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AVAMAR ACTIVATION MANAGER ADMINISTRATION GUIDE
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FOREWORD

Scope and Intended Audience

Scope. This publication describes using Avamar Activation Manager to activate Avamar client software on desktops and laptops in an enterprise environment.

Avamar Activation Manager can also be used to activate Avamar client software on servers in an enterprise environment. However, that use is not within the scope of this publication.

Intended Audience. The intended audience of this document are people who will install and administer Avamar client in an enterprise environment, and who have experience with the administration of:

- Windows computers and networks
- Mac computers and networks
- Systems management tools, such as Microsoft's Systems Management Server 2003 or System Center Configuration Manager 2007
- LDAP-compliant directory services, such as Microsoft's Active Directory

Product Information

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

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 - Choose 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 choose the Close command from the File menu.
Enter: <code>cd /temp</code>	Bold fixed-width text denotes shell commands that must be entered exactly as they appear in this publication.
<code>--logfile=FILE</code>	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.
<code>Installation Complete.</code>	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.

INTRODUCTION

This chapter provides an overview of EMC® Avamar® and Avamar Activation Manager.

About Avamar

Avamar solves the challenges associated with traditional backup, enabling fast, reliable backup and recovery for enterprise desktops and laptops, remote offices, data center LANs, and VMware environments.

Avamar is a backup and recovery software product that utilizes patented global data deduplication technology to identify redundant sub-file data segments at the source, reducing daily backup data by up to 500x—before it is transferred across the network and stored to disk. This allows companies to perform daily full backups even across congested networks and limited WAN links.

Key Avamar features are:

- Deduplicates backup data at the source—before transfer across the network
- Enables fast, daily full backups across existing networks and infrastructure
- Reduces required daily network bandwidth by up to 500x
- Enables VMware backups through Guest, ESX Service Console, and VCB
- Up to 10x faster backups
- Data encrypted in flight and at rest
- Patented RAIN technology provides fault tolerance across nodes and eliminates single points of failure
- Scalable grid architecture
- Global data deduplication reduces total backup storage by up to 50x
- Recoverability verified daily—no surprises
- Centralized web-based management
- Simple one-step recovery
- Flexible deployment options, including Avamar Data Store package

About Avamar Activation Manager

Avamar Activation Manager provides a centralized way to activate a large number of newly installed Avamar clients with a specific Avamar server, domain, and group.

The Avamar Activation Manager software provides a web browser interface through which an Avamar administrator can:

- View deployed Avamar servers, domains, and groups
- Obtain domain information about computers from LDAP-like directory services, such as Active Directory
- Obtain information about a domain's computers by importing a CSV file
- Assign Avamar clients to Avamar servers, domains, and groups
- Initiate registration and activation of Avamar clients

The installation of Avamar client on enterprise desktops and laptops, and other supported computers, can be silently pushed using many of the popular Systems management products or can be run from each client.

Avamar Activation Manager populates its list of clients available for assignment and activation using a post-install list of clients obtained from the Systems management tool, or by querying a directory service.

When information about the association of individual clients with operational units can be obtained from the directory service, clients are shown in the client list nested beneath their associated operational units.

Using Avamar Activation Manager, an Avamar administrator can drag and drop clients into specific Avamar domains and groups, and initiate their registration and activation. Avamar Activation Manager provides a log that shows the status of each assignment and activation.

About the Guide

The focus of this guide is on the use of Avamar Activation Manager to activate Avamar for thousands of desktops and laptops.

Avamar Activation Manager can also be used to register and activate Avamar client on other computers, such as an enterprise's servers. These computers will not have access to the Avamar Desktop/Laptop features but the steps in this guide can be followed to register and activate those supported computers using Avamar Activation Manager.

The information presented in this guide should be used in combination with the Avamar product documentation listed in "Assumptions and References" on page 9. Except as modified by the information in this guide, that documentation applies both to deployments that support servers and to deployments that support desktop and laptop clients.

Guide Organization

This guide is organized as follows:

SUBJECT MATTER	LOCATION
Hardware, software, and other environmental requirements for Avamar Activation Manager.	"Environment" on page 10
Configuring Avamar Activation Manager to use your company's directory service. Information about the decisions that should be made before using Avamar Activation Manager.	"Planning and Preparation" on page 14
Description of the steps required when remote installing Avamar clients using Systems management tools.	"Installing the Client Software" on page 21
Detailed examination of the Avamar Activation Manager UI and explanation of how to use it to register and activate Avamar clients.	"Activating Clients" on page 27
Description of the Avamar Activation Manager log and its use.	"Avamar Activation Manager Log" on page 45

Assumptions and References

This guide does not attempt to provide introductory materials for basic Avamar technology or delivery methods.

The following Avamar documentation selections provide additional information:

- *Avamar Desktop/Laptop Release Notes*
- *Avamar Release Notes*
- *Avamar Release Notes Addendum*
- *Avamar System Administration Manual*
- *Avamar Operational Best Practices Manual*
- *Avamar Backup Clients Installation Guide and Reference Manual*

Download the preceding manuals at <http://Powerlink.EMC.com> (the EMC Powerlink® website) in the following location:

Support > Technical Documentation and Advisories > Software ~ A-B ~ Documentation > Avamar

ENVIRONMENT

This chapter describes the environment required by Avamar Activation Manager.

Avamar Activation Manager

This section lists the requirements for Avamar Activation Manager.

Network

Networks that meet the following requirements are supported by this solution:

CATEGORY	REQUIREMENT
Protocol	TCP/IP
Routers	Must permit TCP packet routing between the Avamar server and each client computer.
Firewalls	Must allow bidirectional communication between the Avamar server and each client computer using TCP data ports 7778, 27000, 28001, 28002, and 29000.
Naming System	Must facilitate connections between each client and the Avamar server, including situations where IP address changes are caused by DHCP and VPN access.

Domain

Domains that meet the following requirements are supported by this solution:

CATEGORY	REQUIREMENT
Directory Service	LDAP-compliant services, such as: Microsoft's Active Directory. NOTE: A directory service is only required when using Avamar Activation Manager without an imported client list.
Naming Scheme	Each label in a client's FQDN must be less than 63 characters and each FQDN must not exceed 255 characters, including dots. Clients that exceed these requirements cannot be activated using Avamar Activation Manager. These clients will be listed in the Avamar Activation Manager log. Hostnames and organization unit names cannot contain the forward slash character ('/'). Avamar Activation Manager uses this character to separate the hierarchical levels of a directory service. ^a
Systems Management	<ul style="list-style-type: none"> • Microsoft's "System Center Configuration Manager" • IBM's "Tivoli Management Framework" • HP's "OpenView ServiceCenter" NOTE: While a systems management tool vastly simplifies the task of installing Avamar Desktop/Laptop software on client computers, it is only required when you want to use Avamar Activation Manager with a client list that contains only clients with the software installed.

- a. Some directory services, such as Microsoft's Active Directory, allow the forward slash ('/') character to be used as part of a computer or organizational unit. To avoid the display of inaccurate directory information in the Avamar Activation Manager UI, rename any computers and organizational units that use this character before using the Query Directory Service function.

Avamar System

Avamar systems that meet the following requirements are supported by this solution:

CATEGORY	REQUIREMENT
Avamar server software	Version 5.0
Avamar Enterprise Manager	Version 5.0
Avamar client	Version 5.0
Avamar Desktop/Laptop	Version 5.0

Avamar Administrative Account

An Avamar administrator whose domain and Avamar accounts meet the following requirements can perform the tasks described in this guide:

CATEGORY	REQUIREMENT
Domain	Domain administrator rights
Directory service	Read right
Avamar system	Avamar administrator rights, including access to Avamar Enterprise Manager

Administrator's Computer

An Avamar administrator's computer that meets the following requirements can perform the tasks described in this guide:

CATEGORY	REQUIREMENT
Web Browser ^a	On Windows: <ul style="list-style-type: none"> Windows Internet Explorer versions 7.x.x and 8.x.x Mozilla Firefox 3.x.x On Mac: <ul style="list-style-type: none"> Apple Safari 3.0 and 4.0
Adobe Acrobat Reader	7.0 or later. Available from www.adobe.com . Optional. Required in order to view documentation.

