWare server is booting up. This is typically caused by other applications and essential operating system components competing for the same memory that the Avamar NetWare Client is attempting to allocate.

If this occurs, edit the AUTOEXEC.NCF and move the Avamar NetWare Client entries earlier in the load order.

The following example file listing shows a typical AUTOEXEC.NCF file with Avamar NetWare Client entries appended to the end of the file (the default location in the load order for these entries):

```
set Bindery Context = O=dev
SET Daylight Savings Time Offset = 1:00:00
SET Start Of Daylight Savings Time = (MARCH SUNDAY SECOND 2:00:00 AM)
SET End Of Daylight Savings Time = (NOVEMBER SUNDAY FIRST 2:00:00 AM)
SET Time Zone = EST5EDT
# Note: The Time zone information mentioned above
# should always precede the SERVER name.
SEARCH ADD SYS:\JAVA\BIN
SEARCH ADD SYS:\JAVA\NWGFX\BIN
SEARCH ADD SYS:\JAVA\NJCLV2\BIN
SEARCH ADD SYS:\NI\UPDATE\BIN
# WARNING!!
FILE SERVER NAME CLINW1
# WARNING!!
# If you change the name of this server, you must update
# the server name in all the licenses that are assigned
# to it using iManager.
LOAD CONLOG MAXIMUM=100
LOAD TCPIP
LOAD PCNTNW.LAN PCI SLOT=3 FRAME=ETHERNET_II NAME=PCNTNW_1_EII
BIND IP PCNTNW_1_EII addr=10.6.248.190 mask=255.255.255.0 gate=10.6.248.1
MOUNT ALL
IPMINIT.NCF
SYS:\SYSTEM\NMA\NMA5.NCF
BSTART.NCF
load nile.nlm
load httpstk.nlm /SSL /keyfile:"SSL CertificateIP"
LOAD PORTAL.NLM
LOAD NDSIMON.NLM
LOAD NICISDI.XLM
LOAD SASDFM.XLM
# -- Added by AFP Install --
AFPSTRT.NCF
# -- End of AFP Install --
# -- Added by CIFS Install --
CIFSSTRT.NCF
# -- End of CIFS Install --
SYS:/BIN/UNIXENV.NCF
LOAD PKI.NLM
LOAD NLDAP.NLM
# -- Added by Scripting Install --
SCRIPT.NCF
SEARCH ADD SYS:\APACHE2
#ACCESS TO XTIER SOFTWARE
SEARCH ADD SYS:\XTIER
LOAD NCPL
```

```
AP2WEBUP
#Apache2 is now the admin server
ADMSRVUP
# tc4admin begin
SEARCH ADD SYS:/tomcat/4/bin
tcadmup.ncf
# tc4admin end
# tomcat4 begin
sys:/tomcat/4/bin/tomcat4.ncf
# tomcat4 end
# tomcat5 begin
SEARCH ADD SYS:/tomcat/5.0/bin
sys:/tomcat/5.0/bin/tomcat5.ncf
# tomcat5 end
# Storage Management Services components required for Backup
SMSSTART.NCF
#Added By FTP Server
ftpstart.ncf
#Added By FTP Server END
#---Added By Native File Access For Unix---
nfsstart
#---Added By Native File Access For Unix END---
LOAD EMBOX.NLM
# -- Added by MYSQL Install --
SEARCH ADD SYS:\mysql\bin
mysqld_safe --autoclose
# -- End of MYSQL Install --
openwbem.ncf
LOAD RDBHOST.NLM
LOAD TOOLBOX.NLM
LOAD MONITOR.NLM
# Added by Avamar Client Install
SYS:\AVAMAR\BIN\AVCTL.NLM start
```

IMPORTANT: The AUTOEXEC.NCF file is a critical operating system configuration file. Be very careful when making modifications in order to ensure that the server is able to boot up and initialize properly.

The AUTOEXEC.NCF file is a text file that can be edited from a Windows client with a mapped drive to the NetWare server SYS volume. It can also be modified from the NetWare server console using either the NWConfig Console or directly from the Edit Console.

IMPORTANT: The Avamar NetWare Client has dependencies on Novell Storage Management Services (SMS). Therefore, ensure that the entry for `SMSSTART.NCF` occurs prior to `SYS:\AVAMAR\BIN\AVCTL.NLM start` entry in the AUTOEXEC.NCF load order.

NOTE: Because each customer environment is different, EMC cannot offer any definitive suggestions regarding the optimum location for the Avamar NetWare Client entries in the load order. Each NetWare administrator must determine the best location in the load order on each individual NetWare server.

To modify AUTOEXEC.NCF using the NWConfig Console:

1. From the NetWare server console, type **`Load NWConfig.NLM`** and press **ENTER**.

   The NWConfig Console appears.

2. Select **NCF Files Options > Edit AUTOEXEC.NCF file**.

   The AUTOEXEC.NCF file appears in the Edit Console window.

3. Move the Avamar NetWare Client entries from the end of the file to earlier in the load order.
4. Save your changes and exit the AUTOEXEC.NCF editing session.
5. Reboot the NetWare server.
6. Verify that the AVAGENT Console is loaded.

IMPORTANT: Do not select **Create AUTOEXEC.NCF** file or **Create STARTUP.NCF file**. Doing so will adversely impact your file server and could prevent it from properly initializing during start up. If you mistakenly select either of these commands, immediately escape (press **ESC**) without saving.

To modify AUTOEXEC.NCF directly from the Edit Console:

1. From the NetWare server console, type **`Load Edit.NLM SYS:\System\AUTOEXEC.NCF`** and press **ENTER**.

   The AUTOEXEC.NCF file appears in the Edit Console window.

2. Move the Avamar NetWare Client entries from the end of the file to earlier in the load order.
3. Save your changes and exit the AUTOEXEC.NCF editing session.
4. Reboot the NetWare server.
5. Verify that the AVAGENT Console is loaded.

Installing the Avamar NetWare Client

Unless your NetWare server has an HTTP connection to the Avamar server, you will not be able to directly download the Avamar NetWare Client software install package to the NetWare server.

In order to support the broadest range of NetWare environments, this publication instructs you to download and install Novell client software on a Windows computer on the same network as the NetWare server, then map the NetWare server SYS volume to a Windows drive letter. You will then be able to download the Avamar NetWare Client software install package and copy it over to the NetWare server, where it can be installed from the NetWare server system console.

Therefore, in most cases to successfully install and configure the Avamar NetWare Client software directly on a Novell NetWare server, you must perform all of the following tasks in the following order:

- *Download and Install Novell Server Updates* (page 45)
- *Download and Install Novell Client Software* (page 46)
- *Download the Avamar NetWare Client Software Install Package* (page 48)
- *Install and Register Avamar NetWare Client Software* (page 48)

Download and Install Novell Server Updates

In order to ensure adequate performance and stability during backup and restore operations, EMC strongly recommends that you install the following Novell updates on your NetWare 6.5 SP6, SP7 and SP8 Servers:

NetWare 6.5 SP 6 Servers

1. Install each required update in the following order by pointing your web browser to the location listed in the instructions column for each update.

UPDATE	INSTRUCTION
Winsock	http://download.novell.com/Download?buildid=qxJni5EswNU~
CIMOM	http://download.novell.com/Download?buildid=LaqVAPb33l0~
LibC	http://download.novell.com/Download?buildid=3zlJxNGW9n4~
MM	http://download.novell.com/Download?buildid=_Zr_v9QAoFA~

2. Follow the detailed download and installation instructions provided by Novell for each respective update.

NetWare 6.5 SP 7 Servers

1. Install each required update in the following order by pointing your web browser to the location listed in the instructions column for each update.

UPDATE	INSTRUCTION
COMN.NSS	http://download.novell.com/Download?buildid=vgIJ013SZ8c~
WINSOCK	http://download.novell.com/Download?buildid=qxJni5EswNU~
TCP	http://download.novell.com/Download?buildid=6fH3feVnmQM~

2. Follow the detailed download and installation instructions provided by Novell for each respective update.

NetWare 6.5 SP 8 Servers

1. Install each required update in the following order by pointing your web browser to the location listed in the instructions column for each update.

UPDATE	INSTRUCTION
NSS	http://download.novell.com/Download?buildid=jq51Wf0qquA~
MM	http://download.novell.com/Download?buildid=el6hX1lumoo~

2. Follow the detailed download and installation instructions provided by Novell for each respective update.

Download and Install Novell Client Software

1. Log into a Windows computer on the same network as the NetWare server.
2. Download the Novell client software from the Novell web site (www.novell.com).
3. Install the Novell client software by following the instructions provided by Novell.
4. Map the NetWare server SYS volume to a Windows drive letter by performing the following:

   (a) Right-click the Novell client system tray icon and select **Novell Map Network Drive...**

   The Map Drive dialog box appears.

(b) Select or type the following:

FIELD/OPTION	DESCRIPTION
Select the drive letter to map	Select one of the available drive letters from this list.
Type the network path to the resource	Type the full network path to the NetWare server SYS volume using the following UNC syntax: **\\NETWARE-SERVER\SYS** Where NETWARE-SERVER are the actual IP address or hostname, as defined in corporate DNS, of your NetWare server.
Type your network user name	Type **admin**.
Check to make folder appear as the top most level	Select this option.
Check to always map this drive letter when you start Windows	Leave this option cleared.
Map Search drive	Leave this option cleared.

(c) Click **OK**.

The Map Drive dialog box closes.

If you are not already logged into the Novell NetWare server, a Novell Login dialog box appears.

If this occurs, you must log into the Novell NetWare server using the admin user account and password.

(d) Ensure that **admin** appears in the Username field.

(e) Type the password for the admin user account in the Password field.

(f) Click **OK**.

The Novell Login dialog box closes.

Download the Avamar NetWare Client Software Install Package

1. From the Windows computer that you used to perform the previous task, point your web browser at the Avamar server by typing the following URL:

   http://AVAMARSERVER

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

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

   Depending on your browser security settings, a security alert dialog box might appear.
2. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The Secure Log On page appears.
3. Page down until the **Documents and Downloads** hyperlink is visible.
4. Click **Documents and Downloads**.

   The Documents and Downloads page appears.
5. Click the **Novell NetWare 6.5** hyperlink.

   A directory listing appears in your browser.
6. Click the **AvamarClient-VERSION.Netware6.zip** install package.

   Your browser will prompt you to either open the file “in-place” (on the server) or save it to your local computer. For this procedure, you must save the file to a convenient temporary folder (directory) within the NetWare server SYS volume.
7. Save the **AvamarClient-VERSION.Netware6.zip** install package to a convenient temporary folder (directory) within the NetWare server SYS volume.
8. Note this location for future use.

Install and Register Avamar NetWare Client Software

1. Ensure that you are still logged into the Windows computer that you used to perform the previous tasks.
2. From Windows Explorer, browse to the temporary folder (directory) within the NetWare server SYS volume where you downloaded the file from the previous task.
3. Unzip the AvamarClient-VERSION.Netware6.zip install package.

   The unzip operation will automatically extract the contents to a folder (directory) called AVCLNT.
4. Copy the entire AVCLNT folder (directory) to the NetWare server SYS volume top-level (root) folder (directory).

   The remainder of this procedure is performed from the NetWare server system console.

   TIP: The Novell **rconj.exe** utility can be used to remotely access the NetWare server system console.
5. From the NetWare server system console, load NWCONFIG.NLM.

6. Select **Product Options > Install a product not listed**.
7. Type:

   SYS:AVCLNT

   A license prompt appears.
8. Press **ESC** to acknowledge the license.
9. Select **yes** and press **ENTER** to accept the license agreement.
10. Accept the default response to register the client.
11. If registration was selected, the following appears:

```
=== Client Registration and Activation
This script will register and activate the client with the Administrator
server.
Enter the Administrator server address (DNS text name, not numeric IP address)
below.

Enter the Administrator server address:
```

12. Type the actual network hostname (as defined in DNS) of your Avamar Administrator server and press **ENTER**.

    The following appears:

```
Enter the Avamar server domain:
```

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

> **IMPORTANT:** If typing a subdomain (for example, (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character will cause an error and prevent you from registering this client.

13. Press **ENTER** to accept the default domain (clients).

    A confirmation prompt appears.
14. Press **ENTER** to acknowledge the installation completion message.

    Following step 14, screen focus typically switches to the NetWare server system console.
15. Switch to the NWconfig screen and press **ENTER** to complete this procedure.

Manually Stopping and Restarting the avagent Service

Although the Avamar NetWare Client should be fully functional after performing the installation procedure (page 45), you can access additional client controls that can be used to start or stop the Avamar NetWare Client service, as well as register or unregister the Avamar NetWare Client with an Avamar server.

This entire procedure is performed from the NetWare server system console.

> **TIP:** The Novell **rconj.exe** utility can be used to remotely access the NetWare server system console.