- a. To avoid long-running JavaScript warnings following the instructions specific to your browser in "Preventing Long-Running JavaScript Warnings" on page 12.

Preventing Long-Running JavaScript Warnings

The Avamar Activation Manager UI uses JavaScript scripts to perform many of its tasks. Sometimes an Avamar Activation Manager UI script will require more time to finish than is permitted by a web browser's script timeout default value.

When this happens a message appears and the script is stopped. You can click continue to allow the script to finish its work.

To avoid seeing this message, increase the timeout period as described in the following, browser-specific, sections.

Internet Explorer

To increase the timeout period for Internet Explorer:

1. Open a registry editor, such as Regedt32.exe.
2. Open the key:
`HKEY_CURRENT_USER\Software\Microsoft\InternetExplorer\Styles`
If the key does not exist, create it.
3. Create a new DWORD value called "MaxScriptStatements" under this key.
4. Set the value of the DWORD to 20,000,000.
This number represents the number of script statements.
5. Restart the browser.

Firefox

To increase the timeout period for Firefox:

1. In the browser address bar, type:
`about:config`
The about:config warning appears.
2. Click **I'll be careful, I promise!**.
The Preferences window opens.
3. In Filter, type:
`dom.max_script_run_time`
The script run time preference appears.
4. Double-click the preference.
The Enter integer value dialog box appears.
5. Type **30** and click **OK**.
6. Restart the browser.

Safari

To increase the timeout period for Safari:

1. On the Safari menu, select **Preferences**.
2. On the Advanced tab, select **Show Develop menu in menu bar**.
3. On the Develop menu, select **Disable Runaway JavaScript Timer**.

PLANNING AND PREPARATION

This chapter describes the planning and preparation required before using Avamar Activation Manager to register and activate Avamar clients.

Workflow Overview

The flow of tasks for using Avamar Activation Manager to register and activate Avamar client on your enterprise's desktop and laptop computers is described in the following steps.

The first five steps are expanded in this chapter. The remaining steps provide references to other chapters for descriptions of the tasks:

1. Configure Avamar Activation Manager to use your company's directory service as described in "Configure Avamar Activation Manager" on page 15.
2. Add all Avamar servers that you will use to the Avamar Enterprise Manager database using the steps listed in "Avamar Servers" on page 19.
3. Determine the Avamar domains you will use and which clients will be assigned to each domain as discussed in "Avamar Domains" on page 19.
4. Identify the requirements of the client computers to be included in the Avamar system as described in "Identify Client Requirements" on page 20.
5. Decide on the groups you will need in each of your Avamar domains, and create them. "Avamar Domains" on page 19 and "Avamar Groups" on page 20 provide information about these tasks.
6. Install the Avamar Desktop/Laptop software on the client computers. "Installing the Client Software" on page 21 provides information about this task.
7. Use Avamar Activation Manager to assign the client computers to the appropriate domains and groups, register them, and activate them. "Activating Clients" on page 27 describes these tasks.

Configure Avamar Activation Manager

Before using Query Directory Service, configure Avamar Activation Manager with the Kerberos realms of your organization.

The Query Directory Service screen uses the values you type in `ldap.properties` to populate the list boxes in the User Domain and Directory Domain fields described in "Query Directory Service" on page 29.

To configure Avamar Activation Manager:

1. Log in to the Avamar utility node as root.
2. Change the working directory to:

```
/usr/local/avamar/etc
```

3. Open `krb5.conf` in a plain text editor.

The file contains the following template realm definition:

```
[realms]
EXAMPLE.COM = {
kdc = example.com:88
admin_server = example.com:88
kpasswd_server = example.com:464
default_domain = EXAMPLE.COM
}
```

4. Under the `[realms]` heading, make a copy of the template realm definition for each Kerberos realm in your environment, replacing the template references to "EXAMPLE.COM" and "example.com" with the fully qualified domain name of each of your Kerberos realms.

For example, if you have two Kerberos realms, `corp.company.com` and `eng.company.com`, the finished `krb5.conf` file is:

```
[realms]
CORP.COMPANY.COM = {
kdc = corp.company.com:88
admin_server = corp.company.com:88
kpasswd_server = corp.company.com:464
default_domain = CORP.COMPANY.COM
}
ENG.COMPANY.COM = {
kdc = eng.company.com:88
admin_server = eng.company.com:88
kpasswd_server = eng.company.com:464
default_domain = ENG.COMPANY.COM
}
```

NOTE: The examples in the file are for reference only and must be removed or commented-out from the finished krb.conf file. Use the number sign ('#') as the first character of a line to comment out the entire line.

5. Save and close krb5.conf.
6. Open ldap.properties in a plain text editor.

The file contains the following template definition:

```
ldap.url.example=ldap://example.com:389
ldap.qualified-name.example=example.com
```

7. Modify ldap.properties so that each Kerberos realm is mapped to the correct LDAP URL by replacing the template definition with the actual values for your environment.

For example, if you have two Kerberos realms, corp.company.com and eng.company.com, and your company's default Kerberos realm server is "corp", the finished ldap.properties file is:

```
ldap.url.corp=ldap://corp.company.com:389
ldap.url.eng=ldap://eng.company.com:389
ldap.qualified-name.corp=corp.company.com
ldap.qualified-name.eng=eng.company.com
```

```
ldap.identifier.server-name-short.default=corp
```

The "ldap.identifier.server-name-short.default" value defines a default Kerberos realm server for clients that do not publish one during authentication. This is sometimes seen with mixed OS environments, for example, an Active Directory domain and a Mac client. When the Query Directory Service page loads, the default realm appears in a selected state.

NOTE: The declaration examples in the file are for reference only and must be removed or commented-out from the finished ldap.properties file. Use the number sign ('#') as the first character of a line to comment out the entire line.

8. Save and close ldap.properties.
9. Restart the AAM server:

```
dpnctl stop ems
dpnctl start ems
```


10. For each Kerberos realm, use `krb_auth_verify` to check the configuration.

krb_auth_verify

Enter the Domain Short Name:

shortname

Enter the User Name:

username

Enter the Password:

password

Config file path is `/usr/local/avamar/etc/krb5.conf`

Login name is `username@shortname.example.com`

Directory successfully accessed.

The configuration of `ldap.properties` and `krb5.conf` are correct for the specified domain component.

Where:

- *shortname* is the unique domain component of the Kerberos realm.
- *username* is the username for an account that is authorized to read the directory service’s database.
- *password* is the password associated with *username* in the realm.
- *example.com* is the directory service root domain.

LDAP Verification Tool

The LDAP verification tool, `krb_auth_verify`, checks the values of `krb.conf` and `ldap.properties`. You provide the name of a domain component listed in `ldap.properties`, a username for an account that is authorized to read the directory service’s database, the password for that account, and the root domain of the directory service.

You can use the tool without any arguments, or use the arguments listed in the following table:

ARGUMENT	DESCRIPTION
-v	Provides verbose output when an error is encountered. The output includes Java stack trace information about the error.
-h	Displays usage information.

The tool will display different messages depending upon the error encountered.

MESSAGE	DESCRIPTION
Directory successfully accessed.	<code>krb.conf</code> and <code>ldap.properties</code> are correctly configured for the specified domain component.

MESSAGE	DESCRIPTION
Client not found in Kerberos database	This message appears when: <ul style="list-style-type: none"> The value of Domain Short Name does not match an existing Kerberos realm. The value of Domain Short Name does not match any of the Kerberos realms specified in ldap.properties. The value of User Name does not match a valid account in the authentication realm specified by the value of Domain Short Name.
Pre-authentication information was invalid	The value of Password is not correct for the specified account.
KDC has no support for encryption type	The default encryption type specified in krb.conf is not supported by your company's Active Directory configuration. "Changing the Default Encryption Type" on page 18 describes a method to work around this problem.
Invalid options provided	krb_auth_verify was invoked with an argument other than -v or -h.

Changing the Default Encryption Type

The default configuration of krb.conf specifies the use of MIT Kerberos encryption type "DES cbc mode with CRC-32". This encryption type may conflict with a key distribution center (KDC) in your Active Directory environment. If that occurs, the message "KDC has no support for encryption type" appears.

A possible solution to this conflict is to remove the specified encryption type from krb.conf, thereby permitting the KDC to select the encryption type:

1. Log in to the Avamar utility node as root.
2. Change the working directory to:

```
/usr/local/avamar/etc
```
3. Open krb5.conf in a plain text editor.

The file contains the following specification of encryption type:

```
[libdefaults]
    default_tgs_enctypes = des-cbc-crc
    default_tkt_enctypes = des-cbc-crc
```

4. Comment out the specification.

The finished section looks like this:

```
#[libdefaults]
# default_tgs_enctypes = des-cbc-crc
# default_tkt_enctypes = des-cbc-crc
```

Avamar Servers

To use Avamar Activation Manager to register and activate clients with an Avamar server the Avamar server must be listed in the Avamar Enterprise Manager database. Only Avamar servers that are listed in the Avamar Enterprise Manager database are shown in the Avamar Activation Manager UI.

To add an Avamar server to the Avamar Enterprise Manager database:

1. Open your web browser and log in to Avamar Enterprise Manager.

Point your web browser to the following URL:

`http://AVAMARSERVER/em`

where *AVAMARSERVER* is the hostname as defined in DNS.

The Dashboard page appears.

2. Select **Configure**.

The Configure page appears.

3. Click **Add**.

An Add block appears below the systems list.

4. Type or select the following:

FIELD/OPTION	DESCRIPTION
System name or IP	Type the Avamar server hostname (as defined in corporate DNS) or IP address.
Port	Type the port used to communicate with this MCS. Default is port 7778.
Monitor	Select this option to enable monitoring of this system with Avamar Enterprise Manager. Clear this option to add this system to the Configure page Systems list, but not monitor it.
Password	Type your Avamar administrative user account password.
Note	Type an optional note or comment.

5. Click **Save**.

The Add block disappears and your new system is added to the Configure page Systems listing, and is available in the Avamar Activation Manager UI.

Avamar Domains

Avamar domains provide a means to segregate clients into administrative divisions to provide enhanced security. Administrative access to each domain can be defined on a domain-by-domain basis. This topic is covered in more detail in the system administration manual.

Identify Client Requirements

The backup requirements for an enterprise's servers and its desktops and laptops are usually very different. Identify the requirements of each of these client types and create groups that meet those requirements.

Also, for an enterprise's desktop and laptop computers there may be a significant range of requirements for the folders and files to back up, the frequency of backups, and the length of time to retain the backed up data. Before creating Avamar groups and assigning clients, determine what those requirements are, and which clients can be grouped together based on similar requirements. This step will simplify the tasks that follow.

You may find that much of this evaluation and grouping of clients was done when clients were assigned to organizational units in your directory service (such as LDAP or Active Directory). If this is the case, you can utilize Avamar Activation Manager's integration with your directory service to easily see clients in their organizational units and assign them to appropriately crafted Avamar groups. "Using Avamar Activation Manager" on page 36 describes this.

Avamar Groups

In Avamar, groups provide a means for an administrator to assign the same policies to a set of client computers with similar requirements. Assignment to a group determines the following policies for a client:

- Dataset

The dataset specifies which folders and files will be backed up, and which will be excluded from backups.

- Schedule

The schedule determines when the Avamar server will attempt an automatic backup of the clients in the group.

- Retention

The retention setting specifies how long backed up data will be retained and available for a restore.

In preparation for adding large numbers of desktop and laptop clients to Avamar, create groups that provide for the various requirements of those clients. An Avamar client cannot be assigned to groups in more than one Avamar domain.

The system administration manual provides more information about groups.

INSTALLING THE CLIENT SOFTWARE

This chapter describes installing the Avamar client software on large numbers of computers using a Systems management tool.

NOTE: The Avamar client software can also be installed by running the installer locally on each computer. This method is described in the Avamar Desktop/Laptop documentation, and in the Avamar Backup Clients user guide.

Systems Management Tools

The recommended method for installing the Avamar client software on large numbers of computers is to use a Systems management tool. When you use a Systems management tool you can remotely push install the software on large numbers of computers in a short amount of time.

Also, a Systems management tool can often generate a list of the computers that have the software successfully installed. This list can be used when you assign computers to groups as described in "Using Avamar Activation Manager" on page 36.

Remote installation on Windows computers has been tested and approved using Microsoft's Systems Management Server 2003 (SMS). For Mac computers, remote installation has been tested and approved using SMS with Quest Software's Quest Management Xtensions for SMS. In addition, other Systems management tools may work using the steps outlined in this chapter.

Examples of other Systems management tools that might work to install the Avamar Desktop/Laptop software are:

- Microsoft's System Center Configuration Manager 2007
- IBM's Tivoli Management Framework
- HP's OpenView ServiceCenter
- Symantec's Altiris
- Apple's Remote Desktop

Systems management tools vary. The steps required to push software to a set of computers depend upon the tool you are using. Consult the documentation for your tool to determine the exact steps required to perform these tasks.

Windows Computers

The Avamar client software can be remotely push installed on supported Windows computers.

Avamar Client with Avamar Desktop/Laptop

In general, to remotely push install Avamar client with Avamar Desktop/Laptop on supported Windows computers:

1. Copy the Avamar client for Windows installer package to a location that is accessible to your Systems management tool.

Installer package names are listed in the Avamar Desktop/Laptop release notes.

2. Configure the Systems management tool to copy the correct installer package to each computer.
3. Designate the set of computers on which the software will be installed.
4. Provide the installation launch command:

```
msiexec /qn /I "path_to_MSI_pkg" WORKSTATION=1
```

where *path_to_MSI_pkg* is the full path to the location of the installer package relative to the root of the computer's file system.

5. Launch the Systems management tool's installation process.

Avamar Client without Avamar Desktop/Laptop

In general, to remotely push install Avamar client without Avamar Desktop/Laptop on supported Windows computers:

1. Copy the Avamar client for Windows installer package to a location that is accessible to your Systems management tool.

Installer package names are listed in the Avamar Desktop/Laptop release notes.

2. Configure the Systems management tool to copy the correct installer package to each computer.
3. Designate the set of computers on which the software will be installed.
4. Provide the installation launch command:

```
msiexec /qn /I "path_to_MSI_pkg" WORKSTATION=0
```

where *path_to_MSI_pkg* is the full path to the location of the installer package relative to the root of the computer's file system.

5. Launch the Systems management tool's installation process.

Installer Package Commands

The installer package accepts the following commands:

- **msiexec /qn /I "path_to_MSI_pkg" WORKSTATION=1**

This command installs the Avamar client software and enables the Avamar Desktop/Laptop interface.

- **msiexec /qn /I "path_to_MSI_pkg" WORKSTATION=0**

This command installs the Avamar client software but does not enable the Avamar Desktop/Laptop interface. The basic Avamar interface is enabled instead.