1. From the NetWare server system console, load NWCONFIG.NLM.
2. Select **Product Options** > **View / Configure / Remove installed products**.
3. Select **AVACLNT** and press **ENTER**.

   The following appears:

```
=== Please select an option from the menu below:

s Start Avamar Client Agent
t Stop Avamar Client Agent
r Register Avamar Client
u Unregister Avamar Client

q Quit

Enter an option [struq]:
```

4. Do one of the following:

IF	DO THIS
You want to start or restart the Avamar NetWare Client service.	Type **s** and press **ENTER**.
You want to stop the Avamar NetWare Client service.	Type **t** and press **ENTER**.
You want to register the Avamar NetWare Client with an Avamar server.	Type **r** and press **ENTER**.
You want to unregister the Avamar NetWare Client from an Avamar server.	Type **u** and press **ENTER**.

5. When you are finished, type **q** and press **ENTER** to quit the control application.

Uninstalling the Avamar NetWare Client

This entire procedure is performed from the NetWare server system console.

> **TIP:** The Novell **rconj.exe** utility can be used to remotely access the NetWare server system console.

1. From the NetWare server system console, load NWCONFIG.NLM.
2. Select **Product Options** > **View/Configure/Remove installed products**.
3. Select **AVACLNT** and press **DELETE**.

   This will stop, unregister and remove the Avamar NetWare Client.

   The following appears:

   ```
   ==============================
   "Remove product AVACLNT?"
   No
   Yes
   ==============================
   ```

4. Select **Yes**.

   The following appears:

   ```
   <NLM has terminated; press any key to close screen.>
   ```

5. Press any key to close this window.
6. Switch to the avctl screen and press **ENTER** to complete this procedure.

Upgrading the Avamar NetWare Client

In order to upgrade your Avamar NetWare Client software, you must completely uninstall the old software (page 51) and install the new software (page 45).

INSTALLING/UNINSTALLING AVAMAR SCO CLIENT

This chapter describes how to install and register the Avamar SCO Client software on a client computer.

IMPORTANT: Uninstall (page 62) any previous version of Avamar SCO Client software before installing the new version.

System Requirements

The client computer on which you want to install the Avamar SCO Client software must meet the following minimum requirements:

REQUIREMENT	MINIMUM
Operating System	• SCO Open Server 5.0.7 • SCO Open Server 5.0.5 • SCO UnixWare 7.1.3
Filesystem	• OpenServer – HTFS, EAFS, DTFS, AFS, S51K • UnixWare – SFS, S5, BFS, VxFS, UFS
RAM	128 MB.
Hard Drive Space	200 MB permanent hard drive space (1 GB recommended) for software installation. The Avamar client software also requires an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM. This space is used for local cache files.
Network Interface	10baseT or higher, configured with latest drivers for your platform.

Downloading the Install Package

1. Log into the computer onto which you want to install this software.
2. Point your web browser at the Avamar server by typing the following URL:

   `http://AVAMARSERVER`

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

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

   Depending on your browser security settings, a security alert dialog box might appear.
3. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The Secure Log On page appears.
4. Page down until the **Documents and Downloads** hyperlink is visible.
5. Click **Documents and Downloads**.

   The Documents and Downloads page appears.
6. Click the correct operating system hyperlink for your client computer.

   A directory listing appears in your browser.
7. Do one of the following:

IF	DO THIS
Installing SCO Open Server 5.0.5 or 5.0.7.	Use install package AvamarClient-sco5.0.5-i386-VERSION.pkg
Installing UnixWare 7.1.3.	Use install package AvamarClient-unixware7.1.1-i386-VERSION.pkg

   Where VERSION is the specific version Avamar SCO Client software you are installing.
8. Download the Avamar SCO Client install package to any convenient temporary install directory on your system.

   NOTE: /tmp is used as an example temporary install directory in the remainder of this chapter. Your actual temporary install directory may be different.

9. Note the actual filename of the Avamar SCO Client install package.

   NOTE: AvamarClient-sco5.0.5-i386-VERSION.pkg is used as an example filename for the Avamar SCO Client install package in the remainder of this chapter. Your actual filename will be different.

Installing and Registering the Avamar SCO Client

NOTE: This procedure demonstrates how to install Avamar SCO Client software on SCO Open Server 5.0.5 or 5.0.7. The procedure is substantially the same for installing Avamar SCO Client software on UnixWare 7.1.3. However, the install package name, specific files installed, and so forth will be slightly different.

Log in as root

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

Install Avamar SCO Client Software

2. Type:

   cd /tmp

   pkgadd -d - < AvamarClient-sco5.0.5-i386-VERSION.pkg

   Where AvamarClient-sco5.0.5-i386-VERSION.pkg is the actual Avamar SCO Client install package you previously downloaded (page 53).

   The following appears in the command shell:

```
The following packages are available:

   1  Avamar   AvamarClient
               (i386) 5.0-100.400

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

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

AvamarClient
(i386) 5.0-100.400
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]
```

3. 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.
```

Register this Client With the Avamar Server

4. Type the following:

   /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]:
   ```

5. 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):
   ```

6. Type the actual network hostname (as defined in DNS) of your 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, your Avamar system administrator may have defined other domains and subdomains. Consult your Avamar system administrator for the specific domain you should use when registering this client.

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

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: 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 Configuration and Setup

If you intend to use Avamar SCO Client 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)

Log in as root

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

Create Temporary Directories

2. Next, create temporary directories that will be used to download and extract the SCO packages by typing:

   cd /tmp

   mkdir supplement gwx openssh

   ls -l

   supplement, gwx and openssh directories should be present.

Log Into SCO FTP Server

3. Log into the SCO FTP server as follows:

   (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 your 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.
   ```

Download OS Supplement (oss646c) Package

4. Download the OS Supplement (oss646c) package as follows:

(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)
```

Download OS GWX libs (gwxlibs-2.1.0Ba) Package

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

   (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)
   ```

Download OS OpenSSH (openssh-4.2p1) Package

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

   (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.
   ```

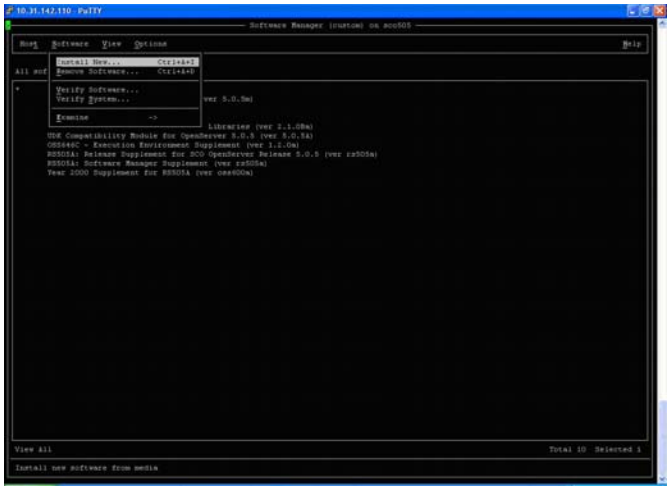
8. Use the SCO Software Manager program to install the packages in the following order:
   - OS Supplement
   - GWX libs
   - OpenSSH

   (a) Type:

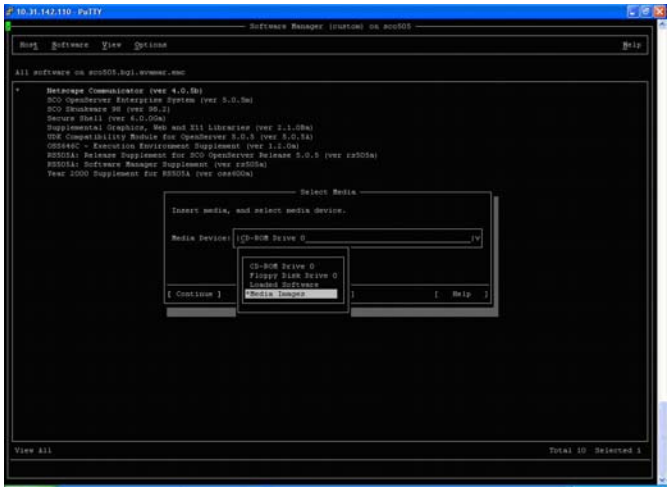
   `scoadmin software`

   The SCO Software Manager program appears.

   (b) Select **Software > Install New...**

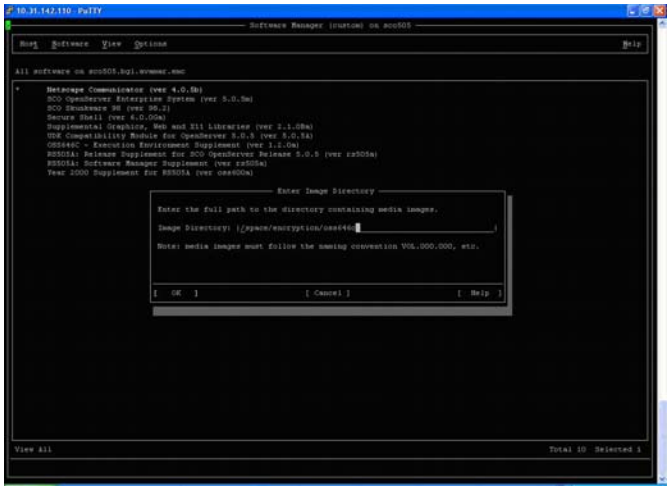


   (c) Select **media images** from the **Media device:** menu.

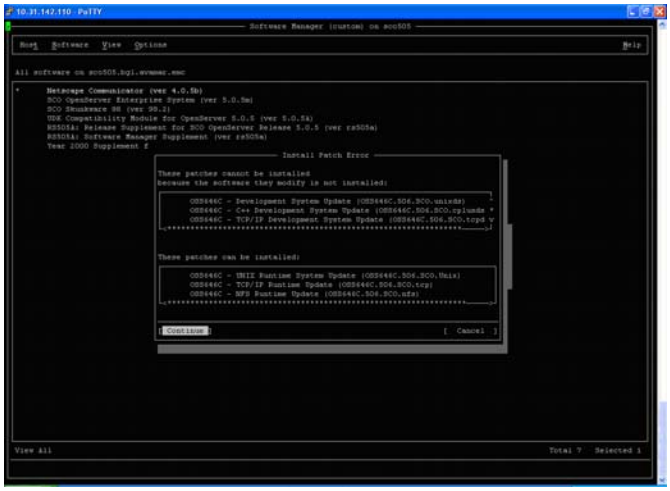


   (d) Type the full path of the directory that contains the OS Supplement (oss646c) package.

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



(f) Select **Continue** in the next screen.



(g) Repeat steps b thru g to install the remaining two packages (that is, 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 the Avamar SCO Client

NOTE: This procedure demonstrates how to uninstall Avamar SCO Client software on SCO Open Server 5.0.5 or 5.0.7. The procedure is substantially the same for uninstalling Avamar SCO Client software on UnixWare 7.1.3. However, the install package name, specific files removed, and so forth will be slightly different.

Log in as root

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.
```

Uninstall Avamar Software

3. Type the following:

   pkgrm avamar

   The following appears in the command shell:

```
The following package is currently installed:
      Avamar   AvamarClient
               (i386) 5.0-100.400

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 the Avamar SCO Client

In order to upgrade your Avamar SCO Client software, you must completely uninstall the old software (page 62) and install the new software (page 54).

Manually Stopping and Restarting the avagent Service

The Avamar SCO Client agent (**avagent**) is configured to run as a service and is started automatically as part of the installation procedure. It will also restart automatically following a system reboot. Therefore, in most cases, you do not need to manually stop or restart it. However, if you experience unexpected system behavior and do not want to reboot your entire system, the following commands can be used to manually stop and restart the **avagent** service.

Manually Stopping the avagent Service

Log in as root

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

   /etc/avagent stop

Manually Restarting the avagent Service

Log in as root

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

   /etc/avagent restart

Getting avagent Status

Log in as root

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

   /etc/avagent status

INSTALLING/UNINSTALLING AVAMAR SOLARIS CLIENT

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

IMPORTANT: Uninstall (page 69) any previous version of Avamar Solaris Client software before installing the new version.

System Requirements

The client computer on which you want to install the Avamar Solaris Client software must meet the following minimum requirements:

REQUIREMENT	MINIMUM
Operating System	• Sun Solaris 10 • Sun Solaris 9 • Sun Solaris 8
CPU	• SPARC • x86 (Solaris 10 only)
Filesystem	• UFS • VxFS • ZFS
RAM	128 MB.
Hard Drive Space	200 MB permanent hard drive space (1 GB recommended) for software installation. The Avamar client software also requires an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM. This space is used for local cache files.
Network Interface	10baseT or higher, configured with latest drivers for your platform.

Downloading the Install Package

1. Log into the computer onto which you want to install this software.
2. Point your web browser at the Avamar server by typing the following URL:

   `http://AVAMARSERVER`

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

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

   Depending on your browser security settings, a security alert dialog box might appear.
3. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The Secure Log On page appears.
4. Page down until the **Documents and Downloads** hyperlink is visible.
5. Click **Documents and Downloads**.

   The Documents and Downloads page appears.
6. Click the correct operating system hyperlink for your client computer.

   A directory listing appears in your browser.
7. Download the Avamar Solaris Client install package to any convenient temporary install directory on your system.

   NOTE: /tmp is used as an example temporary install directory in the remainder of this chapter. Your actual temporary install directory may be different.

8. Note the actual filename of the Avamar Solaris Client install package.

   NOTE: AVAMARSOLARIS.pkg is used as an example filename for the Avamar Solaris Client install package in the remainder of this chapter. Your actual filename will be different.

Customizing the Install Location

This topic is only applicable if you want to install the Avamar Solaris Client somewhere other than the default location.

To customize the var and base installation directories, set the following environment variables to the desired location before beginning the installation procedure:

- AVAMAR_INSTALL_VARDIR_PATH
- AVAMAR_INSTALL_BASEDIR_PATH

Installing and Registering the Avamar Solaris Client

Log in as root

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

Install Avamar Solaris Client Software

2. Change directory to your temporary install directory (page 65). For example:

   `cd /tmp`

3. Type the following:

   `pkgadd -d AVAMARSOLARIS.pkg`

   Where AVAMARSOLARIS.pkg is the actual filename of the Avamar Solaris Client install package you previously downloaded (page 65).

   The following appears in the command shell:

```
The following packages are available:
   1  AVMRclnt            Avamar Solaris Client
                          (sparc) 5.0-100.400


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...