- **msiexec /qn /I "path_to_MSI_pkg"**

This command acts the same as WORKSTATION=0 and enables the basic Avamar interface.

Mac Computers

The Avamar client software can be remotely push installed on supported Mac computers.

Avamar Desktop/Laptop XML Installation File

The file dtlt.xml is used to enable Avamar Desktop/Laptop during a remote push install of Avamar client on a Mac. This file is included when you receive the Avamar client installer package. If it is not available, it can easily be created.

To create dtlt.xml:

1. Open a new file in a plain text editor.
2. Add the following lines to the file:

```
<array>  
  <string>PKG_REF_2</string>  
</array>
```

3. Save the file as dtlt.xml, and close the editor.

Avamar Client with Avamar Desktop/Laptop

In general, to remotely push install Avamar client with Avamar Desktop/Laptop on supported Mac computers:

1. Copy the Avamar client for Mac installer package to a location that is accessible to your Systems management tool.
Installer package names are listed in the Avamar Desktop/Laptop release notes.
2. Copy dtlt.xml to the same location.
3. In your Systems management tool, set the location of the installer package and dtlt.xml as the source location.

Configure the Systems management tool to copy the installer package and file to each computer.

4. Designate the set of computers on which the software will be installed.
5. Provide the basic installation launch command:

```
/usr/sbin/installer -applyChoiceChangesXML "dtlt.xml" -pkg  
"install_package" -target install_location
```

where *install_package* is name of the installer package and *install_location* is where you want the software installed. Normally, *install_location* is the root (/) but any local volume is allowed.

NOTE: Run this command on a single line; without the line break that is caused by the formatting of this guide.

6. Launch the Systems management tool's installation process.

Avamar Client without Avamar Desktop/Laptop

In general, to remotely push install Avamar client without Avamar Desktop/Laptop on supported Mac computers:

1. Copy the Avamar client for Mac installer package to a location that is accessible to your Systems management tool.

Installer package names are listed in the Avamar Desktop/Laptop release notes.

2. In your Systems management tool, set the location of the installer package as the source location.

Configure the Systems management tool to copy the installer package to each computer. The location that this file is copied to is the *path_to_install_package* in step 4.

3. Designate the set of computers on which the software will be installed.
4. Provide the basic installation launch command:

```
/usr/sbin/installer -pkg "path_to_install_package" -target /
```

where *path_to_install_package* is the full path to the location of the installer package relative to the root of the computer's file system.

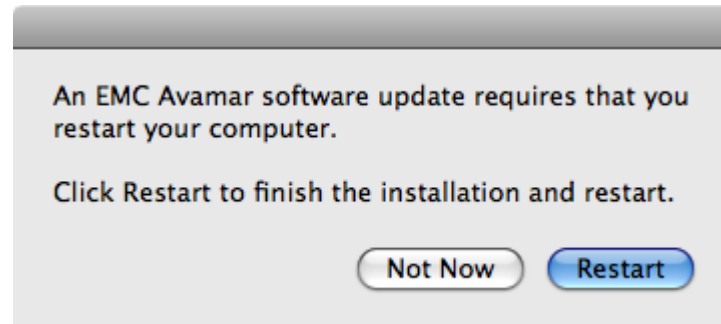
5. Launch the Systems management tool's installation process.

Post-Installation Restart

After installation of Avamar client for Mac (with or without Avamar Desktop/Laptop) a restart of some clients may be required. This is caused by a change to the process data size setting that is made on those computers.

During installation, the installer determines if the process data size is set to less than 96 MB. A minimum process data size of 96 MB is required for optimal performance of Avamar client for Mac.

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



If neither button is clicked within 30 seconds, the reminder is hidden and displayed again in 2 hours.

Clicking **Not Now** causes the reminder to hide for 2 hours and then appear again.

Clicking **Restart** restarts the computer and completes the process data size change. If **Restart** is clicked but the restart process is stopped for any reason, the reminder will not appear again.

Uninstalling

OS-specific uninstallation mechanisms are used to remove Avamar client and the Avamar Desktop/Laptop software.

Uninstall on Windows

To uninstall Avamar client and the Avamar Desktop/Laptop software from a Windows computer:

1. Open the Windows Add or Remove Programs applet.
2. On the list of currently installed programs, select **Backup for Windows**, and click **Remove**.
3. On the confirmation messages, click **Yes**.

The software is uninstalled.

Uninstall on Mac

To uninstall Avamar client and the Avamar Desktop/Laptop software from a Mac computer:

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

The uninstall command requires root (super-user) permissions. Sudo is used to run the command with root permissions. An administrator account or another account listed in sudoers is required by sudo.

3. Run the uninstall script:

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

The software is uninstalled.

ACTIVATING CLIENTS

This chapter describes how to complete the process of providing Avamar data protection for supported computers with the Avamar client software installed, including assigning to an Avamar group, registering, and activating.

Activation Process

Activating an Avamar client with an Avamar server involves two distinct tasks: registering and activating. The tasks can run at the same time or separately.

Registering

Registering an Avamar client occurs when the Avamar server receives information about the client and assigns it a unique client ID. This client ID is eventually passed back to the client during activation.

Traditionally there are three ways to register an Avamar client:

- Client-side registration
Initiated by right-clicking the Avamar server tray icon and selecting **Activate**. Registration and activation occur in the same transaction. Client is added to the Default group.
- Interactive server-side registration
Avamar Administrator is used to add the client to the system in the desired domain and group. A client ID is generated, but activation is a separate process.
- Batch client registration
Multiple clients are described in a single "client definition" file. The clients are registered by importing the file into the Avamar server. A client ID is generated, but activation is a separate process.

For Avamar Desktop/Laptops, Avamar Activation Manager improves on each of these methods by providing a user interface that simplifies the registration (and activation) of large numbers of Avamar Desktop/Laptops. This is described in "Avamar Activation Manager" on page 28.

Activating

Activating an Avamar client is the process of transmitting the client ID (created during registration of the client) from the Avamar server to the client. The client ID is stored in an encrypted file on the client file system and is used to authorize Avamar data protection operations.

Traditionally, there are two ways to activate a client:

- Client-side activation

Initiated by right-clicking the Avamar server tray icon and selecting **Activate**. Registration and activation occur in the same transaction.

- Server-side activation

Avamar Administrator is used to initiate client activation by sending an invitation to the client. The client software accepts the invitation. Invitations are sent to one client at a time.

For Avamar Desktop/Laptops, Avamar Activation Manager improves on both of these methods by providing a user interface that simplifies the activation of large numbers of Avamar Desktop/Laptops. This is described in "Avamar Activation Manager" on page 28.

Avamar Activation Manager

The Avamar Activation Manager software provides a web browser interface through which an Avamar administrator can register and activate a large number of newly installed Avamar clients.

Starting Avamar Activation Manager

Start the Avamar Activation Manager UI from Avamar Enterprise Manager by clicking **Activation Manager**.



The Client Data Source screen appears.

Client Data Source

The Client Data Source screen provides two choices that determine the source for the client data required by Avamar Activation Manager: **Query Directory Service** or **Import Client List**.

EMC Avamar Activation Manager v1.0

Client Data Source

Query Directory Service

Import Client List

Continue Reset

Login Date & Time: Oct 22, 2009 1:33:46 PM User: MCUser

Query Directory Service

When you select **Query Directory Service**, your enterprise's directory service is used to obtain information about clients and, if available, directory service organizational units, such as domains, sub-domains, and groups. Before using Query Directory Service, complete the steps in "Configure Avamar Activation Manager" on page 15.

To use Query Directory Service, start Avamar Activation Manager as described in "Starting Avamar Activation Manager" on page 28 and, on the Client Data Source screen, select **Query Directory Service**. The Directory Service Authentication section appears.

EMC Avamar Activation Manager v1.0

Client Data Source

Query Directory Service

Directory Service Authentication

User Domain: lab.local

Username

Password

Directory Domain: lab.local

Import Client List

Continue Reset

Login Date & Time: Oct 22, 2009 1:33:46 PM User: MCUser

The Directory Service Authentication section has four fields.

FIELD	DESCRIPTION
User Domain	The Kerberos realm used to authenticate the account specified by Username. This list box receives its values from ldap.properties.
Username	Username of an account that is authorized to read the directory service's database.
Password	Password associated with the username.
Directory Domain	The Kerberos realm that is polled for the client and organizational unit information displayed in the Directory Information section of the main Avamar Activation Manager window. This list box receives its values from ldap.properties.

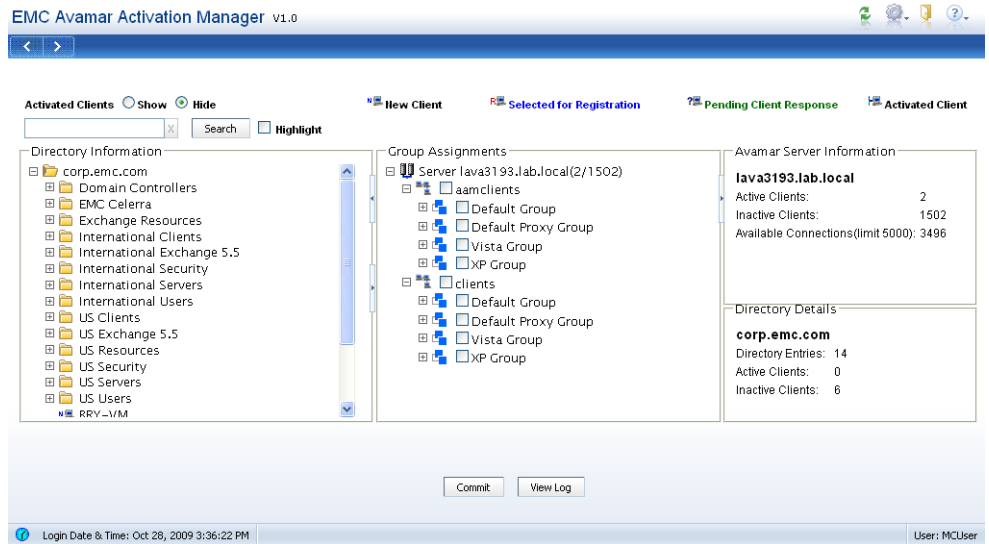
To query your enterprise's directory service for information about clients and, if available, directory service organizational units, such as domains, sub-domains, and groups:

1. Select **Query Directory Service**.

The Directory Service Authentication section appears.

2. In **User Domain**, select the Kerberos realm to use for authentication of your user account information.
3. In **Username**, type the username for the account to use to query the directory service.
4. In **Password**, type the password for the account.
5. In **Directory Domain**, select the Kerberos realm to query for client and organizational unit information.
6. Click **Continue**.

The account information is verified, the directory domain is polled for client and organizational unit information, the Avamar server is polled for Avamar domain and group information, and the UI appears, populated with this information.



Import Client List

As an alternative to using your enterprise's directory service to provide client information, you can import a client list file. The client list file is a plain text, comma separated value (CSV), file containing up to two values for each client:

- (Required) Fully qualified domain name (FQDN)
- (Optional) Directory service logical group name; in LDAP and Active Directory, this is the client's organization unit (OU)

The client list file method is particularly useful when you combine it with output from a Systems management tool's installation of the Avamar Desktop/Laptop software. After an installation run, many Systems management tools can be configured to output a CSV file containing the required values. When this file is imported into Avamar Activation Manager, all clients listed in the Organization Units section are known to have the Avamar Desktop/Laptop software installed.

The second value is optional. If it is not provided, the client is listed at the root level of the hierarchical display.

A correctly formatted client list file looks like the following example.

```
Hostname, Group
User1-desktop.Acme.corp.com, acme.corp/USA/MA
User1-laptop.Acme.corp.com, acme.corp/USA/CA/SFO
User2-desktop.Acme.corp.com, acme.corp/Engineering
User3-desktop.Acme.corp.com,
User4-desktop.Acme.corp.com,
```

A forward slash ('/') is used to separate the hierarchical levels of the directory service logical group name.

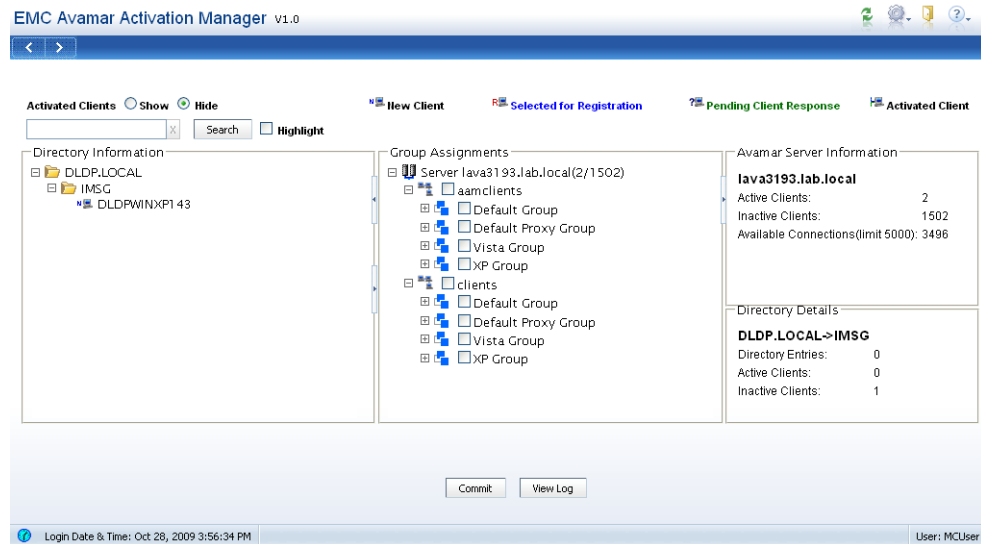
To use the client list file as a data source:

1. Select **Import Client List**.
2. Click **Browse**, and find and select the file.

NOTE: The client list file must be available on the computer that is running the Avamar Activation Manager web browser UI.

3. Click **Continue**.

The client list file is imported, the Avamar server is polled for Avamar domain and group information, and the UI appears, populated with this information.



The client list file used in the pictured example contained the following data:

Hostname , Group

DLDPWINXP143 , DLDP . LOCAL /IMSG

The Avamar Activation Manager UI





The Avamar Activation Manager UI uses four data sections, several controls and other graphical elements to simply and enhance the activation process.

Directory Information

The Directory Information section uses a familiar hierarchical tree view to display clients and their directory service group relationships.

A folder icon represents each level of the directory hierarchy.

The following icons are used to represent clients and client state:







-  Client that has not been selected to be registered or activated
-  Client that is pending registration
-  Client that is registered and invited to activate
-  Client that is fully registered and activated

Group Assignments

Information about each Avamar server's hierarchical relationships of domains, subdomains, groups, and clients is provided in the Group Assignments section. The information in this section is obtained from all Avamar servers that can be reached by Avamar Activation Manager.

The Group Assignments section is the active work area of Avamar Activation Manager. Clients are assigned to a domain and group and registered/activated by dragging their icon from the Directory Information section and dropping them in a group in this section.