Avamar Solaris Client
(sparc) 5.0-100.400

This software is copyright EMC 2001-2009.

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.

EMC Corporation
135 Technology Drive Suite 100
Irvine, CA 92618
(949) 743-5100

Relocate install from /opt/AVMRclnt? [n]
```

5. Press **ENTER** to accept the default install location.

   The following appears in the command shell:

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

   Avamar Solaris Client local cache files require an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM on this machine.

   Ensure that the directory location you specify in this step has sufficient room for these local cache files.

6. Press **ENTER** to accept the default cache and log file location.

   The following appears in the command shell:

   ```
   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,?]
   ```

7. Type **y** and press **ENTER**.

   The following appears in the command shell:

   ```
   Installing EMC Client as <AVMRclnt>
   ## Installing part 1 of 1.
   /opt/AVMRclnt/AvamarClient-License.txt
   /opt/AVMRclnt/bin/avagent.bin
   /opt/AVMRclnt/bin/avregister
   /opt/AVMRclnt/bin/avrunner
   /opt/AVMRclnt/bin/avscc
   /opt/AVMRclnt/bin/avtar
   /opt/AVMRclnt/bin/avtar.bin
   /opt/AVMRclnt/bin/unix.pin
   /opt/AVMRclnt/etc/avagent.d
   [ verifying class <apps> ]
   /opt/AVMRclnt/lib/libstdc++.so.5.0
   [ verifying class <libs> ]
   ## Executing postinstall script.
   Installation complete
   You may run /opt/AVMRclnt/bin/avregister to register this host with the
   Administrator server.
   avagent Info <5241>: Logging to /opt/AVMRclnt/var/avagent.log
   avagent Info <5417>: daemonized as process id 9714
   avagent.d Info: Server started.
   Installation of <AVMRclnt> was successful.
   ```

Register this Client With the Avamar Server

8. Type the following:

   /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 actual network hostname (as defined in DNS) of your 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, your Avamar system administrator may have defined other domains and subdomains. Consult your Avamar system administrator for the specific domain you should use when registering this client.

> **IMPORTANT:** If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character will cause an error and prevent you from registering this client.

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 the Avamar Solaris Client

Log in as root

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

Uninstall Avamar Software

2. Type the following:

   pkgrm AVMRclnt

   The following appears in the command shell:

```
The following package is currently installed:
            AVMRclnt       Avamar Solaris Client
                           (sparc) 5.0-100.400
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 dependencies.
## Processing package information.
## Executing preremove script.
avagent.d Info: Server 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.5.0
/opt/AVMRclnt/lib
## Removing pathnames in class <etcs>
## Removing pathnames in class <apps>
/opt/AVMRclnt/etc/avagent.d
/opt/AVMRclnt/etc
/opt/AVMRclnt/bin/unix.pin
/opt/AVMRclnt/bin/avtar.bin
/opt/AVMRclnt/bin/avtar
/opt/AVMRclnt/bin/avscc
/opt/AVMRclnt/bin/avrunner
/opt/AVMRclnt/bin/avregister
/opt/AVMRclnt/bin/avagent.bin
/opt/AVMRclnt/bin
/opt/AVMRclnt/AvamarClient-License.txt
/opt/AVMRclnt
## Removing pathnames in class <none>
## Updating system information.

Removal of <AVMRclnt> was successful.
```

Upgrading the Avamar Solaris Client

In order to upgrade your Avamar Solaris Client software on the Sun Solaris platform, you must completely uninstall the old software (page 69) and install the new software (page 66).

Manually Stopping and Restarting the avagent Service

The Avamar Solaris Client agent (**avagent**) is configured to run as a service and is started automatically as part of the installation procedure. It will also restart automatically following a system reboot. Therefore, in most cases, you do not need to manually stop or restart it. However, if you experience unexpected system behavior and do not want to reboot your entire system, the following commands can be used to manually stop and restart the **avagent** service.

Manually Stopping the avagent Service

Log in as root

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

   /etc/init.d/avagent Stop

Manually Restarting the avagent Service

Log in as root

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

   /etc/init.d/avagent start

Getting avagent Status

Log in as root

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

   /etc/init.d/avagent status

INSTALLING/UNINSTALLING AVAMAR WINDOWS CLIENT

This chapter describes how to install and register Avamar Windows Client software on a client computer.

Capabilities and Limitations

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

Windows Server 2008 Core Installations. If you deployed Windows Server 2008 using the Core Installation feature, you will not have access to the traditional full graphical user interface (GUI). Therefore, you must install and maintain the Avamar Windows Client software entirely from a DOS prompt using the **msiexec** utility. Refer to *Windows Server 2008 Core Installation and Maintenance* (page 76) for additional information.

Disabling NTFS Last Access Time Inhibits Backing Up Changed ACLs. If the NTFS Last Access Time feature is disabled on a Windows backup client, the Avamar Windows Client software is not able to detect any further Windows ACL changes. This means that the ACL setting stored during the original file backup is the ACL setting that will be applied on all future restores.

NTFS Last Access Time feature is enabled by default, but is sometimes disabled for performance purposes. Reestablishing proper Avamar Windows Client 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.

   The registry entry that controls whether Last Access Time is enabled or disabled is HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\FileSystem\NtfsDisableLastAccessUpdate.

   A value of 1 enables Last Access Time; a value of 0 disables Last Access Time.

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