The following icons are used in the Group Assignments section:

-  Avamar server
-  Avamar server domain or subdomain
-  Avamar server group
-  Client that is pending registration
-  Client that is registered and invited to activate
-  Client that is fully registered and activated

Avamar Server Information

The Avamar Server Information section provides information about the selected Avamar server:

- **Active Clients** lists the number of clients that have been fully registered and activated.
- **Inactive Clients** lists the number of clients that are registered but not activated. This includes both registered but not yet invited, and registered and invited clients.
- **Available Connections** lists the current number of Avamar Desktop/Laptops that can be added to the selected Avamar server. This number is determined by subtracting the combined amounts of **Active Clients** and **Inactive Clients** from the client limit (5000 clients is the default value).


Directory Details

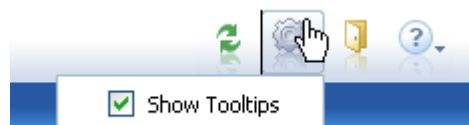
The Directory Details section provides summary information about the directory service data displayed in the Directory Information section:

- **Directory Entries** lists the number of next-level logical groups or organizational units displayed.
- **Active Clients** lists the number of fully activated clients contained in the selected logical groups or organizational unit.
- **Inactive Clients** lists the number of clients contained in the selected logical groups or organizational unit that are not fully activated.

Controls

The Avamar Activation Manager web browser UI has the following controls:

- **Activated Clients** — Located at the top of the window, **Activated Clients** provides a toggle for showing or hiding clients that have successfully been activated. Select **Show** to display fully activated clients in the Directory Information and Group Assignments sections; select **Hide** to hide them.
- **Search** button, with text field and **Highlight** option — Located above the Directory Information section, the **Search** button initiates a search of the Directory Information section for a computer with a specific name or several computers with similar names. "Searching for Clients" on page 36 describes how to use this control.
- **Commit** button — Click **Commit** to push registration information to the Avamar server based on the current state of the Group Assignments section and to generate and send a client ID to each client shown in the Registered state in that section.
- **View Log** button — Click **View Log** to display the Avamar Activation Manager log.
- Refresh button — To refresh the view, click the button 
- **Show Tooltips** — Select to view Tooltips, clear to hide them.



Session Timeout

A session times out after 30 minutes of inactivity. When your session has been running for 30 minutes or more without any interaction between your web browser and the Avamar Activation Manager server it will time out. Avamar Activation Manager will not time out while a commit task is in progress.

When your session times out, close the web browser window or tab in which the session was running, and re-launch Avamar Activation Manager as described in "Starting Avamar Activation Manager" on page 28.

To change the session timeout value:

1. Log in as root on the Avamar utility node.
2. Stop the Apache Tomcat server.

```
/usr/local/avamar.bin/emwebapp.sh --stop
```

3. Open for editing the following file:

```
/usr/local/jakarta-tomcat-5.5.9/webapps/aam/WEB-INF/web.xml
```

4. Change the value of the session-timeout tag to a new value, in minutes.

For example, the default section is:

```
<session-config>  
<session-timeout>30</session-timeout>  
</session-config>
```

To change the timeout value to 1 hour, modify the section to:

```
<session-config>  
<session-timeout>60</session-timeout>  
</session-config>
```

5. Restart the Apache Tomcat server:

```
/usr/local/avamar.bin/emwebapp.sh --start
```

The timeout value is changed.

Using Avamar Activation Manager

The Avamar Activation Manager web browser UI is used to perform the following tasks:

- "Searching for Clients" on page 36
- "Using Directory Information Search" on page 40
- "Registering and Activating Clients" on page 41
- "Removing Clients" on page 43
- "Re-inviting Clients" on page 43

IMPORTANT: Do not perform new user activations during a backup window and do not perform more than 1,000 activations at one time. Running both new user activations and backups at the same time, or running more than 1,000 simultaneous activations, can exceed available server resources.

Searching for Clients

The Avamar Activation Manager UI provides the ability to search for specific computers listed in the Directory Information section. You can search for a computer using its full name or search for computers that match a search string.

Search String

The search string is one or more characters that you type into the search field.

You can use wildcards in the search string:

- Asterisk (*) represents zero or more characters
- Question mark (?) represents one character

It must comply with the following rules:

- No more than 24 characters
- Cannot start with a period character
- Cannot contain any of the characters in the following table:

CHARACTER	NAME	UNICODE
/	Solidus	002F
:	Colon	003A
?	Question Mark	003F
"	Quotation Mark	0022
<	Less-than Sign	003C
>	Greater-than Sign	003E
\	Reverse Solidus	005C

CHARACTER	NAME	UNICODE
,	Comma	002c
~	Tilde	007E
!	Exclamation Mark	0021
@	Commercial At	0040
#	Number Sign	0023
\$	Dollar Sign	0024
%	Percent Sign	0025
^	Circumflex Accent	005E
	Vertical Line	007C
&	Ampersand	0026
'	Apostrophe	0027
(Left Parenthesis	0028
)	Right Parenthesis	0029
{	Left Curly Bracket	007B
}	Right Curly Bracket	007D
_	Low Line	005F

Search Matching

When you click **Search**, the string is compared to the names of all computers listed in the Directory Information section. If a computer name matches the string, the computer is included in the search results.

To find a specific computer the search string must exactly match that computer's name.

The following table describes the rules governing search matches.

RULE	EXAMPLE SEARCH STRING	EXAMPLE RESULTS
Computer names are searched for an exact match to the search string. The match is not case-sensitive.	123abc-example	<p>Matches:</p> <ul style="list-style-type: none"> • 123abc-example • 123aBc-example • 123abC-example <p>Does not match:</p> <ul style="list-style-type: none"> • abcexample • labcode.example.com • Abc.corp.example.com • bca.example.com • ab_c.example.com • AB-C.example.com

RULE	EXAMPLE SEARCH STRING	EXAMPLE RESULTS
An asterisk represents any zero or more characters in a computer's name.	*ab*	Matches: <ul style="list-style-type: none"> • abc.example • cabc.124.net • labcode.example.com • ab_c.example • cab • AB-C.corp.example.com Does not match: <ul style="list-style-type: none"> • bca.example • a_c.example.com • A-B123
A question mark represents any one character in a computer's name.	a?c	Matches: <ul style="list-style-type: none"> • abc • a2c • a_c • aBc • AbC Does not match: <ul style="list-style-type: none"> • ab_c • abc123 • AB-C
Special characters in a computer's name are not ignored.	*ab.c*	Matches: <ul style="list-style-type: none"> • cab.com • 123ab.corp • terAB.c Does not match: <ul style="list-style-type: none"> • abc • ABC • abc.corp

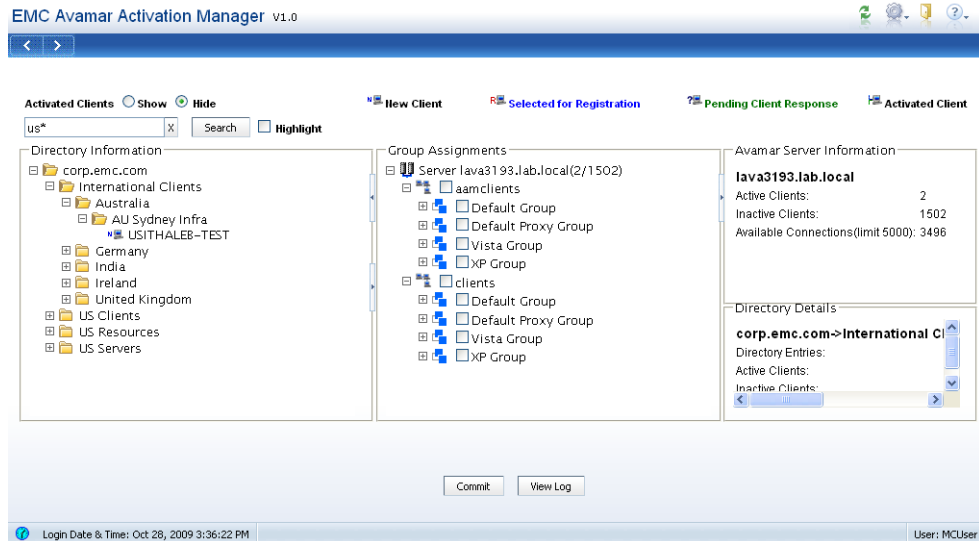
Search Results Views

The results of your Directory Information section search appear over the current Directory Information section. A search produces results in either the default view or the Highlight view.

Default view

The default search results view presents all matching computers at the top level and all top-level folders that contain at least one matching computer. To see matching computers beneath the top level, expand the displayed folder, and any intervening sub-folders until the computers are displayed.

To drag and drop all matching computers in this results view, select all top-level folders and all top-level computers in the view and drag that selection set. Selecting a folder in this view selects the matching computers it contains. It does not select any non-matching computers the folder contains.



Highlight view

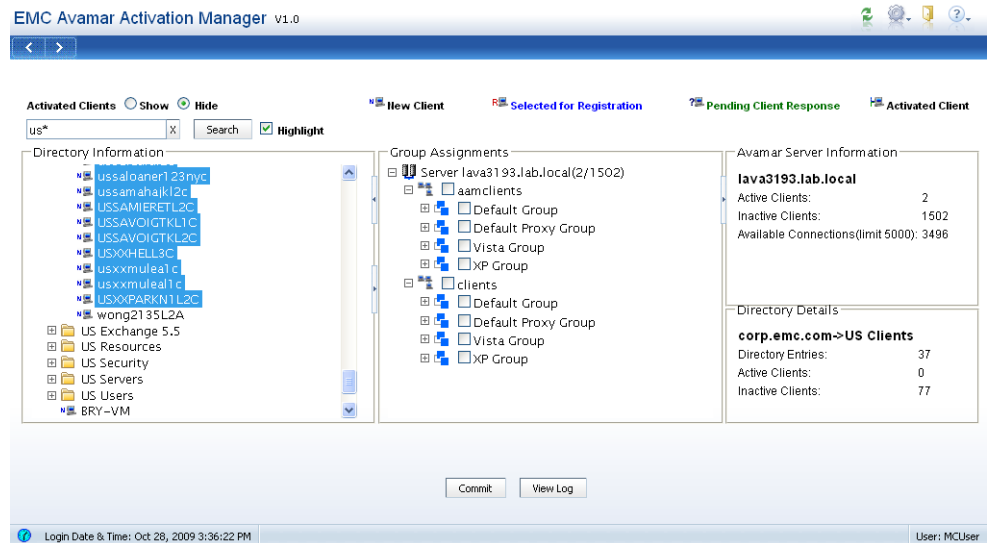
Select **Highlight** next to the Search button before running a search to perform a focused search of computers that are currently visible either on the top level or on an expanded branch.

Computers that are not currently visible but are on a branch that was expanded and then collapsed during the current session are also searched.

The search does not include computers that are on a branch that has not been expanded during the current session.

The results of a Highlight search are displayed by highlighting the visible computers that match the search criteria. The results may require scrolling to see every matching computer.

To drag and drop all matching computers in this results view, drag any one of the selected computers and all selected computers will be included. Or click any computer's name to select it and clear all other computers. The matching computers will remain in the results but only the selected computer will be dragged.



Using Directory Information Search

Directory Information search can be used to:

- Search and activate using the default view
- Search and activate using the Highlight view
- Return to full Directory Information view

Search and activate using the default view

To search and activate computers using the default view:

1. Type your search string in the search field.
2. Clear **Highlight**.
3. Click **Search**.
4. Activate computers from the results:
 - Select all computers in the results by selecting all top-level folders and all root level computers in the view and drag that selection set to a group in Group Assignments.
 - Expand folders and subfolders as needed to find individual computers in the results, select one or more computers, and drag the selection to a group in Group Assignments.
5. In Group Assignments, select the checkbox next to each client you want to register and activate.
6. Click **Commit**.

“Registering and Activating Clients” on page 41 describes the activation process in more detail.

Search and activate using the Highlight view

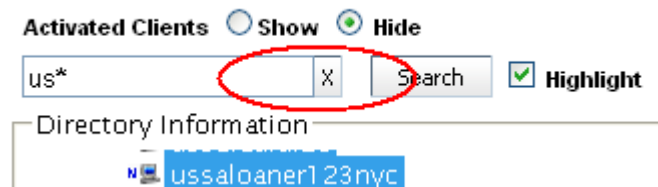
To search and activate computers using the Highlight view:

1. Expand all branches of the Directory Information tree that you want searched.
2. Type your search string in the search field.
3. Select **Highlight**.
4. Click **Search**.
5. Activate computers from the results:
 - Activate all computers in the results by dragging any one of the selected computers to a group in Group Assignments.
 - Browse the results, select one or more computers, and drag the selection to a group in Group Assignments.
6. In Group Assignments, select the checkbox next to each client you want to register and activate.
7. Click **Commit**.

“Registering and Activating Clients” on page 41 describes the activation process in more detail.

Return to full Directory Information view

To clear the results of a search and return to the full Directory Information view click the **X** next to the search field.



Registering and Activating Clients

To register and activate clients:

1. Log in to Avamar Enterprise Manager using an Avamar administrator account.
2. Click **Activation Manager**.

The Avamar Activation Manager Client Data Source screen appears.
3. Complete the steps to use one of the data sources as described in “Query Directory Service” on page 29 and “Import Client List” on page 31, and click **Continue**.

The Avamar Activation Manager web browser UI appears.



4. In the Directory Information section, find the clients you want to activate and select them. When selecting clients, press **Ctrl** to select more than one and **Shift** to select several in sequence.

Use Search to find specific clients by name as described in "Using Directory Information Search" on page 40.

NOTE: Selecting an organizational unit folder includes all of the clients in that folder. Dragging and dropping a folder is the same as dragging and dropping all of the clients it contains.



5. In the Group Assignments section, display the domain and group that you want to add the selected clients to.
6. Drag the selected clients from the Directory Information section to the Group Assignments section and drop them on the selected group.

Or, if you have selected an organizational unit folder, drag and drop that folder on the selected group.


Each selected client's icon changes from  to  , indicating that the registration of the client is pending.

7. Repeat steps 4 through 6 until all clients are added to an Avamar group.
8. In Group Assignments, select the checkbox next to each client you want to register and activate, or the checkbox next to a group to select all of the clients in the group.
9. Click **Commit**.

Registration information for all unregistered clients dragged into the Directory Information section is pushed to the Avamar server. A unique client ID is generated for each newly registered client and is pushed to the client.

Each newly registered client's icon changes from  to  , indicating that the client is registered, and completion of activation is pending.

Clients remain in the pending activation response state until the activation invitation is accepted. Acceptance is automatically handled by the Avamar client software on each client.

After the software accepts the invitation, an encrypted client ID is stored on the client and the client joins its group's backup schedule. Once the client is activated, its icon changes to  .

If a timely activation of a client does not occur, it is usually because the client is unavailable or because the Avamar Desktop/Laptop software is not properly installed. Review the log as described in "Avamar Activation Manager Log" on page 45 to determine the status of each client's activation invitation.

Client Selected for Multiple Activations

When a computer is inadvertently selected for activation with more than one Avamar server, a message appears:

Client *computer_name* is selected for activation with more than one server.

where *computer_name* is the name of the computer that is selected for activation with more than one server.

To correct this problem, find each instance of the computer in Group Assignments and clear all but the one associated with the Avamar server with which it should be activated.