```
fsutil behavior set disablelastaccess 0
```

2. Delete all local Avamar Windows Client cache files

   The Avamar Windows Client cache files are:

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

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

   Delete these files. This will cause them to be recreated the next time this client is backed up.

System Requirements

The client computer on which you want to install the Avamar Windows Client software must meet the following minimum requirements:

REQUIREMENT	MINIMUM
Operating System	• Windows Vista Home basic • Windows Vista Premium • Windows Vista Enterprise (32- and 64-bit) • Microsoft Server 2008 • Microsoft Windows Cluster Server 2003 • Microsoft Server 2003 • Microsoft Server 2003 x64 Edition • Microsoft Windows XP Professional • Microsoft Windows XP Home **NOTE:** Microsoft Server 2008 and Microsoft Windows Cluster Server 2003 both support active/passive and active/active cluster configurations.
Filesystem	• FAT16 • FAT32 • NTFS
RAM	512 MB.
Hard Drive Space	250 MB permanent hard drive space (1 GB recommended) for software installation. The Avamar client software also requires an additional 12 MB of permanent hard drive space for each 64 MB of physical RAM. Additional disk space might be required by your snapshot technology. Backing up the Windows System State requires an additional 1 GB of free disk space.
Network Interface	10baseT or higher, configured with latest drivers for your platform.

Installing the Avamar Windows Client

This procedure should be used to install Avamar Windows Client software on all supported versions of Microsoft Windows (page 72) except Server 2008 Core Installations.

IMPORTANT: For Windows clusters, you must install the Avamar Windows Client on all nodes of the cluster. Also, the client must be installed to the same directories on all cluster nodes. For example, if you install the Avamar client to C:\AVS1 on the first node, you must install the Avamar client to the same directory C:\AVS1 on all other nodes in the cluster.
Refer to *Appendix A — Support for Microsoft Windows Clusters* (page 95) for complete cluster installation instructions.

IMPORTANT: Do not use this procedure to install Avamar Windows Client software on Server 2008 Core Installations.

Refer to *Windows Server 2008 Core Installation and Maintenance* (page 76) if installing Avamar Windows Client software on Windows Server 2008 Core.

1. Log into the computer onto which you want to install this software.

   IMPORTANT: You must log in as Administrator if installing the Avamar Windows Client on Windows Vista platforms.

2. Point your web browser at the Avamar server by typing the following URL:

   `http://AVAMARSERVER`

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

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

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

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

   The Secure Log On page appears.

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

5. Click **Documents and Downloads**.

   The Documents and Downloads page appears.

6. Click the correct operating system hyperlink for your client computer.

   A directory listing appears in your browser.

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

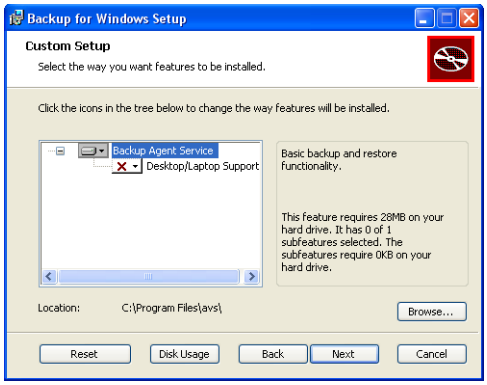
   Your browser will prompt you to either open the file “in-place” (on the server) or save it to your local computer. Either method will work. However, if you save the file to your local computer, you must open (double-click) that installation file to continue with this procedure.

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

   The installation wizard appears.

9. Follow the on-screen instructions.

   Immediately after accepting the End User Licensing Agreement, the Backup for Windows Setup screen appears.



10. Do one of the following:

IF	DO THIS
You are installing Avamar Windows Client software on a server.	Go directly to step 11.
You are installing Avamar Windows Client software on a desktop or laptop machine.	Select Desktop/Laptop Support, then go to step 11.

11. Click **Next**.

    The Ready to install Backup for Windows screen appears.

12. Click **Install** to begin the installation procedure.

13. When prompted, click **Finish** to complete the installation procedure.

    The installation wizard closes.

    The Avamar icon (shown left) appears in the system tray.

Registering the Avamar Windows Client

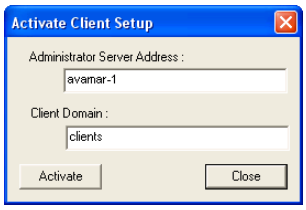
Before you can backup or restore any files on this client computer, you must register it with the Avamar server.

1. Right click the Avamar system tray icon (shown left).

   A menu appears.

2. Select **Activate**.

   The Activate Client Setup dialog box appears.



3. Type the following:

FIELD	DESCRIPTION
Administrator Server Address	Administrator server network hostname as defined in DNS.
Client Domain	Avamar domain where you want this client to reside. The default domain is “clients.” However, your Avamar system administrator may have defined other domains and subdomains. Consult your Avamar system administrator for the specific domain you should use when registering this client. **IMPORTANT:** If typing a subdomain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character will cause an error and prevent you from registering this client.

4. Click **OK**.

   The Activate Client Setup dialog box closes.

Uninstalling and Upgrading the Avamar Windows Client

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

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

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

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

IMPORTANT: If you need to upgrade to an older version Avamar Windows Client software, you must completely uninstall the existing version and install the new software. Upgrades are not possible under these circumstances.

Windows Server 2008 Core Installation and Maintenance

If you deployed Windows Server 2008 using the Core Installation feature, you will not have access to the traditional full graphical user interface (GUI). Therefore, you must install and maintain the Avamar Windows Client software entirely from a DOS prompt using the **msiexec** utility using these procedures.

Installing and Registering the Avamar Windows Client

IMPORTANT: In order to obtain the Avamar Windows Client software installation package, you will need another computer capable of connecting to the Avamar using a web browser.

1. Log into a computer capable of connecting to the Avamar using a web browser (not the Windows Server 2008 Core system).
2. Point your web browser at the Avamar server by typing the following URL:

   http://AVAMARSERVER

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

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

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

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

   The Secure Log On page appears.

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

   The Documents and Downloads page appears.

6. Click the **Windows 2008** hyperlink.

   A directory listing appears in your browser.

7. Use WinSCP or FTP to copy the AvamarClient-windows-x86-VERSION.msi install package to a temporary folder on the Windows Server 2008 Core system.

   NOTE: C:\Temp is used as an example temporary folder for the remainder of this procedure. Your actual temporary folder might be different.

8. Log into the Windows Server 2008 Core system and open a DOS prompt.
9. Change directory to the temporary folder by typing:

   ```
   C:
   cd \Temp
   ```

10. Initiate the Avamar Windows Client software installation by typing:

    ```
    msiexec /i AvamarClient-windows-x86-VERSION.msi
    ```

    The installation wizard appears.

11. Follow the on-screen instructions.
12. Click **Finish** to complete the installation procedure.
13. Next, you must register this Avamar Windows Client with the Avamar server using the **avregister.bat** program as follows:

    (a) Switch to the DOS prompt.

    (b) Type:

    ```
    C:\Program Files\avs\bin\avregister.bat MCS-NAME DOMAIN
    ```

    Where MCS-NAME is the actual network hostname (as defined in DNS) of your Avamar MCS and DOMAIN is an optional location for this client on the Avamar server, respectively.

    If DOMAIN is not supplied, the default domain “clients” is used. However, your Avamar system administrator may have defined other domains and subdomains. Consult your Avamar system administrator for the specific domain you should use when registering this client.

IMPORTANT: If specifying a subdomain (for example, (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character will cause an error and prevent you from registering this client.

Uninstalling the Avamar Windows Client

Uininstalling the Avamar Windows Client software is accomplished by running the **msiexec** utility as described in the previous topic.

If you pass in the same installation package, a wizard screen appears, which offers you an opportunity to remove or repair the current Avamar Windows Client software.

To unistall the current Avamar Windows Client software, select **Remove** and follow the remaining on-screen instructions.

Upgrading the Avamar Windows Client

Uininstalling the Avamar Windows Client software is accomplished by running the **msiexec** utility as described in the previous topics.

If you pass in a newer version installation package, a wizard screen appears, which offers you an opportunity to install the newer version Avamar Windows Client software.

BACKUP AND RESTORE

Following installation and registration, Avamar clients typically have their data backed up automatically by way of regularly scheduled backups initiated by the Avamar server. Data can also be restored by the system administrator using Avamar Administrator. However, “on-demand” backup and restore operations can also be initiated directly from the Avamar client.

Capabilities and Limitations

International Character Support. Avamar generally supports the use of specific supported international characters in directory, folder and filenames. 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 you do not have a compatible font installed on your system, any characters that cannot be resolved by the system will be 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. Refer to your *Avamar Release Notes* for additional international language support information.

Restoring International Characters With Avamar Web Restore. When performing restores using the Avamar Web Restore feature, restores containing directories or multiple files are delivered in the form of a zip file. When unzipping the zip file, file and directory names containing international characters might not restore properly due to inherent limitations in some zip utilities. Therefore, in order to correctly restore files containing international characters using the Avamar Web Restore feature, you must 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

Also be advised that 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. It is not possible to restore encrypted files with the the Avamar Web Restore feature. Any files that were encrypted at the time of the original backup will be restored as empty (zero byte) files. If you need to restore encrypted files, contact your Avamar system administrator. He or she can restore encrypted files using the Avamar Administrator graphical management console.

Windows Clients

Avamar Windows Clients initiate on-demand backups and restores using the Avamar client application running in the system tray.

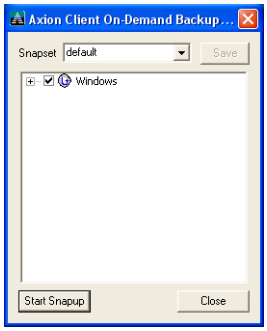
Performing an On-Demand Backup

1. Right click the Avamar system tray icon (shown left).

   A menu appears.

2. Select **Back Up Now**.

   The Avamar Client On-Demand Backup dialog box appears.



3. Select a set of files from the drop-down list.
4. Select the files and directories you want to backup.
5. Click **Start Backup**.

   The Avamar Client On-Demand Backup dialog box closes and the backup is initiated.

Performing a Restore

On-demand restores are initiated from the Avamar client application running in the system tray. However, you actually select which files to restore from your web browser.

IMPORTANT: Due to inherent limitations in the way Windows handles encryption and decryption, encrypted files cannot be successfully restored using this procedure.

1. Right click the Avamar system tray icon (shown left).

   A menu appears.

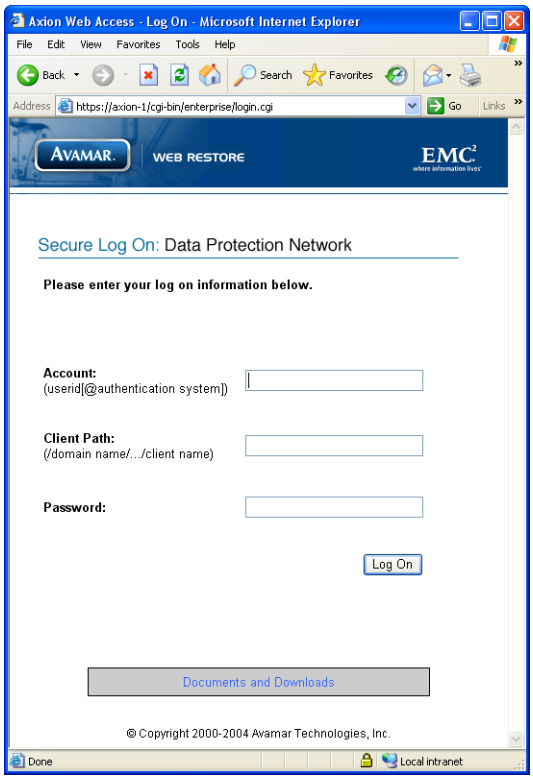
2. Select **Restore**.

   Your web browser is launched.

   A Security Alert dialog box may appear (depending on your specific browser settings).

3. If a Security Alert dialog box appears, click **Yes** to proceed.

   The Security Alert dialog box closes and the Avamar Secure Logon web page appears.

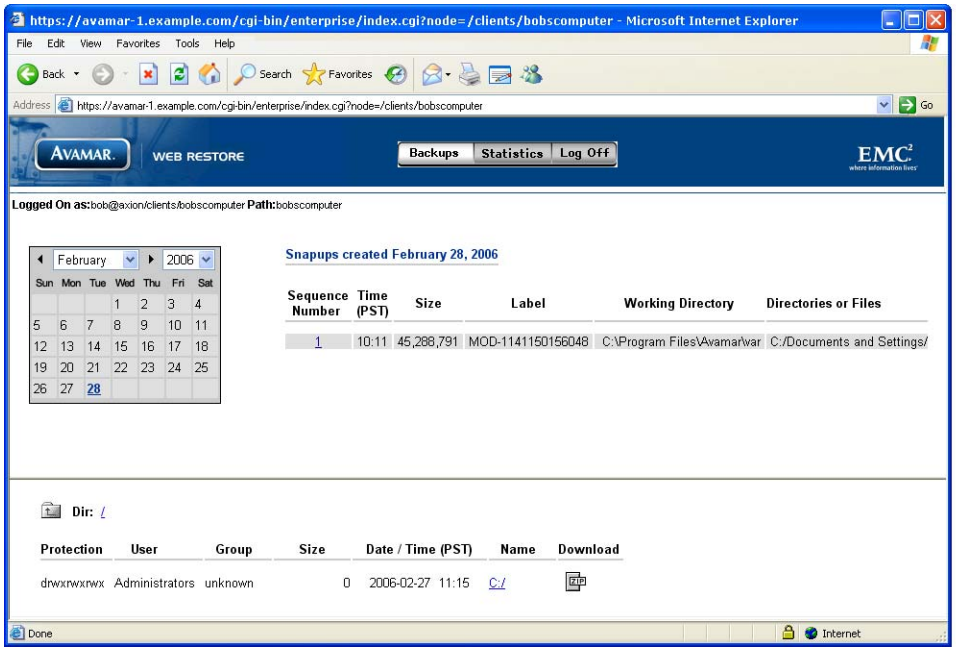


4. Type the following:

FIELD	DESCRIPTION
Account	Type your Avamar user account name in the form of: USERID@AUTHENTICATION-SYSTEM Where USERID is your Avamar user name and AUTHENTICATION-SYSTEM is the authentication system defined for your Avamar user account. The default internal authentication system is “avamar.” You may be using an external authentication system (for example, Windows Active directory, OpenLDAP, and so forth) at your site. Consult your Avamar system administrator for additional information.
Client Path	Type the location of this Avamar client in the form of: /DOMAIN/CLIENT Where DOMAIN is the Avamar domain (not Internet domain) where this client resides and CLIENT is the Avamar client name. **IMPORTANT:** This entry must begin with a forward slash (/).
Password	Avamar user account password. If using the internal “avamar” authentication system, Avamar passwords are case-sensitive and must: • Be between six and 32 characters in length • Contain only alphanumeric, hyphen, period or underscore characters • Contain at least one alphabetic character If using an external authentication system, the password rules and constraints of that system apply.

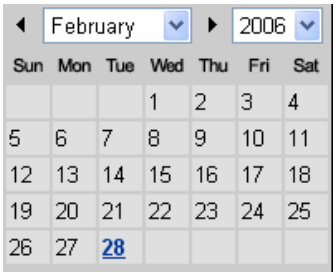
5. Click **Log on**.

   The Avamar Web Services web page appears.



6. Click **Backups**.

   The Avamar Web Services web page provides a browsable calendar for locating backups in the Avamar server.

   Underlined dates indicate that a backup was performed on that date, from which you ca restore files.

   Clicking a valid backup date on the calendar populates the backups list beside the calendar.

   Clicking a valid backup name populates the backup contents list below the calendar.

7. Click a valid (underlined) backup date in the Calendar.
8. Click a valid (underlined) backup in the Sequence Number column.
9. Click **Name** to expand the directory tree.

   At many levels of the file system, one or more zip files will appear. These zip files provide the mechanism for restoring multiple files and directories. Simply download them as you would any other file from a web site and unzip the zip file, either directly overwriting the file you want to restore or unzipping to a temp directory where you can browse the restored files prior to moving them into the final location (for example, your My Documents folder, Program Files folder, and so forth).

IMPORTANT: If more than one file is selected for restore, the sum of all the original file sizes cannot exceed 1GB. If your restore requirements exceed this limitation, you must restore your files in several smaller batches or have your Avamar system administrator restore your files using Avamar Administrator.

However, there is no size limitation on restoring a single file in this manner.

10. Click the file or zip file you want to restore.
11. Download or open the file or zip file by following the on-screen instructions provided by your web browser.

TIP: When working with zip files, it is a good practice to download and unzip the contents to a temp directory (for example, C:/temp). This allows you to open and verify restored files prior to moving them to their final location (for example, your My Documents folder, Program Files folder, and so forth). However, you can unzip files directly to their final location if you decide to do so.

12. Unzip the zip file using an approved zip utility (page 79), then restore the desired directories or files.

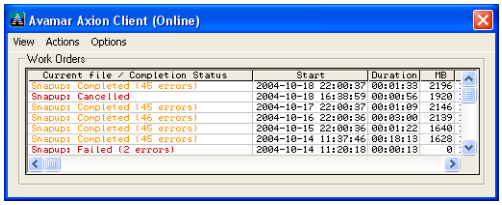
Getting Status

1. Right click the Avamar system tray icon (shown left).

   A menu appears.

2. Select **Open**.

   The Avamar Client Status dialog box appears.



   In-progress backups are shown in the Work Orders list.

Mac OS X Clients

Avamar Mac OS X Clients initiate on-demand backups and restores using the AvamarClient application, located in the Applications folder. By default, the AvamarClient application is launched at login, and appears in the Dock while running.

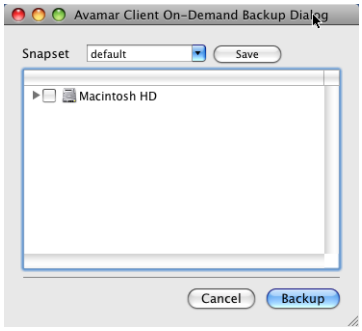
Performing an On-Demand Backup

1. Right click the AvamarClient application icon.

   A menu appears.

2. Select **Back Up Now**.

   The Avamar Client On-Demand Backup Dialog box appears.



3. Select the files and directories you want to backup.
4. Click **Back Up**.

   The Avamar Client On-Demand Backup Dialog box closes and the backup is initiated.

Performing a Restore

On-demand restores are initiated from the AvamarClient application running in the Dock. However, you actually select which files to restore from your web browser.

1. Right click the AvamarClient application icon.

   A menu appears.

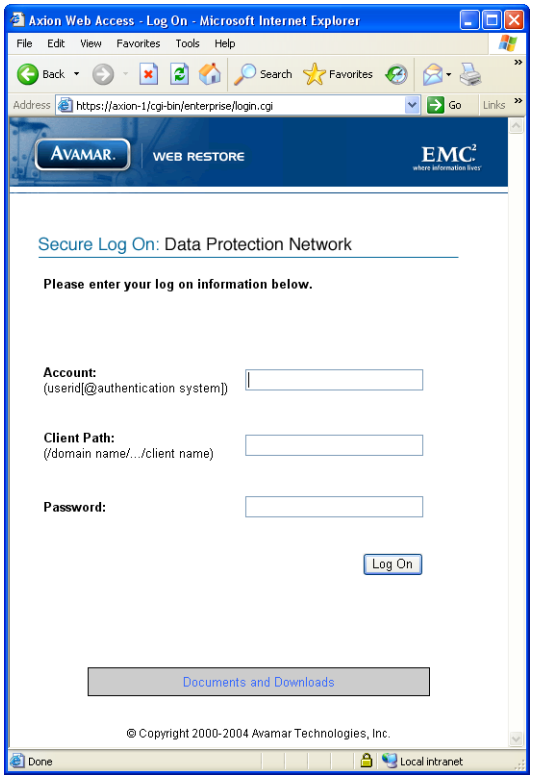
2. Select **Restore**.

   Your web browser is launched.

   A Security Alert dialog box may appear (depending on your specific browser settings).

3. If a Security Alert dialog box appears, click **Yes** to proceed.

   The Security Alert dialog box closes and the Avamar Secure Logon web page appears.

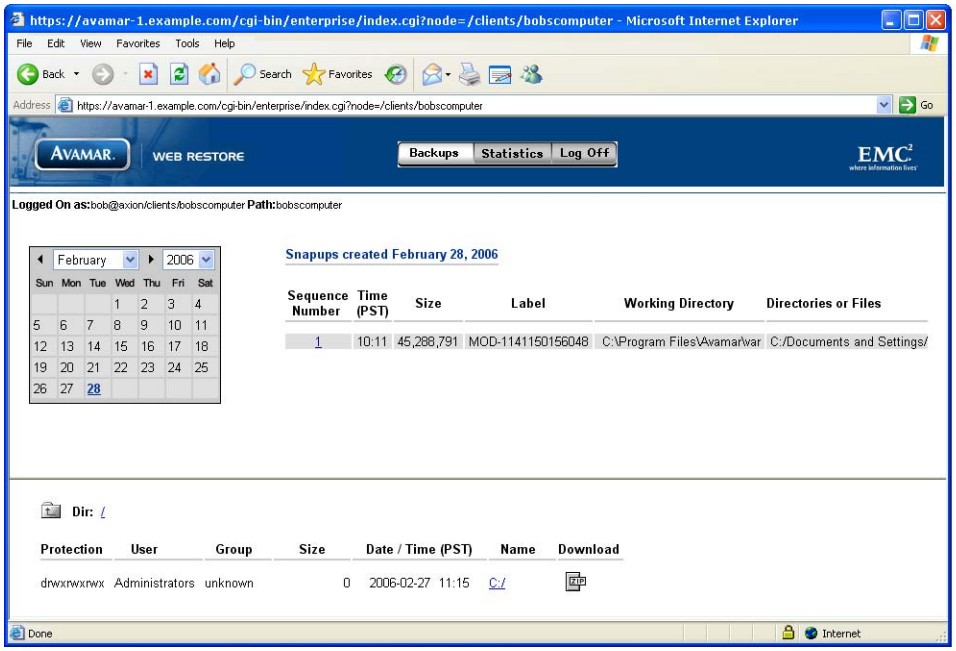


4. Type the following:

FIELD	DESCRIPTION
Account	Type your Avamar user account name in the form of: USERID@AUTHENTICATION-SYSTEM Where USERID is your Avamar user name and AUTHENTICATION-SYSTEM is the authentication system defined for your Avamar user account. The default internal authentication system is “avamar.” You may be using an external authentication system (for example, Windows Active directory, OpenLDAP, and so forth) at your site. Consult your Avamar system administrator for additional information.
Client Path	Type the location of this Avamar client in the form of: /DOMAIN/CLIENT Where DOMAIN is the Avamar domain (not Internet domain) where this client resides and CLIENT is the Avamar client name. **IMPORTANT:** This entry must begin with a forward slash (/).
Password	Avamar user account password. If using the internal “avamar” authentication system, Avamar passwords are case-sensitive and must: • Be between six and 32 characters in length • Contain only alphanumeric, hyphen, period or underscore characters • Contain at least one alphabetic character If using an external authentication system, the password rules and constraints of that system apply.

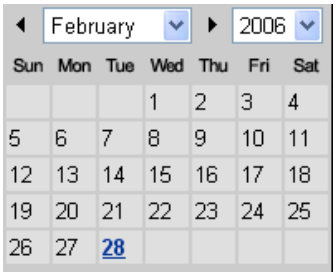
5. Click **Log on**.

   The Avamar Web Services web page appears.



6. Click **Backups**.

   The Avamar Web Services web page provides a browsable calendar for locating backups in the Avamar server.

   Underlined dates indicate that a backup was performed on that date, from which you can restore files.

   Clicking a valid backup date on the calendar populates the backups list beside the calendar.

   Clicking a valid backup name populates the backup contents list below the calendar.

7. Click a valid (underlined) backup date in the Calendar.
8. Click a valid (underlined) backup in the Sequence Number column.
9. Click **Name** to expand the directory tree.

   At many levels of the file system, one or more zip files will appear. These zip files provide the mechanism for restoring multiple files and directories. Simply download them as you would any other file from a web site and unzip the zip file, either directly overwriting the file you want to restore or unzipping to a temp directory where you can browse the restored files prior to moving them into the final location (for example, your My Documents folder, Program Files folder, and so forth).

IMPORTANT: If more than one file is selected for restore the sum of all the original file sizes cannot exceed 1GB. If your restore requirements exceed this limitation, you must restore your files in several smaller batches or have your Avamar system administrator restore your files using Avamar Administrator.

However, there is no size limitation on restoring a single file in this manner.

10. Click the file or zip file you want to restore.
11. Download or open the file or zip file by following the on-screen instructions provided by your web browser.

TIP: When working with zip files, it is a good practice to download and unzip the contents to a temp directory (for example, /temp). This allows you to open and verify restored files prior to moving them to their final location (for example, your Documents folder, Applications folder, and so forth). However, you can unzip files directly to their final location if you decide to do so.

12. Unzip the zip file using an approved zip utility (page 79), then restore the desired directories or files.

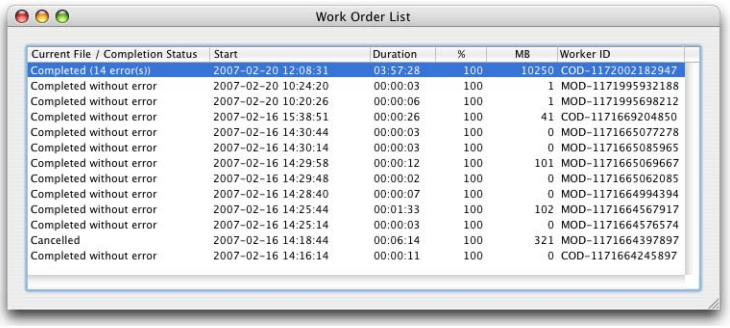
Getting Status

1. Right click the AvamarClient application icon.

   Avamar Client commands appear in the menu bar.

2. Select **View** > **Work Order Status** from the menu bar.

   The Work Order List window appears.



In-progress and completed backups are shown in the Work Orders list.

AIX, FreeBSD, HP-UX, Linux, SCO and Solaris Clients

AIX, FreeBSD, HP-UX, Linux and Solaris clients initiate on-demand backups and restores using the **avtar** command line.

> **IMPORTANT:** Space limitations in this publication cause these examples to continue (wrap) to more than one line, However, all commands and options must be entered on a single command line (no line feeds or returns allowed).

Performing an On-Demand Backup

This example backs up files within the MyFiles and abcd directories on a Linux computer and labels the backup jdoeFiles.

1. Open a command shell.
2. Type the following on a single command line:

```
/usr/local/avamar/bin/avtar -c --label="jdoeFiles"
 MyFiles/ abcd/ --id=jdoe@avamar/clients/MyClient
```

Performing a Restore

This 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.

1. Open a command shell.
2. Type the following on a single command line:

```
/opt/AVMRclnt/bin/avtar -xv --target="old_newsletters"
 --before="2009-10-31 15:00:00"
 --id=jdoe@avamar/clients/MyClient --label="newsletters"
```

This example restores files found in the abcd and MyFiles directories in the backup labeled newsletters into the old_newsletters directory on a Linux computer.

1. Open a command shell.
2. Type the following on a single command line:

```
/usr/local/avamar/bin/avtar -xv --label="newsletters"
 --target="old_newsletters" abcd/ MyFiles/
 --id=jdoe@avamar/clients/MyClient
```

Getting Status

This example lists information about the three most recent backups created after the indicated date and time. Verbose (status and warning) messages are turned on and the command path is correct for a Linux client.

1. Open a command shell.
2. Type the following on a single command line:

```
/usr/local/avamar/bin/avtar --backups --verbose --count=3
 --after="2009-10-31 11:17:33"--id=jdoe@avamar/clients/MyClient
```

This example lists files and directories inside the backup labeled jdoeFiles created before the indicated date and time. Highly verbose (**--verbose=2**) messages are turned on and the command path is correct for an HP-UX or Solaris computer.

1. Open a command shell.
2. Type the following on a single command line:

```
/opt/AVMRclnt/bin/avtar -t --verbose=2 /myfiles/rem
 --label="jdoeFiles" --before="2009-10-31 04:30:15"
 --id=jdoe@avamar/clients/MyClient
```

NetWare Clients

Avamar NetWare Clients initiate on-demand backups and restores from the NetWare system console using the **avtar** command line.

Certain Hidden NetWare Folders and Files Not Backed Up. Due to an inherent limitation within Novell Storage Services (NSS), the following folders (directories) and files are excluded from all backups:

Two hidden folders (directories): Network Trash Folder and DESKTOP.AFP. These folders (directories) will only be present if AppleTalk Filing Protocol (AFP) is loaded on the server.

A hidden file, ~dfsinfo.8-p, might be present on NSS volumes. This file is created in conjunction with Volume Location Database (VLDB) and Distributed File Services (DFS).

This limitation applies to both the (native) Avamar NetWare Client and integrations using the Avamar NDMP Accelerator.

Because this limitation is within NSS and not the Avamar client, no interim solution exists.

IMPORTANT: Space limitations in this publication cause these examples to continue (wrap) to more than one line, However, all commands and options must be entered on a single command line (no line feeds or returns allowed).

Performing an On-Demand Backup

The following example backs up files within the MyFiles directory on a NetWare server and labels the backup as “MyFiles.”

From the NetWare server console, type the following on a single command line:

```
sys:avamar\bin\avtar -c vol1:\MyFiles --server=MyMCServer
 --account=/clients/MyClient --sms_auth=.admin.MyContext
 --sms_password=MyEDirPwd --id=MyAvUser --password=MyAvPassword
 --label="MyFiles"
```

Notice the syntax used to specify the volume prefix of the path. The backup will be successful if either “vol1:” or “vol1:\” is entered. However, you must specify the same volume prefix during your on-demand restore (page 93) or the restore will fail. If unsure, perform a status request (page 93) to verify the syntax used for the original backup.

IMPORTANT: NSS volumes with compression enabled can cause memory contention issues during backups. Therefore, EMC strongly recommends that compression be suspended during backup operations.

Performing a Restore

The following example restores all the contents of vol1:\MyDir from the backup labeled MyFiles into the NewFiles directory on a NetWare server, and logs all messages to MyRestore1.log.

From the NetWare server console, type the following on a single command line:

```
sys:avamar\bin\avtar -xv --label="MyFiles" --target="vol1:\NewFiles"
 vol1:\MyDir --server=MyMCServer --account=/clients/MyClient
 --sms_auth=.admin.MyContext --sms_password=MyEDirPwd --id=MyAvUser
 --password=MyAvPassword --logfile=sys:\avamar\var\MyRestore1.log
```

The following example restores vol1:\MyDir from the backup labeled MyFiles to its original location on a NetWare server. All messages are logged to MyRestore2.log.

From the NetWare server console, type the following on a single command line:

```
sys:avamar\bin\avtar -xv --label="MyFiles" vol1:\MyDir
 --server=MyMCServer --account=/clients/MyClient
 --sms_auth=.admin.MyContext --sms_password=MyEDirPwd --id=MyAvUser
 --password=MyAvPassword --logfile=sys:\avamar\var\MyRestore2.log
```

Getting Status

The following example lists information about the three most recent backups created after the indicated date and time. Verbose (status and warning) messages are turned on and the command path is correct for a NetWare client.

From the NetWare server console, type the following on a single command line:

```
sys:avamar\bin\avtar --verbose --backups --count=3
 --after="2009-10-31 11:17:33" --server=MyMCServer
 --account=/clients/MyClient --sms_auth=.admin.MyContext
 --sms_password=MyEDirPwd --id=MyAvUser --password=MyAvPassword
```

The following example lists files and directories inside the backup labeled MyFiles created before the indicated data and time. Highly verbose (**--verbose=2**) messages are turned on and the command path is correct for NetWare client.

From the NetWare server console, type the following on a single command line:

```
sys:avamar\bin\avtar --verbose=2 -t --label="MyFiles"
 --before="2009-10-31 11:17:33" --server=MyMCServer
 --account=/clients/MyClient --sms_auth=.admin.MyContext
 --sms_password=MyEDirPwd --id=MyAvUser --password=MyAvPassword
```

Setting Up Pre- or Post-Backup Scripts

This topic provides instructions for setting up pre- or post-backup scripts for an Avamar NetWare Client backup.

To set up a pre- or post-backup script, perform the following:

1. Navigate to SYS:AVAMAR\ETC\SCRIPTS.

   This location contains your NetWare scripts. For more information about creating NetWare scripts, refer to Novell NetWare documentation.

2. Create the Avamar server script.

   Avamar server scripts use .SH extensions (PRE.SH, for example).

3. Add a line to PRE.SH that specifies the location of the NetWare script. For example, if PRE.NCF script is your pre-backup script you would type the following text:

   SYS:AVAMAR\ETC\SCRIPTS\PRE.NCF

To specify a pre- or post-script with a backup, use the **--run-at-start=SCRIPT** or **--run-at-end=SCRIPT** option with the **avtar** command.

To use Avamar Administrator to back up an Avamar NetWare Client, specify the pre- or post-backup scripts in the Backup Command Line Options dialog box:

1. From the Backup Command Line Options dialog box, click **Show Advanced Options**.
2. To run a pre-backup script, type the Avamar server script in the Run user-defined script at beginning of backup text box.
3. To run a post-backup script, type the Avamar server script in the Run user-defined script at end of backup text box.

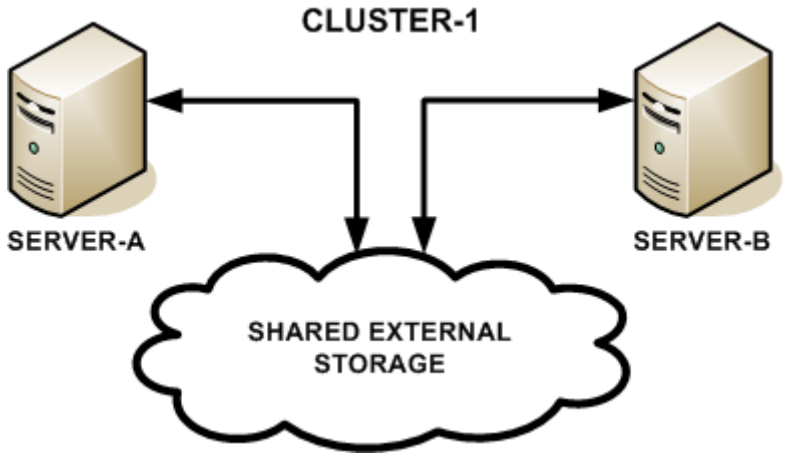
For more information on using Avamar Administrator, refer to the *Avamar System Administration Guide.*

APPENDIX A — SUPPORT FOR MICROSOFT WINDOWS CLUSTERS

This appendix presents additional information about how to protect Microsoft Windows clusters environments.

If your site has implemented Microsoft Windows clusters, you must install a special Avamar Windows Cluster Client in order to protect data residing on shared external storage within those clusters.

For clarity, consider a greatly simplified Microsoft Windows cluster comprising two servers (SERVER-A and SERVER-B) and some amount of shared external storage. Further consider that this cluster hosts an SQL Server database.



Cluster Groups and Resources. For purposes of this discussion, a cluster group (CLUSTER-1) is defined with cluster nodes SERVER-A and SERVER-B, the SQL Server database instance and a designated area of the shared external storage (for example, drive S:) declared as resources.

Online and Offline Cluster Groups. SERVER-A is activated as the owner of CLUSTER-1. Users now transparently access that SQL Server database instance which is running on SERVER-A by way of a virtual IP address and hostname assigned to the cluster group. Data is written to and read from the designated area of the shared external storage (for example, drive S:). SERVER-B is not the owner at this time and cannot access drive S: at all.

In a virtual cluster group, at any given time only one server in each cluster can access the shared external storage for a single shared application; that server is called the *active* node. The other server will be offline or standing by; that server is sometimes referred to as the *passive* node. In normal day-to-day operations, the active and passive roles are frequently rotated between the servers.

Required Resources. In order to properly protect data residing on this Microsoft cluster, the following resources must be defined for it:

- IP address
- Network name
- Shared external storage

The Quorum disk must be in the default cluster group.

Refer to your Microsoft cluster documentation for additional detailed technical information.

Functional Overview. In order to properly protect data residing on this Microsoft cluster, you must:

1. Install the normal (non-cluster) Avamar Windows Client on all nodes in the cluster (SERVER-A and SERVER-B in the example) according to the instructions found in *Installing the Avamar Windows Client* (page 73).

   NOTE: The Avamar Windows Client must be installed to the same directories on all cluster nodes. For example, if you install the Avamar client to C:\AVS1 on the first node SERVER-A, you must install the Avamar client to the same directory C:\AVS1 on SERVER-B and all other nodes in the cluster.

2. Register the Avamar Windows Clients on each machine according to the instructions found in *Registering the Avamar Windows Client* (page 75).

   This protects data residing on the internal hard disk drives of both SERVER-A and SERVER-B.

   NOTE: Each node (SERVER-A and SERVER-B in the example) will be managed as individual clients in Avamar Administrator and that this will allow you to schedule backups of data residing on each server's internal hard disk drive.

3. Install the Avamar Windows Cluster Client on the active node (the server that currently has access to the shared external storage) according to the instructions found in *Installing the Avamar Windows Cluster Client* (page 99).

   NOTE: The Avamar Cluster Client only needs to be installed on the active node of the cluster.

Capabilities, Limitations and Best Practices

Avamar supports the following server platforms and applications in both active-passive and active-active configurations.

32-bit clusters on Windows Server 2003:

- 32-bit SQL Server 2005 and 2008
- 32-bit Exchange 2003
- 32-bit Lotus Domino 6.5, 7.0, and 8.0x

64-bit clusters on Windows Server 2003:

- 64-bit SQL Server 2005 and 2008
- 64-bit Exchange 2007

32-bit clusters on Windows Server 2008:

- 32-bit SQL Server 2008
- 32-bit Oracle 11*g*

64-bit clusters on Windows Server 2008:

- 64-bit SQL Server 2008
- 64-bit Exchange 2007
- 64-bit Oracle 11*g*

> **NOTE:** Exchange 2003 is only available as a 32-bit application and is therefore not supported on 64-bit server platforms.

Do Not Mix Individual Client File system Data with Shared Cluster Data in the Same Dataset. If you access one of the cluster clients in Avamar Administrator, it will be possible to view shared external storage belonging to the cluster. However, you should not under any circumstances allow that data to be backed up with that client. In fact, you should explicitly exclude any shared cluster directories from the Avamar dataset that will be used to back up the individual client internal hard disk drive.

Conversely, if you access the cluster client in Avamar Administrator, it will be possible to view the internal file system of each client. However, you should not under any circumstances allow that data to be backed up as part of shared cluster data. In fact, you should explicitly exclude any internal client directories from the Avamar dataset that will be used to back up the cluster shared external storage.

Mixing individual client filesystem data with shared cluster data might compromise the ability to properly restore shared cluster data in the future.

Microsoft "Windows Compute Clusters" Not Supported. Microsoft now offers two different products with the word "cluster" in the name:

Windows Clustering is the term applied to the cluster product supported by the cluster-enabled Avamar Windows Client software. Microsoft also refers to this product as a "server cluster."

Another Microsoft product called a "Windows Compute Cluster" is a relatively recent offering and is not supported by the cluster-enabled Avamar Windows Client software.

Do Not Back up the Quorum Drive. Microsoft explicitly advises that no attempts should ever be made to back up or restore the Quorum drive. This cluster resource must always remain under exclusive control of the cluster. Therefore, examine any Avamar datasets to ensure that the resource is not being backed up. Explicitly excluding the Quorum drive is the surest way to accomplish that.

> **IMPORTANT:** Drive Q is commonly mapped to the Quorum drive in many Microsoft Windows cluster environments. If this is the case in your environment, do not under any circumstances install any Avamar software on drive Q. Also ensure that drive Q is excluded from any backup dataset.

Activate physical nodes of cluster on Avamar server before configuring the Avamar Cluster Client. When configuring a Window cluster with the Avamar Cluster Configuration tool, all physical nodes of the cluster must be activated on the Avamar server before running the tool.

Installing the Avamar Windows Cluster Client

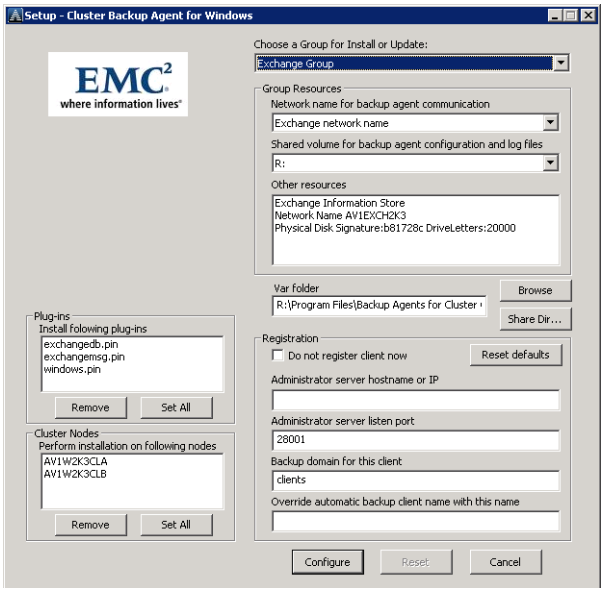
The Avamar Windows Cluster Client only needs to be installed on the active node of the cluster.

IMPORTANT: For Windows clusters, you must install the Avamar Windows Client on all nodes of the cluster. Also, they must be installed to the same directories on all cluster nodes. For example, if you install the Avamar client to C:\AVS1 on the first node, you must install the Avamar client to the same directory C:\AVS1 on all other nodes in the cluster.

1. Install the Avamar Windows Client on all nodes in the cluster according to the instructions found in *Installing the Avamar Windows Client* (page 73).
2. Register each Avamar Windows Client according to the instructions found in *Registering the Avamar Windows Client* (page 75).
3. Determine which server in the cluster currently has access to the shared external storage for that cluster.

   This is the active node for that cluster.
4. Log onto the active node in the Windows cluster.
5. From the avs\bin directory, run **AvamarClusterConfiguration.exe**.

   The Setup - Cluster Backup Agent for Windows dialog box appears.



6. Select or type the following:

	FIELD/OPTION	DESCRIPTION
	Choose a Group for Install or Update.	Select the correct cluster group, on which you want to install this software, from this drop-down list.
GROUP RESOURCES	Network name for backup agent communication	This drop-down list contains all network names (hostnames) assigned to this cluster group. Select the network name you want to use for Avamar client-server communication from this drop-down list.
	Shared volume for backup agent configuration and log files	This drop-down list contains all shared external storage drives assigned to this cluster group. Select the shared external storage drive on which you want to install this software. **NOTE:** Some types of Windows clusters, such as Exchange Server 2007 CCR clusters, typically do not have shared storage in the cluster group. In that case, the configuration and log files must be placed on a shared network folder that all nodes in the cluster can access and write to. You can specify the path to this folder in the Var folder box.
	Var folder	Specifies the path to a shared network folder where the configuration and log files are to be placed. If a shared volume is available, this field is automatically filled in by default. Type the UNC path or click **Browse** to specify an existing folder, or click **Share Dir** to create a shared folder. **IMPORTANT:** All nodes of the cluster must have write access to the Var folder location.

	FIELD/OPTION	DESCRIPTION
REGISTRATION	Do not register client now	If selected, client associated with this cluster group will not be registered with the Avamar server. This client will have to be manually registered and activated before you can back up any data.
	Administrator server host name or IP address	Administrator server network hostname as defined in DNS.
	Administrator server listen data port	The default data port for Avamar client-server communication is 28001. Unless you are using a different data port at your site, you should leave this set to 28001. Consult your Avamar system administrator for the specific data port you should use when registering this client.
	Backup domain for this client	Avamar domain where you want this client to reside. The default domain is “clients.” However, your Avamar system administrator might have defined other domains and sub-domains. Consult your Avamar system administrator for the specific domain you should use when registering this client. **IMPORTANT:** If typing a sub-domain (for example, clients/MyClients), do not include a slash (/) as the first character. Including a slash as the first character will cause an error and prevent you from registering this client.
	Override automatic backup client name with this name	If you do not want the Avamar client name to be the same as the cluster group name, type another Avamar client name in this field.

	FIELD/OPTION	DESCRIPTION
PLUG-INS	Install following plug-ins	Displays all of the plug-ins currently installed that will work on clusters. Generally you will not need to change the defaults. If you don't want Avamar to use a particular plug-in, select the item and then click **Remove**. If you want to reload the complete list of plug-ins that were displayed when you opened this window, click **Set All**.
CLUSTER NODES	Perform installation on following nodes	Displays a list from Windows cluster services of all of the nodes that are part of the cluster. Generally you will not need to change the defaults. If there is a node on the cluster that you don't want the cluster backup agent service installed on, select the item and then click **Remove**. If you want to reload the complete list of nodes that are part of this cluster, click **Set All**.

7. Click **Configure**.

   You will be prompted for credentials to run the Avamar service.

   When installation is complete, a message box will confirm the configuration of the client is complete, and will list the plug-ins that were configured. After you click **OK**, the setup dialog box is displayed, and the Configure button will be unavailable.

> **IMPORTANT:** If the Var folder is on a network share, you must start the backup cluster agent from an account that has full access permissions to the folder where Avamar log files are written.

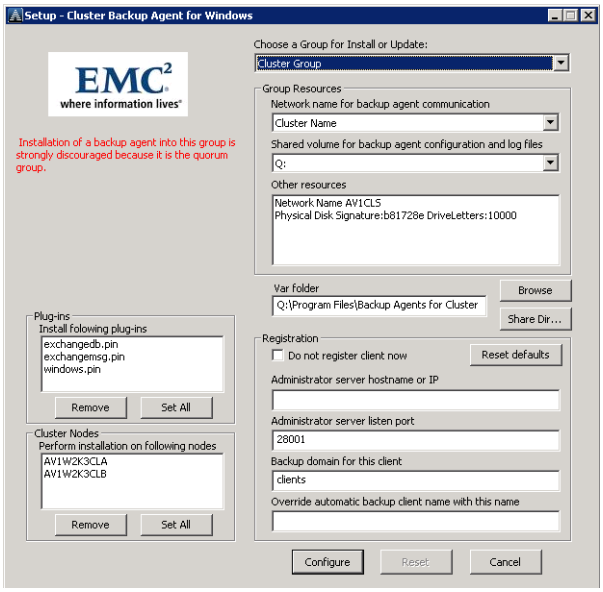
Uninstalling the Avamar Windows Cluster Client

Uninstalling the Avamar Windows Cluster Client, like installing the Avamar Windows Cluster Client, is performed on the active node in the cluster. You do not perform the uninstall steps on every node in the cluster.

NOTE: It is recommended that all cluster nodes are operational during the uninstall process.

1. Log on to the active node in the Windows cluster.
2. From the avs\bin directory, run **AvamarClusterConfiguration.exe**.

   The Setup - Cluster Backup Agent for Windows dialog box appears.



3. In **Choose a Group for Install or Update**, select the cluster group you want to uninstall.
4. Click **Reset**.

Uninstalling an older version of Windows Cluster Client and upgrading to Avamar Cluster Client

To uninstall an older version of cluster client:

1. Take the cluster offline with the cluster administration tool that corresponds with the version of Windows Server:

   (a) In Windows Server 2008, open **Failover Cluster Management.**

   -or-

In Windows Server 2003 open **Administrator Tools > Cluster Administrator**.

(b) Right-click the Backup Agent service and take it offline.

2. On the passive node, in Add/Remove Programs, uninstall all Avamar clients: Windows Client and Windows Cluster Client.
3. On the active node, in Add/Remove Programs, uninstall all Avamar clients: Windows Client and Windows Cluster Client.
4. Using the cluster administration tool again, delete the Backup Agent resource.

   Uninstall of all Avamar clients on the passive and active nodes is complete.

To upgrade to Avamar Cluster Client:

NOTE: When installing the clients, use the same var folder as the previous Avamar installation. Uninstall does not remove this folder, so your config and log files will still be available there.

1. Install the Windows Client on each node, following the steps in *Installing the Avamar Windows Client* (page 73) and *Registering the Avamar Windows Client* (page 75)
2. Install the Avamar Cluster Client on the active node, following the steps in *Installing the Avamar Windows Cluster Client* (page 99).

Advanced Information for Multi-Homed Clusters

Plug-ins connect to their corresponding services using the IP address to which the plug-in is bound. If the service is not configured to listen on that IP address, the plug-in will not be able to connect.

For example, on a multi-homed cluster, if the Avamar backup agent is bound to one IP, and Exchange or SQL is bound to a different IP, many key Avamar features such as browsing, backup and restore will not work.

Therefore, in order to properly configure multi-homed cluster environments for use with Avamar, you must modify the primary network name such that it depends on both IP addressees.

APPENDIX B — SUPPORT FOR VCS BY AVAMAR SOLARIS CLUSTER CLIENT

This appendix describes how to install and register the Avamar Solaris Cluster Client software in a Solaris two-node cluster that runs Veritas Cluster Server (VCS).

Cluster Configurations Avamar supports backups and restores of the Veritas File System (VxFS) from Solaris platforms that run VCS. Avamar supports two-node active/active and two-node active/passive VCS configurations.

In an active/active cluster configuration, each node runs an instance of Avamar Solaris Cluster Client 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.

System Requirements The Avamar Solaris Cluster Client supports VCS versions 4.1 and 5.0 on Solaris 8 and Solaris 10 platforms. The following matrix shows the supported versions of VCS and Solaris:

VCS	SOLARIS 8 SPARC	SOLARIS 10 X86 64-BIT	SOLARIS 10 SPARC 64-BIT
4.1	X	X	
5.0			X

Before installing the Avamar Solaris Cluster Client software, ensure that the following requirements have been met:

1. The following software has been installed on each cluster node:
   - Veritas Cluster Server
   - Veritas Volume Manager (VxVM)
   - Veritas File System (VxFS)

2. The following resources have been configured for VCS service groups:
   - IP resource (which identifies the service group)
   - Mount resource (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 Avamar Solaris Cluster Client Packages

User=root

1. Log into the active VCS node.
2. Open a command shell and log in as root.
3. Point your web browser at the Avamar server by typing the following URL:

   `http://AVAMARSERVER`

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

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

   Depending on your browser security settings, a security alert dialog box might appear.
4. If a security alert dialog box appears, click **Yes** or **OK** to allow redirection to the Avamar secure web server.

   The Secure Log On page appears.
5. Page down until the **Documents and Downloads** hyperlink is visible.
6. Click **Documents and Downloads**.

   The Downloads and Documentation page appears.
7. Click the correct operating system hyperlink for your client computer.

   A directory listing appears in your browser.

Download Software Packages

8. Download the Avamar Solaris Cluster Client install packages to any convenient temporary install directory on your system.

> **NOTE:** The remaining steps use the /tmp directory as an example temporary install directory.

The following table lists the installation packages for each supported platform:

FOR THIS PLATFORM	DOWNLOAD THIS PACKAGE
Solaris 8 Sparc	AvamarClusterClient-solaris8-sparc-VERSION.pkg
Solaris 10 Sparc	AvamarClusterClient-solaris10-sparc-VERSION.pkg

FOR THIS PLATFORM	DOWNLOAD THIS PACKAGE
Solaris 10 x86 64-bit	AvamarClusterClient-solaris10-x86_64-VERSION.pkg

Installing and Registering the Avamar Solaris Cluster Client

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

> **NOTE:** The output in this procedure refers to AvamarClusterClient-solaris10-sparc-5.0.100-199.pkg for illustration purposes only.

Install the Avamar Solaris Cluster Client

1. Log into the active VCS node as user root.
2. Change directory to your temporary install directory (page 106). For example:

   `cd /tmp`

3. Type:

   `pkgadd -d AVAMARSOLARISCLUSTERCLIENT.pkg`

   Where AVAMARSOLARISCLUSTERCLIENT.pkg is the installation package you previously downloaded (page 106).

   The following appears in the command shell:

   ```
   The following packages are available:
      1 AVMRclusclnt       Avamar Cluster Client
                           (sparc) 5.0.100-199