Removing Clients

While working with clients in the Avamar Activation Manager UI, you may occasionally drag clients into Group Assignments that you do not want to register and activate at that time. You can easily remove any clients added to Group Assignments since the last time **Commit** was clicked.


The removal process can only be used with clients that are pending registration. Clients that have been registered and pending an activation response cannot be removed using this method.

To remove clients that are pending registration:

1. Find the client in Group Assignments.

The client's icon will be .

2. Select the checkbox next to the client.
3. Repeat this for each client you want to remove.
4. Right-click anywhere in Group Assignments, and select **Remove Clients**.

All selected clients are removed from Group Assignments and their icon changes back to .

Re-inviting Clients

After correcting any problem that caused a client registration and activation invitation attempt to fail, you can re-invite the client.


To re-invite clients:

1. Log in to Avamar Enterprise Manager using an Avamar administrator account.
2. Click **Activation Manager**.

The Avamar Activation Manager Datasource Selection screen appears.

3. Complete the steps for one of the data sources as described in "Query Directory Service" on page 29 and "Import Client List" on page 31, and click **Continue**.


The Avamar Activation Manager web browser UI appears.

4. Find the clients that you want to re-invite in the Grid Information section, and select the checkbox next to their names. The icon for clients that are in the pending activation state and can be re-invited is  .

5. Click **Commit**.

Registration information for all re-invited clients is pushed to the Avamar server. A unique client ID is generated for each and is pushed to the client.

Clients remain in the pending activation response state until the activation invitation is accepted. Acceptance is automatically handled by the Avamar client software on each client.

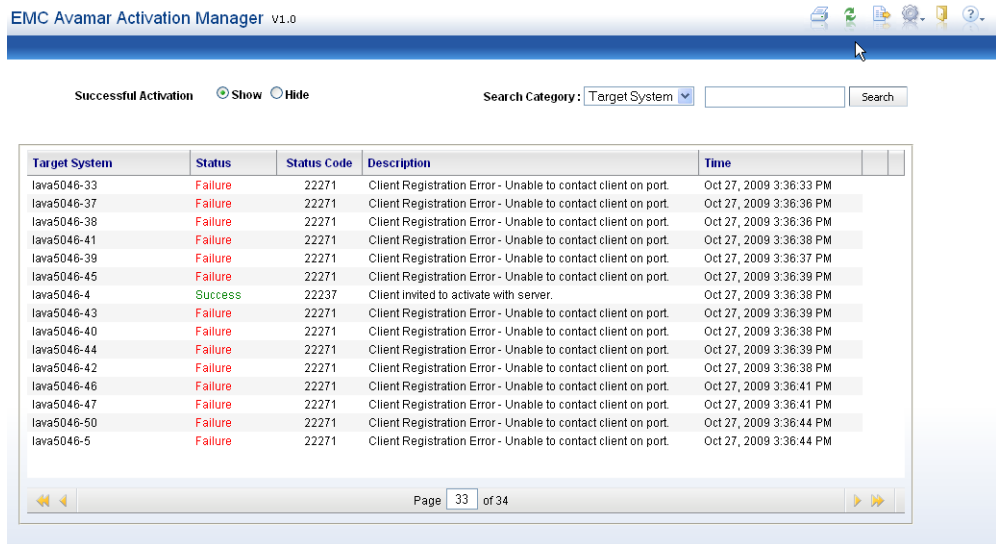
After the software accepts the invitation, an encrypted client ID is stored on the client and the client joins its group's backup schedule. Once the client is activated, its icon changes to  .

AVAMAR ACTIVATION MANAGER LOG

The Avamar Activation Manager log provides an up-to-date record of the status of all registration and activation tasks initiated through the UI. You can use it to determine which clients successfully have Avamar backup installed and which require follow-up work in order to be sure that they are protected.

Using the Log

To open the Avamar Activation Manager log, click **View Log**.



The log has a line-by-line record of each client registration and activation attempt.

The log displays information using the columns described in the following table.

COLUMN NAME	DESCRIPTION
Target System	The client's hostname.
Status	Displays Success when the client was contacted, the Avamar Desktop/Laptop software is properly installed, and the activation invitation was delivered. In all other cases it displays Failure .
Status Code	Displays the following numeric status codes: <ul style="list-style-type: none"> • 22237 for Success • 22271 for Failure due to inability to contact the client • 23006 for Failure because the client's hostname is longer than 63 characters
Description	Displays a brief description of the result: <ul style="list-style-type: none"> • Client Registration Error — Unable to contact client on port • Client invited to activate with server • Client hostname longer than 63 characters
Time	Displays the time of the attempt relative to the Avamar server's time zone.

To hide successful registration and activation invitation events, in **Successful Activation**, select **Hide**. To show them, select **Show**.

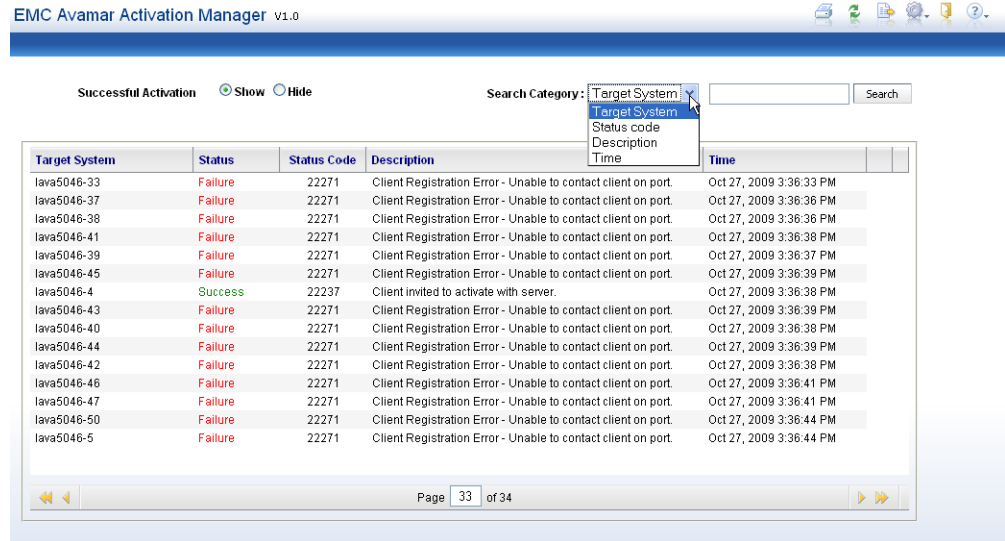
Refreshing the View

To refresh the log with the most current information, click **Refresh**.

Searching the Log

To search the log:

1. Select one of the search categories from the list box.



2. In the text field, type a text string to search for in that category.
3. Click **Search**.

The search categories are described in the following table.

SEARCH CATEGORY	DESCRIPTION
Target System	Client hostname
Status Code	Numeric event codes
Description	Brief descriptions of event result
Time	Time of event relative to the Avamar server's time zone

Exporting the Log

The log can be exported as a comma-separated value (CSV) file. The export can be viewed immediately using an application capable of displaying CSV files, or you can save it.

Exporting and Viewing

To export and view the log immediately:

1. On the log window, click 

A dialog box opens.

2. Select **Open**.
3. Select the application.
This should be an application that can open and display CSV files.
4. Click **OK**.

Exporting and Saving


To export and save the log:

1. On the log window, click **Export**.
A dialog box opens.
2. Select **Save**.
3. Click **OK**.
A save dialog box opens.
4. Select a name and save location for the file.
5. Click **Save**.

Printing the Current Log View

The current browser view of the log can be printed.

To print the current view:

1. On the log window, click 
The Print dialog box opens.
2. Configure the print settings.
3. Click **OK**.

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