   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-solaris10-sparc-5.0.100-199.pkg>

   Avamar Cluster Client(sparc) 5.0.100-199

   This software is copyright EMC Corporation, 2001-2009.

   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.
   ```

5. Press **ENTER** to accept the default install location.

   The following appears in the command shell:

```
## 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
```

6. Type **y** and press **ENTER**.

   The following appears in the command shell:

```
Installing Avamar Cluster Client as <AVMRclusclnt>

## Executing preinstall script.
## 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.
```

7. 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:
```

8. 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):
```

9. 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]:
```

10. Do one of the following:

IF	THEN
Oracle will be installed	Type **y** and press **ENTER**.
Oracle will not be installed	Type **n** and press **ENTER**.

    The following appears in the command shell:

```
Enter the hostname or dns alias associated with virtual-ip (10.31.140.36):
```

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 Administrator 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 into the passive node as root.
16. Type:

    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:
```

17. 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]:
```

18. 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]:
```

19. Type **n** and press **ENTER**.

Bringing VCS Resource Online

To bring VCS resources online, type:

hares -online avagent_SERVICEGROUP -sys HOSTNAME

Where SERVICEGROUP is the resource name of the Avamar application specified during the installation (page 109) and HOSTNAME is the system where the VCS service group is in PARTIAL state.

Uninstalling the Avamar Solaris Cluster Client

1. Open a command shell and log into the active 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 Solaris Cluster Client software by typing:

   pkgrm AVMRclusclnt

   The following appears in the command shell:

```
The following package is currently installed:
      AVMRclusclnt Avamar Cluster Client
                  (sparc) 5.0.100-199

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.
```

APPENDIX C — SUPPORT FOR SOLARIS ZONES

This appendix presents additional information about using the Avamar Solaris Client to protect Solaris Zones.

Important Terms and Concepts

This topic introduces and discusses important terms and concepts that you should be familiar with before attempting to 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 using flexible, software-defined boundaries. Solaris Containers allow many private execution environments 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, and its own name space that can be tailored to the application that will run in it.

Global and Non-Global Zones. There is always one zone 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, whether or not these processes are running within a non-global zone.

NOTE: The term “local zone” is specifically discouraged, because in this context “local” is not an antonym of “global.”

Capabilities and Limitations

Installation Errors Can Occur with Older Version Software. If installing older versions of Avamar Solaris Client software in non-global zones, the following error might appear:

```
pkgadd: ERROR: postinstall script did not complete successfully
```

You can safely ignore this error (the software did install correctly). Furthermore, version 3.7.2.94 and later software does not return this error.

avagent Restart Limitation. Restarting the avagent process from the global zone forcibly terminates all avagent processes (both global and non-global), but only restarts the avagent process in the global zone. Therefore, if Avamar Solaris Client software has been installed in non-global zones, 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 Solaris Client software in the global zone or in individual non-global zones. The procedure is the same one presented earlier in this publication. The only difference is whether you begin the installation sequence from the global zone or from a non-global zone.

Installing Avamar Solaris Client software in the Global Zone

Log in as root

1. Open a command shell and log into as root.
2. Log into the global zone.

> **NOTE:** The “global#” prompt indicates that you are successfully logged into the global zone.

3. Perform the following installation tasks presented earlier in this publication:

   (a) *Downloading the Install Package* (page 65)

   (b) *Installing and Registering the Avamar Solaris Client* (page 66)

Installing Avamar Solaris Client software in a Non-Global Zone

Log in as root

1. Open a command shell and log into as root.
2. Log into the global zone.

> **NOTE:** The “global#” prompt indicates that you are successfully logged into the global zone.

3. From the global zone, log into 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* (page 65)

   (b) *Installing and Registering the Avamar Solaris Client* (page 66)

Ensure that All Non-Global Zone Configurations are Backed Up

Back up and restore of global zone data is performed using the same procedure presented earlier in this publication. Refer to *Backup and Restore of AIX, FreeBSD, HP-UX, Linux, SCO and Solaris Clients* (page 90) for additional information.

However, in order to successfully restore non-global zone data, a current copy of that non-global zone's configuration must exist on the Avamar server.

IMPORTANT: Attempting to restore non-global zone data without current zone configuration information might result in loss of data.

There are two procedures for exporting and saving a non-global zone configuration:

- *Manually Exporting and Saving a Non-Global Zone Configuration* (page 115)
- *Using a Preprocessing Script to Automatically Export and Save Your Non-Global Zone Configuration Each Time You Perform a Backup* (page 116)

The advantage to the second method is that each time you perform a backup, the zone configuration will automatically be saved with that backup.

Manually Exporting and Saving a Non-Global Zone Configuration

Log in as root

1. Open a command shell and log into the global zone as root.

   NOTE: The "global#" prompt indicates that you are successfully logged into the global zone.

2. Print each non-global zone's configuration and direct it to a file as follows:

   ```
   zonecfg -z zone1 export > zone1.config
   ```

   Where zone1 is the non-global zone configuration you want to back up.

3. Place this configuration file in a location that ensures it will be backed up the Avamar server the next time a backup is performed.

4. Repeat steps 2 thru 3 for each global zone you will be backing up.

Using a Preprocessing Script to Automatically Export and Save Your Non-Global Zone Configuration Each Time You Perform a Backup

The best practice for backing up your zone configuration is to create a preprocessing script that will export the zone configuration and save each time a backup is performed.

Log in as root

1. Open a command shell and log into the global zone as root.

   NOTE: The "global#" prompt indicates that you are successfully logged into 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 your non-global zone name.

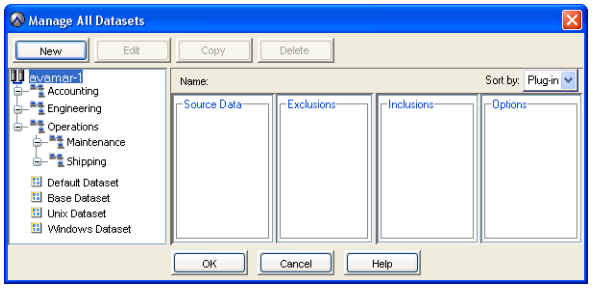
3. Save your changes.

   Next, you must create an Avamar dataset for each non-global zone you will be backing up.

4. Start Avamar Administrator.

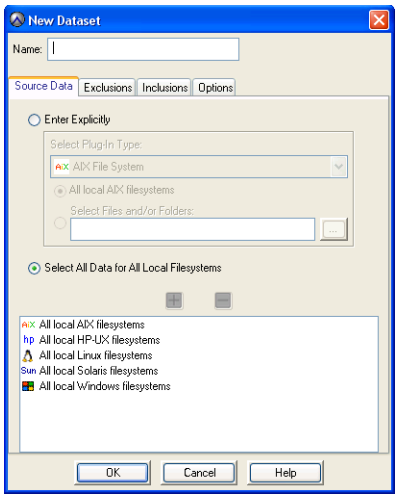
5. Select **Tools > Manage Datasets...**

   The Manage All Datasets window appears.



6. Click **New**.

   The New Dataset dialog box appears.



7. Type a name for this new dataset.

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

8. Click the Source Data tab.

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

9. Select **Enter Explicitly** and Select Solaris File System from Select Plug-in Type list.
10. Select **Select All Data for All Local File Systems**.
11. Click the Options tab.
12. Select **Include Advanced Options**.
13. In the Pre Script Run user-defined script at beginning of backup field, type the name of the preprocessing script you created in steps 2 thru 3.

    For example, zone1_config.sh.

14. Click **OK**.

    The New Dataset dialog box closes.

15. Repeat steps 2 thru 14 for each non-global zone you will be backing up.

Non-Global Zone Disaster Recovery

As previously mentioned, restoring global zone data is performed using the same procedure presented earlier in this publication. Refer to *Backup and Restore of AIX, FreeBSD, HP-UX, Linux, SCO and Solaris Clients* (page 90) for additional information.

However, if performing disaster recovery of entire non-global zone, you must use one of the following procedures:

- *Procedure 1: Restoring an Entire Non-Global Zone From a Global Zone Backup* (page 118)
- *Procedure 2: Restoring an Entire Non-Global Zone From a Non-Global Zone Backup* (page 119)

TIP: Sun Microsystems recommends using the first procedure.

Procedure 1: Restoring an Entire Non-Global Zone From a Global Zone Backup

In order to completely restore a non-global zone from a global zone backup, you must 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. From Avamar Administrator, restore the zone configuration file a convenient temporary directory within the local zone.

   /tmp is used as an example temporary directory for the remainder of this procedure.

   IMPORTANT: Do not restore any other files at this time.

Log in as root

2. Open a command shell and log into the global zone as root.

   NOTE: The “global#” prompt indicates that you are successfully logged into the global zone.

3. Type:

   `cd /tmp`

4. Specify that the zone1.config file should be used recreating the zone by typing:

   `zonecfg -z zone1 -f zone1.config`

5. Install the zone by typing:

   `zoneadm -z zone1 install`

6. In order to prevent the system from displaying sysidtool prompts on initial zone log in, delete the .UNCONFIGURED file by typing:

   rm /export/home/zones/zone1/root/etc/.UNCONFIGURED

7. Switch back to Avamar Administrator and restore the remaining non-global zone files and directories.
8. Be sure to include the **--restoresystem** advanced plug-in option.

   Refer to your *Avamar System Administration Guide* for additional information about supplying advanced plug-in options.
9. Switch back to your command shell session.
10. After the restore has completed, boot up the zone by typing:

    zoneadm -z zone1 boot
11. Confirm the zone is running by typing:

    zoneadm list -cv

    The following appears in your command shell:

```
ID  NAME    STATUS   PATH          BRAND   IP
0   global  running  /             native  shared
4   zone1   running  /zones/zone1  native  shared
```

12. Confirm you can log into the zone by typing:

    zlogin zone1

Procedure 2: Restoring an Entire Non-Global Zone From a Non-Global Zone Backup

1. From Avamar Administrator, restore the zone configuration file a convenient temporary directory within the local zone.

   /tmp is used as an example temporary directory for the remainder of this procedure.

   IMPORTANT: Do not restore any other files at this time.

Log in as root

2. Open a command shell and log into the global zone as root.

   NOTE: The “global#” prompt indicates that you are successfully logged into the global zone.

3. Type:

   cd /tmp
4. Specify that the zone1.config file should be used recreating the zone by typing:

   zonecfg -z zone1 -f zone1.config

5. Install the zone by typing:

   zoneadm -z zone1 install

6. In order to prevent the system from displaying sysidtool prompts on initial zone log in, 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 the zone is running by typing:

   zoneadm list -cv

   The following appears in your command shell:

```
ID NAME   STATUS  PATH         BRAND  IP
0  global running /            native shared
4  zone1  running /zones/zone1 native shared
```

9. Log into the zone by typing:

   zlogin zone1

10. Reinstall the Avamar Solaris Client software in the non-global zone and register it with the Avamar server.

> **NOTE:** It might be necessary to deactivate this non-global zone client instance from the Avamar server in order to successfully reactivate it with the Avamar server.

11. Switch back to Avamar Administrator and restore the remaining non-global zone files and directories.

> **NOTE:** Sun Microsystems recommends that no shared LOFS file systems be restored from within a non-global zone. By default, Avamar will not traverse any LOFS or NFS file systems during backups, so this should not be an issue.

APPENDIX D — VMWARE GUEST-LEVEL BACKUP AND RESTORE

Avamar currently offers three different methods to protect data residing in VMware environments:

Guest-level backup and restore, which involves installing Avamar client software inside each virtual machine.

Integration with VMware Image Backup, which involves installing Avamar client software on a proxy server.

Integration with VMware Consolidated Backup (VCB), which involves installing Avamar client software on the VCB proxy server.

ESX Server backup and restore, which involves installing Avamar client software directly on the ESX Server.

Only guest-level backup and restore is discussed in this publication because the other three methods require advanced VMware knowledge, scripting ability or additional hardware.

For additional information about integrating Avamar with VMware Image Backup or VCB, or directly backing up ESX Servers, refer to your *Avamar System Administration Guide*.

Advantages. Guest-level protection is the most common data protection method because of the many advantages it offers:

- Highest level of data deduplication, resulting in maximum storage efficiency
- Guest-level backup easily fits into most existing backup schemes; day-to-day backup procedures do not change
- Support for fast partial restores of individual directory (folder) or files
- Optional support for application-level support for DB2, Exchange, Oracle and SQL Server databases
- No advanced scripting or VMware knowledge required

Considerations. The only significant consideration to this approach is that although file and directory restores are a simple one-step process, full system recovery is a two-step procedure in which you first load a known-good operating system image inside the virtual machine, then restore the unique data from the

guest-level backups stored on the Avamar server. Performing full system restores is beyond the scope of this publication. Instead, refer to your *Avamar System Administration Guide* for additional information.

Installation and Configuration. In order to implement guest-level backup, you simply use the procedures found elsewhere in this publication to install the correct Avamar client for each virtual machine in exactly the same manner as you install the Avamar client software on physical machines. No advance scripting or configuration is needed.

On-Demand Backups and Client-Initiated Restores. Basic on-demand backups and client-initiated restores can be performed using the procedures found elsewhere in this publication. Use the correct procedure for your computing platform.

APPENDIX E — SUPPORT FOR NOVELL NSS VOLUMES

Novell Storage Services (NSS) is the file system originally created for NetWare.

With the introduction of OES Linux, Novell made its common services available on to this operating system. By doing so, it has provided an easier migration path for customers wishing to deploy Linux in their environments. Therefore, NSS volumes can be created on and managed 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.

Requirements

In order to properly back up Novell OES Linux SP2 NSS volumes (including the metadata) using the Avamar Linux Client, the following additional requirements must be satisfied:

1. Linux User Management (LUM) and Novell Storage Services (NSS) must be installed and configured.
2. The OES Linux server must be patched as follows:
   (a) Upgrade the kernel to 2.6.5-7.282 or higher.
   (b) Install/upgrade to km-nss-4.9.26-0.1.i586.rpm or higher.
   (c) Install/upgrade to novell-nss-4.9.23-1.i586.rpm or higher.
   (d) Install/upgrade to novell-sms-zapishim-2.6.5_7.282-1.0.5.i586.rpm or higher.
3. NSS must be configured with the following switches either through nssstart.cfg or nsscon:

   ```
   nss /ListXattrNWMetadata
   nss /CtimeISMetadataModTime
   ```

IMPORTANT: Subsequent releases of OES Linux might require less manual configuration than what is described in the previous procedure (that is, you might only need to configure LUM and NSS). However, EMC strongly recommends that you refer to information found on www.novell.com in order to confirm precisely which configuration tasks need to be performed on these servers running any subsequent OES Linux release.

Capabilities and Limitations

In order to maintain data integrity of transactional systems that use files hosted on NSS volumes, you must shut down those applications prior to initiating a backup.

There is no snapshot support for NSS on OES Linux.

The OES Linux local eDirectory database is not backed up.

Additional Resources

TOPIC	LOCATION
Novell Storage Services	www.novell.com/documentation/oes/pdfdoc/nss_enu/nss_enu.pdf
Linux User Management	www.novell.com/documentation/oes/pdfdoc/lumadgd/lumadgd.pdf

APPENDIX F — NETWARE APPLICATION NOTES

This appendix discusses various topics that are unique to using Avamar in Novell NetWare environments.

Pool Snapshots. Avamar uses the Novell Storage Services (NSS) pool snapshot feature, which makes a point-in-time snapshot of a data pool available for backup.

The snapped pool name will always be the concatenation of the string "AV_" and a unique hexadecimal value such as "8F5AA0A0." Therefore, if the volume to be backed up is named DATA_VOL and it belongs to the DATA pool, the snapped pool name would be generated as AV_8F5AA0A0. Additionally, the snapped volume name would be DATA_VOL_SV.

Note that if a previous pool snapshot of DATA exists and was created by another application or manually from the server console, the name would be DATA_VOL_SV001. The volume name suffix is determined and handled by NSS.

You can view pool information by typing **`nss /pools`** at the server console prompt. Space information can be viewed by typing **`nss /spaceinformation`**. For a list of other NSS console commands, type **`nss /?`**.

In the backup Advanced Options, you have the option to specify the stored-on pool for the snapshot. The stored-on pool is where the pool snapshot is actually kept. As writes are made to the original pool, the original block data is first copied to the stored-on pool.

Novell recommends that 10-20% of the original pool size is available on the disk used for the snapshot pool. The actual space needed is unique to each environment and is affected by the write activity to the original pool. Novell also recommends that the stored-on pool is different from the original pool and, if possible, that it also resides on a different disk.

> **IMPORTANT:** If a pool snapshot exists, the same stored-on pool must be used. If unsure, use iManager to determine the correct stored-on pool to type in the backup options. EMC strongly recommends not creating or removing any pool snapshots during backup operations.

In order to ensure data integrity, the data pool must first be made quiescent. This briefly prevents new writes from taking place once the present transactions are completed.

> **IMPORTANT:** Although NSS takes steps to complete all outstanding transactions before creating the pool snapshot, there might still be situations where data of transactional systems is compromised. If an application is not snapshot-aware, it cannot respond to the NSS notification of a pending snapshot. Otherwise, it would flush its cache, commit pending writes among other steps to make itself quiescent thus ensuring the integrity of its data. If your transactional systems are not snapshot-aware, it is recommended to shut them down prior to the backup.

Go to www.novell.com for additional information about Novel Storage Services (NSS) and pool snapshots.

INDEX

A

B

L

M

N

S

T

U

V

W

X

Z